OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

Community Effects Plan

August 2025



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Cariboo Gold Project

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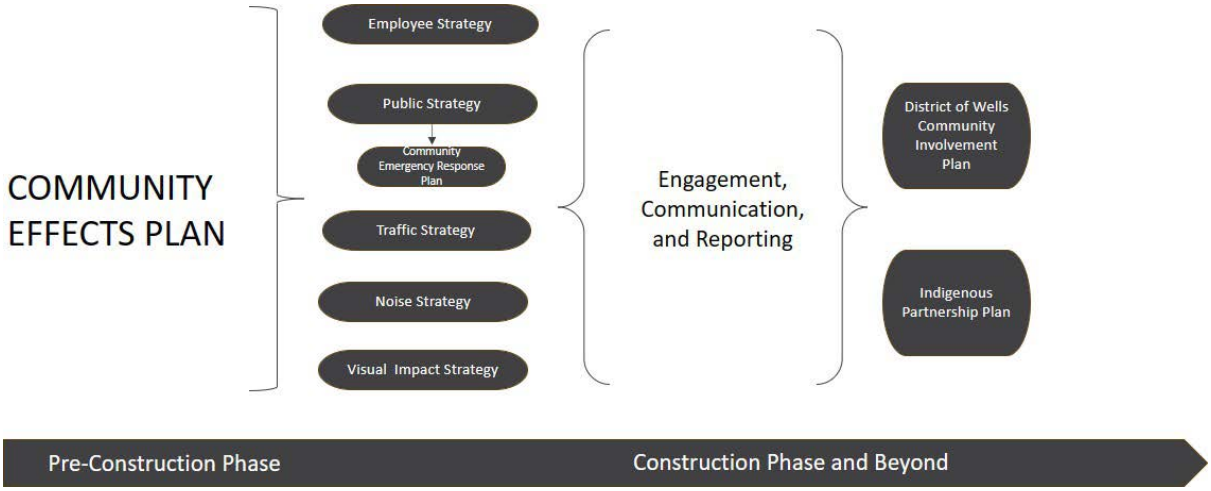
SUMMARY

The Community Effects Plan is a condition of the Environment Assessment Certificate (EAC) in British Columbia for the Cariboo Gold Project (Project). The Project is an underground gold mine in the Cariboo Regional District (CRD) that is located in and adjacent to the community of Wells, BC. The Project is within or in proximity to the unceded traditional territories of the following Indigenous nations: Lhtako Dené Nation, Xatśūll First Nation, Williams Lake First Nation, Tŝilhqot'in National Government, and Nazko First Nation. The Construction phase of the Project is estimated to start in January 2025 and is anticipated to last two years. The Operation phase of the Project is predicted to last for approximately 12 years. This 2024 Community Effects Plan outlines strategies for implementing mitigations that address potential community impacts resulting over the lifespan of the Project.

The Community Effects Plan is informed by engagement with Indigenous nations, technical committees, community advisory committee, and local governments that was conducted during the development of the environmental assessment (EA) for the Project. The five distinct strategies in the Community Effects Plan consolidate the mitigation measures identified in Condition 16 of the EAC conditions and Table 20.1: Summary of Proposed Mitigation Measures for the Project. The five strategies that make up the Community Effects Plan are the:

- Employee Strategy
- Public Strategy
- Traffic Strategy
- Noise Strategy
- Visual Impact Strategy

Additional details and contextual information for the strategies can be found in Appendices A through E of the Community Effects Plan. The Community Effects Plan is intended to be implemented through an adaptive management and monitoring process that evolves and changes to new information, feedback, and priorities of the local community and Participating Indigenous nations over the life of the mine. An Engagement, Communication, and Reporting Strategy (Appendix G) supports the adaptive management and monitoring process. The Community Effects Plan will be overseen by Independent Environmental Monitors and verified by the Environmental Assessment Office (EAO). The diagram below provides a visual summary of the Community Effects Plan.



The area where the Project is located is made up of rural and remote communities that have been shaped by a rich Indigenous heritage and a long history of resource development. Some of the challenges facing the region include an aging population, economic dependency on resource industries and social issues such as substance use and mental health.

The mitigations described in the Community Effects Plan were developed through engagement and consultation with local communities and Participating Indigenous nations who may be potentially impacted by the Project. Discussions with the Technical Advisory Committee (TAC) and the Community Advisory Committee (CAC) during the development of the Project's EA also informed the strategies contained in the Community Effects Plan. In addition to the 25 members of the public that comprised the CAC, the following Participating Indigenous nations, local community, and partners provided input that informed the development of the Community Effects Plan:

- Participating Indigenous Nations:
- Lhtako Dené Nation
- Xatśūll First Nation
- Williams Lake First Nation
- Local government, health authorities, and local community:
- District of Wells (District)
- City of Quesnel
- Interior Health
- Northern Health

Local Social and Community Services Provincial Government:

- Ministry of Energy, Mines, and Low Carbon Innovation (EMLI)
- Ministry of Environment and Climate Change Strategy
- Ministry of Water, Land and Resource Stewardship
- Ministry of Forests
- Ministry of Jobs, Economic Recovery, and Innovation
- Ministry of Indigenous Relations and Reconciliation
- Ministry of Transportation and Infrastructure
- Ministry of Agriculture

Mitigations addressed through the Community Effects Plan's strategies also considered the Project's impacts on diverse populations. A Gender Based Analysis was conducted for the Project's EA to understand if the Project would have disproportionate effects on different population groups. The results of the analysis identified that:

- Human health effects would be disproportionately experienced by those with underlying health conditions, and those who consume higher quantities of fish, have higher exposure to sediment, or drink water from Wells.
- Children and young adults may be disproportionately affected by changes in the population of Wells and human health risks.
- Adults who are not working or not benefiting from the Project (such as those who do not benefit from the opportunities offered by the Project, and who face increased challenges due to increases in the cost of living in the community) may be disproportionately affected economically.
- Residents of Wells who live in closer proximity to the Project will be disproportionately affected from noise and vibration, light, dust, and vehicle traffic, and the changes to the views in Wells.
- The Project could strain emergency health, health, and social services in Quesnel, and have direct or indirect negative effects on vulnerable populations.
- Residents in the CRD and specifically in Wells may experience both positive economic effects, and negative effects from the Project.

Individuals that may potentially experience adverse effects include:

- Individuals who may not adjust well to living in a camp environment or working longer shifts.

- Individuals who do not make positive lifestyle choices with their increased income (e.g. those who choose to engage in substance abuse).
- Individuals affected by changes associated with the rotating work schedule or the rural location of the Project, whether it be a worker at the jobsite, family members at home dealing with the household while the worker is away, or those moving to the community without a support network.
- Individuals whose current lifestyle, perceived or otherwise, is being negatively affected, which could result in increased mental health issues, violence, or family breakdown.

Assumptions and Limitations of the Community Effects Plan:

- The Community Effects Plan is designed using an adaptive management and monitoring approach, which assumes that there will be ongoing adjustments based on evaluation and feedback.
- The 2024 Community Effects Plan is based on engagement that took place during the development of the Project's EA. The information gathered from previous engagement activities is assumed to be appropriate and applicable for the development of this 2024 Community Effects Plan.
- The Community Effects Plan serves as a framework for coordinating mitigations but does not provide an analysis or results from implementing mitigations.

Community Effects Plan Implementation Plan

Engagement, Communication, and Progress Reporting

Successful implementation of the Community Effects Plan relies on meaningful engagement, effective communication, and transparent progress reporting. The Community Effects Plan: Engagement, Communications, and Reporting Strategy (Appendix G) details a plan for engaging with the public, local community, Participating Indigenous nations, and partners, through the following methods:

- Electronic Methods:
  - Utilizing electronic platforms for disseminating information, such as emails and newsletters and leveraging social media channels to provide updates and engage with the communities and public.
- Print Methods:
  - Sending out mail-outs and newsletters to keep the communities and the public informed.
  - Publishing updates in the local newspaper to reach a wider audience.

- Face-to-Face Methods (virtual or in-person):
  - Hosting formal meetings to discuss Project updates and address concerns.
  - Conducting community meetings to gather feedback and provide information.
  - Arranging one-on-one meetings for personalized discussions.
  - Participating in community events to interact with the local community and Participating Indigenous nations.
  - Organizing mine-site visits to showcase operations and address questions.
  - Establishing a Community Relations Office in Wells to serve as a point of contact for the public.
  - Appointing Community Liaisons from Indigenous nations and the District to facilitate communication.
- Formal Document Reviews:
  - Providing opportunities for the local community, Participating Indigenous nations, and partners to review and provide feedback on formal documents related to the Project, such as the Community Effects Plan Annual Report.

Employee Strategy

The Community Effects Plan Employee Strategy will address concerns and interests raised by the local community, Participating Indigenous nations, and Project partners related to the effects that Project workers may have on local communities. The Employee Strategy also outlines strategies to support residents of the local community and Participating Indigenous nations gain employment with the Project or support them during their employment with the Project. BGM plans to implement mitigations and address potential issues related to Project workers through:

- Employee Behavior and Conduct Management:
  - BGM will enforce policies to manage and prevent inappropriate behavior or conduct by workers in relation to the local community and Participating Indigenous nations. All workers must sign and comply with BGM's Code of Conduct, which applies to all employees while on shift, including off-duty hours during their rotation, regardless of whether they are local or non-local, and regardless of where they are residing. The Code of Conduct applies for the full duration of an employee's work rotation at the Project. BGM's Code of Conduct outlines expectations for behavior, safety, and ethical conduct.
  - BGM enforces zero-tolerance policies for alcohol and drug use, bullying, harassment, and workplace violence to ensure a safe and respectful work environment.
- Addressing Challenges to Community Well-being:

- Plans will be implemented to address challenges that workers may pose to the well-being of the local community and Participating Indigenous nations. This includes providing $15,000 per year for support services to address specific concerns related to mental health, safety, or supporting population groups to gain employment with the Project that have historically been underrepresented in mining.

- Addressing Housing Market Pressures:
  - BGM will mitigate pressures on the local housing market that could potentially result from the increase in population caused by an influx of Project workers. Strategies include providing worker accommodations for non-local workers.
- Workforce Diversity and Local Hiring:
  - BGM plans to increase the diversity of its workforce through equitable hiring practices and creating a safe and inclusive workplace through their workplace policies and programs.
  - BGM provides mandatory training programs for all employees on policies related to equal employment, Code of Conduct, anti-bullying, harassment, safety, and cultural awareness.
  - BGM prioritizes local and Indigenous hiring, offers training opportunities to increase the skills of the local workforce, and will host or will participate in Local and Regional job fairs and open houses to inform the public about employment opportunities.
- Cultural and Psychological Safety:
  - BGM's Human Resource Policy ensures respect for human rights, promotes diversity and inclusion, and provides processes to address employee concerns.
  - BGM discourages Project workers from participating in recreational activities like hunting, fishing, and off-road vehicle use within the Project footprint in efforts to mitigate conflicts and protect natural resources.
  - BGM is developing policies and training programs to embed cultural awareness into all aspects of its operations to promote respect for Indigenous cultural practices and rights.
- Support for Re-Employment:
  - Plans will be in place to support re-employment opportunities for workers during temporary or permanent Project closure. Plans include providing training, education, or support for workers transitioning to new employment opportunities.
  - BGM offers support services and benefits to employees during temporary or permanent Project closure, including career planning, transition support, and extended health benefits under certain conditions.

BGM's policies and programs aim to create a safe, respectful, and inclusive workplace environment, promote local and Indigenous employment opportunities, and mitigate potential negative impacts on the surrounding communities. By engaging with the community and implementing measures to prevent adverse effects, BGM hopes to build positive relationships with the local communities. BGM also wants to ensure the well-being and sustainability of the Project's workforce and neighboring communities.

Employee Accommodation Strategy

The Employee Accommodation Strategy outlined by BGM addresses the need to accommodate workers from outside the local area during different phases of the Project while considering the impact on local housing and health services. During the Construction and Operations phases, workers from outside the local area are expected to stay at worker accommodations. New accommodations will be built at the mine site and QR Mill, and upgrades will be made to existing BGM-owned accommodations to house the workforce. Employees will be required to leave the accommodations when they are not on duty. The worker accommodations will include amenities such as single-person rooms, kitchens, fitness rooms, and recreational areas. Workers must comply with the Code of Conduct, including the zero-tolerance for drugs and alcohol policy. Workers will be discouraged from participating in recreational activities such as hunting or fishing within the Project footprint.

Employee Transportation

Shuttles will transport workers from Quesnel to the mine site and QR Mill during the Construction phase. Once accommodations are built, shuttles will run according to shift schedules, with parking available for personal and commercial vehicles at various Project sites.

Employee Strategy Implementation

To effectively mitigate community concerns related to the Project workforce, BGM is focusing adherence to the Code of Conduct and training. The plan emphasizes collaboration with the local community and Participating Indigenous nations and the implementation of measures to support workforce development and well-being.

BGM plans to report quarterly employment projections to the local community and partners, including the health authorities and school boards to support collaboration and planning efforts. BGM will share information about the worker accommodations and how BGM is addressing barriers to employment during community meetings.

Public Strategy

The Public Strategy outlines how BGM will address community and public concerns related to the Project. The Public Strategy also includes BGM's Community Emergency Response Plan that

details how BGM will mitigate and address Project-related emergency events that have the potential to impact the local community.

BGM will implement the Public Strategy using the engagement methods outlined in the Community Effects Plan Engagement, Communication, and Reporting Plan (Appendix G).

- Monitoring for Effects and Mitigation Measures:
  - BGM will monitor the effects of the Project and the effectiveness of mitigation measures for diverse groups by adapting engagement methods to effectively reach diverse populations and seeking to understand how the Project is impacting them.
- Addressing Concerns from the Public:
  - BGM commits to responding to public comments within 24 hours or providing a meaningful response within 5 business days if an immediate response is not possible. Concerns will be organized by theme or topic, summarized, and shared at community meetings.
- Respecting Confidentiality:
  - BGM will keep the identity of individuals submitting questions or concerns confidential. Anonymous submission options include comment boxes, anonymous letters, and online forms. Comments and questions will be themed, summarized, and posted to the project website's FAQs without identifying information.
- Financial Contributions
  - BGM will provide the following financial contributions to community partners to support engagement and consultation. Financial contribution will also be made to mitigate potential adverse social effects of the Project.
    - **Community Liaison**: BGM has signed an agreement with the District in the amount of $140,004 annually for a full-time Community Liaison position. The Community Liaison will support the District to engage with BGM and participate in Project- related matters during both the Construction and Operations phases. Their responsibilities include reviewing documentation provided by BGM or the EAO and representing the community's interests. The Community Liaison will engage with the community and the District and share their feedback to BGM. The Community Liaison will attend community meetings in the District. BGM and the District will evaluate the position and the terms of the agreement annually and adjust as needed.
    - **Lhtako Dené Nation Community Liaison**: BGM supports a community liaison position for the Lhtako Dené Nation who is responsible for sharing information about the Project with the community and relaying community feedback to BGM.
    - **Mental Health Support Worker**: BGM will contribute $15,000 annually towards a Social Worker to provide confidential mental health support to residents of Wells and

Quesnel. The Mental Health Support Worker/Social Worker will attend Project-related community events to provide mental health support and advise BGM on local community mental health concerns when concerns are identified. . BGM will provide funding for the position for four years. The position will be evaluated annually, and adjustments will be made as required.

- **Amata Transition House Society**: BGM has signed a funding agreement with Amata Transition House Society to help address issues related to domestic violence, sexual exploitation, and abuse that may arise from the Project. Additionally, these contributions can be directed towards supporting individuals from underrepresented groups in the mining industry to participate in Project employment opportunities.

Community Emergency Response Plan

The Community Emergency Response Plan (CERP) addresses local community concerns regarding potential emergencies related to the Project that could result in an emergency for the community. The key components of the plan include:

- Prevention and Preparation:
  - **Community Hazard Assessment**: Identifies industry and Project-specific hazards to the community so that BGM can prevent incidents and prepare for a community emergency event. The hazard assessment will support BGM to identify their role in addressing vulnerabilities, mitigating hazards, and preparing to respond to, or recover from, a variety of hazards events.
  - **Emergency Planning**: Includes Site-specific Safety and Evacuation Plans for key job sites and identifying who will fill primary and backup BGM and Contractor personnel and what their responsibilities will be to fill key Incident Command System roles. BGM has engaged in comprehensive planning which is detailed in their Mine Emergency Response Plan and their Site-Specific Emergency Plans.
  - **Training and Practice Exercises**: BGM employs teams with specialized training in emergency response. Personnel will practice responding to emergencies by participating in training exercises. If BGM's trained personnel do not have the capacity to respond to an emergency, local emergency services will be brought in to assist.
- Potential Hazards:
  - BGM has identified various hazards that could pose risks to the community, categorized as follows:
    - Atmospheric Hazards (e.g., flooding, heavy rain, high wind);
    - Geological Hazards (e.g., avalanche, landslide, earthquake);
    - Hazardous Materials and Explosions (e.g., release of poisonous fumes, explosions,
    - hazardous liquid spills);
    - Hydrological Hazards (e.g., drought, flooding);

- Infrastructure Failures (e.g., dam breaches, structural failures);
- Interruptions to Critical Services (e.g., major power outages, security threats);
- Transportation Incidents (e.g., vehicle accidents, helicopter accidents); and
- Fire (e.g., forest fire, surface infrastructure fire).

BGM trains members of their workforce with special training to respond to emergencies on site, including first aid and firefighting personnel. BGM will also have a specialized team trained for responding to mine-site emergencies and coordinating emergency responses.

BGM emphasizes prevention measures, specialized training, and coordination with local emergency services to ensure effective response and mitigation of potential impacts on the community. Additionally, comprehensive first aid facilities and qualified personnel are available on-site to address injuries and reduce the strain on existing health services in the community.

Collaboration between BGM and the District includes the development of joint emergency preparedness plans with clear communication protocols and roles. An independent assessment of emergency procedures will be conducted to further improve response effectiveness.

Traffic Strategy

The Traffic Strategy addresses concerns related to the impact of Project-related traffic on the safety and well-being of the community. BGM developed a comprehensive Traffic Control Plan to manage traffic accessing the Mine site, minimize accidents, and mitigate adverse environmental effects.

Traffic Control during Operations:

BGM aims to minimize disruptions to Wells caused by Project-related traffic by diverting mine-related traffic away from the town and over a newly built highway bypass. The following measures will also be implemented:

- **Safety Training**: Staff and contractors using roads to and from the site will undergo proper safety training.
- **Regulatory Compliance**: All BGM employees and contractors must adhere to BC traffic regulations, including speed limits, and Forest Service Road regulations.
- **Code Compliance**: Adherence to the Health, Safety, and Reclamation Code for Mines in British Columbia.
- **Specific Procedures**: Adherence to the Ore Transport Standard Operating Procedure during active ore concentrate transport.
- **Road Use Policy**: Employees and contractors must follow the Road Use Policy outlined in the Traffic Control Plan, including speed limits and specific road access instructions.

Traffic and Vehicle Protocols:

Additional protocols will be implemented to support community safety and minimize disruption:

- **Maximum Speeds**: Speed limits will vary depending on road, weather, and traffic conditions, with a maximum of 30 km/h within Wells and 40 km/h along the A road and 500 road. The maximum allowable speeds (40 km/h on company owned and maintained roads) are conditional depending on road, weather, and traffic conditions. For example , reduced speeds of 25 km/h will be followed when there is more than 2 mm of rain per hour, there is accumulation of 5cm or more unplowed snow, or temperatures are less than 5°C. Employees will be informed of expectations related to driving to weather conditions during Employee orientation. These thresholds were selected for the following reasons:
    - There is a risk of hydroplaning with 2.5 mm or more water on road surfaces (Bridgestone 2021).
    - British Columbia guidelines require snow removal for an accumulation of 5 cm or more snow (BC Shared Services 2025).
- - Ice may form on road surfaces when temperatures fall below 5°C (Road Safety at Work N.D.).**Rules for Passing**: Passing is only permitted with radio contact and mutual agreement between drivers.
- **Traffic Patterns and Signage**: Right-hand drive traffic, signage at intersections, active portal entrances, and one-way traffic situations, as well as truck crossing signs at junctions.
- **Radio Control**: A road access to the Mine Site and the QR Mill Site will be radio controlled.
- **Priority Right-of-Way**: Emergency response vehicles, wildlife, pedestrians, and cyclists always have priority right-of-way.
- **Parking**: All drivers will use the “Back-in” or “Drive Through” protocol when parking their vehicle or bringing their vehicles to a stop for longer than 5 minutes. Employees will be informed of expectations related to parking protocols during their employee orientation.

BGM’s Commitment:

BGM commits to a maximum of 25 haul truck round trips on Highway 26 per day during the Operations phases of the Project. The implementation of the Traffic Control Plan will manage the number of haul truck round trips on Highway 26 effectively.

Traffic Strategy Evaluation:

As outlined in the Traffic Strategy and Implementation Plan, BGM will conduct regular assessments and compliance inspections to monitor the effectiveness of their traffic control measures. Key points of the evaluation process include:

- **Law Enforcement Collaboration**: BGM will collaborate with local law enforcement to ensure compliance with posted speed limits and other traffic regulations.
- **Periodic Assessments**: Annual assessments will be conducted to evaluate the implementation of traffic control measures. These assessments will help identify any shortcomings or areas for improvement.
- **Adjustments as Needed**: If traffic control measures are found to be ineffective or there are violations of traffic control measures, BGM will adjust their mitigations accordingly to enhance effectiveness and address concerns.
- **Evaluation**: BGM will seek feedback from the public, local community, Participating Indigenous Nations, and partners to evaluate the effectiveness of the Community Effects Plan's traffic strategy. Feedback will be gathered through engagement activities and discussions.
- **Monitoring Issues Tracking Table**: BGM will monitor the Issues Tracking Table for traffic-related issues to gauge the effectiveness of their traffic measures in addressing community concerns. This tracking mechanism will provide valuable insights into any ongoing issues or emerging trends related to traffic management.

By combining compliance inspections, analyzing feedback, and ongoing monitoring of issues, BGM will continuously evaluate and improve their traffic strategy to ensure the safety and well-being of the community.

Traffic Strategy Reporting:

BGM is committed to transparent communication regarding traffic-related considerations, ensuring that the public, local community, District Community Liaison, Participating Indigenous Nations, and partners are informed. The reporting commitments include:

1. **Community Effects Plan Annual Report**: Traffic-related information will be included in the Community Effects Plan Annual Report, which will be posted on the Project website, reviewed at community meetings, and shared with representatives of the local community, District Community Liaison, Participating Indigenous Nations, and partners. This report will provide updates on how BGM is addressing community traffic-related concerns.

2. **Immediate Reporting of Incidents**: Certain incidents involving mine-related traffic will be reported immediately to the Mine Manager. These incidents include vehicle collisions or near misses involving single vehicles, multiple vehicles, pedestrians, cyclists, or wildlife, as well as evidence of unauthorized access to Project sites or prohibited activities.

3. **Weekly and Monthly Reports**: Health, Safety, and Environmental (HSE) staff will complete weekly and monthly reports as part of overall site safety reporting. These reports will be

reviewed by departmental managers and operations supervisors to ensure accountability and address any safety concerns related to traffic.

4. **Documentation and Record-Keeping**: Near-miss and incident reports will be assigned unique identifier numbers and filed electronically and in hard copy at the Project site offices. Records will be kept for the duration of the Project to track trends, identify areas for improvement, and ensure compliance with safety protocols.

By adhering to these reporting commitments, BGM aims to maintain transparency, promote accountability, and ensure the safety of all stakeholders involved in Project-related traffic activities.

Noise Strategy

BGM developed a comprehensive noise strategy in collaboration with SoftdB to minimize the impact of noise from the Project on the community of Wells. The strategy includes the following key elements:

- **Evaluation**: Compliance with noise regulations will be assessed based on the 1-hour A-weighted equivalent sound level (LAeq) measured in decibels (dBA). The maximum allowable LAeq limit for the Project is set at 40 dBA during any single 1-hour time period, day, or night.
- **Noise Modelling**: Computer noise modelling will be conducted for both the Construction and Operation phases of the Project to assess the sound contribution and aid in planning administrative and physical noise abatement measures. This modelling will help identify the need for mitigation measures to ensure compliance with the specified noise limit.
- **Baseline Noise Monitoring**: Baseline noise monitoring has been conducted using SoftdB ProStation monitoring stations to establish the existing background sound level before the start of Project-related activities. This data will assist in assessing Project compliance and planning for future phases.
- **Monitoring Locations**: Representative Sensitive Receptors (RSRs) have been identified in Wells, representing many sensitive receptor locations in the impacted areas. Monitoring stations will be strategically placed at these locations to continuously monitor noise levels and estimate the Project noise contribution.
- **Monitoring Equipment**: Class 1 integrating sound level meters meeting the IEC Standard 61672 will be used at monitoring stations. These meters will be laboratory certified and field calibrated regularly to ensure accurate measurements. Measurement microphones will be installed at appropriate heights and distances from reflecting surfaces to minimize interference.

- **Blasting Restrictions**: Blasting activities during the Construction and Operation phases will be restricted to the hours between 0600 and 1800 to mitigate noise impacts on the community.

Overall, the Noise Strategy and implementation plan will ensure compliance with noise regulations and minimize the impact of Project-related activities on the community of Wells. SoftdB will support BGM in reviewing noise impacts and revising the strategy in response to monitoring results or identified issues throughout all Project phases.

Noise Strategy Evaluation

BGM will conduct spot checks at monitoring locations to measure the noise contribution of the Project and evaluate the effectiveness of noise mitigations. Soft dB will submit noise summary reports to BGM every three months, as per the Community Effects Plan Engagement, Communications, and Reporting Strategy.

If non-compliance is detected, BGM and Soft dB will review monitoring results, correlate them with Project activities, and develop an action plan to achieve compliance promptly.

Feedback from the public, local community, and Participating Indigenous Nations will also inform the evaluation of noise mitigations. Comments and concerns will be tracked on the Issue Tracking Table, reviewed by the Acoustical Consultant, and addressed by BGM in a timely manner. Actions taken to address concerns will be communicated in the Community Effects Plan Annual Report.

Noise Strategy Reporting

A summary of noise monitoring results will be included in the Community Effects Plan Annual Report, which will be reviewed by the local community, Participating Indigenous Nations, and partners. Additionally, the report will be accessible to the public on the Project website, ensuring transparency and accountability regarding noise impacts and mitigation efforts.

Visual Impact Strategy

BGM developed a Visual Impact Strategy in collaboration with WSP to address concerns raised by residents in Wells regarding the potential negative visual effects of the Project.

BGM used 3D visualization tools and mapping to understand how the Mine Site would appear in different seasons and from various viewpoints. Photo simulations allowed BGM to prototype different mitigation ideas and evaluate their effectiveness. Additionally, high precision topography data helped identify areas in Wells where the Mine Site might be most visible.

To reduce the visibility of the mine, BGM plans to strategically position infrastructure and construct berms for both re-vegetation and screening purposes. BGM will also use local plant

species to enhance natural screening. BGM will monitor the effectiveness of these measures over time.

Light pollution resulting from the project will be measured and mitigated through a lighting plan that minimizes light spillover through the placement and type of lighting fixture used, while ensuring worker safety and equipment security. Monitoring of light levels will be conducted regularly, during different seasons, and adjustments will be made if adverse impacts are identified.

Adaptive Monitoring and Management Plan

The Community Effects Plan uses an adaptive monitoring and management process to facilitate continued success and change of the Community Effects Plan over the life of the Project. The Community Effects Plan's adaptive monitoring and management process allows for the ongoing assessment and adaptation of the Community Effects Plan in collaboration with the local community, Participating Indigenous nations, and partners to mitigate adverse effects effectively.

The adaptive management cycle, as outlined by the BC Ministry of Environment and Climate Change Strategy, consists of several key stages:

1. Assess: Define issues and how mitigative actions will be evaluated.
2. Design: Develop a plan to achieve desired outcomes.
3. Implement: Put the plan into action and document any deviations.
4. Monitor: Assess the plan's effectiveness and identify areas for improvement.
5. Evaluate: Compare results to predictions and learn from outcomes.
6. Adjust: Make changes to management practices based on evaluation results.

The Community Effects Plan 's adaptive approach ensures that BGM is responsive to changing circumstances, feedback, and new information, thereby enhancing their accountability, and improving outcomes over the Project's lifespan.

Success Indicators

BGM will know that the Community Effects Plan is successfully addressing concerns raised by the local community, Participating Indigenous nations, and partners if there are:

- Reduced concerns raised via grievance mechanisms.
- Positive relationships with stakeholders.
- Successful implementation of management plans.
- High levels of community engagement.

ABBREVIATIONS

Terminology used in his document has been defined where it is first used, while the following list has been presented to assist readers that choose to review only portions of the document.

Abbreviation	Description
BC	British Columbia
BMPs	Best Management Practices
CAC	Community Advisory Committee
CEMP	Construction Environmental Management Plan
CERP	Community Emergency Response Plan
CIP	Community Involvement Plan
City of Quesnel	Quesnel
CO	carbon monoxide
COPCs	Contaminants of Potential Concern
CRD	Cariboo Regional District
dBA	decibel
District of Wells	District
EA	Environmental Assessment
EAC	Environmental Assessment Certificate
EAO	Environmental Assessment Office (BC)
EMLI	Ministry of Energy, Mines and Low Carbon Innovation (BC)
EMP	Environmental Management Plans
ERP	Project Emergency Response Plan
FSTSF	Filtered Stack Tailings Storage Facility
g/t	grams per metric tonne
GBA+	Gender-Based Analysis Plus
GCMP	Ground Control Management Plan

Abbreviation	Description
H&S	Health and Safety
ha	hectare
HHERA	human health and ecological risk assessment
HRVA	Hazard Risk and Vulnerability Analysis
HSE	Health, Safety and Environment
IH	Interior Health
IPP	Indigenous Partnership Plan
km	kilometre
km/h	Kilometre per hour
km^2	square kilometre
kV	kilovolt
L	Litre
LAA	Local Assessment Area
LAeq	1-hour A-weighted sound level
LiDAR	Light Detection and Ranging
Ltd	Limited
m	Metre
MAPA	Mines Act Permit Amendment
masl	Metres above sea level
MERP	Mine Emergency Response Plan
ML	metal leaching
ML/ARD	Metal Leaching and Acid Rock Drainage
MOF	Ministry of Forests
MOTI	Ministry of Transportation and Infrastructure (British Columbia)
MWh	Megawatt Hour
MZP	Main Zone Pit

Abbreviation	Description
NH	Northern Health
NO_2	nitrogen dioxide
NOx	oxides of nitrogen
NP	neutralization potential
NPAG	Non-Potentially Acid Generating
NRCan	Natural Resources Canada
NStQ	Northern Secwépemc te Qelmucw
OCP	Official Community Plan
ODV	Osisko Development Corporation
OHSMP	Occupational Health and Safety Plan
PAG	Potentially Acid Generating
PAHs	Polycyclic aromatic hydrocarbons
PM	particulate matter (PM10, PM2.5)
POR	Point of Reception
Project	Cariboo Gold Project
Proponent	Osisko Development Corporation (ODV)
QR Mill	Quesnel River Mill
QSRMP	Quesnel Sustainable Resource Management Plan
RAA	Regional Assessment Area
ROM	run of mine
RSR	Representative Sensitive Receptors
SAR	species at risk
SARA	Species at Risk Act
SO_2	sulphur dioxide
SWI	Sustainable Workforce Initiative
t	tonne

Abbreviation	Description
TAC	Technical Advisory Committee
TEK	Traditional Ecological Knowledge
TEM	Terrestrial Ecosystem Mapping
the Code	Health and Safety and Reclamation Code for Mines in BC
TLUS	Traditional Land Use Study
TNG	Tŝilhqot'in National Government
TSF	tailings storage facility
TSP	total suspended particles
URF	uncemented rock fill
WHA	Wildlife Habitat Area
WRSF	waste rock storage facility
WSP	WSP Global Inc.
WTP	Water Treatment Plan

1. INTRODUCTION

On October 10, 2023, pursuant to Section 29 (4)(c) of the British Columbia Environmental Assessment Act, 2018, the Minister of Environment and Climate Change Strategy and the Minister of Energy, Mines and Low Carbon Innovation, issued an Environment Assessment Certificate (EAC) for the Cariboo Gold Project (the Project). This Community Effects Plan is a condition of the EAC that outlines legally binding requirements to which BGM must adhere to through the life of the Project.

The Minister noted that Barkerville Gold Mines Ltd. (BGM) engaged broadly and deeply with Participating Indigenous nations, the Technical Advisory Committee, the Community Advisory Committee, provincial agencies, and local governments to identify issues and seek ways to address issues and concerns (EAO 2023). Through BGM's engagement efforts during the development of the Project's Environmental Assessment (EA), the BC Environmental Assessment Office (EAO) was able to identify the requirements for the Community Effects Plan. BGM is a wholly-owned subsidiary of Osisko Development Corp.

Key themes identified in the EAO's Assessment Report that are relevant to the Community Effects Plan describe residual effects from the Project's activities to air quality, water quality, infrastructure and services, wildlife, and human and community health. The EAO conducted a thorough and significant assessment of the potential Project effects and seriously considered effects on human health, Wells, and potentially adverse effects to Indigenous peoples (EAO 2023).

Compliance for the certificate conditions in the Community Effects Plan will be overseen by one or more Independent Environmental Monitors and will be separately verified by the EAO's Compliance and Enforcement branch (EAO 2023d).

1.1 Purpose for the Plan

The Community Effects Plan serves as a blueprint for implementing an adaptive monitoring and management process that addresses community concerns related to the Project. The Community Effects Plan organizes and guides the strategies identified and discussed within this plan. The goal of the Community Effects Plan is to ensure that mitigation measures that address adverse community effects are effectively implemented. This document was developed in consultation with the District of Wells (District) and the public and is a legal requirement of the EAO.

The Community Effects Plan is an adaptive monitoring and management plan that BGM will continue to assess and adapt over time in response to feedback from the local community,

Participating Indigenous nations, and other project partners. The Community Effects Plan will also evolve to continuously improve to effectively mitigate adverse effects of the Project. The Community Effects Plan is designed to be flexible and adaptive to changing circumstances, or when new information is available that can inform decisions about monitoring and management. Discussions about the effectiveness of the mitigations and potential changes to the mitigations will be ongoing and the review of the Community Effects Plan Annual Report will identify if adjusted or new mitigations are effective.

To support this adaptive approach, BGM will develop baseline information to monitor the effectiveness of mitigation measures under each strategy area of the Community Effects Plan. This will include collecting pre-implementation data where necessary—for example, establishing baseline employment conditions, traffic volumes, community feedback themes, and initial noise and visual conditions. Where data is not currently available, BGM will collaborate with Participating Indigenous nations, the District of Wells, and other partners to gather relevant baseline information during the first year of Construction. This information will serve as a reference point for evaluating change over time and informing continuous improvement. Additional information about the adaptive management process is discussed in Section 6: Adaptive Monitoring and Management

The Community Effects Plan consolidates the mitigation measures identified in Condition 16 of the Certificate conditions and Table 20.1: Summary of Proposed Mitigation Measure for the Project. The Community Effects Plan provides guidance and direction through several strategies

designed to mitigate potential adverse effects of the Project on the local community and Participating Indigenous nations. The Community Effects Plan addresses the concerns raised by the community related to noise, employment, land and resource use, infrastructure and services, community health, accidents, and malfunctions. The Community Effects Plan incorporates conditions imposed by the EAO including daytime-only restrictions on blasting, and vegetation screening on the Services Building and Transmission Line poles. The Community Effects Plan also outlines the strategies, commitments and programs that address concerns raised by Participating Indigenous nations. For example, the Community Effects Plan addresses socio-economic considerations for the local community and Participating Indigenous nations by providing guidance on:

- Maximizing local hiring.
- Implementing practices to address the potential for gender-based violence and increase diversity in employment.
- Establish Corporate Codes of Conduct for workers.
- Providing funding for a social worker and community liaison position in the District.

- Providing support to the Amata Transition House Society for diverse groups who may be impacted.

The EAO requirements for the Community Effects Plan are outlined in Condition 16 of Schedule B – Table of Conditions (EAO 2023), and are intended to ensure BGM addresses the mitigations listed in the following Tables (ODV 2022e):

- 20.1-2 (Acoustic),
- 20.1-9 (Employment and Economy),
- 20.1-10 (Land and Resource Use),
- 20.1-11 (Infrastructure and Services),
- 20.1-12 (Community Health),
- 20.1-16 (Malfunctions and Accidents),
- 20.1-18 (Lhtako Dené Nation),
- 20.1-19 (Williams Lake First Nations), and
- 20.1-20 (Xatśūll First Nation).

The Summary of Proposed Mitigation Measures for the Project Table can be found in Appendix F. As per the requirements of Condition 16, the Community Effects Plan provides five distinct strategies:

- Employee Strategy,
- Traffic Strategy,
- Public Strategy,
- Noise Strategy, and
- Visual Impact Strategy.

Comprehensive details or contextual information regarding each of these strategies can be found in Appendices A though E.

In Appendix G, the Community Effects Plan includes an Engagement, Communications, and Reporting Strategy. The Engagement, Communications and Reporting Strategy is guided by the EAO's Certificate conditions related to ongoing engagement with Participating Indigenous nations, Northern Health (NH), Interior Health (IH), the District, and social and community services that will support the development, implementation, and adaptive monitoring and management of the Community Effects Plan.

The Community Effects Plan is intended to be implemented through an adaptive management process that evolves and changes to new information, feedback, and priorities of the local community and Participating Indigenous nations. Progress reporting about the effectiveness of mitigation measures is a key feature of Community Effects Plan implementation, and opportunities for reciprocal communication are outlined that will facilitate an adaptive process that may result in revising mitigations, strategies, and action as needed. Section 6 (Adaptive Monitoring and Management Plan) of the Community Effects Plan and the Engagement, Communications, and Reporting Strategy (Appendix G) outlines the process for updating the Community Effects Plan.

Implementation of the Community Effects Plan will run from the Construction phase anticipated to begin August 2024 through to the end of the Closure phase of the Project in 2039. The Community Effects Plan is not required during the Post-Closure phase which is anticipated to last 5–10+ years.

1.2 Table of Concordance

Table 1.2-1 identifies which mitigations from Table 20.1 or a Condition is addressed in the document. The Detailed Mitigation Table (Appendix K) details how mitigations in relation to other management plans required by other conditions of BGM's EAC will be implemented.

Table 1.2-1: Table of Concordance

Mitigation or Condition	Document Section
16.1 The Holder must retain one or more Qualified Persons with a minimum of five years of relevant experience in the identification and management of socio-economic effects associated with industrial projects in rural or remote communities, unless otherwise authorized by the EAO, to develop a plan to adaptively monitor and mitigate socioeconomic effects of the Project. The Plan must be developed in consultation with Participating Indigenous nations, NH, Interior Health, EMLI, and the District.	Section 4.1 Qualifications
16.2 Following development of the plan, the Holder must provide the plan to the EAO for review a minimum of 60 days prior to the planned commencement of Construction, unless otherwise authorized by the EAO	N/A
16.3 The plan must include at least the following: A) How the mitigation measure in Tables 20.1-2, 20.1-9, 20.1-10, 20.1-11, 20.1-12 (Section 7.14), 20.1-16, 20.1-18, 20.1-20 in the Mitigations Table will be implemented.	Section 5.3.1-5.3.5 Employee Strategy, Public Strategy, Traffic Strategy, Noise Strategy, Visual Impact Strategy
Table 20.1-2 (Acoustic)	Section 5.3.4 Noise Strategy Appendix D: Community Effects Plan Noise Strategy Appendix K: Table 1-1 Acoustic Detailed Mitigation Table

Mitigation or Condition	Document Section
Table 20.1-9 (Employment and Economy)	Section 5.3.1 Employee Strategy Section 5.3.2.1 Public Strategy (Financial Contributions) Appendix K: Table 2-1 Employment and Economy Detailed Mitigation Table
Table 20.1-10 (Land and Resource Use)	Section 5.1 Engagement, Communications, and Reporting Section 5.3.1 Employee Strategy Workforce Accommodations Section 5.3.3 Traffic Strategy Section 5.3.4 Noise Strategy Blasting during Construction and Operations Section 5.3.5 Visual Impact Strategy Appendix C Traffic Control Plan Appendix G Community Effects Plan Engagement, Communications, and Reporting Strategy Appendix K: Table 3-1 Land and Resource Use Detailed Mitigation Table
Table 20.1-11 (Infrastructure and Services)	Section 5.1 Engagement Communications and Reporting Section 5.3.1 Employee Strategy Section 5.3.3 Traffic Strategy Appendix A Workforce Policies and Programs Appendix C Traffic Control Plan Appendix G Community Effects Plan Engagement, Communications, and Reporting Strategy Appendix K: Table 4-1 Infrastructure and Services Detailed Mitigation Table
Table 20.1-12 (Human Health and Community Health)	Section 5.3.1 Employee Strategy Section 5.3.2 Public Strategy Community Emergency Response Plan Section 5.3.2 Public Strategy Financial Contributions Appendix A Workforce Policies and Programs Appendix K: Table 5-1 Human and Community Health Detailed Mitigation Table
Table 20.1-16 (Malfunctions and Accidents)	Section 5.3.2 Public Strategy Community Emergency Response Plan Appendix B: Community Effects Plan Public Strategy Appendix K: Table 6-1 Malfunctions and Accidents Detailed Mitigation Table
Table 20.1-18 (Lhtako Dené Nation)	Section 5.3.2 Public Strategy Community Emergency Response Plan Appendix B: Community Effects Plan Public Strategy Appendix K: Table 7-1 Lhtako Dené Nation Detailed Mitigation Table
Table 20.1-19 (Williams Lake First Nation)	Section 5.1 Engagement, Communications and Reporting

Mitigation or Condition	Document Section
	Section 5.3.1 Employee Strategy Section 5.3.2 Public Strategy Section 5.3.3 Traffic Strategy Appendix A: Workforce Policies and Programs Appendix B: Community Effects Plan Public Strategy Appendix C: Traffic Control Plan Appendix G: Community Effects Plan Engagement, Communication, and Reporting Strategy Appendix K: Table 8-1 Williams Lake First Nation Detailed Mitigation Table
Table 20.1-20 (Xatśūll First Nation)	Section 5.1 Engagement, Communications and Reporting Section 5.3.1 Employee Strategy Section 5.3.2 Public Strategy Section 5.3.3 Traffic Strategy Appendix A: Workforce Policies and Programs Appendix B: Community Effects Plan Public Strategy Appendix C: Traffic Control Plan Appendix G: Community Effects Plan Engagement, Communication, and Reporting Strategy Appendix K: Xatśūll First Nation Detailed Mitigation Table
Employee	
B) A description of the policies and training to be implemented pertaining to workplace Code of Conduct/ethics, cultural sensitivity, drug and alcohol use, respectful workplace, and workplace violence (including gender-based violence), including the opportunity for the public to provide input into the policies and training.	Section 5.3.1.1 Employee Policies and Programs Section 5.3.1.2 Code of Conduct Appendix A: Workforce Policies and Programs
C) How employees will be moved to site, including by shuttle bus, personal vehicle, or other method	Section 5.3.1.3 Employee Transportation
D) Commitment to the following: The Code of Conduct and relevant Employee accommodation policies described in (b) must apply to all Employees while on shift, including off duty; and Training for onboarding new Employees must be informed by engagement with Participating Indigenous nations and NH.	Section 5.3.1.3 Worker Accommodation Policies
E) Annual employment reporting during Construction and the first five years of Operations, reported annually in quarterly intervals and including projections. These reports will include non-confidential information pertaining to the labour force, specifically: • The number of people working (direct and contracted) and the type of position they hold; • Voluntarily provided identity factors, such as gender and ethnicity	Section 5.3.1.3 Employee Accommodation Strategy

Mitigation or Condition	Document Section
• The home location (town or city) of Employees; and • Accommodation type of each Employee (if non-local).	
F) How BGM will implement a policy aimed to prevent non-local Employees from engaging in recreational hunting and fishing and ATV and snowmobile use during their rotation shift, including off-duty.	Section 5.3.1.3 Employee Accommodation Strategy – Worker Accommodation Policies
G) How BGM will implement its objectives to hire at least 75% of the project workforce from the Cariboo Regional District and Fraser Fort George Regional District if people are qualified and available.	Section 5.3.1.2
H) Description of gender equity and diversity employment measures and practices to be implemented;	Section 5.1 Engagement, Communications, and Reporting Section 5.3.1.2 Section 5.3.1.4 Appendix G: Community Effects Plan Engagement, Communications, and Reporting
(I) An Employee accommodation strategy, which will include at least the following: • Estimates on the number of Employees and families that are expected to immigrate into Wells and Quesnel, their expected demographics, and how Employee accommodations will be managed and overseen. These estimates must be specific to Wells and Quesnel and broken down by local, new-to-area-temporary, and new to area-permanent. • Description of Construction and Operations work camp and Employee accommodation policies, camp and Employee accommodation design and capacity, monthly camp and Employee accommodation design and capacity, monthly camp and Employee accommodation utilization, Employee transportation, Employee eligibility criteria of residing at work camp or other accommodation, Employee schedules, personal and commercial vehicle parking, and camp and Employee accommodation amenities; • The estimates in the first bullet must be reviewed, and if required, updated at 1 year, 6 months and 3 months prior to Construction, or unless otherwise authorized by the EAO. • How actual numbers for the estimates in the first bullet will be reported to the EAO and NH bi-annually throughout the Construction and annually throughout Operations or when an influx of Employees in anticipated; • Local accommodation for Employees during Construction of the Mine Site work camp must be offered to Employees by BGM within existing work	Section 5.3.1 Engagement, Communication, and Reporting Section 5.3.1.3 Employee Accommodation Strategy

Mitigation or Condition	Document Section
camps or other temporary accommodations owned by BGM and does not include rental of local accommodation; • Measures to minimize rental of local housing by direct Employees of BGM during Construction and Operations. • How this strategy considers and mitigates impacts to diverse groups and those that may be affected disproportionately • How this strategy will be monitored and evaluated for its effectiveness on an ongoing basis to verify that is aligns with the predictions provided in the Application; • How this strategy was developed and implemented with the consultation of local community service providers and diverse groups, and • How this information will be reported out to affected communities, service providers and community representatives.	
(J) Employment, training, and recruitment mechanisms that aim to address barriers to employment, including childcare, and support transferrable skills development.	Section 5.3.1.2 Code of Conduct Section 5.3.1.4 Employee Strategy Implementation
(K) Mitigation measures including but not limited to training to support re-employment during temporary and permanent Project closures.	Section 5.3.1.2 Employee Strategy – Code of Conduct Section 5.3.1.5 Monitoring, Evaluating, and Reporting
Traffic	
(L) A plan for traffic control during Operations	Section 5.3.3 Traffic Strategy Appendix C: Traffic Control Plan
(M) A commitment to a maximum for 25 truck roundtrips on Highway 26 per day	Section 5.3.3.2 Traffic Strategy and Implementation – BGM's Commitment of a maximum of 25 haul truck roundtrips on Highway 26 per day Appendix C: Traffic Control Plan
Public	
(N) How BGM will establish and chair at least quarterly (or as otherwise authorized by the EAO) community meetings for the first year of Construction and first year of Operations, then at least bi-annually (or as otherwise authorized by the EAO) throughout the remainder of Construction and Operations for the purpose of discussion on effects from the Project in the local area, mitigation measures to address social and economic effects, future project development plans, and the Community Effects Plan and its implementation.	Section 5.3.1 Engagement, Communications, and Reporting Section 5.3.2.1 Public Strategy and Implementation Appendix B: Community Effects Plan Public Strategy Appendix G: Engagement, Communications, and Reporting Strategy
(O) How BGM will engage the public, Participating Indigenous nations, local governments, and	Section 5.3.1 Engagement, Communications, and Reporting

Mitigation or Condition	Document Section
infrastructure and service providers regarding Project activities and actions related to the implementation of mitigation measures.	Section 5.3.2.1 Public Strategy and Implementation Appendix B: Community Effects Plan Public Strategy Appendix G: Engagement, Communications, and Reporting Strategy
(P) How monitoring for effects on and the effectiveness of mitigation measures for diverse groups will be conducted.	Section 5.3.2.1 Monitoring for Effects on and the Effectiveness of Mitigation Measure for Diverse Groups Appendix B: Community Effects Plan Public Strategy
(Q)The process, including response times, for which concerns from the public, including those raised through condition 12.2f, regarding the Project will be responded to, communicated at the community meetings in (n) and reported on the public website. Condition 12.2f - A description of how to submit questions or concerns about the Project to the Holder, including options for anonymous submissions and self-identification as Indigenous, and a description of how personally identifying information for any person submitting a comment will be kept confidential.	Section 5.3.2.1 Public Strategy and Implementation Appendix B: Community Effects Plan Public Strategy
(R) The terms of the Holder's financial contributions towards: A community liaison position in the community during Construction and Operations with the objective of reviewing documentation, reflecting the community's concerns, and participating in the community meetings in (n), or as otherwise authorized by the EAO; A mental health support worker position in the District of Wells and the City of Quesnel during Construction and Operations with the objective of helping to address Project impacts, including to mental health, or as otherwise authorized by the EAO; and The Amata Transition House Society with the objective of helping to address any Project contributions to domestic violence, sexual exploitation, and abuse issues as well as consideration for Project impacts that may be limiting individuals from all groups, including diverse groups from participating in Project employment opportunities, or as otherwise authorized by the EAO.	Section 5.3.2 Public Strategy – Financial Contributions Appendix B: Community Effects Plan Public Strategy
(S) Description of communication and engagement processes with Participating Indigenous nations, NH, and District of Wells during all Project phases regarding Project activities and updates, as well as Project-related social and economic issues or concerns, including noise	Section 5.3.1 Engagement, Communications, and Reporting Section 5.3.2.1 Public Strategy and Implementation Appendix B: Community Effects Plan Public Strategy Appendix G: Community Effects Plan Engagement, Communications, and Reporting Strategy
(T) A Community Emergency Response Plan related to the Project, including:	Section 5.3.2 Public Strategy – Community Emergency Response Plan Appendix B: Community Effects Plan Public Strategy

Mitigation or Condition	Document Section
The roles, responsibilities and capacity of different emergency response parties and infrastructure during emergencies related to the Project, including how the Holder will work with these different parties to develop joint response strategies to respond to incidents in the area; The stakeholders, contact information and communications protocols, including timing and early notification to Health Emergency Management BC regarding emergency preparedness and response, informed by NH Emergency Roles & Responsibilities (2022, or as updated or replaced from time to time); A hazard assessment that identifies industry and Project-specific hazards that may require specialized equipment, services, expertise, or capacities among service providers; Worst-case event casualty and injury, including type and estimates; An evaluation of the limitations of emergency services in the District of Wells and the effects of the events in (ii) on those services; An evaluation of evacuation procedures for the community and the Project's workforce and procedures for notifications; and Identification of the scenarios in which the Holder would undertake or fund additional health impact assessment studies (or human health risk assessments) for Project-related incidents to inform appropriate health and social service response if requested by NH or Interior Health.	
(U) Mitigation measures that would mitigate impacts to emergency response to/from the District of Wells and Barkerville Historic Site and Evacuation Procedures.	Section 5.3.2 Public Strategy - Community Emergency Response Plan Mitigation Measures Appendix B: Community Effects Plan Public Strategy
Noise	
(V) A plan for limiting noise impacts, developed by a Qualified Professional, including at least: • BGM must measure ambient baseline noise, which is not influenced • by BGM's exploration or Project activities, prior to Construction. • A maximum equivalent sound level of 40 dBA of Project noise contribution at the nearest Dwelling and downwind sound locations to the Mine Site for average noise over a one-hour period, or as otherwise authorized by the EAO. • The methods by which the Project noise contribution will be continuously monitored at multiple monitoring	Section 5.3.4 Noise Strategy Appendix D: Community Effects Plan Noise Strategy

Mitigation or Condition	Document Section
locations, including downwind within residential area, during Construction and Operations • Mitigation measures for noise at the work camp, including a clear process for receiving and responding to noise-related complaints from employees and the public, through channels such as a dedicated phone line (778-414-8493), email address (feedback@osiskodev.com), and the project website (https://osiskodev.com/cariboo-gold-project); • Any blasting during Construction or Operations must be conducted between 0600 and 1800 hours.	
Visual Impacts	
(W) How the Mine Site Complex building and transmission line poles will be screened from specific viewpoints with vegetation or rationale provided for where this is not possible	Section 5.3.5 Visual Impact Strategy
(X) How light pollution from the Project infrastructure will be measured, monitored, and mitigated in the District of Wells; and	Section 5.3.5 Visual Impact Strategy
(Y) How emission of the light towards the sky from lighting at the Mine Site Complex will be reduced by using lighting that produce a low and uniform lighting that would meet operational lighting needs and will not exceed angles above 90 degrees.	Section 5.3.5 Visual Impact Strategy

1.3 Background and Project Summary

The Project, which is developed and operated by BGM, is an underground gold mine and associated facilities including a new transmission line located in and adjacent to Wells, Electoral areas C and F of the Cariboo Regional District (CRD) and the City of Quesnel (Quesnel). The Project has a production capacity of 4,900 tonnes per day (1,793,404 tonnes per year) of mineralized material (ore). The purpose of the Project is to extract ore from the mine and process the extracted material to produce gold doré bars for export to world markets (ODV 2022).

BGM envisions that they will develop a mindful mining project in collaboration with the local community and Participating Indigenous nations to establish a sustainable and long-term mining operation in BC's Cariboo Region. The Project will create opportunities for BGM's Indigenous partners and local stakeholders and is committed to biodiversity conservation and integrated approaches to land use planning. BGM values Indigenous Knowledge partnerships and will support the socio-economic wellbeing of Indigenous nations and the local communities. (ODV 2022).

The Project was issued an EAC on October 10, 2023, by the British Columbia (BC) Minister of Environment and Climate Change Strategy and the BC Minister of Energy, Mines and Low Carbon Innovation (EAO 2023a).

1.3.1 Project Phases

The Project has been divided into five distinct phases which include: Pre-Construction, Construction, Operations, Closure (including reclamation), and Post-Closure. Table 1.3-1 details the duration and key activities of each Project Phase (ODV 2022).

Table 1.3-1: Project Phase Durations

Project Phase	Project Year	Duration	Project Component	Predicted Key Activities
Pre-Construction	Year 1 and 2	2 years	Planning and Development	Engagement, resources conversion[2], feasibility studies, baseline environmental studies, engineering design, permitting.
Construction	Year 1	1 year	Mine Site	Grading, soil salvage, construction of main and ancillary facilities, portal development (use of explosives), water diversion/collection/treatment/discharge, management of construction wastes, workforce accommodation.
			Transmission Line	Clearing, preparation, soil management, construction of towers and cable installation.
			Transportation Routes	Transport of workforce and construction materials and removal of wastes.
Construction	Year 1	1 year	QR Mill	Grading, soil salvage, construction/upgrading of main and ancillary facilities, water diversion/ collection/ treatment upgrades, management of construction wastes, workforce accommodation, TSF drawdown, treatment, and discharge
Operations	Year 1 to 12	12 years	Mine Site	Blasting, ore and waste rock loading, waste rock storage, ore sorting, flotation, maintenance of equipment and management of materials/wastes, water management and treatment, use of the workforce accommodation. Includes the construction of the flotation circuit in the first year of operation
			Transmission Line	Maintenance
			Transportation Routes	Transport of concentrate to QR Mill, transport of workforce and material required for operations and removal of wastes

Project Phase	Project Year	Duration	Project Component	Predicted Key Activities
			QR Mill	Concentrate crushing, processing, tailings management, maintenance of equipment and management of materials/wastes, water management and treatment, workforce accommodation
Closure	Year 13 to 14	2 years	Mine Site	Decommissioning and removal of facilities, underground mine openings will be sealed with engineer-designed plugs to prevent ingress by people and animals and permitting underground workings to be flooded, site reclamation including re-contouring and re-vegetation, engineered cover placement for the WRSF, water management and treatment.
			Transmission Line	Decommissioning and removal of towers and cables once power is no longer required, reclamation including recontouring and re-vegetation.
			Transportation Routes	Transport of workforce and materials required for closure. and removal of equipment and wastes.
			QR Mill	Decommissioning and removal of facilities, site reclamation including re-contouring and re-vegetation, water management treatment, and installation of FSTSF closure cover
Post-Closure – Active Care[1]	Year 15+	5 years expected (up to 10 years maximum)	Mine Site	Post-closure active care (active water treatment) and maintenance of the site and environmental monitoring, water management and treatment
			Transmission Line	Monitoring as required
			Transportation Routes	Monitoring as required
			QR Mill	Post-closure active care (active water treatment) and maintenance of the site, environmental monitoring, water management and treatment.
Post-Closure – Passive Care		5 Years	Mine Site	Post-closure passive care (no active or passive water treatment) of the site and environmental monitoring.
			Transmission Line	Monitoring as required

Project Phase	Project Year	Duration	Project Component	Predicted Key Activities
			Transportation Routes	Monitoring as required
			QR Mill	Post-closure passive care (no active or passive water treatment) of the site, environmental monitoring.

Notes: 1 Post-Closure duration is an estimate, but the post-closure monitoring will carry on until closure objectives have been achieved.

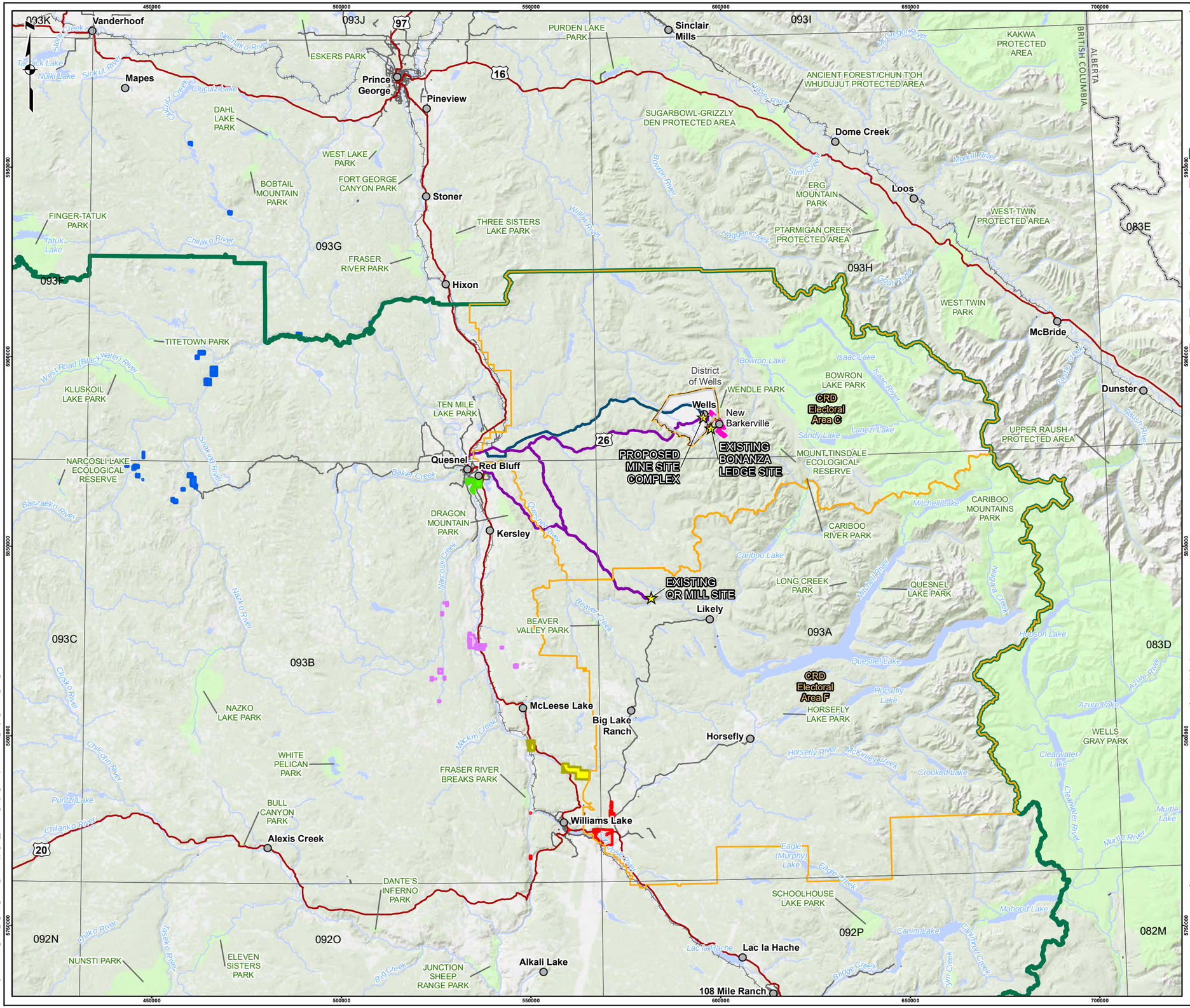
2 Resources conversion is moving from measured to probable proven reserves. QR: Quesnel River

Construction phase of the Project is predicted to last approximately two years, followed by up to 12 years of Operations, a two-year Closure phase, and a Post-Closure phase (5-10+ years). During Phase 1 of Operations (approximately years 1 through 4), ore produced by the Project will be initially processed at the Bonanza Ledge Site, with the concentrate produced trucked on existing roads to the Quesnel River Mill (QR Mill) (EAO 2023c).

1.3.2 Project Location

The Project is located in the CRD, with the Mine Site Complex located in Wells (Figure 1.3-1). Existing and expanded facilities and access roads at the Bonanza Ledge Site near Wells and at the existing QR Mill, located 115 km driving distance away from the Mine Site will support the Project's operations. The QR Mill from the Mine Site is accessed 56 km along Highway 26 and 59 km of the 500 Nyland Lake Forest Service Road. The 500 Nyland Lake Forest Service Road is maintained by West Fraser Mills Ltd.

The proposed Project also includes a new 138 kV transmission line, 69.5 km in length, which runs from Barlow Substation, near Quesnel to the Mine Site. The Mine Site is accessed along Highway 26 to Wells from Quesnel, BC, and will include a newly built highway bypass before Wells that will enable traffic to exit the highway before the community. Highway 26 and the 500 Nyland Lake Road will serve as transportation routes for workers and goods to the QR Mill from Quesnel. Workers will also be able to access the QR Mill from Quesnel along the Quesnel Hydraulic Road to 2700 Road and the 500 Nyland Lake Road (ODV 2022).

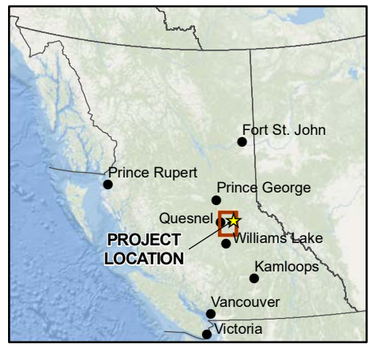


LEGEND

- POPULATED COMMUNITY
- HIGHWAY
- ROAD
- RAILWAY
- WATERCOURSE
- WATERBODY
- PARKS/PROTECTED AREA
- CRD ELECTORAL AREAS
- CRD (CARIBOO REGIONAL DISTRICT)
- DISTRICT OF WELLS MUNICIPALITY BOUNDARY
- BARKERVILLE HISTORIC TOWN AND PARK
- PROPOSED PROJECT INFRASTRUCTURE LOCATION
- PROPOSED TRANSPORTATION ROUTE
- PROPOSED TRANSMISSION LINE ROUTE

FIRST NATION RESERVE

- ESDILAGH FIRST NATION (MEMBER NATION OF TŜILHQOT'IN NATIONAL GOVERNMENT)
- LHTAKO DENE NATION
- NAZKO FIRST NATION
- SODA CREEK FIRST NATION
- WILLIAMS LAKE FIRST NATION



REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
2. HILLSHADE DERIVED FROM LIDAR DATA FLOWN BY MCELHANNAY CONSULTANTS LTD. JUNE 27, 2016.
3. BASE DATA SOURCE: ESRI, GEOBASE, NRCAN, AND THE GIS USER COMMUNITY.
4. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

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OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

PROJECT LOCATION AND COMMUNITIES

REV.	DESCRIPTION	DATE	INITIALS
A		9/14/2022	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	1.3-1

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1.3.3 Project Workforce

BGM plans on employing workers from the local area during all phases of the Project and will share information regarding contracting and employment opportunities with local communities, including the Participating Indigenous nations as they become available. BGM is also aware that many local businesses are struggling to find staff and fear that they will be competing with the Mine for employees. BGM commits to working with the community to discuss local hiring policies, to ensure BGM does not negatively impact local businesses. In reality, the workforce requirements for the Project are up to twice the population of Wells and many workers will come from outside the local area (ODV 2022a). The Project's workforce is anticipated to place pressure on the North Cariboo housing market (Urbanics Consultants Ltd. 2019).

BGM recognizes that they can improve the diversity in their current workforce and is committed to hiring qualified workers from diverse backgrounds by implementing inclusive hiring and employment practices. Strategies for inclusive hiring can be found in the Workforce Policies and Programs (Appendix A). The implementation of the Community Effects Plan includes ongoing discussions and engagement with under-represented population groups in the mining workforce to understand barriers to employment and strategies for overcoming those barriers.

1.3.4 Construction Phase (estimated 2-Year)

BGM expects that they will need an average of 200 workers, peaking to 273, on site to support the Construction Phase, including infrastructure, the Services Building, and development of the underground mine. BGM will hire a variety of contractors for construction and will prioritize the use of local contractors for available opportunities. Some contractors provide specialized services, such as in underground development and may come from outside the local area. Most of the construction jobs will not be full-time permanent and contractors are expected to come to site, complete their task, and leave.

BGM will hire administrative, technical, and support staff during the Construction phase and many of those positions are expected to transition to the Operations phase (ODV 2022a).

1.3.4.1 Operations Phase (estimated 12 Years)

The Project is estimated to require up to 488 employees during the Operations phase, including jobs for skilled trades, professionals, technical, environmental, regulatory/permitting, support and administrative fields.

BGM workers during the Operations phase will be accommodated at the new Workers Accommodation at the Mine Site Complex and the new Workers Accommodations at the QR Mill. This will reduce the Project's impact on the local housing supply, minimizing the socio-economic impact of the Project.

The mine will operate on a two 12-hour shifts/day for automated operations and 10-hour shift/day for underground activities. The Project will operate seven days a week, 365 days per year. BGM plans to hire contractors for many of the operational tasks, which will provide several full-time equivalent positions for heavy vehicle operators, local transportation services, audit and monitoring services, and catering.

BGM will coordinate pickup locations in Quesnel, at Prince George airport or in Wells and shuttle workers to and from the Mine Site Complex or the QR Mill.

Additional direct employment and contractor employment opportunities are expected to be created through businesses which manufacture, process, and/or market goods and services that support the construction, operation, and maintenance activities for the Project (ODV 2022).

The Project is expected to generate the following economic benefits for the CRD and BC more broadly:

- Creating $5.219M over the life of the Project.
- Creating the equivalent of 19,312 person-years (full-time equivalents) would be sustained or created over the duration of the Project.

The region is expected to benefit from increased economic activity related to the Project estimated at 75% of the total impact in terms of value added and 43% of jobs supported by all the investments and operations of the Project (ODV 2021a).

1.3.4.2 Closure Phase (estimated 2 Years)

BGM anticipates that a total of 14 employees are required from the Tailings, Waste, and Water Management department for the Closure Phase.

1.3.4.3 Post-Closure Workforce

The Project's Post-Closure phase will require a small number of employees. BGM anticipates that three employees will be required during the active care phase from the Tailings, Water, and Water Management department for the treatment of the Mine Site Complex Water Treatment Plant (WTP) and the QR Mill WTP, as well as site maintenance activities. Once the Project is in the passive care phase, one Environmental Technician is expected to conduct site monitoring at the Mine Site Complex and the QR Mill sites.

1.4 Regional Description

The Project is located in, or within, proximity to the unceded traditional territories of the following Indigenous nations: Lhtako Dené Nation, Xatśūll First Nation, Williams Lake First Nation, Tŝilhqot'in National Government, and Nazko First Nation. Additional information about the Participating Indigenous nations is found in Section 3 of this document.

The Project is located in the CRD with the Mine Site Complex located in Wells. The CRD spans over 80,000 km^2 and is home to a population of approximately 62,000 residents. The CRD consists of 12 Electoral Areas and four municipalities including the District of 100 Mile House, City of Quesnel, the District of Wells, and the City of Williams Lake (CRD n.d.).

Much of the region is rural and remote in nature and shaped by a rich Indigenous heritage. The population is characterized as independent and self-reliant, friendly, welcoming, and supportive of each other. The region is evolving as new residents move to the area and bring new values and expectations (BDCA 2023).

The communities in this area have a long history of resource development that has shaped the communities' cultural, social, political, and economic conditions. As with other resource dependant areas, the Cariboo Region has experienced several challenges which resulted in impacts to socio-economic wellbeing. Challenges faced in the Cariboo Region include changing market conditions, changing perceptions of natural resource development, the consolidation and streamlining of operations, trade policies and environmental challenges such as the pine beetles, and climate change events such as fires and floods have created challenges over the past two decades (ODV 2022b). The impacts of the COVID-19 pandemic shifted metal and mineral prices, which resulted in impacts to mining operations by causing a reduction in investment and disrupting production (Northern Development 2019). Furthermore, the COVID-19 pandemic's impact on the economy affected affordability, which exacerbated challenges for many living in the region because of rising fuel, food, and housing costs.

The communities in the region are experiencing a demographic shift with little to no population growth and an aging population, a trend that is anticipated to continue over the lifespan of the Project (ODV 2022b). As the average age in the region continues to increase, over time this will result in additional demands on local and regional services required by an aging population (such as medical services).

Employment and economic activity for the region is concentrated in Quesnel, with limited economic and employment opportunities being available in the CRD Electoral Areas C and F and the District of Wells (ODV 2022b).

Based on information obtained for the Socio-Economic Existing Conditions Report (WSP 2021) that was developed for the Project Application, there is:

- A higher percentage of the population in the assessment area is Indigenous compared to that of BC, and this percentage is increasing at a much higher rate than BC.
- A much lower percentage of visible minorities compared to that of BC, which is increasing at a lower rate than the rest of BC.

- A lower percentage of dual-parent families compared to BC, and a higher percentage of single parent female families than the rest of BC.
- A lower percentage of households with children in Quesnel or Wells when compared to communities in other CRD Electoral Areas.

The crime rate in the CRD is considerably higher than that in BC. Currently key issues in Quesnel and surrounding areas are substance abuse and mental health issues, both of which are increasing. The opioid crisis is an ongoing issue for Quesnel, with a significant portion of minor property crime fuelled by the drug crisis (WSP 2021). While property crimes have continued to increase in recent years, there are very few drug offences in Wells (McLeary 2020, per. Comm. in WSP 2021).

BC Emergency Health Services is facing challenges with staffing stations throughout rural BC due to the location and a staffing model where most staff are part-time. Staff retention is problematic in rural areas such as Wells since many paramedics will take a six-month position to complete their initial requirements and then transfer to another location (WSP 2021). In recent years, there have been more drug, alcohol, and mental health-related calls. It was noted that there were not as many traffic accidents on Highway 26 as would be expected given the mix of traffic on the road (WSP 2021). Significant efforts are currently underway to improve emergency health services in Wells by hiring additional paramedics who could be on-call.

Both the Quesnel and Wells Volunteer Fire Brigade expressed that they could manage the number and types of fires they have had to attend.

A full range of health services are available in Quesnel. Residents in Wells primarily access their health services in Quesnel, but a nurse practitioner travels to Wells to offer a primary care clinic one day a month. (Wells n.d.).

There are no health services available in the immediate area of the QR Mill property or for those working at site. Workers rely on site services, emergency services, or service in other parts of the region.

The Local Assessment Area (LAA) and the Regional Assessment Area (RAA) that were used for the Project's EA straddles the NH and the IH. Health services accessed in Quesnel or north of Quesnel fall within the NH's region, whereas communities that access health services south of Quesnel would fall in the Interior Health's region.

Community and social service providers in Quesnel and surrounding areas expressed that many of the social issues in the area result from past and ongoing trauma, isolation, family dysfunction, or in response to the economic downturn. Demand currently exceeds capacity for supporting those addressing mental health in the community (WSP 2021). However, there are several agencies in Quesnel supporting those experiencing homelessness, domestic or other types of

violence, and low-income households. Specialized support services are available for immigrants and LGBTQ2, children and youth, and Indigenous peoples, although the demand for immigrant support services has decreased in recent years.

The Canadian Index of Multiple Deprivation that provides a measure of social wellbeing based on inequalities related to situational vulnerability, economic dependency, ethno-cultural composition, and residential instability indicate that Quesnel and Wells experience a higher degree of deprivation and vulnerability when compared to other Community Health Service Areas in BC. A higher degree of deprivation and vulnerability suggests that Quesnel may have an increased need for social and community support services.

Childcare is a common issue across the region due to a limited supply of qualified front line childcare providers due to a common feeling of being undervalued and underpaid, creating challenges for parents wanting to participate in the workforce (SPARC BC 2020 in WSP 2021).

Wells was noted for a high percentage of homes (30%) in need of major repair, which was attributed to the fact that many of the homes in Wells were built during the last mining boom in the 1930s. As of February 2024, only one house is for sale in Wells, BC, listed below $200,000 (Royal LePage 2024). Home sales in the northern BC region, which includes Quesnel and Wells were 22.7% below the five-year average, which may have been a result of higher interest rates reducing affordability. The average price of a homes in the northern BC region in December 2023 was $411,502, which is essentially the same as the average home price in December 2022 (BCNREB 2023). The rental market is very tight for the region and demand regularly exceeds supply, resulting in higher rents and affordability challenges for those with lower incomes. (ODV 2022k).

Wells had the highest participation rate of women in the workforce compared to other communities in the region, whereas the lowest participation rates for women were found in Quesnel (WSP 2021). However, Wells had the highest unemployment rate in the CRD as a whole. Unemployment rates for men are higher than women, and higher than that for BC. These differences may be related to the fact that more men are employed in the resource sector, which experiences more fluctuations in employment than other sectors or more diversified economies (WSP 2021).

The level of education attainment in the area often reflects the requirements of the major employers in the area. As manufacturing and construction is the top industry in the region, the region has a higher percentage of their population with their highest educational attainment in trades training than BC (WSP 2021).

1.5 Methodology

The content of this Community Effects Plan addresses the conditions outlined by the EAO for the EAC and as such, much of the information and guidance for the Community Effects Plan was obtained from the research, engagement, and assessment conducted for the Project's EA. Information sources include:

- Documents prepared for the Project EA Application.
- Reports written by the EAO with respect to the Project.
- Records from engagement efforts with Participating Indigenous nations, the public, the District, IH, NH, and Social and Community Services.
- Records from the Technical Advisory Committee (TAC) and the Community Advisory Committee (CAC).
- Information gathered on March 19, 2024, during a meeting with the District of Wells to introduce the Community Effects Plan, its purpose, and proposed contents.

Qualified persons from Falkirk Environmental Consulting Ltd., Soft dB, WSP, and Pacific Safety were engaged to lead the development of specific strategies for implementing initiatives and actions that monitor and mitigate community effects identified in the Project's EA.

The Community Effects Plan Engagement, Communications and Reporting Strategy (Appendix G) attached to this plan will support the ongoing collection of information to continue developing and adapting the plan to ensure that the mitigations implemented effectively over the life the Project.

2. PARTICIPATING INDIGENOUS NATIONS, THE LOCAL COMMUNITY, AND PARTNERS

This section provides a description of the different Participating Indigenous nations, local communities and partners that contributed to the development of the Community Effects Plan.

2.1 Description of Participating Indigenous Nations, the Local Community, and Partners

2.1.1 Lhtako Dené Nation

Lhtako Dené Nation is part of the Dakelh (or Southern Carrier) Nation in the Athapaskan language group. Lhtako Dené Nation, prior to 1988 was known as the Quesnel Indian Band, and as the Red Bluff Indian Band from 1988 to 2010, is located near the City of Quesnel (BC AFN 2023a).

Lhtako Dené Nation has four reserves located within its traditional territory totalling 682.7 hectares (ha): Dragon Lake 3, Quesnel 1, Rich Bar 4, Sinnce-Tah-Lah 2. The traditional territory is centred on the Fraser and Quesnel Rivers, and Lhtako Dené Nation ancestors lived in villages on Ahbau Lake, Bowron Lake, Punchaw Lake, Puntataenkut Lake, Ten Mile Lake, and Tzenzaicut Lake. The Dakelh people have occupied the vast area encompassing Barkerville, Wells, and the Bowron Lakes region since time immemorial.

Lhtako Dené Nation relies on a variety of methods for transferring Indigenous Knowledge and traditions among generations. Cultural camps, which are traditional Indigenous encampments developed to host traditional activities, are held to pass these skills to younger generations. Oral histories and teachings are also important to describe spiritual and cultural sites throughout the Cariboo Region. Trapping of small fur-bearing animals is fundamental to the Lhtako Dené Nation traditional mode of life and the transmission of cultural values and traditions. As of today, Lhtako Dené Nation members still use most of the traditional plant species and the forest for daily food gatherings, medicines, and teachings for cultural education to the next generation.

Under the direction of Band Administration, Lhtako Dené Nation offers its community members a variety of services programs, including Administration, Education, Health, Housing, Finance, Social Development, Wastewater/Maintenance, Lands and Natural Resources, and Employment Assistance. Services are also provided by other service providers, and Lhtako Dené Nation members also access a variety of services in the City of Quesnel (ODV 2022g).

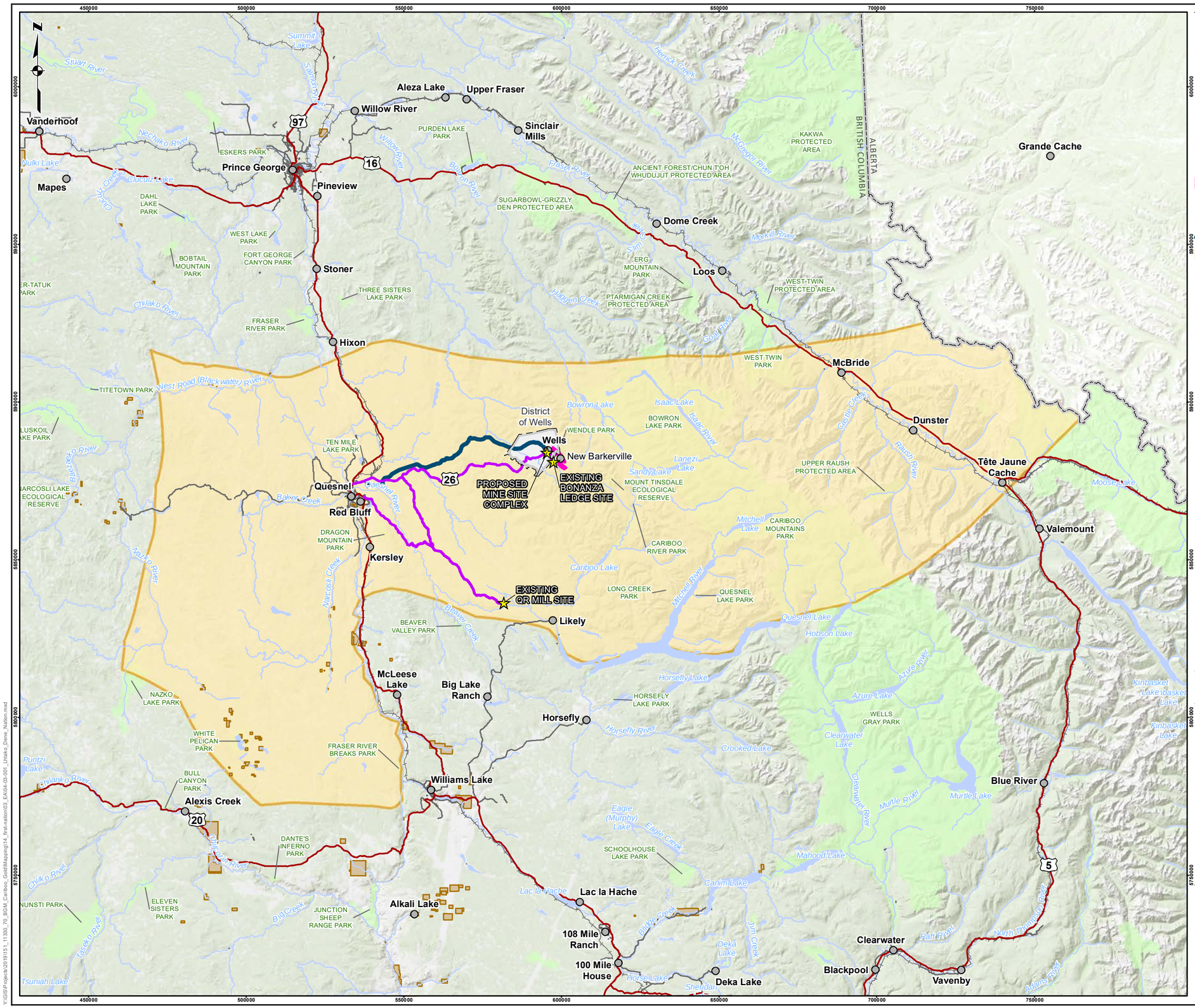

Vanderhoof
Mapes
Prince George
Pineview
Stoner
Hixon
Quesnel
Red Bluff
Kersley
Likely
McLeese Lake
Big Lake Ranch
Horsefly
Williams Lake
Alexis Creek
Alkali Lake
Lac la Hache
108 Mile Ranch
100 Mile House
Deka Lake
Clearwater
Blackpool
Vavenby
Valemount
Blue River
McBride
Dunster
Tête Jaune Cache
Dome Creek
Loos
Sinclair Mills
Upper Fraser
Aleza Lake
Willow River
Grande Cache
District of Wells
Wells
New Barkerville
EXISTING BONANZA LEDGE SITE
PROPOSED MINE SITE COMPLEX
EXISTING QR MILL SITE
97
16
26
20
5
ALBERTA
BRITISH COLUMBIA
Fraser River
Nechako River
Stuart River
Summit Lake
Willow River
Bowron River
McGregor River
Parsnip River
Peace River
Morkill River
Goat River
Raush River
Castle Creek
Isaac Lake
Bowron Lake
Lanezi Lake
Sandy Lake
Mitchell Lake
Quesnel Lake
Hobson Lake
Horsefly Lake
Azure Lake
Clearwater Lake
Crooked Lake
Murtle Lake
Mahood Lake
Eagle (Murphy) Lake
Canim Lake
Deka Lake
Horse Lake
Caribou Lake
Puntzi Lake
Tsuniah Lake
Moose Lake
Kinbasket Lake
Baker Creek
Beaver Creek
Big Creek
Eagle Creek
Jim Creek
Raft River
Adams River
Mitchell River
Quesnel River
Chilko River
Chilcotin River
Fraser River
Clearwater River
North Thompson River
Narcosli Creek
Blackwater River
Euchiniko River
Tsacha Lake
Ulkatcho Indian Reserve
Nazko Indian Reserve
Redstone Indian Reserve
Stoney Indian Reserve
Alexis Creek Indian Reserve
Anaham Indian Reserve
Canoe Creek Indian Reserve
Dog Creek Indian Reserve
Williams Lake Indian Reserve
Soda Creek Indian Reserve
Canim Lake Indian Reserve
Canoe Creek Indian Reserve
Kluskus

Table 2.1-1: Lhtako Dené Nation

Chief and Council [1,2]	Agreements Signed [3]
Clifford Lebrun, Chief Wanda Aldred, Councillor Ray Alfred, Councillor Tim Michell, Councillor	• First Nations Clean Energy Business Fund Revenue Sharing (FNCEBF) Agreements • Lhtako Dene FNCEBF Agreement (Castle Mountain Hydro Project) – 2016 **Forestry Agreements** • Lhtako Dene FCRSA Renewal Agreement – 2022 • Lhtako Dene FCRSA Amendment Agreement #1 – 2019 Lhtako Dene Forest Consultation and Revenue Sharing Agreement – 2018 • Lhtako Dene Nation Interim Measures Agreement – 2006 **Other** • Southern Dakelh Nation Alliance Hubulhsooninats'Uhoot'alh Foundation Framework Agreement Bridging and Funding Agreement – 2021 • Lhtako Dene Nation Economic & Community Development • Agreement – 2020 • Southern Dakelh Nation Alliance Hubulhsooninats'Uhoot'alh • Foundation Framework Agreement – 2018

1 Reference for the Lhtako Dené Nation Chief and Council is BC Assembly of First Nations (2023a)

2 Up-to-date Chief and Council can be found at: Lhtako Dene Nation | British Columbia Assembly of First Nations

3 Reference for Lhtako Dené Nation's Agreements is Government of BC (2023a)

2.1.2 Xatśūll First Nation

Xatśūll First Nation is a First Nation government belonging to the Secwépemc Nation and is located in the Central Interior, BC near the City of Williams Lake. Xatśūll First Nation has two reserves located within its traditional territory totalling 2,093 ha: Deep Creek 2 and Soda Creek 1 (ODV 2022h). Xatśūll First Nation has traditionally occupied a vast territory in the BC Cariboo region, including the area on which a portion of the Project is proposed to be developed. Prior to the imposition of the Indian Reserve system, Xatśūll First Nation travelled, used, and occupied large tracts of land in their territory, extending from Mount Alex Graham in the west, to the Quesnel Lake and Horsefly areas in the east, and towards Bowron Lakes in the north (Landmark 2021).

Xatśūll First Nation, along with Stswēceḿc Xgāt'tem (Canoe Creek/Dog Creek) and Tsq'ēsceń (Canim Lake), are members of and receive services from the Northern Shuswap Tribal Council.

The Northern Shuswap Tribal Council is a Northern Secwépemc te Qelmucw (NStQ) organization. Collectively as the NStQ, Xatśūll First Nation, Williams Lake First Nation, Stswēceḿc Xgāt'tem (Canoe Creek/Dog Creek) and Tsq'ēsceń (Canim Lake) entered the Treaty process in 1993 as a path forward with a Shared Governance model. Under this governance structure, each member Nation will have:

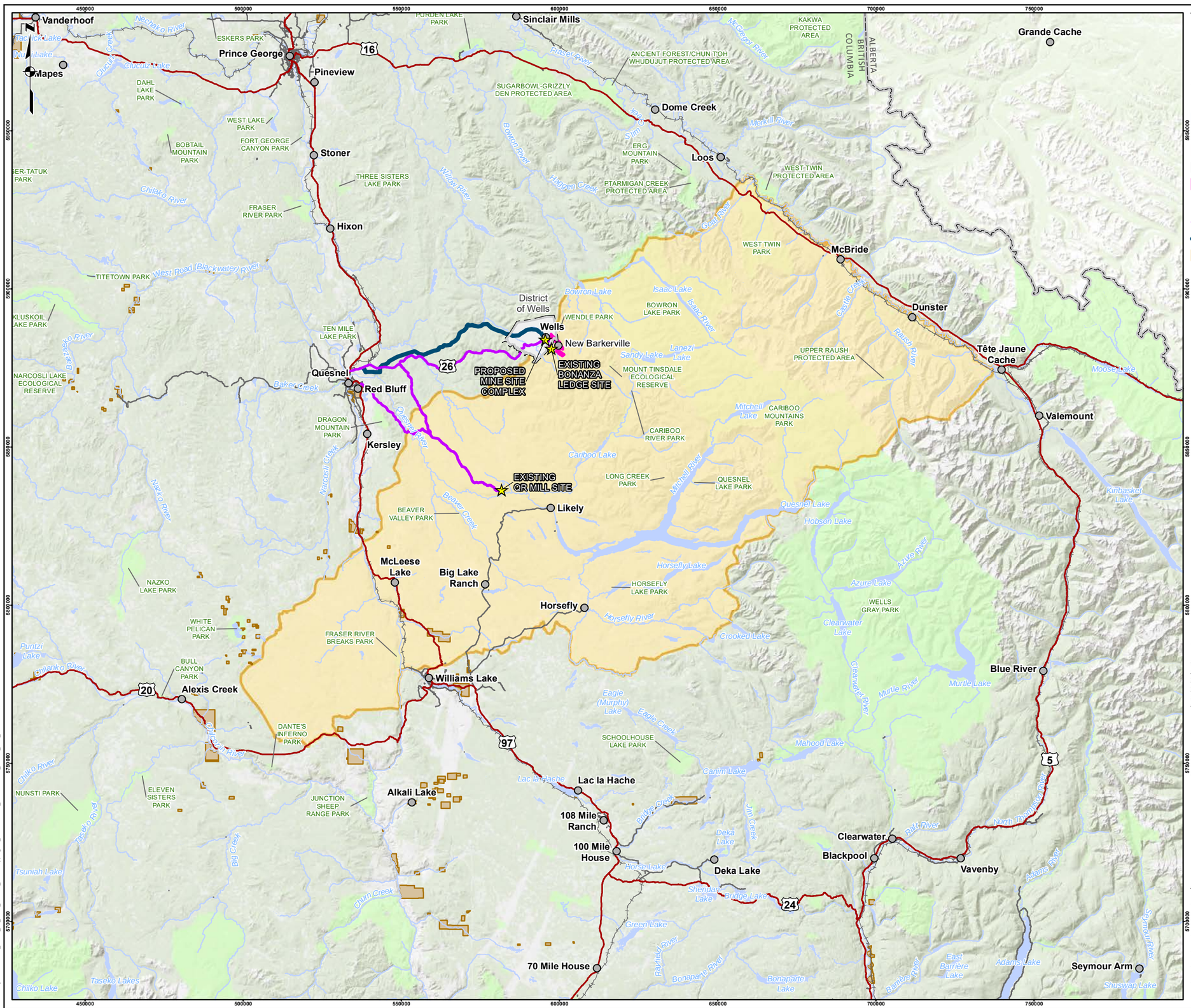
- authority over areas affecting the everyday lives of its community members including housing, wellness programs, infrastructure, local economic development, and land use on Treaty Settlement Lands; and
- a regional government with authority over areas where the four Nations have common interests and cooperation which results in costs savings or increased political clout (NStQ 2023).

The NStQ are currently in Stage 5 of the BC Treaty Process (Negotiation to Finalize a Treaty) and are hoping to complete this stage within the next five years and members will have a vote to accept that Treaty or not. If ratified by members and the BC and Canadian governments, NStQ would then proceed to Stage 6 (Implementation of the Treaty) (Xatśūll First Nation 2023a). Xatśūll First Nation community members have instructed the Xatśūll Treaty Team to address "big picture" issues over the next year. These issues include:

- Co-management of natural resources throughout the traditional territory;
- Certainty and extinguishment of Aboriginal Title and Rights;
- Taxation; and
- Fiscal relations and revenue sharing (ODV 2022h).

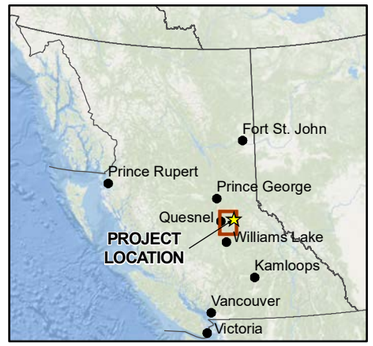
Xatśūll First Nation has an extensive traditional territory with ongoing resource development. Their Natural Resource department acts as a liaison for companies that want to do business in the territory and the band. The Natural Resource department is responsible for responding to referrals. The referral responses highlight the potential impacts of activities on Xatśūll First Nation's Title and Rights, environmental resource management and environmental sustainability. Referrals are typically in response to Forestry and Mining operations, agriculture and range, water licenses, and residential development (Xatśūll First Nation 2023b).

Xatśūll First Nation has agreements with larger companies where higher-level concerns and opportunities to participate are discussed.



LEGEND

- POPULATED COMMUNITY
- HIGHWAY
- ROAD
- RAILWAY
- WATERCOURSE
- WATERBODY
- PARKS/PROTECTED AREA
- FIRST NATION RESERVE
- DISTRICT OF WELLS MUNICIPALITY BOUNDARY
- BARKERVILLE HISTORIC TOWN AND PARK
- PROPOSED PROJECT INFRASTRUCTURE LOCATION
- PROPOSED TRANSPORTATION ROUTE
- PROPOSED TRANSMISSION LINE ROUTE
- XATS'ULL FIRST NATION



REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
2. HILLSHADE DERIVED FROM LIDAR DATA FLOWN BY MCELHANNAY CONSULTANTS LTD. JUNE 27, 2016.
3. BASE DATA SOURCE: ESRI, GEOBASE, NRCAN, AND THE GIS USER COMMUNITY.
4. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

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OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

XATS'ULL FIRST NATION TRADITIONAL TERRITORY

REV.	DESCRIPTION	DATE	INITIALS
A		9/9/2022	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
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Table 2.1-2: Xatśūll First Nation

Chief and Council [1,2]	Agreements Signed [3]	Businesses [4]
• Rhonda Phillips, Chief • Marjorie Sellers-Cady, Councillor • Donna Dixon, Councillor • Pat Sellars, Councillor • Kelly Sellars, Councillor	**Treaty Stage** • Stage 5 - Final Agreement negotiations **Completed Agreements** • Soda Creek Umbrella Agreement – 2020 • Xatśūll (Soda Creek) Incremental Treaty Agreement – 2016 Agreement in Principle • AIP - Signed July 2018 • AIP Appendices - July 2018 • NStQ AiP Range Tenures **Economic and Community Development Agreements** • Xatśūll (Soda Creek) Economic and Community Development Agreement (Mt. Polley) – 2013 • Xatśūll (Soda Creek) Economic and Community Development Agreement – (Gibraltar) 2014 **Forestry Agreements** • Xatśūll Forest Consultation and Revenue Sharing Agreement – 2023 • Xatśūll Forest Consultation and Revenue Sharing Agreement – 2019 • Xatśūll Forest Consultation and Revenue Sharing Agreement – 2015 • Xatśūll First Nation Mountain • Pine Beetle Agreement – 2008 • Xatśūll First Nation Mountain • Pine Beetle Agreement – 2007 • Xatśūll First Nation Interim Agreement on Forest & Range Opportunities – 2007	• Whispering Willows Campsite • Xatśūll Heritage Village • Xatśūll Development • Corporation • Xatśūll Mountain House Ranch

Chief and Council [1,2]	Agreements Signed [3]	Businesses [4]
	Other Agreements • NStQ Yecweminul'ecw Land and Resource G2G Amending Agreement – 2021 • Letter of Understanding between Soda Creek Indian Band (Xatśūll First Nation), Williams Lake Indian Band and Province (Mt. • Polley Mine) – August 2014	

1 Reference for the Xatśūll First Nation Chief and Council is the Band's Governance website (2023c)
2 Up-to-date Chief and Council can be found at: Chief and Council - Xatśūll First Nation
3 Reference for Xatśūll First Nation Agreements is Government of BC (2023b)
4 Reference for the Xatśūll First Nation Businesses is the Band's Economic Development and & Businesses website (2023d)

2.1.3 Williams Lake First Nation

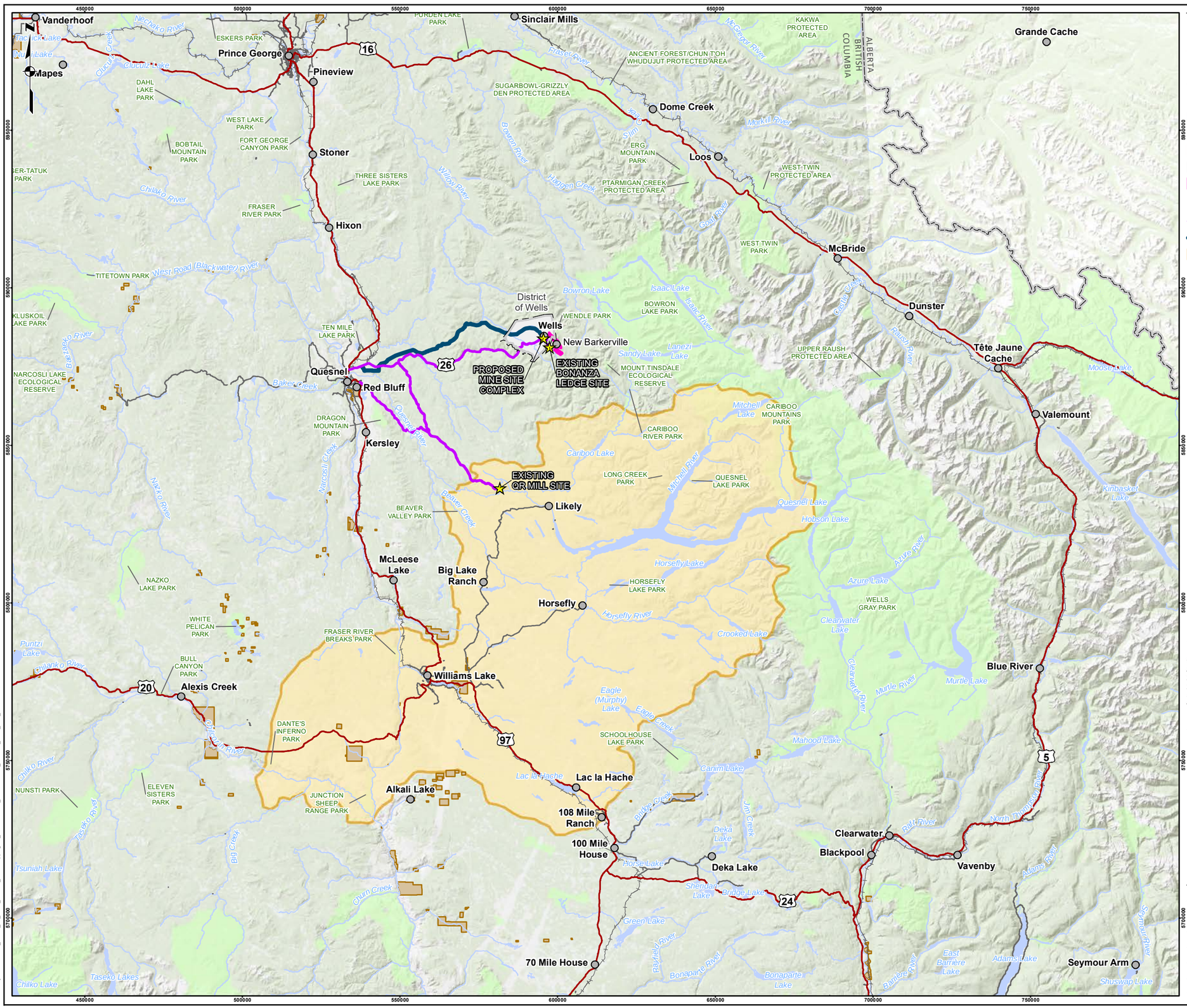
Williams Lake First Nation (T'exelc) is a First Nation government belonging to the Secwépemc Nation. Williams Lake First Nation is located in the Central Cariboo Region adjacent to the City of Williams Lake BC Williams Lake First Nation has eight reserves located within its traditional territory totaling 1,983 ha: Asahal Lake 2, Carpenter Mountain 15, Chimney Creek 5, Five Mile 3, James Louie 3A, San Jose 6, Tillion 4, and Williams Lake 2 (ODV 2022i).

Williams Lake First Nation is in the process of transitioning away from the Indian Act and is currently in Stage 5 of a 6 Stage BC Treaty Process. Since 1991, Williams Lake First Nation has developed its own Membership Code (1991), Custom Election Code (2007), and the community is presently governed by their Land Management Code (2016) and Financial Administration Law (2018) (Williams Lake First Nation 2023a). The effect of becoming an operational First Nation and having control and management over all land management activities has greatly benefited the community. The Williams Lake First Nation Land Management Code, developed by its community membership, provides direction on how land management activities will be implemented and ensures transparency to the members. Williams Lake First Nation can pursue, negotiate, and sign off on economic development opportunities promptly and efficiently (Williams Lake First Nation 2023b).

The Natural Resource Department is responsible for reviewing, responding, and managing the resources within the Williams Lake First Nations Stewardship area. This is completed through many avenues such as referrals, participation agreements, protocols, and through the NStQ-wide Yecweminul'ecw (Take Care of the Land) Agreement, with which Xatśūll First Nation is also a signatory. The Yecweminul'ecw (Take Care of the Land) Agreement includes the following:

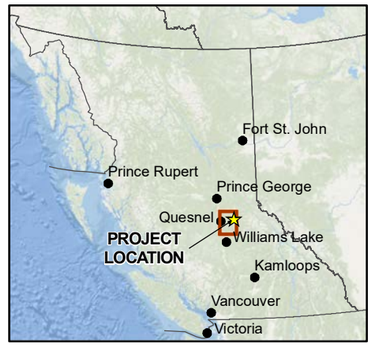
- Recommending best stewardship practices to Council for Natural Resources;

- Building and maintaining T'exelc and NStQ knowledge and capacity;
- Working with Industry, Government, and Private sector to enhance resource management;
- Working with the whole Williams Lake First Nation team and corporations to provide revenue, employment, training, and mentorship to their community members; and
- Engaging with all the NStQ communities about best management practices for the NStQ Stewardship area (Williams Lake First Nation 2023c).



LEGEND

- POPULATED COMMUNITY
- HIGHWAY
- ROAD
- RAILWAY
- WATERCOURSE
- WATERBODY
- PARKS/PROTECTED AREA
- FIRST NATION RESERVE
- DISTRICT OF WELLS MUNICIPALITY BOUNDARY
- BARKERVILLE HISTORIC TOWN AND PARK
- PROPOSED PROJECT INFRASTRUCTURE LOCATION
- PROPOSED TRANSPORTATION ROUTE
- PROPOSED TRANSMISSION LINE ROUTE
- WILLIAMS LAKE FIRST NATION



REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
2. HILLSHADE DERIVED FROM LIDAR DATA FLOWN BY MCELHANNAY CONSULTANTS LTD. JUNE 27, 2016.
3. BASE DATA SOURCE: ESRI, GEOBASE, NRCAN, AND THE GIS USER COMMUNITY.
4. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

NAD83 CSRS
UTM ZONE 10N

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OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

WILLIAMS LAKE FIRST NATION TRADITIONAL TERRITORY

REV.	DESCRIPTION	DATE	INITIALS
A		9/9/2022	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	2.1-3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

25mm

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Table 2.1-3: Williams Lake First Nation

Chief and Council [1, 2]	Agreements Signed [3]	Businesses [4]
• Willie Sellars, Chief • Ann Louie, Councillor • Dancing Water Sandy, Councillor • Chris Wycotte, Councillor • Shae Chelsea, Councillor	**Treaty Stage** • Stage 5 – Final Agreement negotiations **Completed Agreements** • Williams Lake (T'exelc) Incremental • Treaty Agreement – 2016 **Agreement in Principle** • AIP – Signed July 2018 • AIP Appendices – July 2018 • NStQ AiP Range Tenures **Other Agreements** • NStQ Yecweminul'ecw Land and Resource G2G Amending Agreement – 2021 • NStQ Yecweminul'ecw Government-To Government Agreement – Oct. 2018 • Williams Lake Indian Band Economic and Community Development Agreement – 2013 • Letter of Understanding between Soda Creek Indian Band, Williams Lake Indian Band and Province (Mt. Polley Mine) – August 2014 **Forestry Agreements** • Williams Lake FN FCRSA Renewal • Agreement – 2022 • Williams Lake FN FCRSA Amendment • Agreement #1 – 2019 • Williams Lake Indian Band Forest Consultation and Revenue Sharing Agreement – 2017 • Williams Lake Indian Band Interim Agreement on Forest & Range Opportunities – 2008 • Williams Lake Indian Band Mountain Pine Beetle Agreement – 2008	• Sugar Cane Archaeology • Sugar Cane Development Corporation • Sugar Cane Petroleum Products • Borland Creek Logging Ltd. • Unity Cannabis • Sugar Cane Cannabis • Coyote Rock Estates • Coyote Rock Golf Course • Chief Will-Yum Campsite

1 Reference for the Williams Lake First Nation Chief and Council is the Community's Chief and Council website (2023d)
2 Up-to-date Chief and Council can be found at: About | Williams Lake First Nation
3 Reference for Williams Lake First Nation Agreements is Government of BC (2023c)
4 Reference for the Williams First Nation Businesses is the Community's Businesses website (2023e)

2.1.4 District of Wells

Wells is a mining and tourist town located along Highway 26 approximately 80 km east of Quesnel. Wells is a destination within the CRD known for its history, art, and adventure. Wells is the nearest municipality to both Barkerville and the Bowron Lakes, which are destinations for visitors to the Cariboo region (ODV 2021b). Community services in Wells include paramedics, volunteer fire department, nurse practitioner visits, one elementary school, and a federal police detachment staffed with officers who also service Quesnel (EAO 2023b).

Community health is promoted in several ways, including all-season outdoor recreation (hiking, skiing, snowboarding, snowmobiling, snowshoeing, etc.); water-based recreation (canoeing, kayaking, etc.); the arts (particularly the Island Mountain Arts and Sunset Theatre); the Wells School; and cultural events. The local economy in Wells is based on tourism, including visits to the Barkerville Historic Town and Park and Bowron Lake Provincial Park, timber harvesting, mineral exploration, and development (including placer mining), arts and crafts production and sales, and outdoor recreation (ODV 2021b).

The District completed its draft Official Community Plan (OCP) in summer 2023, a policy document and land use framework that guides the community's vision and goals for the next 20 years. The OCP reflects the community's values and sets out the path for realizing a shared vision for the future. The OCP provides direction for a variety of important items including: recreation and parks; social development (education, equity and inclusion, culture, poverty, etc.); environmental protection and hazards (areas that should not be developed); climate change and community resilience; infrastructure (roads, sewer, water, electricity, and telecommunications); economic development; housing; community safety; design and architecture; and location of land uses (residential, park, industrial, commercial, etc.). The guiding principles that have guided the development of the OCP, future planning, and decision-making include:

1. Develop a community that is both environmentally and economically sustainable;
2. Invest in infrastructure upgrades that will promote community and environmental health;
3. Strike a balance between arts, culture, heritage, and industry;
4. Diverse and affordable housing options for residents and seasonal workers;
5. Maintain Wells' unique character and pedestrian-first, compact design;
6. Create an inclusive, self-sufficient community;
7. Wells will continue to be a peaceful and quiet community; and
8. Develop a community that is designed to be fully accessible for people of all ages and abilities (Wells 2023a).

Municipalities within the CRD are responsible for water distribution and treatment. Drinking water is provided by the municipalities or some individuals have water licenses and wells. The District does not currently have the capacity to meet existing demand and future growth for its water utilities because of challenges with the capacity of their infrastructure. Wells has had several challenges with their water quality, including a drinking water advisory released in February 2021 (Wells 2021; WSP 2021). Additionally, NH released a swimming water advisory in June 2023 along the shoreline of Jack of Club Tailings and Visitor Centre Beaches due to tailings contamination from historic mining activities (Wells 2023b).

On the third Tuesday of each month, Wells has a Primary Care Clinic that is staffed by the NH. Emergency Health Services for Wells is provided by the BC Ambulance Service and local paramedics are on call for 911 emergency services. Non-emergency health services are provided in Quesnel, which falls under the NH (Wells, n.d.).

2.1.5 Interior Health

Interior Health (IH) is a regional health authority that provides integrated health services and program delivery across BC's southern interior. IH is mandated by the Health Authorities Act to plan, deliver, monitor, and report on publicly funded health services for the people that live within its boundaries.

IH works with the Ministry of Health and Ministry of Mental Health and Addiction, as well as health organizations, communities, and leaders that make a positive difference in the lives of everyone in the region. The IH region covers 215,000 square kilometres that are located on the ancestral, unceded, and traditional territories of the seven Interior Region First Nations: Dãkelh Dené, St'át'imc, Syilx, Tŝilhqot'in, Ktunaxa, Secwépemc, and Nlaka'pamux Nations (IH 2023).

2.1.6 Northern Health

Northern Health (NH) is a regional health authority that provides a full range of health care services to the residents of Northern BC, and it is the largest geographic health region in the province covering the northern two-thirds of BC. NH covers an area of nearly 600,000 square kilometres and offers health services in over two dozen communities through 50 health locations. Services are distributed based on population size, referral base (catchment population), and degree of isolation from larger centres. Northern Health serves a small and diverse population of approximately 300,000 residents who live mostly in rural and remote communities (NH 2017). Within the Project area, Northern Health provides health services to Quesnel and surrounding areas. Health care facilities in Quesnel include GR Baker Memorial Hospital, Dunrovin Park Lodge, Westside Clinic, the Quesnel Mental Health Team, QUESST Unit, Quesnel Public Health Unit, and the Quesnel Primary Care Clinic (NH 2020). As Wells has a population of fewer than 500 people, Wells is considered a catchment community, and they form part of the referral base for larger centres.

2.1.7 Social and Community Services

The local community and Participating Indigenous nations are supported by a wide variety of non-profit and for-profit community providers that provide services aiming to address the needs of diverse populations. Support services are available for children, youth, adults, families, and seniors as well as other vulnerable populations. Some support services may also be provided by Participating Indigenous nations for their members (WSP 2021).

Services include income support, programs that address health and social issues, build healthy communities, or provide employment and training services (WSP 2021).

2.2 Incorporation of Community Knowledge

The mitigations addressed by the Community Effects Plan were developed through engagement and consultation with communities impacted by the Project and discussions that occurred with the Technical Advisory Committee (TAC) and the Community Advisory Committee (CAC), as well as engagement with Participating Indigenous nations. This section provides an overview of how Participating Indigenous nations, NH, IH, EMLI, and the District contributed to the development of this plan.

2.2.1 Technical Advisory Committee

The TAC is made up of provincial and local government staff or representatives with the mandate and expertise to review the Project, as well as Participating Indigenous nations. The TAC advises the EAO and Participating Indigenous nations on technical matters important for the assessment of the EA for the Project. The groups represented on the TAC include the following:

- Provincial Government
  - Ministry of Energy, Mines, and Low Carbon Innovation (EMLI)
  - Ministry of Environment and Climate Change Strategy
  - Ministry of Water, Land and Resource Stewardship
  - Ministry of Forests
  - Ministry of Jobs, Economic Recovery, and Innovation
  - Ministry of Indigenous Relations and Reconciliation
  - Ministry of Transportation and Infrastructure
  - Ministry of Agriculture
- Health Authorities
  - IH
  - NH

- Local Government
  - District of Wells
  - City of Quesnel
- Indigenous Nations and Representatives
  - Lhtako Dené Nation
  - Xatśūll First Nation
  - Williams Lake First Nation
  - PGL (representing Lhtako Dené Nation)
  - LGL Limited – environmental research associates, Source Environmental Associates, and Intrinsik Corp. (representing Xatśūll First Nation and Williams Lake First Nation)

2.2.2 Community Advisory Committee

The CAC was comprised of twenty-five members from the public who were interested in participating more fully in the EA process and to provide information and guidance related to potential effects to the community resulting from the Project. Consultation with the CAC brought forward key issues and concerns that are aimed to be addressed through the implementation of this Community Effects Plan (EAO 2023b).

2.2.3 Public Engagement

Community values and public goals were considered for the Community Effects Plan and the EAO sought public input through five public comment periods. The public shared their views through virtual and in-person open houses, and through opportunities to discuss the Project with technical experts. Comments were received primarily from individuals living near the location of the Project, or from individuals who travel to the area, or who have worked for BGM's existing operation (EAO 2023b).

2.2.4 Incorporation of Community Consultation and Engagement Feedback

During the process to develop the EA for the Project, Participating Indigenous nations, the TAC, the CAC provincial agencies, and local governments raised issues and concerns that were considered by the EAO and resulted in the requirement for the Community Effects Plan. Three rounds of review were completed for the EA, including additional technical memos from BGM. The EAO also held public comment periods and two open houses. At the end of the legislated time period for the EA Review, the EAO provided a Notice Regarding Application Review that highlighted issues and concerns raised during the EA review phase and directed BGM to provide additional information or to make revisions. BGM worked on the resolution of issues with the TAC and Participating Indigenous nations. Key themes include addressing concerns related to air

quality, water quality, infrastructure and services, wildlife, and human and community health, including the Project's effects on the health and wellbeing of the Wells community, and changes to access to the land for members of the Participating Indigenous nations (EAO 2023b). The draft Community Effects Plan was provided for review to Participating Indigenous nations, NH, IH, EMLI, and the District. Feedback received about the plan has been tracked and logged.

2.2.5 Community Involvement Plan/District of Wells Plan

The District of Wells Community Involvement Plan (CIP) will be created following the initial implementation of the Community Effects Plan in response to community input and feedback to the Community Effects Plan. The development of the CIP will be an initial outcome of the Community Effects Plan's adaptive monitoring and management process.

The purpose of the CIP is to outline the process BGM will follow to meet its commitments to community members, stakeholders, and the public during all phases of the Project. Through proactive engagement with the District, the CIP will strengthen and maintain constructive relationships and identify initiatives to maximize positive economic benefits from the Project to flow to Wells. This community-specific plan will outline how BGM will establish collaborative dialogue with local community members, stakeholders, and the public to better understand the priorities of residents of Wells and integrate their feedback into all levels of Project planning, decision-making, and implementation. A tailored issues monitoring plan will be developed to respond to concerns raised by residents of Wells and the District.

2.2.6 District of Wells

This section introduces the concerns, interests, and potential effects of the Project to the District, describes the engagement activities by BGM with the District and its outcome, and the feedback from the engagement guiding the development of the Community Effects Plan.

2.2.6.1 Concerns, Interests, and Potential Effects of the Project on the District of Wells

The District raised concerns and interests related to the Project's potential effects to their water treatment/management challenges and sewer infrastructure maintenance issues. The District sources its water from a single underground well and this water distribution system has issues with breakage and leakage. In February 2021, NH recommended an advisory from exposure to lead in drinking water by using other sources of drinking water. The District responded by providing bottles of potable water to its citizens until the situation was resolved. The water distribution infrastructure in Wells is outdated and suffers from continual maintenance issues, including leaks that place pressure on their limited water supply. The water delivery system was replaced in the 1980s; however, the materials used for the replacement were not municipal grade and are failing on the south side of the community. An upgrade of the water treatment system was announced in 2019 and is jointly funded by the District, provincial, and federal governments.

This project has not started, and the District is currently securing additional funds to address issues with the water's delivery system, treatment, and supply.

Outdated sewer infrastructure, built in the 1980s, continuously requires maintenance. There is only one lift station, and it needs upgrading. The sewage lagoon has non-compliant issues with provincial regulations and the discharge is continual. Regulatory authorities are aware of the sewer infrastructure maintenance issues; however, the only option for the District would be to shut the town down until an upgraded facility is available. The District applied for infrastructure funding and are planning for future treatment options (WSP 2021).

2.2.6.2 Engagement Activities by BGM with the District of Wells and its Outcome

During Process Planning, the Mayor and Councillor(s) of the District served as the Local Government members for the TAC. BGM engaged with Wells on the Project, beginning early in the Project Planning. BGM invited representatives to community workshops and provided newsletters. Input was documented in several ways including meeting notes, phone/email records, and tracking tables.

Feedback on the Project from the District was shared with BGM's technical and study teams to ensure that it was integrated into the Project and study planning (ODV 2022j).

2.2.6.3 Feedback from the Engagement with the District of Wells to Guide the Development of the Community Effects Plan

The engagement activities with the District influenced changes to the Project design with the intent to reduce potential environmental and social impacts. These changes included:

- Identifying ways in which the mine can promote tourism in the area;
- Upgrading water and sewer infrastructure with sufficient capacity to support the development in town;
- Enhancing electricity service to Wells and the surrounding areas;
- Updating the Project Emergency Response Plan to ensure the public are notified in a timely manner (i.e., supports a 24/7 notification system); and
- Updating the Mine Emergency Response Plan ensure the public are notified in a timely manner (i.e., supports a 24/7 notification system) (ODV 2023).

2.2.7 Northern Health

This section introduces the concerns and interests of the Project raised by the NH, describes the engagement activities by BGM with the health authority and its outcome, and how feedback from NH guided the development of the Community Effects Plan.

2.2.7.1 Concerns and Interests of the Project to Northern Health

The NH expressed concerns related to air and water contamination resulting in potential effects on human health. Concerns were also raised about the capacity of the existing health infrastructure to meet increased demands resulting from the Project if there was an accident or influx of individuals requiring health services.

2.2.7.2 Engagement Activities by BGM with Northern Health

During the assessment of the Project, the Health and Resource Development Technical Advisor and a Technical Advisor for Northern Health participated in the TAC. NH provided comments and information to support the assessment of potential effects resulting from the Project (EAO 2021).

2.2.7.3 Feedback from the Engagement with Northern Health to Guide the Development of the Community Effects Plan

Feedback from NH that informed the Community Effects Plan was obtained through engagement and consultation with the TAC and during the EA review process.

2.2.7.4 Interior Health

This section introduces the concerns and interests of the Project raised by IH, describes the engagement activities by BGM with the health authority and its outcome, and the feedback from the engagement guiding the development of the Community Effects Plan.

2.2.7.5 Interior Health's Concerns and Interests Related to the Project

During the engagement with Technical Advisors on the Initial Project Description, the concerns and interests of the IH related to the capacity of existing worker accommodations to house more workers, impacts to air quality, and the significant public health risks of a mine dam failure.

2.2.7.6 Engagement Activities by BGM with the Interior Health and its Outcome

During the Process Planning, the Specialist Environmental Health Officer of the IH were Provincial Agency (including Health Authority) members that participated in the TAC. IH provided comments and information requests during the Initial Project Description point of the EA (EAO 2021).

2.2.7.7 Feedback from the Engagement with the Interior Health to Guide the Development of the Community Effects Plan

Feedback from IH that informed the Community Effects Plan was obtained through engagement and consultation with the TAC and during the EA review process.

2.2.8 Ministry of Energy, Mines and Low Carbon Innovation

This section introduces the concerns and interests of the Ministry of Energy, Mines and Low Carbon Innovation (EMLI) related to the Project, describes the engagement activities by BGM with

the Ministry and its outcome, and the feedback from engagement guiding the development of the Community Effects Plan.

2.2.8.1 Concerns and Interests of EMLI Related to the Project

As part the TAC comments and BGM's responses, the concerns and interests of EMLI related to the Project are summarized under four main categories including: 1) geochemistry; 2) water balance/water quality modelling approach; 3) mine waste management facilities/waste rock storage facilities; and 4) project description.

Geochemistry

- Geochemical characterization program should include all geological materials, including overburden sampling at the Mine Site Complex and the QR Mill.
- Additional sampling and analysis for calcareous siltstone from the total waste rock to identify and manage waste rock;
- Confirmation of all Contaminates of Potential Concern (COPCs) with water quality guidelines were screened in the amended permit for Bonanza Ledge mine; and
- The assessment of metal leaching/acid rock drainage (ML/ARD) potential along the transmission line construction.

Water Balance/Water Quality Modelling Approach

- Geochemical modelling on top of the GoldSim modelling used for the water quality model;
- Site specific information used to develop the water quality model's source terms;
- Assumptions of non-contact water diversion and no leakage from liners during high flow events;
- Water quality modeling that has a node that shows blended predicted quality at the Mine Site;
- Assumption that the Main Zone Pit (MZP) is a fully mixed system and lime dosing stations between the water treatment system and MZP, and between the Filtered Stack Tailings Storage Facility (FSTSF) and the MZP; and
- Evaluating the sensitivity of the water quality model that all reservoirs are fully mixed versus having two layers (EAO 2022).

Mine Waste Management Facilities/Waste Rock Storage Facilities

- Waste Rock Storage Facility (WRSF) designs describe the foundation conditions, including where founded on historic mine rocks and specify the type of liner (if any) proposed to be used to separate the new waste rock from foundation materials or underlying historic waste rock; and

- Anticipated volume of tails to be produced for the Project and stored in the FSTSF.

Project Description

- Discuss why the northeast portion of Jack of Clubs Lake is excluded from the Project footprint;
- Provide information on the soil and overburden inventories for the disturbance associated with the Cariboo Gold Mine Site, Bonanza Ledge Site, QR Site, and Mosquito Creek Site. If soil and overburden shortfall is expected, describe the measures that will be implemented to meet end land use and capability objectives;
- Note the soil and overburden suitability for the use of reclamation should not be used as fill;
- Describe the engineered covers being considered for progressive reclamation of WRSFs;
- Describe the projected short-term and long-term implications of the dry stack tailings on the availability of metals and accumulation in vegetation growing on tailing storage facilities;
- Describe how the various tailings storage options influence the volume requirements of overburden and soil materials to meet end land use and closure objectives;
- Describe how pre-existing management plans or technologies eliminate, control, or mitigate the impacts of windblown dust associated wit the various tailings handling options;
- Discuss why overburden is classified as waste for the Project; and
- A Bat Management Plan is required if Project activities have the potential to effect bats and/or bat habitat (EAO 2020a).

2.2.8.2 Engagement Activities by BGM with EMLI and its Outcome

During the Process Planning, the Technical Operations Director, Geotechnical Engineering Manager, Environmental Geoscience Manager, Reclamation Inspector, two Senior Geotechnical Inspectors, Senior Environmental Scientist, Senior Project Lead, and Senior Project Management Advisor of EMLI were Provincial Agency (including Health Authority) members that participated in the TAC. EMLI provided comments and information requests during the Initial Project Description and Application Review points of the EA (EAO 2021).

2.2.8.3 Feedback from the Engagement with EMLI to Guide the Development of the Community Effects Plan

Feedback from EMLI that informed the Community Effects Plan was obtained through engagement and consultation with the TAC and during the EA review process.

2.2.9 Social and Community Services

This section introduces the concerns and interests of the Project raised by social and community services, describes the engagement activities by BGM with social and community services, and the feedback received from the engagement that has guided the development of the Community Effects Plan.

2.2.9.1 Social and Community Service's Concerns and Interest Related to the Project.

Representatives from social and community services expressed that potential impacts from the Project on social and community services include increased stress on the capacity of social and community support services to serve an increased demand for services from an increased population, particularly for individuals experiencing vulnerabilities. In some cases, such as for schools, the increase in population may help to maintain some of the funding that would otherwise be lost due an aging population and decline in student numbers (ODV 2022d).

Challenges may exist in securing daycare, however, recently more Early Childhood Educators are being trained in the region, which may relieve some of the pressure on childcare providers (ODV 2022d).

2.2.9.2 Engagement Activities Conducted by BGM with Social and Community Services and the Outcome

BGM recognizes that there is limited capacity in the region for social and community services supporting human and community wellbeing. BGM's Health and Medical Services Plan for the Project's employees and contractors is intended to offset pressures put on the health services that the Project workforce may create. The Health and Medical Services Plan also includes strategies for improving mental health and reducing domestic violence to support healthy communities (ODV 2022d).

Currently, BGM has a strong relationship with the Amata Transition House Society and will support the hiring of a social worker to confidentially address issues related to mental health, substance abuse, and domestic violence that could result from mining culture and the Project. BGM will collaborate and consult with the Amata Transition House Society on which community social service providers should be engaged to better understand or mitigate community concerns resulting from the Project.

Indigenous Cultural Awareness Training and Diversity, Equity, and Inclusion training for the Project's workforce may also help to address some of the community's concerns by identifying strategies for BGM to use to improve their employment policies to assist more inclusive and accessible hiring, and to support BGM to appropriately engage with diverse population to develop a greater understanding of the Project's impacts.

2.3 Incorporation of Traditional Knowledge from Participating Indigenous Nations

BGM envisions that their Project will be designed in collaboration with the local community, Participating Indigenous nations, and partners. During the EA process, BGM engaged with Lhtako Dené Nation, Xatśūll First Nation, and Williams Lake First Nation as Participating Indigenous nations. Nazko First Nation and the Tŝilhqot'in National Government will be notified of Project milestones by the EAO because they did not self-identify to participate in the EA process. BGM holds ongoing discussions with Participating Indigenous nations in their efforts to identify concerns, interests and to resolve issues. Chapter 11.0 Lhtako Dené Nation, Chapter 12 Williams Lake First Nation, and Chapter 13 Xatśūll First Nation of the EA outlines their Indigenous Interests and the Project's potential effects as they relate to the valued components assessed in the EA. Traditional Knowledge was also obtained through Traditional Land Use studies that presented a decolonized approach for understanding and using Indigenous Knowledge in order to develop and propose culturally respectful mitigations to reduce potential adverse effects. Comments and feedback from the Participating Indigenous Nations to the Community Effects Plan and BGM's response has been tracked and logged.

2.3.1 Indigenous Partnership Plan

The Indigenous Partnership Plan (IPP) will be created following the initial implementation of the Community Effects Plan in response to community input and feedback to the Community Effects Plan. The development of the IPP will be an initial outcome of the Community Effects Plan's adaptive monitoring and management process.

The purpose of the IPP is to outline the process BGM will follow to meet its commitments to Participating Indigenous Nations during all phases of the Project. Through proactive engagement with the Indigenous nations, the IPP will strengthen and maintain constructive relationships and identify initiatives to maximize Project opportunities for Indigenous nations. This Indigenous specific plan will outline how BGM will establish collaborative dialogue with Participating Indigenous nations to better understand their priorities and integrate their feedback into all levels of Project planning, decision-making, and implementation. A customized monitoring plan to support the implementation of the IPP will be developed to respond to concerns raised by the Participating Indigenous nations.

2.3.2 Lhtako Dené Nation

This section introduces the concerns, interests, and potential effects of the Project raised by the Lhtako Dené Nation, describes the engagement activities by BGM with the community and its outcome, and the feedback from the engagement guiding the development of the Community Effects Plan.

2.3.2.1 Concerns, Interests, and Potential Effects of the Project to Lhtako Dené Nation

As part of the Processing Planning Phase and as documented in the Application Information Requirements, the concerns and interests of the Lhtako Dené Nation related to the Project are summarized under four main categories: 1) traditional land use and practices, 2) water, 3) caribou, and 4) community well-being. The potential effects to Lhtako Dené Nation Indigenous Interests in and around the Mine Site and the appropriate usage of Traditional Ecological Knowledge for all phases of the EA process were informed by the Traditional Land Use and Occupancy Study (TLUOS).

Traditional Land Use and Practices

Lhtako Dené Nation is concerned about ongoing resource development in their territory that may affect their traditional land use and practices including existing habitation sites, spiritual sites, access to traditional use areas, commercial use and harvesting locales, water and air quality, subsistence and medicinal plant gathering areas, and effects to animal health and habitat. The TLUOS identified numerous traditional land use sites that are either fully or partially within the Project area and buffer with sites near the Mine Site and Wells. During engagement activities and as described in the TLUOS, 500 Nyland Lake Road is an important area to harvest cranberries, huckleberries, Saskatoon berries, and soapberries, access area to hunt moose and deer, and it is the first visited area during the seasonal round. Fishing was identified as a past activity at the Jack of Clubs Lake, but the lake is no longer used for traditional land use due to historical contamination from old mine tailings.

Water

The health of water has been raised as an important issue by the Lhtako Dené Nation as it directly impacts their water-based traditional practices, including fishing, harvesting of freshwater fish and waterfowl, and waterway transportation. Effects to water include water quality (both groundwater and surface water), surface water quantity, hydrology, and aquatic ecosystems. Jack of Clubs Lake is no longer used for fishing due to contamination from old mine tailings. The community is interested in the reclamation of Jack of Clubs Lake and wants adequate water management practices implemented for the Project. Water management at the Mine Site and QR Mill was also raised as a concern by the Lhtako Dené Nation, particularly in regard to discharge, treatment, and non-compliance issues with historical mining operations. Additional information on tailings management, filtered tailings storage, and potential effects on water quality and aquatic resources was requested by Lhtako Dené Nation (ODV 2022g).

Caribou

Conservation and recovery of the local Barkerville Caribou herd is a priority for the Lhtako Dené Nation as this is a keystone species from a cultural perspective and a species at risk concern both provincially and federally. Lhtako Dené Nation members hunted caribou as their main food

source with the meat dried and preserved by canning. Caribou was harvested throughout their home range, including areas along the Willow River, Island Mountain, Wells, and Jack of Clubs Lake. Caribou herds are mainly impacted by cumulative impacts with forestry operations, interactions with moose and moose hunting, predation by wolves and hunters, and forest fires reducing critical caribou habitat. Currently, Lhtako Dené Nation does not hunt caribou, but aspires to hunt and harvest caribou in the future.

The potential effects of the Project to caribou in the Lhtako Dené Nation traditional territory include:

- Loss of wildlife species and/or wildlife habitat;
- Sensory disturbance to wildlife species;
- Disruption to movement patterns or wildlife corridors;
- Loss of wildlife species through direct mortality; and
- Loss of wildlife species through indirect mortality and attractants.

Critical caribou habitat is located within the Mine Site and the eastern section of the Transmission Line and Project activities may result in loss or alteration of caribou habitat. Caribou are highly sensitive to sensory disturbances and disruption to movement patterns by Project activities and infrastructure. Construction and workforce traffic associated with the Project activities may result in direct and indirect mortality of caribou.

Caribou have a low resilience to stress and are not well responsive and adaptable to potential residual effects. The estimated population unit is less than 100 animals, and the herd is in a vulnerable position to additive stress and mortality. BGM will meet with Lhtako Dené Nation on how to support caribou recovery initiatives and are planning to implement a Caribou Mitigation and Management Plan for the Project (ODV 2022g).

Community Well-being

Community well-being includes the integration of Lhtako Ecological Knowledge, Dakelh language and teaching, community and cultural cohesion, and intergenerational knowledge transfer. Lhtako Dené Nation must be able to uphold their stewardship systems, customs, beliefs, and values for the community to be healthy. Access to transportation routes and cultural sites along with encroachment of non-community members have the potential to impact community well-being and safety. The Nation anticipates economic gains from the current Project while ensuring that natural resources are maintained for the benefit of future generations.

Lhtako Dené Nation community members expressed the uncertainty of the Project's proposed effects and perceived the associated negative effects of the Project to be high. The community feels that further discussion and information-sharing of the Project's technical nature and large-

scale mining operations is warranted. This is so the parties can reach a mutual understanding of the risks and potential benefits of mining development within the study area (ODV 2022g).

2.3.2.2 Engagement Activities by BGM with Lhtako Dené Nation and its Outcome

BGM has been engaging with Lhtako Dené Nation since 2016. Engagement activities included meetings, presentations, site tours, phone calls, emails, and submissions through the EAO that have been incorporated into the Project planning and design.

Lhtako Dené Nation signed a Life-of-Project Agreement with BGM to facilitate the development of the Project with consent and support in October 2020. This Project Agreement builds on an Engagement Protocol, Relationship Agreement, and Capacity Funding Agreement, which have provided Lhtako Dené Nation opportunities to cover their capacity building and costs to participate in the regulatory review processes, complete a TLUOS specific to the project, and retain independent consulting firms to provide technical review of materials and submissions.

Lhtako Dené Nation signed a Notice of Consent for the Project on August 18, 2023, which confirms that (1) Lhtako Dené Nation understands the Project and its potential effects on rights, title, and interests under Section 35 of the Constitution Act; (2) Lhtako Dené Nation has been adequately consulted and accommodated; (3) Lhtako Dené Nation has agreed not to delay steps, or bring any court actions or proceedings to the Project, the Environment Assessment, and any other regulatory process for the Project; and (4) Lhtako Dené Nation grants the rights, tenures, permits, approvals, and other authorizations for the Project, including amendments, supplements, replacements to authorizations, and any other decisions or actions of the Crown that are required for the Project (ODV 2022g).

2.3.2.3 Feedback from the Engagement with Lhtako Dené Nation to Guide the Development of the Community Effects Plan

The feedback from the engagement with Lhtako Dené Nation was utilized to understand how the Project may potentially impact their Indigenous Interests and how measures can be incorporated into the Project to avoid, mitigate, or address these impacts. As directed by Lhtako Dené Nation's leadership, BGM will continue to work with the community's leadership, staff, community members, and third parties to identify appropriate methods of engagement and communication (ODV 2022h).

2.3.3 Xatśūll First Nation

This section introduces the concerns, interests, and potential effects of the Project raised by Xatśūll First Nation, describes the engagement activities by BGM with the community and its outcome, and the feedback from the engagement guiding the development of the Community Effects Plan.

2.3.3.1 Concerns, Interests, and Potential Effects of the Project to Xatśūll First Nation

As part of the Processing Planning Phase and as documented in the Application Information Requirements, the concerns and interests of Xatśūll First Nation related to the Project are summarized under four main categories: 1) traditional land use and cultural heritage practices, 2) land stewardship, 3) economic development and opportunities, and 4) community health and safety.

Traditional Land Use and Cultural Heritage Practices

Xatśūll First Nation is concerned about Project impacts to transportation routes, resource use areas, areas of spiritual or cultural significance, and habitation sites. The meaningful exercise of Section 35 Aboriginal and Treaty Rights by Xatśūll First Nation for traditional land use activities has been affected by ongoing industrial activities, both now and for the viability for future rightsholders. Xatśūll First Nation is concerned that additional development in their traditional territory will exacerbate existing conditions. As the effects to traditional land use and cultural heritage practices encompass a broad range of activities by Xatśūll First Nation, it can be affected by impacts to land and resource use, archaeology and heritage resources, and culture (ODV 2022h).

Land and Resource Use

The potential effects of Project activities to land and resource use within Xatśūll First Nation traditional territory include: reduced/changed access, decrease in environmental conditions, decrease in enjoyment/experience to contemporary land and resource use, increased pressure on public land and resource use by the Project's workforce, and change in visual quality. Potential effects related to environmental conditions along the Transportation Route during the Construction, Operations, and Closure phases are caused by noise and emissions of the Project activities and workforce traffic. The potential impacts to visual quality and character of the Mine Site LAA during Construction, Operations, and Closure phases include vegetation clearing and maintenance, landform modifications, and surface infrastructure at the Mine Site (ODV 2022h).

Archaeology and Heritage Resources

The potential effects of Project activities to archaeology and heritage resources include damage to the integrity and changes to access of archaeological, historical, or paleontological sites or deposits, if present. Ground disturbance from Project activities around the Mine Site and QR Mill can affect traditional land use through the change or loss of access to spiritual and culturally sensitive sites.

Culture

The potential effects of the Project activities to culture include changes to plant species of cultural significance, traditional foods, and Indigenous language and teaching. Alteration or loss

of plant species is primarily through clearing activities at the Mine Site and QR Mill and only within areas for new or upgraded infrastructure of the Surface Footprint (ODV 2022h).

Land Stewardship

Xatśūll First Nation are stewards of their land, who care about the effects on all living creatures and their habitat and have requested to participate in all land stewardship initiatives. Xatśūll First Nation requested to be given a better understanding of impacts of the Project to water quality and critical habitat for Southern Mountain Caribou. Xatśūll First Nation are interested in protecting wildlife, fish, vegetation, and water while also ensuring the Project can be conducted (ODV 2022h).

Freshwater Fish

The potential effects of Project activities to fish and fish habitat within Xatśūll First Nation traditional territory include: loss or alteration of instream and riparian habitats and change in surface water quantity resulting in effects to fish and fish habitat. The direct loss of instream and riparian habitats are from Project activities at the Mine Site and QR Mill. A clearspan bridge will be constructed at the Mine Site to cross the Willow River and riparian clearing will be required at the bridge crossing. The changes in flow may cause the following alterations and destruction to fish and fish habitat during Construction, Operations, and Closure:

- Erosion of banks and beds, increases in water depth velocities of the rearing habitat for juveniles or small-bodied fish;
- Reduce pooling areas for adults or large-bodied fish who use this habitat for refuge or overwintering habitat; and
- Reduce annual recruitment due to velocity barriers that reduce critical spawning success and overwintering survival.

Fishing and trapping and access to the locations are not anticipated to be impacted by the Project. Water quality degradation from industry along the Fraser River remains to be a concern for Indigenous nations as they harvest and consume fish from the river. It is not anticipated that water contamination or changes to water quality will take place as a result of the Project, due to planned water treatment and management methods throughout the life of the Project. Details on the water treatment plant and water treatment system are provided in Section 7.4 Surface Water (ODV 2022h).

Wildlife

The potential effects of Project activities to wildlife and wildlife habitat within Xatśūll First Nation traditional territory include:

- Loss of wildlife species and/or wildlife habitat;

- Sensory disturbance to wildlife species;
- Disruption to movement patterns or wildlife corridors;
- Loss of wildlife species through direct mortality; and
- Loss of wildlife species through indirect mortality and attractants.

Wildlife will be affected by habitat alteration from clearing activities and construction of the Mine Site, QR Mill, and the Transportation Route. Sensory disturbances, which include noise and visual sources during Construction and Operations, can affect songbirds and ungulates around the Mine Site, QR Mill, and the Transportation Route. Disruption of movement patterns, habitat fragmentation, and human disturbance, related to noise and worker presence during Construction and Operations, have minor effects to medium and large carnivores and furbearers. Direct mortality risk to amphibians, ungulates and large carnivores is anticipated to be primarily caused by construction in breeding habitats (wetlands for amphibians), wildlife-vehicle collisions, and/or an increase in hunting mortality (ungulates) (ODV 2022h).

Vegetation

Even with mitigation measures, there will still be a loss and alteration of traditional use plant species within the Surface Footprint of the Project (ODV 2022h). The majority of the Project infrastructure will be constructed and operated on brownfield sites (previously disturbed areas caused by historical mining operations) to lessen the effects on the natural ecosystem and decrease the impact to vegetation compared to an area with a fully undisturbed footprint (ODV 2022l). Vegetation clearing will occur near the Mine Site and QR Mill, and these sites are not used for harvesting. Effects to land stewardship from vegetation effects are limited in extent and low in magnitude. Progressive revegetation and reclamation will be planned and implemented with a focus on re-establishing plant communities with native plant materials suitable for the local region and undertaken during the appropriate growing season and conditions. (ODV 2022h and 2022l).

Soil

Xatśūll First Nation noted less availability of suitable camping and gathering areas as a result of changes to soil quantity and quality in the area from unrelated project activities. Additional losses around the Mine Site and QR Mill are anticipated because of Project activities, including direct loss of soil quantity, soil compaction and dust accumulation, and alteration of terrain stability (ODV 2022h). Application of BGM's Soil Management Plan, Reclamation and Closure Plan, and well-established Best Management Practices (BMPs) for the management of soils will be implemented prior to the start of construction and throughout the Operations phase of the Project. Efforts to conserve soil quality during stripping, handling, transport, storage, and redistribution are discussed in a Soil Management Plan and the Reclamation and Closure Plan.

Industry-standard BMPs for soil erosion and dust management will be implemented to limit soil erosion and fugitive dust deposition. These measures are applied to minimize loss and alteration of soil quality and quantity (ODV 2022m). The changes to soil quality and quantity are not anticipated to have a significant impact to Xatśūll First Nation's ability to practice Land Stewardship within their territory. Additionally, Xatśūll First Nation expressed interest in reclamation activities as part of Project mitigation (ODV 2022h).

Surface Water

Construction of the water management system for the Mine Site will alter flows downstream in the receiving environment, beginning with the Construction Phase. Changes in streamflow will be limited with the Surface Water LAA and will be maintained within the historical range of variability.

The discharge of treated effluent to Jack of Clubs Lake will result in changes in lake outflow and water level. Annual average flows at Jack of Clubs Lake at the outlet are predicted to remain similar to existing conditions and change to the seasonal distribution of flows is predicted during Operations. Measurable changes to streamflow are not predicted at Willow River downstream of Mosquito Creek or locations further downstream within the RAA.

The discharge of treated effluent to Rudy Creek will result in changes in stream flows. Stream flows at Rudy Creek are maintained within the historical range of variability.

Surface water concentrations at Jack of Clubs Lake and Rudy Creek will increase relative to existing conditions but will remain below Surface Water Quality guidelines and toxicological benchmarks. The magnitude of the effect to Surface Water is low and the extent is within the LAA (ODV 2022h).

Groundwater

Construction and operation at the Mine Site will alter groundwater quantity relative to existing conditions. Dewatering of groundwater at the Mine Site has the potential to reduce surface water baseflow, reduce discharges where historical mine workings and ground surface intercept, and lower water levels at the drinking water aquifer used by the community of Wells. Closure of the Mine Site will alter groundwater quantity relative to existing conditions. Water level reduction in Wells' Aquifer is less than a 1 metre (m) change from existing conditions.

Operation of the underground mine will alter groundwater quality relative to existing conditions. The predicted underground mine water quality will exceed guidelines for key parameters of COPCs. Arsenic and sulphate concentrations will exceed relevant guidelines in existing underground mine water.

The Wells Aquifer is currently affected by historical mine water and impacts the water supply well for the community of Wells. BGM is actively working with the District on the following to address concerns regarding the quality of the community water supply:

1. Establish a new well location by sourcing water from suitable surface water or groundwater options; and
2. Upgrade the current water supply pipeline infrastructure to resolve issues wit the potable water supply for the community (ODV 2022h).

Air Quality

Concerns from Xatśūll First Nation members was the potential for changes in air quality to impact the land by reducing the suitability of sites for camping, gathering, and harvesting due to contamination from pollutants, soot, and dust. Fugitive dust is anticipated to be produced by material handling and dumping, dozing, on-road and non-road transport, and combustion and point sources and these activities will only occur at the Mine Site itself and along roads.

The residual effect of particulates from the Mine Site, QR Mill, and the Transportation Route is considered moderate. Once Project activities cease during the Post-Closure Phase, the expected magnitude of the increase in ambient particulate matter is moderate, the geographic extent of the emissions is local, and the residual effect is fully reversible. Other residual effects including emissions from sulfur dioxide (SO2), carbon monoxide (CO), and nitrogen dioxide (NO2) are likely to occur because of combustions from generator sets, on-road and non-road equipment, heating infrastructure, and explosives. These activities will take place during the Construction and Operation Phases of the Project (ODV 2022h).

Economic Development and Opportunities

Xatśūll First Nation's primary interest regarding economic development for the Project is capacity building and employment for the community. Xatśūll First Nation are interested in completing some of the environmental work from the Project to build community capacity and improve community trust in the information. There is an expectation that Xatśūll First Nation members will be employed by the Project or provided with education and training to pursue employment in the mining industry.

Xatśūll First Nation also expressed interest in developing experience and training for community members to become water technicians. Xatśūll First Nation requested to define opportunities to Indigenous-owned businesses to act as suppliers for the Project and whether there will be contracting or joint-venture opportunities. Discussions are ongoing between Xatśūll First Nation and BGM with respect to a potential impact benefit agreement and Xatśūll First Nation expressed an interest in ensuring that capacity funding continues to be available to support the community's participation in the regulatory approvals and environmental assessment processes associated with the Project (ODV 2022h).

Community Health and Safety

Xatśūll First Nation must be able to uphold their stewardship systems, customs, beliefs, and values for the community to be healthy. Access to transportation routes and cultural sites along with encroachment of non-community members have the potential to impact community well-being and safety. Xatśūll First Nation also raised concerns about emergency procedures during mine site shutdowns due to the Mount Polley failure near the community. The Nation anticipates economic gains from the current Project while ensuring that natural resources are maintained for the benefit of future generations.

Knowledge Keepers expressed concerns regarding the cumulative effects of many industrial activities. Some Knowledge Keepers have also raised concerns about the effects of mining and the mining culture on the community's health, safety, well-being, and land-use practices, issues related to the protection of Indigenous women and girls, and issues related to addictions and substance abuse (ODV 2022h).

2.3.3.2 Engagement Activities by BGM with Xatśūll First Nation and its Outcome

BGM has been engaging with Xatśūll First Nation since 2017. Engagement activities included meetings, presentations, site tours, phone calls, submission of project documents for review, and provision of capacity funding to facilitate Xatśūll First Nation's participation in the environmental assessment process. BGM maintains records of engagement activities, concerns raised, and responses provided to ensure that the engagement process is accurately captured, and that interests, concerns, and responses were recorded and addressed. BGM recognizes the importance of understanding how Xatśūll First Nation's input influenced the Project planning and engagement process.

Since 2019, Xatśūll First Nation and BGM have entered into a series of capacity funding agreements with BGM covering all costs incurred by Xatśūll First Nation for their participation in the environmental assessment and consultation process (ODV 2022h).

Xatśūll First Nation signed an initial notification of lack of consent on August 14, 2023. The purpose of the letter was to recognize that Indigenous nations make decisions on consent based on their laws, governance, and traditions to express their right to Indigenous self-determination and self-governance. The Nation shared the letter with BGM's leadership to resolve their concerns and meet with the Ministers to develop options to address these concerns. Some of the reasons of the lack of consent are:

1. If a new drinking water source in Wells cannot be identified, then address the Project effects on the groundwater quality at the water supply during the Operations, Closure, and Post-Closure phases;

2. Water treatment/management and storage capacity at the QR Mill Site has some potential for release of untreated water during the event of large flood conditions;
3. Uncertainties of the effluence discharge affecting water quality at Jack of Clubs Lake, Lowhee Creek, and Rudy Creek;
4. Frequent monitoring of fish and fish habitat with the implementation of appropriate management and monitoring plans;
5. Direct, indirect, and cumulative adverse effects of the Project on vegetation, ecosystems, wildlife, and habitat with specific conservation concerns to the Barkerville subpopulation of the Quesnel Highlands Population unit of southern mountain caribou; and
6. A mercury advisory for lake trout and bull trout at the Jack of Clubs Lake (Xatśūll First Nation First Nation 2023e).

On August 17, 2023, Ministers Heyman and Osborne wrote a letter to Xatśūll First Nation to directly engage with the community on the formal notification of lack of consent for the Project. Xatśūll First Nation signed a follow-up letter regarding the lack of consent on September 25, 2023. The Province of BC is committed to understanding and addressing Xatśūll First Nation's concern with the Project and have appropriately addressed their concerns with conditions proposed during the environmental assessment process. Xatśūll First Nation, however, still have some concerns in terms of water treatment/management and water quality with the Environmental Assessment Application as water stewardship is a fundamental priority to the Nation. Xatśūll First Nation stated in their letter that the Nation is not prepared to wholly withdraw their lack of consent notice but can work towards consent through a commitment from the permitting process (Xatśūll First Nation 2023f).

2.3.3.3 Feedback from the Engagement with Xatśūll First Nation to Guide the Development of the Community Effects Plan

The feedback from the engagement with Xatśūll First Nation was utilized to understand how the Project may potentially impact their Indigenous interests and how measures can be incorporated into the Project to avoid, mitigate, or address these impacts. As directed by Xatśūll First Nation's leadership, BGM will continue to work with the Nation's leadership, staff, community members, and third parties to identify appropriate methods of engagement and communication (ODV 2022h).

2.3.4 Williams Lake First Nation

This section introduces the concerns, interests, and potential effects of the Project to Williams Lake First Nation, describes the engagement activities by BGM with the community and its

outcome, and the feedback from the engagement guiding the development of the Community Effects Plan.

2.3.4.1 Concerns, Interest, and Potential Effects of the Project to Williams Lake First Nation

As part of the Processing Planning Phase and as documented in the Application Information Requirements, the concerns and interests of Williams Lake First Nation related to the Project are summarized under four main categories: 1) traditional land use and cultural heritage practices, 2) economic development/opportunities, 3) land stewardship, and 4) community health and safety. The potential effects to Williams Lake First Nation Indigenous interests were informed by the Traditional Land Use Study (TLUS) and ongoing engagement with the community.

Traditional Land Use and Cultural Heritage Practices

Topics addressed regarding traditional land use and cultural heritage practices in the TLUS are habitation and gathering areas, subsistence, transportation routes, sacred places, ancestral sites, community well-being, recreation, and other. The meaningful exercise of Section 35 Aboriginal and Treaty Rights by Williams Lake First Nation has been affected by ongoing industrial activities with varying degrees of impact depending on the disturbance and area within the traditional territory, both now and their viability for future rightsholders. Williams Lake First Nation is concerned that additional development in their traditional territory will exacerbate existing conditions. Specifically with the Project, there is an interest in understanding the potential effects to water quality, road use, and the cumulative effects on the access roads within the area of the QR Mill. Williams Lake First Nation want to know the existing condition on-site and are inquiring on details regarding the storage of potentially-acid generating rock at the QR Mill Site. Williams Lake First Nation wish to develop traditional use studies in the area of the QR Mill. Issues of special concern were the potential effects to wildlife and wildlife habitat, effects to vegetation, effects to fish habitat downstream of the QR Mill, and salmonid populations (ODV 2022i).

Economic Development/Opportunities

The primary interest regarding economic development opportunities for the Project is capacity building for Wiliams Lake First Nation. There is a desire for some of the archaeological, construction, and environmental work completed during the Construction and Operation phases of the Project to be conducted by a Williams Lake First Nation-owned company or from joint venture opportunities to build community capacity. The creation of employment opportunities for local and regional residents, including Williams Lake First Nation, is a positive effect of the Project. BGM is currently working with local education and training institutions to train local workers for potential employment opportunities with BGM. During the Closure phase of the Project, the communities and employees will be made aware of the mine's lifespan and will be encouraged to consider this in their planning as the Project advances (ODV 2022i).

Land Stewardship

Land stewardship is a central value of Williams Lake First Nation. Stewardship, as described in the TLUS, is deeply embedded spiritual beliefs and values to respect living things and thus is about the need to look after resources. Williams Lake First Nation is interested in maintaining resources for stewardship as its importance is for both economic and spiritual role. Williams Lake First Nation is interested in protecting wildlife, fish, vegetation, and water while also ensuring the Project can be conducted (ODV 2022i).

Wildlife

The potential effects of Project activities to wildlife and wildlife habitat within Williams Lake First Nation traditional territory include:

- Loss of wildlife species and/or wildlife habitat;
- Sensory disturbance to wildlife species;
- Disruption to movement patterns or wildlife corridors;
- Loss of wildlife species through direct mortality; and
- Loss of wildlife species through indirect mortality and attractants.

Caribou will be negatively affected by the Project activities as this particular wildlife species have a low natural resilience to imposed stresses and will not respond and adapt to a potential residual effect. Potential residual effects from the Project can interact with other present/ongoing or future activities and projects including forestry, placer mining, and transportation activities. These activities can impact optimal habitat for caribou by physically altering the landscape and/or sensory disturbance. Forestry cut blocks next to the Transmission Line or other components of the Project can increase the area of open space (ODV 2022i).

Freshwater Fish

The potential effects of Project activities to fish and fish habitat within Williams Lake First Nation traditional territory include: changes in water quantity at the QR Mill and result in the effects to fish and fish habitat. The changes in flow may cause the following alterations and destruction to fish and fish habitat during Construction, Operations, and Closure:

- Erosion of banks and beds, increases in water depth velocities of the rearing habitat for juveniles or small-bodied fish;
- Reduce pooling areas for adults or large-bodied who use this habitat for refuge or overwintering habitat; and
- Reduce annual recruitment due to velocity barriers that reduce critical spawning success and overwintering survival.

Fishing, especially for chinook and sockeye, is an important part of Williams Lake First Nation subsistence activities and livelihoods. Fishing and trapping and access to their locations within Williams Lake First Nation territory are not anticipated to be impacted by the Project. Water quality degradation from industry along the Fraser River remains to be a concern for Indigenous nations as they harvest and consume fish from the river. It is not anticipated that water contamination or changes to water quality as a result of the Project, due to water treatment from the Project's Management and Monitoring Plans (ODV 2022i).

Vegetation

The effects of Project activities to vegetation within Williams Lake First Nation traditional territory include: loss and alteration of plant species and communities, wetlands and wetland functions, and ecosystems. Loss of vegetation is primarily through clearing activities during construction and this Project activity has the potential to cause the following effects:

- Edge effects related to previously cleared areas and dust deposition from the use of gravel-surfaced roads; and
- Spread of invasive and non-native plant species that can affect plant community composition and function.

Even with implementation of mitigation measures, there will still be loss and alteration of vegetation within the Surface Footprint. Clearing activities at the QR Mill will occur at new or upgraded infrastructure within the Surface Footprint; additionally, there will be no clearing activities planned outside of the current QR Mill boundary and along the Transportation Route. Effects on the health of vegetation have a direct effect on land stewardship within the Williams Lake First Nation traditional territory. Vegetation supports the habitat and food sources for significant wildlife species of interest, additionally provides sources of food and ceremonial and medicinal plants to the Nation (ODV 2022i).

Soil

The potential effects of Project activities to soil quality and quantity within Williams Lake First Nation traditional territory include: direct loss of soil quantity, alteration of soil quality through compaction and accumulation of dust, and alteration of terrain stability. Based on previously completed environmental assessments, there were 20 Areas of Potential Environmental Concern identified with the local study area and 43 registered contaminated sites through the LAA. Contaminated sites were primarily located near the Fraser River and Quesnel River, and at least three identified fish spawning habitats. Additional losses from the Project activities are limited to the QR Mill boundary due to the intentional use of existing disturbed areas and are not anticipated to have a significant impact on the ability of the Nation to exercise Land Stewardship within their territory. Williams Lake First Nation expressed interest in soil reclamation to ensure traditional land use was maintained after Project closure (ODV 2022i).

Surface Water

The potential effects of Project Activities to surface water quality and quantity within Williams Lake First Nation traditional territory include:

- Alterations to drainage pathways and areas into receiving environments;
- Increase in surface water quantity; and
- Changes to surface water quality.

The Project activities that alter drainage pathways and areas into receiving environment occur outside of the Williams Lake First Nation territorial boundary. The potential impacts, however, occur as the tributaries flow into the Nation's traditional territory. Water diversion ditches during the Construction phase of the Project have the potential to result in physical or chemical changes of surface waters. The discharge of treated effluent Rudy Creek will result in the increase of surface water quantity and changes to surface water quality at the QR Mill. Discharge of the treated effluent will result in incremental increase in streamflow to the downstream receiving environment. Surface water concentrations will also increase in relation to existing conditions. Surface water quality, however, is anticipated to be below relevant water quality guidelines or toxicological benchmarks (ODV 2022i).

Groundwater

The potential effects of Project Activities to groundwater quantity and quality within Williams Lake First Nation traditional territory include: alteration of seepage from the QR Tailings Storage Facility/Filtered Stack Tailings Storage Facility (TSF/FSTSF) and operation of a water supply well. Changes to groundwater quantity at the QR Mill occur during the Construction, Operation, Closure, and Post-Closure of the FSTSF. These changes have the potential to reduce baseflow discharge to surface water. Draining of groundwater has the potential to alter groundwater quality at the QR Mill during Closure and Post-Closure of the FSTSF (ODV 2022i).

Community Health and Safety

Williams Lake First Nation must be able to uphold their stewardship systems, customs, beliefs, and values for the community to be healthy. Access to transportation routes and cultural sites along with encroachment of non-community members have the potential to impact community well-being and safety. Knowledge Keepers expressed concerns regarding the cumulative effects of many industrial activities. Some Knowledge Keepers have also raised concerns about the effects of mining and the mining culture on the community's health, safety, well-being, and land-use practices, issues related to the protection of Indigenous women and girls, and issues related to additions and substance abuse.

Concerns raised by Williams Lake First Nation on the impact to various aspects of community health and safety include: lower standards of care and maintenance due to the mining operation

shut down, noise pollution, and terrain stability in regard to water management. Changes in population, employment, income, and education during the Construction, Operation, and Closure phases of the Project have the potential to affect population health. These changes can then impact other facts that directly contribute to population health including access to housing, effects on infrastructure and services, the lifestyle choices people are able to make, access to healthy food, stress levels, mental health, family health, time available for recreation, and other factors that affect population health.

BGM will work with Participating Indigenous nations to develop the Indigenous Partnership Plan that will identify areas where adaptive management may be required to enhance benefits or mitigate adverse effects if the predicted effects of the Projects are not as expected (ODV 2022i).

2.3.4.2 Engagement Activities by BGM with Williams Lake First Nation and its Outcome

BGM has been engaging with Williams Lake First Nation since 2018 based on their preferences and as directed by Chief and Council. BGM has used a variety of engagement methods with Williams Lake First Nation including regular on-going meetings, providing draft copies of the Initial Project Description, Engagement Plan, and Detailed Project Description for comments, site tours of the underground operations at Bonanza Ledge, Project site figures and digital files, and technical workshops on the QR Mill to their third-party consultant.

BGM sought input from Williams Lake First Nation both on the Project and on engagement methods to ensure that the methods being employed facilitated participation in Project planning and review. Input was documented from meeting notes, phone/email records and tracking tables. BGM maintains records of Project-related engagement activities, concerns raised, and responses provided to ensure that the engagement process was accurately captured. The engagement activities influenced key changes to the Project design and the comments were addressed and incorporated up to the submission of the Environmental Assessment Application.

BGM has entered into capacity funding agreements with Williams Lake First Nation to cover costs to participate in the EA process and to integrate traditional knowledge and use into Project planning. In July 2022, BGM and Williams Lake First Nation entered into a Participation Agreement to facilitate the development of the Project with consent and support from the community.

Williams Lake First Nation signed a Notice of Consent on September 7, 2023, which confirms that (1) Williams Lake understands the nature of the Project and its potential effects on rights, titles, and interests under the Constitution Act 1982; (2) Williams Lake has been adequately consulted and accommodated; and (3) Williams Lake grants the rights, tenures, permits, approvals, and other authorizations for the Project, including amendments, supplements, replacements to authorizations, and any other decisions or actions of the Crown that are required for the Project (ODV 2022i).

2.3.4.3 Feedback from the Engagement with Williams Lake First Nation to Guide the Development of the Community Effects Plan

The feedback from the engagement with Williams Lake First Nation was utilized to understand how the Project may potentially impact their Indigenous Interests and how measures can be incorporated into the Project to avoid, mitigate, or address these impacts. BGM will continue to work with Williams Lake First Nation's leadership, staff, community members, and third parties to identify appropriate methods of engagement and communication (ODV 2022i).

2.4 Potential Project Effects to Diverse Populations Identified through GBA+

This section is informed by the Gender Based Analysis (GBA+) conducted for the Project's EA and provides a summary of the Project's potential effects on diverse populations. Identification and assessment of the Project's effects on diverse groups was conducted using inputs from ongoing engagement activities and specific engagement activities which were inclusive and encouraged participation of diverse groups. BGM made efforts to engage with seniors, youth, people experiencing unemployment, people with disabilities, low-income, women, immigrants, LGBTQ2, and families. Local Community service organizations advised BGM on best practices for engaging diverse populations in the region that included one-on-one discussion or accommodating participants by meeting them in locations familiar to the participant (ODV 2022c).

BGM proactively designed inclusive engagement sessions and made efforts to engage with those affected by the Project, but who may not have felt comfortable attending a more traditional community engagement event. For example, BGM ensured that meeting venues were accessible, where available and welcomed feedback in groups settings, one-on-one, or in written feedback. Shift schedules were also considered when booking engagement meeting times. Health regulations were respected and BGM sought to create safe spaces (ODV 2022c).

Through a comprehensive gender intersectional analysis for the Project's EA and knowledge shared by the TAC, four main population groups were identified that are disproportionately affected by the Project. Table 2.4-1 outlines the identified population groups and their intersectionality with each other and other population groups (ODV 2022c).

Table 2.4-1: Gender Intersectional Analysis

		Population Group			
		Indigenous People	**Women**	**Low-Income**	**Vulnerable Group**
Population	**Indigenous People**	Indigenous Youth Indigenous Elders	Indigenous women	Indigenous People with low incomes	Indigenous people who are vulnerable due to limited education, language barriers, systemic barriers, or racism, or are unemployed.
	Women	Indigenous women	Older/retired women Lone parents Women with language barriers Women experiencing social exclusion	Women with low incomes	Women who are vulnerable due to limited education, language barriers, culture/ethnic minority, and women who are unemployed.
	Low-Income	Indigenous people who are low income	Women with low incomes	Low-Income: Men, women, older/retired individuals, families	Vulnerable groups such as those with limited education, language barriers, systemic social exclusion, or those who are unemployed and have low income.
	Vulnerable Group	Indigenous people who are vulnerable due to limited education, language barriers, systemic social exclusion, or are unemployed.	Women with limited education Women who are the sole parent Women who live in rural or remote areas	Older/retired individuals with low income Low-income families	Individuals or population groups who are vulnerable due to limited education, language barriers, system social exclusion, or unemployment.

In the EAO's Assessment Report for the Project, the EAO summarized that potential residual effects may affect distinct human populations in the following ways (EAO 2023b):

- Human health effects would be disproportionately experienced by those with underlying health conditions, and those who consume higher quantities of fish, have higher exposure to sediment, or drink water from Wells.
- Children and young adults may be disproportionately affected by changes in the characteristics of the population of Wells, and risks to human health.

- Adults who are not working or not benefiting from the Project (such as those who do not benefit from the opportunities offered by the Project, and who face increased challenges due to increases in the cost of living in the community) may be disproportionately affected economically.
- Residents of Wells who live in closer proximity to mine infrastructure and activities would be disproportionately affected by disturbance and adverse effects from noise and vibration, light, dust, and vehicle traffic, and the changes to the views in Wells.
- The Project could strain emergency health, health, and social services in Quesnel, and have direct or indirect negative effects on vulnerable populations.
- Residents in the CRD may experience positive economic effects, and negative effects (associated with the Transmission Lien and Transportation Routes) from the Project; and
- Directly or indirectly, some residents of Wells may experience positive economic benefit from the Project.

Individuals that may potentially experience adverse effects include:

- Individuals who may not adjust well to living in a camp environment or working longer shifts.
- Individuals who do not make positive lifestyle choices with their increased income (e.g. those who choose to engage in drug or alcohol abuse or activities such as the sex trade);
- Individuals affected by project associated stresses whether it be a worker at the jobsite, family members at home dealing with the household while the worker is away, or those moving to the community without a support network; and
- Individuals whose current lifestyle, perceived or otherwise, is being negatively affected, which could result in increased mental health issues, violence, or family breakdown.

Table 2.4-2 summarizes how the Project disproportionately affects the four main population groups (ODV 2022d).

Table 2.4-2: Potential Project Effects to Diverse Populations

Population Group	Project Effects
Indigenous People	Participating Indigenous nations are disproportionately affected by mining projects because of adverse effects to vegetation and wildlife that have high cultural importance (EAO 2023b).
Women	Traditionally, women do not economically benefit from mining projects and may experience greater adverse social effects resulting from camp workers. Women may face increased barriers and challenges to accessing employment opportunities at the Project (EAO 2023b).

Population Group	Project Effects
Low-Income	Individuals (adults and/or their children) who do not economically benefit from the Project may face increases to their cost of living in the community and will face economic challenges (EAO 2023b).
Vulnerable Group: vulnerable due to limited education credentials, language barriers, culture/ethnic minority, and unemployment.	Vulnerable groups may be disproportionately affected by the Project because they are unable to access the economic benefits of the project due to education and language barriers, systemic exclusion, and/or are low-income because of unemployment and are challenged by increased cost of living (EAO 2023b).

3. QUALIFICATIONS, ASSUMPTIONS, AND LIMITATIONS

As per the requirements outlined by the EAO, the Community Effects Plan was developed by Qualified Persons with a minimum of five years of relevant experience in the identification and management of socioeconomic effects associated with industrial projects in rural or remote communities.

3.1 Qualifications

BGM obtained support from Falkirk Environmental Consultants, Soft dB, WSP, and Pacific Safety to support the development of the Community Effects Plan. Table 3.1-1 provides the names, qualifications, and responsibilities of contributors to the Community Effects Plan.

Table 3.1-1: Community Effects Plan Contributors

Company	Name	Qualifications	Responsibility	Section Responsible For
Barkerville Gold Mines Ltd.	Javad Azanchi, P.Eng. General Manager	Over 25 years experience in technical, engineering, manufacturing and leadership related to metallurgy and mining.	Owner/Reviewer	All Sections
	Kelsey Dodd Permit and Compliance Coordinator of Environmental Impact Assessments and Permitting	Permit and Compliance Coordinator for Environmental Impact Assessments and Permitting.	Reviewer	All Sections
Falkirk Environmental Consultants Ltd.	Jennifer Turner, M.Sc., PMP, R.P. Bio. President and Founding Partner, Permitting and Regulatory Specialist	Nearly 25 years experience in environmental impact assessment, permitting coordination, and environmental management planning.	Support	All Sections

Company	Name	Qualifications	Responsibility	Section Responsible For
	Christy Smith, MBA, B.NS. Senior Vice President, Indigenous and Stakeholder Engagement	Over 25 years of in mining related to consultation and engagement, socio-economic reporting and management plan that accompany permits, and the Environmental Assessment process.	Reviewer	All Sections
	Jake Stemeroff, MBA, BBA Human Environment Team Lead	Over 10 years experience assessing socioeconomic and ESG considerations while working on environmental impact assessments, project permitting and management, regulatory engagement and approvals, Indigenous stakeholder engagement and regulatory compliance and oversight.	Reviewer	All Sections
	Paula Salter MSW, B.A. Community Health and Wellbeing Team Lead	Over 15 years experience working as a social planner addressing adverse socio-economic conditions for rural and remote communities and equity seeking populations.	Coordinator/Writer	All Sections
	Ellen Reyes, M.Sc. R.P.Bio Environmental Health Specialist	Environmental Health Scientist with over six years experience in environmental toxicology, aquatic and terrestrial resource management, conservation strategies, environmental DNA methods, and project management for industrial projects in rural communities.	Writer	Section 2: Participating Indigenous nations and Stakeholders. Section 5.3.2.1 Community Emergency Response Plan

Company	Name	Qualifications	Responsibility	Section Responsible For
WSP Canada Inc.	Michael Taylor, BLA, MRM, RPP, MCIP Group Leader Ecology and EIA	Professional Planner with 17 years experience in environmental consulting and project delivery. Project Manager and environmental coordinator for multiple linear infrastructure projects throughout Western Canada. Specializing in environmental regulatory coordination.	Coordination and Support	Section 5.3.5 Visual Impact Strategy
	Jean-Frederick Duquette, B.Sc., Manager Simulation and Virtualization	Over 20 years working with simulation to optimize project integration and reduce visual impact on the surrounding environments.	Writer	Section 5.3.5 Visual Impact Strategy
	Luc Bouchard, M.Sc., Biologist	Specializes in artificial light at night impact analysis of industrial projects. In his career he has collaborated on ecological concept lighting plans and impact analysis of a dozen projects related to mines, wharfs, and roads.	Writer	Section 5.3.5 Visual Impact Strategy
Soft dB	Pierre-Claude Ostiguy, P. Eng., Ph.D., Director – Monitoring Division	Over 12 years in acoustics and vibration with his main area of focus being project management, environmental noise monitoring and noise and vibration monitoring.	Writer/ Reviewer	Appendix D Community Effects Plan Noise Strategy
	Pascal Everton P. Eng Director – Environmental and Industrial Studies	Specialized in acoustics and vibration for over 20 years with his main area of focus being industrial noise control and environmental noise assessments.	Writer/Reviewer	Appendix D Community Effects Plan Noise Strategy

Company	Name	Qualifications	Responsibility	Section Responsible For
Pacific Safety	Sarah Slater, CHSC – Manager of OHS Services and Senior Consultant.	Extensive experience developing and implementing Contractor Safety Management Programs, expertise in the development of risk registers.	Reviewer	Appendix B Public Strategy – Community Emergency Response Plan

3.2 Assumptions and Limitations

3.2.1 Assumptions

Due to the intended adaptive nature of the Community Effects Plan, this 2024 version represents the best thinking and practices for implementation using the available information at this point-in-time. The adaptive monitoring and management of this plan also assumes that existing mitigations will be adjusted in response to ongoing evaluation and communication feedback. As a result, evaluation of this plan requires a developmental evaluation approach as opposed to a summative evaluation approach.

As the Community Effects Plan is a condition of the recently acquired EAC, little community engagement was conducted in the development of this 2024 plan. Rather, community input provided through engagement that occurred during the development of the EA was assumed to be applicable to the Community Effects Plan. BGM will continue engagement and consultation with Participating Indigenous nations, local community, and partners to inform future iterations of the Community Effects Plan.

3.2.2 Limitations

The Community Effects Plan is a framework that coordinates mitigations addressing community concerns and provides guidance on how to implement those strategies. The Community Effects Plan is not designed to provide analysis or the results of implementing mitigations.

4. ALIGNMENT CONSIDERATIONS

BGM's role mitigating community effects may need to consider existing plans and initiatives to facilitate the success of the Community Effects Plan. This section will provide a list and brief description of existing or developing plans, policies, standards, or other project initiatives that may support implementation of the Community Effects Plan.

4.1 Existing BGM Management Plans

The following is a list of existing BGM Management Plans:

- Environmental Management System

  The Environmental Management System document is a comprehensive management tool for the Project, encompassing environmental risk assessment, mitigation measures, responsibilities, reporting, monitoring, and compliance checks. It includes Environmental Management Plans (EMP), Project-specific attachments for tailored management, and Standard Operating Procedures, outlining plans to ensure compliance with regulatory requirements and BGM's policies for project components. Together with BGM's Environmental Protection and Health and Safety Policies, the Environmental Management System establishes the framework for ensuring compliance in project activities.

- Archaeological and Cultural Heritage Resources Management Plan, including a Chance Find Management Plan

  The Archaeological and Cultural Heritage Resources Management Plan directs the safeguarding of CGP sites' archaeological and cultural heritage resources, including procedures for chance finds. It outlines measures to prevent disturbance of unidentified resources, ensuring their preservation, documentation, and protection while minimizing disruption to Project activities.

  BC legislation protects both known and unknown archaeological sites. This plan establishes guidelines and recommended protection and mitigation measures for BGM projects in line with applicable legislation.

- Chemicals and Materials Storage, Transfer, and Handling Plan

  The purpose of the Chemicals and Materials Storage, Transfer, and Handling Plan is to describe the chemicals and materials storage and handling practices that will be used to achieve worker health and safety and environmental protection. The plan is focused on identifying and implementing best practices that comply with applicable regulatory

requirements, are suitable for the particular application, and help prevent the potential for spills of all chemicals and materials used at CGP sites.

- Construction Environmental Management Plan

  The Construction Environmental Management Plan (CEMP) details design mitigations, practices, and procedures to be applied during CGP construction, aiming to minimize adverse environmental impacts. The CEMP's specific objectives are to describe BGM's processes for administering environmental responsibilities in compliance with regulatory requirements, corporate commitments, policies, contractual obligations, and terms attached to permits, approvals, authorizations, and licenses. The CEMP also outlines processes for monitoring and verifying construction contractor environmental compliance and performance as well as for tracking and reporting environmental data. Finally, it will establish standards for reviewing and endorsing more detailed, activity-specific plans and procedures.

- Fuel Management and Spill Contingency Plan

  The Fuel Management and Spill Contingency Plan is applicable to all activities involving fuel handling, aiming to prevent the release of hazardous substances into the environment. It incorporates best practices in line with regulatory requirements, outlining systems and procedures to minimize risks associated with the handling, transportation, and storage of petroleum-based fuel products at the Mine Site.

  The plan's primary goal is to ensure that activities involving fuels and other potentially harmful substances minimize the risk of accidental releases into the ground or water. It also establishes controls for responding to emergency spills, with the overall objective of safely managing on-site fuel and transportation, aiming for zero reportable spills or fuel releases.

- Invasive Plant Management Plan

  The Invasive Plant Management Plan provides environmentally responsible, realistic, and operationally feasible guidance for managing invasive plants at CGP sites. Its objectives are to ensure responsible land management to prevent and mitigate the introduction and spread of invasive plant species, utilizing recognized BMPs, and to implement a strategy aligned with the BC Invasive Alien Plant Program Early Detection and Rapid Response Plan (Inter-Ministry Invasive Species Working Group, 2014).

- Project Emergency Response Plan

  The purpose of the Project Emergency Response Plan (ERP), which includes the Mine Emergency Response Plan (MERP), is to define the BGM Incident Command System structure which outlines the response procedures and preventive measures that are

essential for effective and timely management of an emergency. The MERP will be the main component of the Project ERP and outlines the requirements pursuant to Section 3.7.1 of the Health and Safety and Reclamation Code for Mines in BC (the Code). Local communities and Participating Indigenous nations took part in the identification of potential hazards, emergency communications, and responses.

The Project ERP and Site-Specific Emergency Response Plans ensure that supervisory and other personnel are notified and are prepared to prevent and control an emergency dependent on the level of emergency. The Project ERPs will aid personnel in promptly and effectively responding to emergencies by establishing a common set of practices, outlining strategies for early containment and control, and setting uniform rules for training all emergency response personnel.

- Occupational Health and Safety Plan

  The Occupational Health and Safety Management Plan (OHSMP) applies to all BGM, contractor, and subcontractor construction activities with health and safety (H&S) risks related to the Project's operations. It protects employees and all other persons from undue risks to their H&S arising out of, or relating to, activities at CGP sites. It is also developed to safeguard the public and local nearby communities from risks arising out of, or regarding, activities at mining and/or exploration sites, including the protection and the reclamation of the land and watercourses affected by mining activities.

  The purpose of the OHSMP is to:

  - Clearly outline responsibilities, processes, and procedures to achieve BGM policy commitments and H&S objectives, ensuring regulatory compliance.
  - Document a risk-based approach for planning, assuring, and controlling BGM H&S risks and opportunities.
  - Record project-level H&S program elements as mandated by the Code, BGM's OHSMP, and WorkSafeBC.
  - Offer guidance to Project participants on best H&S practices in the absence of explicit regulatory requirements.

- Soil Management Plan

  The Soil Management Plan is an overarching operational plan that outlines soil management measures that will be implemented at the Mine site. The plan is focused on minimizing potential impacts to soil quality and quantity, and indirectly, minimizing potential impacts to surface water quantity and quality and aquatic habitats. The Soil Management Plan is also intended to support reclamation efforts at CGP's sites.

- Surface Erosion Prevention and Sediment Control Plan

  The Surface Erosion Prevention and Sediment Control Plan guides surface erosion prevention and sediment control activities at the Mine site. The plan describes the approaches and measures to be implemented to minimize surface erosion and sedimentation from mining activities.

  In addition, the Surface Erosion Prevention and Sediment Control Plan outlines the roles and responsibilities of individuals involved in the implementation of erosion and sediment control measures. It defines a monitoring framework to assess the effectiveness of erosion and sediment control measures and to modify or implement additional measures if effectiveness declines.

- Traffic Control Plan

  The purpose of the Traffic Control Plan is to provide the expectations of all Project-related vehicle traffic entering and exiting all CGP sites and to guide how this traffic will be managed on site.

  The objectives of the Traffic Control Plan are to describe processes and procedures to minimize the risk of accidents and incidents from CGP activities involving vehicles and equipment to BGM employees, contractors, and the public. The plan also develops processes and procedures to reduce adverse effects on the environment and wildlife.

- Vegetation Management Plan

  The Vegetation Management Plan is designed to provide environmentally responsible, realistic, and operationally feasible guidance for ecosystem and vegetation management at CGP sites. There are two key purposes of the Vegetation Management Plan: avoid and minimize adverse effects to terrestrial and wetland ecosystem functions and maintain vegetative biodiversity through avoidance and application of mitigation strategies.

- Waste (Refuse and Emissions) Management Plan (a project-specific Fugitive Dust Control Plan, Air Quality Monitoring Plan, and Energy and Greenhouse Gas Management Plan will be incorporated)

  The Waste (Refuse and Emissions) Management Plan provides guidance for waste management strategies to be followed during Construction, Operation, Closure, and Post-Closure for CGP.

  The Waste (Refuse and Emissions) Management Plan includes processes and procedures for proper handling, transport, and disposal of non-hazardous domestic and industrial solid waste and domestic sewage sludge. It also outlines management of air contaminants (emissions and fugitive dust) from CGP activities, including the provision of industry BMPs to control air and fugitive dust emissions and reduce potential adverse effects to people.

The Waste (Refuse and Emissions) Management Plan has two key purposes. The first purpose is to protect workers, the public, and the environment from potential adverse effects associated with waste refuse management and potential adverse effects from air and fugitive dust emissions. The second to minimize the risk and cost associated with the recycling, storage, handling, removal, and disposal of waste from all aspects of CGP properties.

- Wildlife Management Plan, including a Caribou Mitigation and Management Plan, Bat Mitigation and Monitoring Plan, and an Access Management Plan.

  The purpose of the Wildlife Management Plan is to identify management, mitigation, and monitoring measures to limit potential effects on wildlife and wildlife habitat from CGP through all Project phases. The Wildlife Management Plan identifies established conservation guidelines and environmental protection measures recommended for constructing the mine in accordance with applicable legislation and BGM's commitments.

  The Wildlife Management Plan focuses on reducing the risk of direct and indirect wildlife mortality, mitigating the potential for human-wildlife conflicts, and limiting the level of disturbance to wildlife and wildlife habitat as a result of CGP activities or infrastructure. Minimizing disturbance will prioritize staged management measures to reduce impacts to sensitive areas or periods.

  - The Caribou Mitigation and Management Plan will be updated and expanded to include the Project and will be appended to the Wildlife Management Plan.
  - A Bat Mitigation and Monitoring Plan will be developed and attached to the Wildlife Management Plan.
  - An Access Management Plan will be developed and attached to the Wildlife Management Plan.

- Explosives Management Plan

  Prior to construction, BGM will develop an Explosives Management Plan to include details relating to explosive transportation, manufacturing, storage locations, contractor certifications, explosives handling, employee training programs, work instructions, inspections, reporting, documentation, and details of continual improvement initiatives. The Explosives Management Plan will include measures to minimize the release of nitrogen to the aquatic receiving environment and reduce the potential for adverse effects on water quality and aquatic life. ML/ARD Management Plan

  The purpose of a Metal Leaching and Acid Rock Drainage (ML/ARD) Management Plan is to describe the activities required to minimize the potential of ML/ARD.

BGM developed a ML/ARD Management Plan for the Bonanza Ledge Mine. This plan will be updated and expanded prior to construction to cover all relevant aspects of the Project. It will provide guidance on the use, management, and storage of excavated materials with the potential for ML/ARD. In addition, controls to limit or manage seepage and runoff, including treatment or confinement options, will be contained within the plan.

- Ground Control Management Plan

  The purpose of the Ground Control Management Plan (GCMP) is to set out the design criteria and the ground support elements that will be installed in specific underground excavations under varying geological and geotechnical conditions, differing purposes and sizes, and for different design life requirements. The GCMP will inform all personnel of their roles and responsibilities to ensure their safety and guide personnel and operations within the underground mine.

  The GCMP will be a living H&S document and will be subject to regular updates as further geotechnical investigations are conducted and pending the experience of the actual ground conditions encountered during excavation.

- Mine Site QR Mill Water Management Plans

  The Mine Site Water Management Plans will be updated as part of the permitting phase of the Project. The plans outline the strategies and measures BGM will implement to manage water resources effectively and mitigate potential environmental impacts at the Mine Site and the QR Mill. They include strategies for saving water, avoiding pollution, and being ready for emergencies. The plans also define processes for communicating with local communities and monitoring water quality to ensure responsible and sustainable water use in operations.

- Reclamation and Closure Plan

  BGM maintains RCPs for the Bonanza Ledge Mine and QR Mill site, which detail how these sites will be closed. These RCPs provide a basis for developing the integrated reclamation and closure plan for the Project, including costing based on the most current assumptions regarding reclamation and closure of Project facilities and landforms. The goal is to design and reclaim areas to be self-sustaining.

4.2 New, in Development, or Updated BGM Plans

The following is a list of new, in development, or updated BGM Plans:

- District of Wells Community Involvement Plan

  The Community Involvement Plan (CIP) will follow engagement and consultation on this Community Effects Plan. The CIP will outline the process BGM will follow to meet its

commitments to community members, stakeholders, and the public during all phases of the Project.

- Indigenous Partnership Plan

  The Indigenous Partnership Plan (IPP) will follow engagement and consultation on this Community Effects Plan. The IPP will outline procedures to be implemented for maximizing Project opportunities for Indigenous nations. The plan will be developed in collaboration with Participating Indigenous nations. The document will also outline a plan for Indigenous nation's concerns and issues monitoring.

- Discharge Management Plan

  The Discharge Management Plan will provide operational procedures for all discharges to surface water or groundwater during all phases of the Project to protect water quality in the receiving environment.

- Filtered Tailings Management Plan

  The Filtered Tailings Management Plan will outline BGM's strategies to responsibly manage the tailings in the filtered stack tailings storage facility (FSTSF) located at the QR Mill.

  The primary objectives of tailings management activities are to ensure the long-term physical and chemical stability of the tailings and prevent contamination of groundwater and surface water proximal to the FSTSF.

- Health and Medical Services Plan

  In order to minimize the potential impacts to local health services in the Project area, BGM will develop a plan containing procedures that follow the guidance provided in the 2015 Health and Medical Services Plan Best Management Guide for Industrial Camps, prepared by the Office of Health and Resource Development.

  The plan will identify information about the Project, the Project's infrastructure as it pertains to health, the on-site health services and programs that will be offered, and the methods by which the Project will collaborate with health authorities in BC. It will outline methods for collaboration, communication, problem solving, hiring considerations, and quality improvement related to patient flow, trauma care, and responding to medical emergencies.

- Waste Rock and Underground Materials Management Plan.

  The purpose of the Waste Rock and Underground Material Management Plan is to describe the activities required to be undertaken for the Project to handle, manage, test, and dispose of waste materials (on surface and underground) in a manner that minimizes ML/ARD,

minimizes the transport of parameters of concern in contact water, and protects the receiving environment downstream of effluent discharge.

5. IMPLEMENTATION PLAN

5.1 Engagement, Communication, and Progress Reporting

Implementation of the Community Effects Plan requires meaningful ongoing engagement, communication, and progress reporting with the local community, Participating Indigenous nations, and partners to facilitate an effective adaptive monitoring and management process. An adaptive monitoring and management process is described in Section 6 of the Community Effects Plan. The Community Effects Plan Engagement, Communications, and Reporting Strategy (Appendix G) outlines a comprehensive strategy for engaging with the local community, Participating Indigenous nations, and partners.

BGM will engage with the public, the local community, including local government, Participating Indigenous nations, and partners such as regional health authorities on the implementation of the mitigation measures addressed in this Community Effects Plan through the following engagement, communication, and reporting activities and methods that are detailed in the Community Effects Plan Engagement, Communications and Reporting Strategy (Appendix G):

- Electronic Methods
- Social Media
- Project Website
- Email and Phone
- Print Methods
- Mail-Outs, Newsletter, Local Newspaper
- Formal Document Reviews
- Face-to-Face Methods (virtual or in-person)
- Formal meetings
- Community meetings
- One-on-One Meetings
- Community Events
- Mine-site visits
- Community Relations Office
- Community Liaisons (Lhtako Dené Nation, District)

To evaluate the effectiveness of these strategies and verify that outcomes align with the predictions provided in the Application, BGM will implement an iterative evaluation process. This includes tracking feedback received through engagement (e.g., open houses, meetings, document reviews), monitoring issue resolution trends (e.g., complaint logs, response times), and reviewing key indicators such as recurring community concerns or satisfaction with mitigation outcomes. Evaluation will occur quarterly at the internal level, with summary reporting provided annually to the EAO and Participating Indigenous nations. If feedback or monitoring results indicate that a mitigation is not functioning as intended, adaptive management processes will be triggered in accordance with Appendix G, Section 1.4. This evaluation approach is further described in Appendix G, Section 5.1.3.

Table 5.1-1 outlines the communication and engagement processes BGM will use with the local community, Participating Indigenous nations, and partners throughout the life of the Project to provide information about Project activities and updates, including Project-related updates related to social and economic issues and concerns.

Table 5.1-1: Community Effects Plan Engagement Methods

Participating Indigenous Nation, Partner, or Stakeholder	Goal	Method	Frequency
Participating Indigenous Nation: Lhtako Dené First Nation Xatśūll First Nation Williams Lake First Nation	Engagement	Formal Meetings: Depending on topic and action required, BGM will meet with leadership or the natural resources team.	Weekly
		Environmental Monitoring Board	Bi-annual
		Formal Document Review (i.e. annual reports)	Annually or as required
		E-mail and phone Community meetings Community events Mine-Site Visits Community Relations Office	As required
		Community Liaison (Lhtako Dené Nation)	As required
	Communication/ Information Sharing	Newsletters	Monthly
		Social media e-mails website Community Liaison (Lhtako Dené Nation)	As required

Participating Indigenous Nation, Partner, or Stakeholder	Goal	Method	Frequency
	Reporting	Formal Meetings Formal document Review (i.e. annual reports)	Annually
		Community Meetings Website Community Liaison (Lhtako Dené Nation)	As required
District of Wells	Engagement	Formal meetings	Every two weeks
		Formal Document Review (i.e. annual reports)	Annually or as required
		Community Meetings	Quarterly
		E-mail and Phone Community events Mine-Site Visits Community Relations Office Community Liaison	As required
	Communication/Information Sharing	Mail-outs, newsletters, newspaper Social media e-mails website Community Liaison	As required
	Reporting	Formal meetings Formal Document Review (i.e. annual reports)	Annually or as required
		Community Meetings Website Community Liaison	As required
Interior Health	Engagement	Formal Meetings Formal Document Review (i.e. annual reports) Email and Phone	Annually or as required
	Communication/Information Sharing	E-mail	As required
	Reporting	Formal Meetings Formal Document Review (i.e. annual reports)	Annually or as required

Participating Indigenous Nation, Partner, or Stakeholder	Goal	Method	Frequency
Northern Health	Engagement	Formal Meetings Formal Document Review (i.e. annual reports) Email and Phone	Annually or as required
	Communication/Information Sharing	E-mail	As required
	Reporting	Formal Meetings Formal Document Review (i.e. annual reports)	Annually or as required
Social and Community Services	Engagement	Formal Meetings One-on-One Meetings Email and Phone	As required
	Communication/Information Sharing	E-mail	As required
	Reporting	Formal Meetings	As required
Public	Engagement	Community Meetings	Quarterly during the Construction and Operations phase
		Community Events Community Relations Office Email and phone	As required
	Communication/Information Sharing	Mail-outs, newsletters, newspaper Social media e-mails website	As required
	Reporting	Community Events	Quarterly

Progress on the Community Effects Plan will be shared throughout the life of the Project and will be a point of discussion during engagement, communication, and reporting activities with the local community, Participating Indigenous nations, and partners. Activities and outcomes related to the Employees, Traffic, Public, Noise, and Visual Impact Strategies designed to address community concerns will be specifically discussed during engagement, communication, and reporting activities. Progress on the Community Effects Plan will be formally shared with the public through an annual report that may be posted to the Project website or distributed through mailouts and linked through social media channels.

The public can provide input into policies and training by sharing their ideas with BGM during community events, emailing feedback@osisko.com, or speaking to someone over the phone at 778-414-8493. The public can also provide their comment and questions through the Project website. BGM staffs a Community Relations Office in Wells that serves as a point of contact for the public to voice their comments and questions. Additionally, BGM shares information about the Project through social media channels such as Facebook and Instagram. The Public can also share their feedback and provide input into policies and training through the comments of the social media channels.

BGM's staff from their Community Relations team will establish and chair community meetings during Construction and Operations with the local community, Participating Indigenous nations, and partners. Leading up to construction, BGM staff have been meeting with the District every other week and Participating Indigenous nations weekly. The purpose of the community meetings will be to discuss effects on the Project in the local area and the mitigation measures that are designed to address social and economic effects, future project development plans, and the Community Effects Plan overall. The public will have an opportunity to provide input into Project policies and employee training during community meetings.

As the Project moves from the Construction phase to the Operations phase, this Community Effects Plan and the feedback received on this plan will serve to inform early discussions for the CIP and the IPP. The CIP and the IPP are tailored plans that will address the specific concerns of the District and the Participating Indigenous nations.

5.2 Mitigation Implementation

Mitigations to offset or decrease potential effects resulting from the Project that were raised by the local community, Participating Indigenous nations, or partners of the project are addressed through the strategies appended to this Community Effects Plan. An EA Mitigations Tracker (Appendix F) links the mitigations that addresses a community concern to the specific strategy.

5.3 Strategies

The Employee, Public, Traffic, Noise, and Visual Impact Strategies were developed to address mitigations identified in the Project Chapter 20.1 Summary of Mitigation Measures (ODV 2023e). These strategies, policies and plans detail the baseline information that will support the effectiveness of the mitigations; the methods, objectives, location, frequency, timing, and duration of the monitoring; and the scope, content, and frequency of reporting of the monitoring results. Appendices A–E of this Community Effects Plan supplement strategies described in Section 5.3.1-5.3.5.

5.3.1 Employee Strategy

This section of the Community Effects Plan provides details on how BGM will implement mitigations to address concerns or questions raised by the local community, Participating Indigenous nations, or partners about the impact Project workers may have on the local communities. The Community Effects Plan Employee Strategy also describes BGM's plans to hire from the local community and their plans to accommodate non-local workers. Details about the number of workers required during the various phases of the Project are provided in Section 1.3.3 and Section 5.3.1.2.

During the EA process, the Minister noted that BGM engaged broadly and deeply with Participating Indigenous nations, the TAC, the CAC, provincial agencies, and local governments to identify issues and seek ways to address their issues and concerns (EAO 2023a). BGM obtained the input of social and community service providers and diverse groups in the area by tailoring their engagement efforts to reach seniors, youth, people experiencing unemployment, people with disabilities, low-income, immigrants, LGBTQ2, and families. Through BGM's relationship with the Quesnel Women's Resource Centre, BGM obtained guidance on how to reach diverse populations for the purposes of engagement, and how to improve opportunities for diverse groups to participate in employment opportunities created by the Project. Through BGM's engagement efforts during the development of the Project's EA, the BC EAO was able to identify the requirements addressed in this Community Effects Plan Employee Strategy.

Engagement with the public and the District raised concerns that an increase in population caused by BGM employees may exacerbate current housing shortages in the region, property values, and the ability for other businesses to recruit people to the area. A population increase could also increase demand on existing services and decrease accessibility for local residents (EAO 2022j) Wells residents and the District expressed concern that the motels that are now used to house mine workers reduces the availability of accommodations for tourists during peak seasons which may impact festivals that occur in the region. Residents of Wells are concerned that the employees housed at work camps located in their community may negatively impact the community and culture of Wells, as well as stress municipal infrastructure such as water and sewage services (EAO 2020b). In addition to the above issues, representatives of Wells also expressed a desire for BGM to provide support to the community given its significant presence in the community (EAO 2022j). Concerns for the safety of women working or residing at the work camps was expressed by the public. The public also recognized that local jobs would help sustain Wells and attract families, but due to higher paying jobs at the Mine, they may also lead to the loss of workers for local businesses. The public also pointed out that when employees are housed at work camps, they do not become involved with the community and do not support local businesses since food and accommodations are provided at the camps (EAO 2022c).

The TAC, which the NH participates on also requested information about worker accommodations, and expressed concerns related to worker conduct and their interactions within Wells (EAO 2020b).

Employment opportunities, education, and training support have been ongoing topics of discussion between Lhtako Dené Nation and BGM since 2016. Lhtako Dené Nation is also interested in BGM's plans and policies related to Indigenous hiring practices. BGM has a formal Project Agreement with Lhtako Dené Nation that outlines their engagement protocols and employment and business opportunities (ODV 2022g).

Xatśūll First Nation expressed an interest for their members to gain experience through on-the-job training on the Project, particularly for water technicians. Xatśūll First Nation is also interested in BGM's hiring practices for Indigenous people. Concerns for the wellbeing of their community was also raised because it is well known that historically mining camps may have a culture that threatens Indigenous communities and may be particularly unsafe for Indigenous women and girls (ODV 2022h).

Williams Lake First Nation expressed interest in employment and training opportunities for their members because employment and training would provide long-term benefits and opportunities (ODV 2022i).

The Amata Transition House Society is interested in working with BGM to decrease barriers to diverse population groups that have historically been underemployed in the mining sector.

To demonstrate how BGM is addressing concerns and interests raised by the local community, Participating Indigenous nations, and partners, this Community Effects Plan Employee Strategy details:

- Policies and plans that BGM will enforce to manage how workers behave and conduct themselves in relation to the local community and Participating Indigenous nations.
- Plans that BGM will implement to address challenges that workers may pose to the well-being and safety of the local community and Participating Indigenous nations.
- BGM's plans to mitigate pressures that an increase in population created by BGM workers may cause on the local housing market.
- BGM's plans and policies to increase the diversity of their workforce and hire from the local community.
- BGM's plans to ensure the cultural and psychological safety of their employees.
- BGM's plans to support re-employment during temporary or permanent Project closure.

The Community Effects Plan Employee Strategy follows an adaptive monitoring and management process that relies on deep and meaningful engagement with the local community,

Participating Indigenous nations, and partners. The Community Effects Plan Engagement, Communications and Reporting Strategy (Appendix G) details the activities and tactics that BGM will use to facilitate discussions to support meaningful engagement to obtain feedback for effective monitoring and implementation of mitigations to address community concerns related to BGM's workers throughout the life of the Project.

5.3.1.1 Employee Policies and Programs

BGM's corporate workplace policies and programs are tools and processes that address the various concerns and interests raised by the public, the local community, Participating Indigenous nations, and partners about the Project. BGM's workplace policies and programs listed below are described in detail in Appendix A, Workforce Policies and Programs:

- Hiring Policy.
- Policies that all workers (employees, directors, and officers) must sign and comply with related to BGM's Code of Conduct.
- Zero tolerance anti-bullying and harassment policy.
- Open-door policy for resolving employee issues.
- Equal, Diverse and Inclusive Employment Opportunities.
- Priority for Local and Indigenous People's Policy
- Workplace Safety Programs
- Cultural Training and Awareness.
- Employee Assistance Program and Benefits.
- Health and Safety Policy for employees, contractors, and visitors to the site.

BGM's existing Community Relations Policy outlines BGM's commitment to supporting the economic development of the communities their projects are located in or are adjacent to by creating employment opportunities and promoting local purchasing.

BGM also has a Responsible Procurement Policy that commits BGM to enable access and minimize barriers that inhibit participation of local and regional suppliers of goods and services to supply chain opportunities arising from the project's activities.

These policies and associated mandatory on-boarding training will be discussed with the local community, Participating Indigenous nations, and the NH for the purpose of obtaining feedback and input to ensure that BGM's policies and training adequately and appropriately respond to their concerns and interests. BGM will make these policies available to the public by posting them on the Project website (https://www.cariboogold.com/). Monthly newsletters that share information about the Project and highlight worker training or new corporate policies that may be of interest

to the public will be posted to the website and distributed via email to those that subscribe. The public will be invited to comment on policies or worker training through the engagement and feedback methods described in the Community Effects Plan Engagement, Communications, and Reporting Strategy (Appendix G).

5.3.1.2 Code of Conduct

All workers must sign and comply with BGM's Code of Conduct, which applies to all employees while on shift, including off-duty hours during their rotation, regardless of whether they are local or non-local, and regardless of where they are residing. The Code of Conduct applies for the full duration of an employee's work rotation at the Project.

BGM's Code of Conduct establishes specific rules and guidelines governing the behaviour and actions of BGM's employees. It outlines expected standards of behaviour and conduct both within the organization and in external interactions.

BGM will follow Northern Health guidelines for industrial camps and recognizes that self-contained accommodation options for the Project workforce is necessary for protecting the health and safety of their staff. BGM is committed to offsetting pressure on Wells' housing and health services through their employee accommodation policies. If workers are being housed at Camp A, Camp B, the Hubs Motel, or the new accommodation camp in Wells during their shift, they are expected to comply to the Code of Conduct and leave when they are off-shift and maintain their commitments to the Code of Conduct.

- All workers must sign-off on policies that commit them to:
- Zero drugs and alcohol while on site or staying at the worker accommodations.
- Every employee and contractor on site must be "fit for duty."
- A positive and respectful camp environment will be created by building community and promoting inclusivity within the camp.
- Zero tolerance for bullying and harassment including:
    - Sexual harassment.
    - Racial or national origin harassment.
    - Harassment based on gender, race, colour, religion, age, national origin, disability, or sexual orientation; or
    - Retaliation against anyone for making a good-faith complaint of such harassment or for cooperating in BGM's investigations of such complaints.

To support compliance to the Code of Conduct, all Project employees are required to complete mandatory training. Training will be completed at the beginning of employment. BGM also

conducts annual performance reviews including an assessment of employee compliance to policies, employee behaviour expectations and individual employee implementation of what was learned in mandatory training (BGM 2020). A description of mandatory employee policies, programs and training that address community concerns and interests are outlined in the following table.

Table 5.3-1: Description of Mandatory BGM Employee Policies, Programs and Training

Mandatory BGM Employee Policies, Programs, and Training	Description of Programs, Policy, or Training	Desired Outcome of Program, Policy, or Training
Diversity, Equity, and Inclusion Policy	BGM is committed to providing equal opportunities to all existing employees and applicants related to employment and all persons are assessed on their individual merit and not on criteria unrelated to job performance. BGM is assessing pay equity and working to mitigate pay disparities to ensure that the work environment and relations between employees are free of discrimination. Related to this policy is BGM's zero tolerance policy on bullying and harassment. BGM is developing a process for hiring under-represented groups and seeking guidance from qualified professionals to guide this process. Processes for hiring underrepresented groups will be in place in time for the Project hiring process.	• BGM is a fair and equitable employer that benefits from a diverse, equitable and inclusive workforce. • BGM pays their workforce equitably. • BGM employees are free of bullying and harassment. • BGM provides support to reduce barriers to employment with BGM among population groups that have historically been underrepresented in the mining industry. • Individuals from populations groups that have historically been underrepresented in the mining industry are provided information about employment opportunities with the Project.
Priority for Local and Indigenous People Policy	BGM is committed to maximizing local recruitment and providing employment and training opportunities to local community members. BGM is committed to the local communities, Indigenous groups, and Indigenous partners to promote and provide opportunities for qualified candidates to find employment with BGM, while adhering to existing and future agreements. BGM will host or participate in open houses or job fairs.	• Hiring will prioritize local community members before considering external candidates. • Increase skill capacity of the local community and Indigenous people to participate in employment opportunities with the Project. • Members of the local community and Indigenous nations know about employment opportunities with the Project. • BGM adheres to existing and future agreements with the Participating • Indigenous nations and the local community.

Mandatory BGM Employee Policies, Programs, and Training	Description of Programs, Policy, or Training	Desired Outcome of Program, Policy, or Training
Hiring Program	The hiring program is in development and will be informed by input obtained from the local community and Participating Indigenous nations. The hiring program will: • Provide training opportunities to local residents, as appropriate, to increase the skills of the local and regional workforce so that BGM can maximize hiring from the local and regional area; • Host community open houses to inform the public about the types of employment opportunities that are available, the requirements for employment, and available training; • Encourage contractor companies to hire local or regional residents; and • Update and further develop proactive employment policies and programs.	• Maximum hiring from the local community and Indigenous nations. • Increase skills capacity for the local community and Participating Indigenous nations through employment and training. • Provide socio-economic benefits the local community and Indigenous nations to support their wellbeing and sustainability.

Mandatory BGM Employee Policies, Programs, and Training	Description of Programs, Policy, or Training	Desired Outcome of Program, Policy, or Training
Code of Conduct Policies and Training[1]	The Code of Conduct policies apply to directors, officers, employees, contractors, and consultants. The Code of Conduct policies outline the expectations for behaviour so that BGM is: • a non-discriminatory environment; • an equal opportunity employer; • an employer that makes reasonable accommodations for employees; • committed to actions and policies to assure fair employment; • a harassment-free workplace; • a safe and health workplace free of substance abuse; • free of workplace violence; • honest and operates with integrity by avoiding conflicts of interest; • is fair and non-discriminatory in their supplier and contractor relationships; All employees will receive training on the Code of Conduct policies and will be required to sign off on the policies indicating that they know that violations are grounds for disciplinary action.	• BGM is an ethical, healthy, and safe company to work for without discrimination, harassment. • BGM is a trusted company. • BGM does not contribute to adverse social, environment, or human effects as a result of the Project's operations. • BGM is accountable for their directors, officers, employees, contractors, and consultants. • Project employees comply with the Code of Conduct.
Zero-Tolerance Alcohol and Drug Policy	BGM has a zero-tolerance alcohol and drug policy that all staff are required to read and sign. Every employee and contractor on site must be "fit for duty."	• BGM is a safe and healthy workplace. • The worker accommodations at camp have a positive and respectful culture. • Adverse social effects to the local community and neighbouring Indigenous nations, such as threats to community safety or wellbeing resulting from substance abuse are prevented. • Eliminate danger to Indigenous women and girls that has historically occurred in proximity to mining camps due to mining camp culture.

Mandatory BGM Employee Policies, Programs, and Training	Description of Programs, Policy, or Training	Desired Outcome of Program, Policy, or Training
Anti-bullying and Harassment Policy and Training[2]	All employees will receive training on the anti-bullying and harassment policy that prohibits through a zero-tolerance policy the inappropriate conduct or comment by a person towards a worker that the person knew or reasonably ought to have known would cause that worker to be humiliated or intimidated).	• Create a healthy and safe workplace by eliminating: – Sexual harassment – Racial or national origin harassment – Harassment based on gender, race, colour, religion, age, national origin, disability, or sexual orientation; or – Retaliation against anyone for making a good-faith complaint of such harassment or for cooperating in BGM's investigations of such complaints. • Reducing barriers to employment for population groups that have historically been underrepresented in the mining sector due to mining culture or unsafe work conditions. • BGM is a respectful workplace. • BGM eliminates workplace violence, including gender-based violence.
Recreational Land Use Policy and Training[3]	The recreational land use policy prohibits the use of recreational vehicles for off-road or recreational vehicles (All Terrain Vehicles or snowmobiles) by personnel for personal recreation within the Surface Footprint (including Transmission Line and at Facilities). As part of the orientation process, workers will be prohibited from hunting and fishing within the Project footprint and strongly discouraged from hunting or fishing during their stay at the Project..	• This policy will prevent non-local employees from engaging in recreational hunting and fishing, ATV and snowmobile use during their rotation shift and while off duty. This policy addresses concerns raised by Participating Indigenous nations related to conflicts with non-locals related to land stewardship and increased competition for resources from the land.
No Firearms on Site Policy	Workers are prohibited from having firearms on site.	• Prevents hunting and fishing when off-duty. • Improves safety on site.

Mandatory BGM Employee Policies, Programs, and Training	Description of Programs, Policy, or Training	Desired Outcome of Program, Policy, or Training
Cultural Training and Awareness	BGM is developing a cultural training and awareness policy with the support of qualified professionals that will embed cultural awareness into all aspects of BGM's operations and conduct related to the Project. This policy and training will be in place prior to the Construction phase and will be developed in collaboration with Participating Indigenous nations, the local community and NH.	• Eliminate workplace harassment and bullying by creating greater cultural awareness. • Improve respect for Indigenous cultural practice-based rights and land protocols in the Traditional Territory of the Indigenous nations with which the Mine Site is located. • BGM is a culturally safe workplace. • Critical barriers to participation in employment for vulnerable populations are identified and removed. • GBA+ is a key competency for all programs and evident in the workforce. • Cultural considerations are understood and embedded in the recruitment and • retention strategies for Indigenous peoples.
Human Resource Policy[1]	This policy ensures that BGM is: • respecting and promoting human rights; • promoting diversity, equity, and inclusion; • mitigating potential negative impacts and risks to the natural, human, and social environments; • training employees to support their talents; • contributing to the economic and skills development of local communities by promoting local hiring; • Developing mechanisms to respond to employee concerns.	• Create a health, safe, and positive work environment for employees. • Employees feel safe and respected to bring forward concerns they may have with the safety of the workers, the behaviour of workers, negative impacts to the natural, human, and social environments. • Maximize hiring from the local community and Indigenous nations. • Increase the skills capacity of the local community and Indigenous nations. • Appropriately and effectively respond to employee concerns.

1. ODV 2022k
2. BGM 2016
3. Appendix C

As detailed in the Workforce Policies and Programs (Appendix A), the Employee Assistance Programs and Benefits will provide support to direct employees during temporary or permanent Project closure. The Employee Assistance Program and Benefits offers career planning, resume

writing, interviewing skills support, and transition planning, for direct employees of the Project. If a circumstance arises where BGM needs to lay off workers, and then re-hires, they will offer positions to those workers who were laid off first before seeking new hires. BGM will also inform other employers that they are laying off employees and recommend their employees to other employers to support re-employment. BGM will support re-employment for technical service employees, and employees in mid-management or higher positions, by connecting them with a recruiter. Under certain conditions when there is a lay-off, BGM will extend the health benefits for three months.

5.3.1.3 Employee Accommodation Strategy

Although BGM intends aims for 75% of direct and indirect workers for the Construction and Operations phases come from the Cariboo Regional District and Fraser Fort George Regional District, workforce requirements may require BGM to hire workers from elsewhere (ODV 2022m). BGM will provide accommodations to employees that are not local to the area or employees working on a rotation, such as a 14 day on/14 day off schedule. Accommodations will be provided in the new Worker Accommodations at the Mine Site Complex or at the QR Mill (ODV 2022a).

To meet the 75% local hiring objective, BGM is implementing a multi-channel recruitment strategy. In addition to hosting open houses and job fairs, BGM will communicate employment opportunities through the Project website, newsletters, social media, email distribution lists, and postings in local and regional newspapers and employment centres. BGM will also work with Participating Indigenous Nations to circulate job postings through community-specific communication channels.

BGM has partnered with the Amata Transition House Society and other community organizations to support recruitment from underrepresented groups. Through these partnerships, BGM will seek guidance on additional outreach methods and tailored recruitment strategies to enhance workforce diversity and support local hiring. BGM's Sustainable Workforce Initiative (SWI), in collaboration with local training institutions and employment agencies, will further support the preparation of residents for project-related employment opportunities.

Table 5.3-2 shows BGM’s estimated number of workers on site and workforce assumptions during each project phase.

Table 5.3-2: Estimated Number of Workers on Site and Workforce Assumptions per Project Phase

Phase	Construction	Operations	Closure	Post-Closure
# of Workers	200 - 273	~488	~14	~3
Workforce Assumptions	Many of the jobs that BGM will hire outside of the local area will likely be specialized jobs and the workers are predicted to stay at the worker accommodations. BGM does not anticipate that many direct workers will move to the area during construction.	More workers are expected to immigrate to Wells and Quesnel during the Operations phase since this phase is expected to last 12 years. Although housing availability and housing cost may reduce the number who move to the area permanently. Additionally, employment for the partners of mine workers may be limited, which may prevent workers from moving to the area permanently.	Due to the small number of employees required during the Closure phase, 100% of employees are expected to be from the local area.	Due to the small number of employees required during the Post-Closure phase, 100% of employees are expected to be from the local area.

Estimates for the number of Project employees that come from Quesnel or Wells, or from outside the Region is provided in Table 5.3-3. These estimates assume that that those working on Bonanza Ledge will transition to the Project and that there will be no overlap between Project Construction and Operations.

Table 5.3-3: Employee Population Estimates

Direct Jobs	Construction		Operation		Closure		Post Closure	
	%	#	%	#	%	#	%	#
Direct Workforce[1]	100%	273	100%	488	100%	14	100%	3
Quesnel	50%	103	50%	244	64%	9	33%	1
Wells	15%	31	15%	73	36%	5	67%	2
In-Migration	0-5%	0-3	12.5%	61	0%	0	0%	0

Direct Jobs	Construction		Operation		Closure		Post Closure	
New to Area Temporary	0-5%	3 (Wells) Jobs in the Construction phase are assumed to be temporary.	0%	0	0%	0	0%	0
New to Area Permanent	0%	0	12.5%	37 (Quesnel) 12 (Wells) 12 (Other areas in the CRD) Jobs in the Operations phase are assumed to be permanent due to the longer duration of the Project phase.	0%	0	0%	0
Estimated families moving to the local area	0%	BGM does not estimate that families will move to the area during the Construction phase.	9%	30 (Quesnel) 8 (Wells) 8 (Other areas in the CRD)	0%	0	0%	0
Indirect and Induced Jobs[1]	100%	70	100%	76	0%	0	0%	0
Quesnel	55%	29	55%	42	0%	0	0%	0
Wells	15%	8	15%	11	0%	0	0%	0
In-Migration	25%	17	25%	19	0%	0	0%	0
New to Area Temporary	25%	10 (Quesnel) 3 (Wells) 3 (Other areas in the CRD) Jobs in the Construction phase are assumed to be temporary.	0%	0	0%	0	0%	0
New to Area Permanent	0%	0	25%	11 (Quesnel) 4 (Wells) 4 (Other areas in the CRD) Jobs in the Operations phase are assumed to be permanent due to the longer duration of the Project phase.	0%	0	0%	0

Direct Jobs		Construction		Operation	Closure		Post Closure	
Estimated families moving to the local area	0%	BGM does not estimate that families will move to the area during the Construction phase.	9%	9 (Quesnel) 3 (Wells) 2 (Other areas in the CRD) Jobs in the Operations phase are assumed to be permanent due to the longer duration of the Project phase.	0%	0	0%	0

Notes:

1 ODV 2022m

BGM has used a conservative estimate to forecast the number of families that may move to an area based on 2021 census information for Wells and Quesnel. Table 5.3-4 details the assumptions that were applied to the employee estimates to determine the expected number of families that will immigrate to Wells.

Table 5.3-4: Assumptions based on 2021 Census Data

District of Wells – 2021 Census Factor1	Assumption	Quesnel- 2021 Census Factor2	Assumption
Single person households	25%	Single person households	14%
Census families	66%	Census families	80%
Average family size	2.7	Average family size	2.7

1 Statistics Canada 2023a

2 Statistics Canada 2023b

Employee Demographics

BGM anticipates that due to the nature of the industry there will be more male workers than female, and that workers will be within the prime working age group (ODV 2022a). Nevertheless, BGM is committed to diversifying their workforce by hiring qualified workers from historically underrepresented population groups and taking measures to ensure their inclusion in employment opportunities (ODV 2022a). Implementation of the Equal, Diverse, and Inclusive Employment Opportunity Policy will support BGM to hire workers from populations that have historically been underrepresented in the mining industry. Retention of workers who have been historically underrepresented in the mining industry will be supported through the Code of

Conduct. BGM's existing and future agreements with the Participating Indigenous nations ensures that BGM provides meaningful employment opportunities to Indigenous persons. BGM continues to consider measures to reduce barriers to employment by underrepresented groups that include measures to:

- Overcome challenges related to the Project's relatively remote location;
- Living at camp;
- Shift work;
- Local employment opportunities for the partners of workers;
- Childcare associated with shift work, and
- Hesitancy caused by past experiences in similar work environments.

Workforce Accommodation Plan

BGM's workforce accommodation plan demonstrates their response to community concerns and the desire to offset potential negative effects on housing and health services in Wells (ODV 2022k). BGM has also integrated approaches and recommendations from best practice sources including NH's Best Management Guide for Industrial Camps (Northern Health 2015). Local accommodations for workers during construction of the Mine Site work camp will be offered within existing work camps or other temporary accommodations owned by BGM. Local accommodations for construction of the Mine Site does not include accessing local rentals.

During the Construction phase, BGM is building a new 200-person Worker Accommodation facility and upgrading the Worker Accommodations at the QR Mill Site to discourage the short-term rental of local housing during Construction and Operations. Through discussions with the local community, BGM is committed to considering, monitoring, and managing impacts to the local housing and rental markets.

Existing accommodations owned by BGM will be sufficient for the workforce requirements in the pre-production phase of the project. Existing accommodations at the QR Mill site and accommodations owned by BGM in Wells will meet the Project's labour requirements during the Construction phase. During the construction of site earthworks, water management structures, and the new Worker Accommodations, Camp A, Camp B, Ballarat camp, and existing accommodations in Wells (Hubs Motel, Osisko Houses, and Apartments) will house employees. The Worker Accommodations at the QR Mill Site will be upgraded prior to the Operations phase to have sufficient capacity to house the increase of workers during that phase. As the Project moves through the Construction Phase and into the Operations phase, the newly constructed 200-person accommodation facility at the Mine Site will add considerable capacity for workforce accommodations. There may be temporary peaks in the workforce during the Construction phase that will require BGM to house employees through accommodations available in Wells or Quesnel

(ODV 2022a). BGM anticipates that with the new Worker Accommodations at the Mine Site and upgraded accommodations at the QR Mill, there will be sufficient capacity to accommodate all employees that may need accommodations during the Operations phase. When workers are off-duty, they will be required to leave the BGM-provided accommodation.

During the Operations phase through the Closure Phase, the new Worker Accommodations at the Mine Site Complex and upgraded accommodations at the QR Mill will have the capacity to house workers.

During the Closure phase when the Worker Accommodations are being decommissioned, employees will stay at available local accommodations in either Wells or Quesnel. During the Post-Closure Phase, employees assigned to ongoing monitoring or maintenance will stay at available local accommodations.

Worker accommodations are exclusively for workers, contractors, and consultants of BGM. Table 5.3-5 summarizes BGM's Worker Accommodations Plan per Project Phase for employees that are not local to the area and the worker schedule.

Table 5.3-5: Work Force Accommodations Plan

Phase	Construction	Operations	Closure	Post-Closure
Accommodation Plan[1]	• Camp A and Camp B (52 rooms) • Ballarat Camp (76 rooms) • 12 houses and apartments in Wells • QR Mill Camp (75 rooms) • Hubs Motel (25 rooms)	• New Worker Accommodations and the Mine Site (200 rooms). • Upgraded accommodations at the QR Mill (75 rooms).	Existing local accommodations in Wells or Quesnel.	Existing local accommodations in Wells or Quesnel

Phase	Construction	Operations	Closure	Post-Closure
Worker Schedule	• Construction will be carried out 24 hours per day, 7 days a week, 365 days per year in Year 1. • Schedules will vary depending on the role and operational requirement. Schedules will be determined Pre-Construction.	• The mine will operate on two 12-hour shifts/day for automated operations and one 10-hr shift/day for other underground activities. Operations will be carried out 7 days a week, 365 days per year. • Contractors are expected to work 12-hour shifts on a 14 days on/ 14 days off schedule.	TBD	TBD

1 ODV 2022k

New Worker Accommodation Facility

The new 200 person Worker Accommodation facility at the Mine Site is illustrated in Appendix H. Drugs and alcohol are not permitted at BGM's camp accommodations. To support worker well-being, health and safety, and inclusion, workers staying at the new facility will have the following amenities:

- Single person rooms with a bathroom.
- Full kitchen/food services by a camp contractor.
- Fitness room with cardio and strength training equipment.
- TV viewing area with couches and large screen TVs.
- Games room with a pool table, foosball table, and other recreational items.
- On-site wellness programs.

Worker Accommodation Policies

All workers residing at any of the worker accommodations are required to review BGM's Code of Conduct, participate in Code of Conduct training, and sign-off on Code of Conduct policies. Compliance to the Code of Conduct will be integrated into employee performance reviews and includes a behaviour expectation that employees will be respectful, and non-discriminatory

towards diverse populations. To support a healthy and safe workplace culture, all camp accommodations will be dry as there is a zero-tolerance policy on drug or alcohol use in the camp.

As outlined in the recreational land use policy detailed in the Traffic Control Plan (Appendix C), employees staying at BGM's worker accommodations will be prohibited from using ATV's or snowmobiles during their stay. During orientation, workers will be strongly discouraged from hunting or fishing within the Project footprint. BGM also has a no firearm policy that will prevent workers from being able to recreate by hunting.

BGM's Code of Conduct policies are designed to ensure that BGM promotes a healthy, safe, and inclusive culture for everyone, and they are designed to mitigate adverse social effects to disproportionately affected populations. For example, the Code of Conduct policies, trainings, and programs discussed in Section 5.3.1.2 encourages respect for diverse cultures, including Indigenous nations land stewardship protocols, and discourages negative behaviours that may threaten the wellbeing of Indigenous communities, particularly Indigenous women, and girls.

Workers will be required to leave the accommodations at the camp when their rotation is over. The Code of Conduct policies are described in more detail in Section 5.3.1.2.

Employee Transportation

During the Construction phase, BGM will use shuttles to transport workers to the Mine Site and QR Mill from Quesnel to reduce the use of personal vehicles in the area. Company vehicles will be available for work-related purposes from camp to work locations.

Once the Worker Accommodations are built, BGM will provide a shuttle with a pick-up location in Wells that will run according to the shift schedule. Company vehicles can be used on and between sites (ODV 2022a).

Parking lots for company vehicles are located at the (ODV 2022a):

- Electrical Substation adjacent/attached to the Services Building;
- Water Treatment Plant (including water treatment unit transferred from the Bonanza Ledge Site);
- Main Ventilation and Mine Heating infrastructure;
- Security Facilities and Main Entrance Gate;
- Firewater Pumping Station on Jack of Clubs Lake and Firewater Distribution Piping System;
- Treated Discharge Line from the Mine Site WTP, connecting to a diffuser in Jack of Clubs Lake;
- New bridge over the Willow River (hereafter referred to as the Willow River Bridge);
- Fibre Optic Network interconnecting the main areas of the Mine Site;

- New Potable Water Well and associated Potable Water Pipeline;
- Camp Access Road;
- Island Valley Portal Access Road;
- Portals;
- Sewage and septic works;
- Community Relations Office; and
- Security fence and gate.

Personal vehicles will be required to park at the main office and prohibited from being on the mine site. Company vehicles will be used for work related purposes.

5.3.1.4 Employee Strategy Implementation Plan

Successful implementation of the Community Effects Plan Employee Strategy hinges on successful implementation of BGM's Code of Conduct. It is through adherence to the Code of Conduct by all workers and successful of integration of BGM's training principles that BGM will be able to demonstrate to the local community, Participating Indigenous nations, and partners that this Community Effects Plan Employee Strategy is achieving the desired outcomes and addressing community concerns. BGM's objectives for recruiting and retaining 75% of the Project workforce from the CRD and Fraser Fort George Regional District is facilitated through BGM's Workforce Policies and Programs (Appendix A). The following points list the key values of BGM's workforce initiative:

- Ensuring that training is accessible for participants from vulnerable populations.
- Incorporating GBA+ as a key competency to the programs and existing workforce.
- Preparing unemployed individuals for the labour market through a combination of employer partnerships, in-classroom training, job shadowing, work experience, and/or mentorship.
- Understanding the cultural considerations in recruitment and retention of Indigenous peoples.
- Supporting existing and new employees in the labour force to explore opportunities with BGM and to learn new skills and competencies.
- BGM gives priority to the local community and members from Indigenous communities if qualified and available.

Successful implementation of the Community Effects Plan Engagement, Communications, and Reporting Strategy (Appendix G) and the Public Strategy (Appendix B) ensures that BGM shares

information widely but also targets information about employment opportunities with the local community, Participating Indigenous nations, and with potential employees from diverse population groups that have been historically underrepresented in the mining industry. Engagement with the local communities and Participating Indigenous nations is critical for BGM to maximize local recruitment. BGM has existing agreements and is developing agreements with the Participating Indigenous nations to ensure that members from Indigenous communities have access to meaningful employment with BGM. BGM is supporting meaningful employment that has the potential to improve the socio-economic outlook for Indigenous community members by providing training opportunities building skills capacity.

The Workforce Policies and Programs (Appendix A) details BGM's investment in the people of Wells and the Cariboo region through the Sustainable Workforce Initiative (SWI). The SWI ensures that residents of the region share in the success of the Project by providing access to recognized and accredited training or high-quality, safe, well-paid jobs. BGM continues to explore opportunities with local colleges, universities, and training centres to create training options that prepare students for potential careers at the Project and to recruit participants into training programs that address and remove barriers to training for diverse and underrepresented populations.

Gender Equity and Diversity Employment Measures and Practices

BGM is purposefully implementing gender equity and diversity employment measures and practices as evidence through a number of their policies, programs, designs, and strategies described throughout the Community Effects Plan Employee Strategy (Section 5.3.1). Examples of BGM's gender equity and employment measures and practices include:

- Engagement, communications, and reporting methods that are tailored for diverse populations (section 3.1 in Appendix G).
- Seeking the guidance of the Amata Transition House Society on addressing barriers to employment for historically underrepresented populations in the mining industry (section 2.4.1 in Appendix B)
- Working with a qualified professional to design policies, programs, and strategies that integrate GBA+ principles (section 1.0-14.3 in Appendix A).
- Engaging with local Indigenous communities to ensure that the Project does not negatively impact the wellbeing and safety of Indigenous communities (section 2.5 in Appendix B).
- Incorporating GBA+ as a key competency to the programs and existing workforce (section 10-14.6 in Appendix A).

- Implementing the Code of Conduct for all workers, which includes a number of policies designed to consider gender equity and diversity (Section 5.3.1.2), including the following policies that are described in Table 5.3-1:
  - Anti-bullying and harassment policy;
  - Equal, Diverse, and Inclusive employment policy;
  - Priority for Local and Indigenous Peoples; and
  - Cultural Awareness and Training.
- Apply a GBA+ lens to the design of the new Workforce Accommodations (Appendix H).
- Addressing disparities in pay equity (section 1.0-14.3 in Appendix A).

5.3.1.5 Monitoring, Evaluating, and Reporting

BGM will collect information about their workers through a confidential survey that is administered as part of the initial hiring process. The confidential survey will collect information about employees to understand the estimated number of employees and families expected to immigrate into Wells and Quesnel and their expected demographics. This information will be reported to the local community, Participating Indigenous nations, and partners, including the EAO and NH. A confidential and voluntary survey will be administered to employees to monitor BGM's mitigations related to equity considerations. This survey will collect information about identity factors and whether employees are in an entry-level, management, or executive roles. Aggregated information will be reported to the local community, Participating Indigenous nations, and partners including those that would need the information for their own planning purposes such as the health authorities and the school board.

The following table summarizes how BGM will monitor and assess the effectiveness of the mitigation strategies designed to address community concerns related to BGM's workers and how BGM will report back to the community.

Table 5.3-6: Monitoring, Evaluation, and Reporting Plan

Objective/Outcome	Implementation Strategy	Monitoring Process	Evaluation and Reporting Methods
Code of Conduct Policies enforced by BGM will manage worker behaviour and prevent undesirable employee behaviours in relation to the local community and Participating Indigenous nations.	• All workers must comply with • BGM's Code of Conduct policies. • All workers must participate in Code of Conduct training including Equity, Diversity and Inclusion, and Cultural Awareness Training.	• BGM will request feedback from the local community and Participating Indigenous nations if undesirable social behaviours occur in the communities because of the Project. • BGM will review the results of their worker performance management process and determine if workers are adhering to the Code of Conduct policies. • BGM will review engagement results and comments submitted by the public for issues related to employee behaviour in relation to • the local community and Participating Indigenous nations.	• If the local community and Participating Indigenous nations or the public raise concerns about worker behaviour, BGM will collaborate with the community to identify and adjust mitigation strategies. Worker behaviour will be discussed at formal and community meetings when concerns are raised. Information raised during discussions with the community during the first year of Construction will serve as baseline data with which to evaluate mitigations and adjust if needed in collaboration with the community.

Objective/Outcome	Implementation Strategy	Monitoring Process	Evaluation and Reporting Methods
BGM plans and programs address challenges that workers may pose to the well-being and safety of the local community and Participating Indigenous nations.	• All workers must comply with • BGM's Code of Conduct policies. • All workers must participate in Code of Conduct training, including Equity, Diversity and Inclusion, and Cultural Training and Awareness. • BGM will shuttle workers from Quesnel to the Mine Site and QR Mill to reduce traffic and the use of personal vehicles. • BGM will schedule shift start and end times so that they do not coincide with peak traffic periods.	• BGM will request feedback from the local community and Participating Indigenous nations if the Project workers are challenging the well-being of the communities. • BGM will review engagement results and comments submitted by the public for issues created by workers that negatively impact the well-being of communities. • Employee transportation.	• If the local community and Participating Indigenous nations or the public indicate that community well-being is negatively impacted by workers, BGM will engage with the community to seek guidance on adjusting existing mitigation strategies or developing new ones. Concerns related to community well-being will be raised and addressed during formal and community meetings. Information raised during discussions with the community during the first year of Construction will serve as baseline data with which to evaluate mitigations and adjust if needed in collaboration with the community. • BGM will make Community Effects Plan Annual Reports available that include information about: – The number of people working (directly and contracted) and the type of position they hold. – Voluntarily provided identity factors, such as gender and ethnicity – Monthly camp and Employee accommodation utilization. – Employee transportation.

Objective/Outcome	Implementation Strategy	Monitoring Process	Evaluation and Reporting Methods
BGM's plans to mitigate pressures that an increase in population created by BGM employees may cause on the local housing market.	• BGM will use existing BGM-owned facilities during the Construction phase and will use the newly built worker's accommodation facility during the Operations phase for workers to prevent pressures on the local housing market.	• BGM will rely on the District Community Liaison position to bring forward concerns related to the local housing market. • BGM will monitor vacancy rates, rent prices, housing prices against baseline information provided in the EA to determine if the workers may be having an adverse effect on the local housing market. • BGM will review engagement results and comments submitted by the public for issues raised related to the local housing market. • Through the onboarding process, BGM will track the following information: – Number of Direct or Contract Workers. – Number of workers moving to the area and what community they settled in. – The home community of workers. – Monthly Worker Accommodation utilization.	• BGM will share information annually with the local community, community liaisons, and Participating Indigenous nations about changes in the local housing market, such as vacancy rates and housing prices during formal meetings. • BGM will report in the Community Effects Plan Annual Report the following information: – Number of local and non- local workers. – Aggregated information about where worker's home communities are. – The number of people working (directly and contracted) and the type of position they hold. – Voluntarily provided identity factors, such as gender and ethnicity – Monthly camp and Employee accommodation utilization. – Employee transportation. • Baseline information about the housing supply will be sourced from the Socio-Economic Baseline study conducted in July 2021 (WSP 2021).

Objective/Outcome	Implementation Strategy	Monitoring Process	Evaluation and Reporting Methods
BGM's plans and policies increase the diversity of their workforce and hire from the local community.	• BGM is working with Qualified Professionals to recruit and hire workers who have been historically underrepresented in the mining sector. • BGM is considering how to remove barriers to employment for population groups that have been historically underrepresented in the mining sector. • All workers must adhere to BGM's • Code of Conduct policies. • BGM aims to hire 75% of their workforce from the local community and Indigenous nations. • BGM is working with the Amata Transition House Society to reach diverse populations for the purpose of providing employment opportunities. • BGM is applying a GBA+ lens into all their policies, plans, programs, and strategies. • Equity, Diversity, and Inclusion and Cultural Awareness Training will be mandatory for all direct employees of the Project. • BGM is currently considering and assessing wage equity and pay disparities.	Through the onboarding process, BGM will request that workers complete a confidential voluntary self- disclosure survey that collects the following information: • Gender Identity • Age • Indigeneity • Disability • Racialized people/ People of colour • Immigration Status BGM will monitor the local unemployment rate for the duration of the project to determine if the project is having a positive effect on employment rates in the local community.	• If confidentiality can be maintained, BGM will report in the Community Effects Plan Annual Report aggregated data on the identities of their workers. • If confidentiality can be maintained, BGM will report in the Community Effects Plan Annual Report what percentage of their workers are from the local community or an Indigenous Nation. • If confidentiality can be maintained, BGM will report in the Community Effects Plan Annual report the diversity of their workers that hold jobs in entry level, management, and executive level positions. Information about the diversity of the Project's workforce will be reviewed annually again baseline data that will be collected during the first year of Construction. BGM will seek the guidance of a Qualified Professional and the community to adjust existing or develop new strategies to increase the diversity of their workforce. As data becomes available, BGM will report in the Community Effects Plan Annual Report local unemployment rates to assess if they are having a positive impact on employment rates as predicted in the EA.

Objective/Outcome	Implementation Strategy	Monitoring Process	Evaluation and Reporting Methods
BGM's plans to ensure the cultural and psychological safety of their employees.	• All workers (direct employees, contractors, and consultants) must comply with BGM's Code of Conduct policies. • All workers must participate in Code of Conduct training including Equity, Diversity and Inclusion, and Cultural Awareness Training. • GBA+ will be integrated into all of BGM's policies, programs, plans, and strategies.	• BGM has an "open-door" policy and will confidentially track if issues are raised related to the cultural and psychological safety of workers. • BGM will request feedback from past and current employees about their experiences working for the Project. • All employees will be invited to participate in a confidential "exit interview" at the end of their employment with BGM. Issues related to cultural or psychological safety will be tracked. • BGM will administer a confidential employee survey that will request feedback about the cultural and psychological safety of the workers when working for the Project or staying at the worker's • accommodations.	• Results from the confidential worker survey related to cultural and psychological safety will be reported back to the local community and Participating Indigenous nations during formal meetings. • HR will report back results of the confidential worker survey back to BGM management and back to employees. • BGM will seek the guidance of the local community, Participating Indigenous nations, and the Amata Transition House Society on how to adjust existing mitigation measure or develop new mitigations if workers are identifying issues related to cultural and psychological safety. • Baseline information related to cultural and psychological safety will be collected during the first year of Construction through the surveys and employee interviews and can be used for comparison in later years to evaluate the effectiveness of the mitigations.

Objective/Outcome	Implementation Strategy	Monitoring Process	Evaluation and Reporting Methods
BGM's plans to support re-employment during temporary or permanent Project closure.	• Employees will have access to the Employee Assistance Programs and Benefits that offers career planning, and transition planning for employees of the Project. • BGM will work with the local community, Participating Indigenous Communities, and partners to address concerns related to reclamation and closure planning. • The skills that employees gain from working at the Project will be transferable to other industrial projects. • BGM will assist employees in finding re-employment. • Under some conditions, employee health benefits will be extended for 3 months after BGM employment has ended. • BGM will re-hire workers that were laid off for a temporary closure before considering new people for employment opportunities.	• BGM will collaborate with the local community and will seek the input of the District Community Liaison regarding the impact of Project closures on the community.	• Strategies designed to address Project closure will be reviewed by the local community, Participating Indigenous nations, and partners.

5.3.1.6 Employee Strategy Adaptive Management

BGM will respond to monitoring observations that indicate non-compliance, reduced effectiveness, or emerging issues by altering existing or developing new mitigation measures to avoid, reduce and/or remediate the effects. Baseline conditions for key indicators, such as workforce composition, Indigenous and local hiring levels, housing market conditions, diversity metrics, worker conduct, and cultural/psychological safety, will be established during the first year of Construction or drawn from existing socio-economic baseline studies. Monitoring results will be compared against these baseline conditions to determine whether:

- Mitigations are being achieved to the extent contemplated in the Application;
- Effects are different than those predicted in the Application; or
- Identified quantitative or qualitative triggers have been exceeded.

The monitoring process detailed in Table 5.3-6 will detect if there is a qualitative or quantitative trigger. Table 5.3-7 outlines the process and timing to be followed if a trigger is exceeded or if monitoring shows that mitigation measures are underperforming or producing unexpected effects. This includes identifying and implementing altered or new mitigation measures in collaboration with Participating Indigenous nations, the local community, and other partners, and reporting back on progress.

The Community Effects Plan: Engagement, Communication, and Reporting Strategy (Appendix G) is the primary method that will be used to determine if any altered or new mitigations measures and/or remediation activities are effectively mitigating or remediating effects and/or avoiding potential effects. Table 5.3-7 details how mitigation measures will be assessed and identify the rationale for the assessment.

Table 5.3-7: Employee Strategy Adaptive Management for Altered or New Mitigations

Adaptive Management Incident	Monitoring Program	Proposed Indicators	Triggers/Thresholds	Response/Process to Develop Triggers/Thresholds	Implementation and Reporting Back
Employee behaviour negatively impacts community wellbeing and creates social disorder	• Community Effects Plan: Engagement, Communication, and Reporting Strategy (Appendix G) • Employee Transportation Strategy	• Observations of increased crime, harassment, violence, community nuisance resulting from BGM workers. • Changes in the number of BGM workers accessing shuttles to commute to work. • Changes in the number of workers using their personal vehicles from Quesnel to the Mine Site to commute to work. • Changes in traffic volume during peak traffic periods that are reported as a nuisance to the local community due to BGM workers commuting.	• Any qualitative observations or reports of increased, crime, harassment, violence, or nuisance caused by BGM workers. • Five reports per year of increased traffic resulting from commuting BGM workers impeding travel between the Mine Site and Quesnel. • Or as determined in collaboration with the local community, stakeholders, and Participating Indigenous nations.	BGM will engage with the local community, stakeholders, or the Participating Indigenous nations to adjust, modify, or design new mitigations to resolve concerns and issues related to employee behaviour.	BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year.

Adaptive Management Incident	Monitoring Program	Proposed Indicators	Triggers/Thresholds	Response/Process to Develop Triggers/Thresholds	Implementation and Reporting Back
BGM workers put pressure on the local housing supply.	Community Effects Plan: Engagement, Communications and Reporting Strategy (Appendix G)	• Observations and qualitative feedback from existing or potential residents, real estate agents, tourist accommodation operators that there is a lack of accommodations due to BGM workers. • Number of workers accessing the Worker Accommodations • Number of workers moving to the area and what community they settled in. • Changes in housing supply compared to 2021 Socio-Economic Baseline study	• Five reports per year of a lack of housing for current or potential residents in Wells or an inability for tourists to find accommodations resulting from BGM workers using available housing. • Or as determined by the local community, stakeholders, and Participating Indigenous nations.	BGM will engage with the local community, stakeholders, or the Participating Indigenous nations to adjust, modify or design new mitigations to resolve concerns and issues related to pressures on housing.	BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year.

Adaptive Management Incident	Monitoring Program	Proposed Indicators	Triggers/Thresholds	Response/Process to Develop Triggers/Thresholds	Implementation and Reporting Back
BGM's workforce does not reflect the diversity of the regional population	Onboarding Program – completion of confidential demographic survey upon hiring. Socio-Economic Monitoring (regional population demographics)	• Percent of workforce that is Indigenous. • Percent of workforce that is female. • Percent of workforce that is from a visible minority group.	• Less than 5% of the BGM workforce is Indigenous. • Less than 20% of the workforce is female. • Less than 5% of the BGM workforce is from a Visible Minority group • Or as determined in collaboration with the local community, stakeholders, and Participating Indigenous nations.	BGM will engage with the local community, stakeholders, and the Participating Indigenous nations to adjust, modify, or design new mitigations to improve the diversity of the workforce.	BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year.
Few BGM workers are hired from the local communities.	Socio-Economic Monitoring (local unemployment rate)	• Percent of BGM workforce sourced from the CRD or the Fraser Fort George Regional District.	• Less than 50% of BGM's workforce is from the CRD or the Fraser Fort George Regional District. • Or as determined in collaboration with the local community, stakeholders, and Participating Indigenous nations.	BGM will engage with the local community, stakeholders, and the Participating Indigenous nations to adjust, modify, or design new mitigations to increase the percent of the workforce from the local communities.	BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year.

Adaptive Management Incident	Monitoring Program	Proposed Indicators	Triggers/Thresholds	Response/Process to Develop Triggers/Thresholds	Implementation and Reporting Back
Incidences occur among workers that threaten their cultural or psychological safety	Cultural and psychological safety tracking program (confidential employee survey, exit interviews).	• Number of worker reports indicating negative cultural or psychological safety	• One worker report indicating negative cultural or psychological safety.	BGM will engage with the local community, stakeholders, and the Participating Indigenous nations to adjust, modify, or design new mitigations to increase cultural and psychological safety.	BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year.
BGM experiences a temporary or permanent Project closure resulting in worker lay-offs.	N/A – No adaptive management monitoring required due to Project closure.	N/A	N/A	N/A	N/A- BGM will engage with the local community, stakeholders, and Participating Indigenous nations to address concerns.

5.3.1.7 Reporting

The Community Effects Plan Engagement, Communications and Reporting Strategy (Appendix G) outlines how BGM will report back to the public, the local community, Participating Indigenous nations, and partners regarding the effectiveness of the mitigations and any altered or new mitigation measures designed to address community concerns.

BGM will review their employment projections and update them quarterly. Quarterly employment projections will be distributed to the District Community Liaison, Participating Indigenous nations, and partners such as service agencies that support employment. BGM will include employment projections as part of their Community Effects Plan Annual Report during Construction and for the first five years of the Operations phase.

BGM will bi-annually report the following information to the EAO and the NH through formal meetings, the Community Effects Plan Annual Report or via email:

- Estimated number of workers and families expected to immigrate to Wells and Quesnel.
- Expected demographics.
- The number of employees that are local, new-to-area temporary, and new-to-area permanent.
- How worker accommodations will be managed and overseen.

During community meetings, and face-to-face meetings with the local community, Participating Indigenous nations, and partners, BGM will describe how employment, training, and recruitment mechanisms address barriers to employment, including childcare. BGM will seek the advice of the Amata Transition House Society on ways to ease the burden of accessing childcare. BGM is prepared to:

- Provide financial support for the creation and operation of licensed daycare facilities, which will give priority to the children of BGM employees.
- As much as permitted by statue, the hours of operation for any BGM supported daycare facility will be maximized to take into consideration the needs of employees who may be working a rotating shift.
- Consider that childcare issues are very personal and each family situation will be different that unique solutions. BGM will tailor its operating shifts and rotation to consider, as much as practical, the childcare needs of its employees.

During community meetings and in discussion with the local community, service providers, and diverse populations, BGM will describe how employment with the Project supports transferrable skills development and provide examples of the types of skills and jobs that are transferrable.

As reclamation and closure planning advances, BGM will share how their Employee Assistance Programs and Benefits will support re-employment training during temporary and permanent Project closures. BGM will look to the local community, Participating Indigenous nations, and diverse populations for guidance related to re-employment training and skills development.

5.3.2 Public Strategy

The Community Effects Plan Public Strategy provides a blueprint for implementing an adaptive monitoring and management process that addresses public concerns (both Indigenous and non-Indigenous) related to the Project. Engagement, communication, and reporting are key processes for successful implementation and adaptive management of the Community Effects Plan Public Strategy. Additional engagement, communication, and reporting strategies are outlined in the Community Effects Plan Engagement, Communications, and Reporting Strategy (Appendix G).

The Community Effects Plan Public Strategy describes how mitigations will be implemented related to BGM's relationship with the local community, Participating Indigenous nations, and partners (including infrastructure and service providers [ISP] to address community concerns. The Public Strategy specifically focuses on topics related to:

- Description of how BGM will engage with the public, Participating Indigenous nations, and ISP.
- Monitoring for Project effects and the effectiveness of mitigation measures for diverse populations.
- BGM's process for responding to community and Participating Indigenous nations concerns.
- Financial contributions BGM will make to the community and Participating Indigenous nations to monitor and manage adverse effects.
- Engagement, Communication and Reporting processes for the local community, Participating Indigenous nations, and partners, which includes infrastructure and services.
- How BGM will respond if there is a Project-related emergency that has the potential to impact the community and/or Participating Indigenous nations.

5.3.2.1 Public Strategy and Implementation Plan

Successful implementation of this Community Effects Plan Public Strategy is interdependent on the successful implementation of the Community Effects Plan Engagement, Communications and Reporting Strategy (Appendix G). The Community Effects Plan Public Strategy (Appendix B) provides relevant details on how BGM will engage with the public, Participating Indigenous nations, the local community, local governments, and partners (including ISP) regarding Project

activities and actions related to the implementation of mitigation measures and how BGM will monitor effectiveness.

BGM will use a number of methods to engage with the public, the local community, local governments, and partners (including ISP). The following tables lists the tools and tactics that BGM will use for engagement, communications, and reporting. Additional details can be found in section 2 of the Community Effects Plan Public Strategy (Appendix B).

Table 5.3-8: Engagement Methods

Electronic Methods	Print Methods	Face-to-Face Methods (in-person and virtual)
• Social media • Cariboo Gold Project Website (www.cariboogold.com) • E-mail feedback@osiskodev.com • Phone	• Mail-outs, newsletters, and the local newspaper • Community Effects Plan Annual Report and other formal document reviews	• Formal meetings • Community meetings • One-on-one meetings • Community events • Mine Site Visits • Community Relations Office • Lhtako Dené Nation Community Liaison • District Community Liaison

Table 5.1-1 in Engagement, Communications, and Reporting outlines the general methods that BGM will use to achieve their engagement goals related to the Community Effects Plan during the Construction and Operation phases of the Project.

Monitoring for Effects on and the Effectiveness of the Mitigation Measures for Diverse Groups

Monitoring for effects on, and the effectiveness of, mitigation measures for diverse groups is supported through the engagement and consultation methods that are tailored for diverse audiences. To ensure that BGM effectively engages and communicates to diverse audiences about the Project, BGM will adapt their engagement, communication, and reporting methods to reach seniors, youth, people experiencing unemployment, people with disabilities, low-income, women, immigrants, LGBTQ2, and families.

In order to meet the unique needs of diverse groups BGM will seek guidance and advice from local social and community services on appropriate and best practices for engaging diverse populations in the region. For example, BGM has a positive relationship with the Amata Transition House Society. The Amata Transition House Society serves women experiencing vulnerabilities and relays information back to BGM on potential project impacts related to domestic violence, sexual exploitation, and abuse issues. BGM will also seek guidance from Amata Transition House Society on how to improve opportunities for diverse groups to participate in employment opportunities created by the Project.

Specific strategies BGM will use to obtain meaningful feedback from diverse populations are to host one-on-one meetings and allow individuals or groups from diverse populations to identify spaces for engagement that they feel are comfortable and accessible.

BGM is purposefully applying GBA+ throughout their organization's policies and programs in their efforts to give greater consideration to how the project effects diverse groups. Section 5.3.1.4 outlines some of the employment strategies BGM is taking to tailor their programs and policies for diverse groups.

During the EA process for the Project, BGM completed a GBA+ analysis to improve their understanding of the Project's impacts on diverse populations. A GBA+ analysis will be completed as part of any future research or study on the socio-economic effects of the Project and compared and contrasted with the socio-economic baseline study and GBA+ analysis that was completed during the EA process.

BGM will also seek feedback from the Amata Transition House Society about Project impacts on diverse populations and follow their guidance on methods for monitoring the effects of the Project on diverse populations.

Addressing Community Concerns

Maintaining ongoing and active communication with the public, Participating Indigenous nations, and ISP is critical to the overall success of the Project. All comments and concerns received through the public communication channels will be organized by theme or topic and summarized and shared at the community meetings. The following table details how BGM will respond to concerns from the public depending on the public communication channel that they were received from. Public concerns may help guide future iterations of the Community Effects Plan.

Table 5.3-9: BGM's Process for Responding to Public Concerns

Manner that Comment or Question is Received by BGM	BGM's Response
Comments through social media channels	Comments received through social media channels will be monitored by the Community Relations Team. Comments will be summarized and themed and shared at the next scheduled community meeting.

Manner that Comment or Question is Received by BGM	BGM's Response
E-Mail or Phone	Comments received through feedback@osiskodev.com will be answered within 5 business days. If the issue cannot be resolved over email or clarification is required, the issue will be brought forward to the next community meeting for further discussion. The commentor will be notified via email when the next community meeting is scheduled. When comments are received through the phone line (778) 414-8493, a member of the Community Relations Team will call the commentor back to discuss their concern within 5 business days. If the commentor cannot be reached, a member of the Community Relations Team will leave a message inviting the commentor to attend the next community meeting where their comment will be raised for discussion or BGM will provide a resolution. If the commentor did not provide a return phone number, BGM will raise the concern at the next scheduled community meeting.
Letter	The public are welcome to send written comments, concerns, and issues about the Project to the Community Relations Office located in Wells at PO Box 250, Wells, BC, V0K 2R0. If return contact-information and contact preference is provided, a member of the Community Relations Team will respond to the concern by email, phone, or letter within 5 business days. If the concern or issue cannot be resolved, the commentor will be invited to attend the next community meeting, where the issue and concern will be raised for discussion.
Community Meeting	BGM will provide advance notice and broadly advertise through their social media channels, email distribution lists, newspaper, and website the time and location (in-person or virtual) of their community meetings. BGM will share comments and concerns that have been raised by the public through their social media channels, in-person meetings, feedback email, or phone line to everyone that attends the community meeting. BGM will facilitate a discussion about the concern and issue and seek a resolution.
One-on-One Meeting (virtual or in-person)	BGM will address concerns raised by the public during one-on-one meetings in that meeting or will commit to responding to the individual according to their preference within 5 business days. BGM will anonymously bring the individual's concern forward at the next scheduled community meeting.
Website	Concerns received through the website will be addressed by the Community Relations Team within five business days if return contact information is provided. If a comment was shared anonymously, the comment will be raised at the next scheduled community meeting for discussion.

Respecting Confidentiality

Over the past several years, BGM has worked hard to build strong relationships with the local community and Participating Indigenous nations that are built on a foundation of mutual trust and respect. BGM commits to keeping the identity of individuals from the public that submit questions or concerns confidential and provides many options to the public to anonymously submit questions or concerns. Comments and questions that are received by BGM will be themed

and summarized and posted to the FAQs on the Project Website (www.cariboogold.com). No identifying information about the commentor will be included on the website. During the Construction and Operations phases, questions or comments from the public can be anonymously submitted to BGM through the following methods:

- Comment boxes;
- Sending anonymous letters to the Community Relations Office though Canada Post.
    - BGM will have a mailbox and comment box located at their Community Relations Office in Wells that the public will be able to access anonymously to submit written comments, questions, or concerns to BGM. Comment boxes will also be available at the band offices of Participating Indigenous nations.
    - A comment box will be available at all community meetings. BGM will invite participants who wish to remain anonymous to submit their comments or questions through the comment box at the beginning of the community meeting. BGM will also invite commentors to include what community they are from for the purpose of analysing if there are common comments or questions coming from a specific community. BGM will address comments provided through the comment boxes later in the meeting after an opportunity to comment has been provided. Comments that cannot be addressed at the community meetings will be anonymously posted to the Project website as an FAQ.
- The Project website will have a "contact us" form where the public can anonymously submit their comments and questions. Prompts will ask people to voluntarily identify what community or if an individual wishes to self-identify as Indigenous by asking what Indigenous Nation the individual is a member. Answering the prompts will not be mandatory for submitting a comment or question and the option to leave self-identifying information blank will be provided. Comments and questions submitted through the website will be directed to feedback@osiskodev.com, which is managed by BGM's Community Relations Team. Responses to comments received through the website will be summarized, themed with other comments and questions received by BGM through other feedback mechanisms and posted to the website under FAQs. New comments and questions will be posted to the website FAQs quarterly.
- The Community Liaisons for the Lhtako Dené Nation and the District are responsible for bringing comments and question from their communities back to BGM. The Community Liaisons will protect the community members' confidentiality and theme feedback unless the individual requested to be identified so that BGM can respond directly.

Financial Contributions

BGM will provide financial contributions to community partners in their efforts to strengthen their relationships with the community and mitigate adverse social effects of the Project. BGM has

signed an agreement with the District to fund a Community Liaison Position that will support the District on Project-related matters. BGM will contribute $15,000 annually towards a Social Worker to provide confidential mental health support to residents of Wells and Quesnel. BGM has also signed a financial agreement with the Amata Transition House Society.

Community Liaison

BGM has signed an agreement with the District in the amount of $140,004 annually for a full-time Community Liaison position. The Community Liaison position will support the District to engage with BGM and participate in Project-related matters during the Construction and Operations phases of the Project. Their responsibilities include reviewing documentation provided by BGM or the EAO and representing the community's interests. The Community Liaison will engage with the community and the District on Project-related matters and provide community feedback to BGM. The Community Liaison will attend the community meetings in the District. BGM and the District will evaluate the Community Liaison position and the terms of the agreement annually and adjust as needed.

Mental Health Support Worker

BGM will contribute $15,000 annually towards a Social Worker to provide confidential mental health support to residents of Wells and Quesnel with a goal of preventing or responding to mental health issues that are Project-related. The Mental Health Support Worker/Social Worker will attend Project-related community events to provide mental health support and advise BGM on local community mental health concerns when concerns are identified. BGM will fund the position for four years and evaluate the position annually in order to make adjustments when required.

Amata Transition House Society

BGM has signed an agreement to contribute $10,000 per quarter to the Amata Transition House Society to help them address issues that may be caused by the Project that relate to domestic violence, sexual exploitation, and abuse issues. Financial contributions can also be used by the Amata Transition House Society to support individuals from underrepresented groups in the mining industry to participate in Project employment opportunities. Financial contributions will begin with the Construction phases and will continue through out the life of the mine.

Community Emergency Response Plan

Results of engagement with the local community revealed that due to the Project's location in Wells, the community is concerned that a mine emergency may also be an emergency for the community. Additionally, the local community expressed concern that the Project may exacerbate an existing emergency such as a fire or flood because the main evacuation route for residents of Wells and tourists in the area is Highway 26, which is currently in disrepair due to

erosion from swollen creeks (ODV 2021). In response to these community concerns, the Community Effects Plan Public Strategy (Appendix B) includes the Community Emergency Response Plan (CERP) that describes emergency procedures if there is event that endangers the health and safety of personnel, property, equipment, and infrastructure that may also endanger the health and safety of the surrounding community.

Prevention and Preparation

BGM has prepared a Mine Emergency Response Plan that identifies industry and Project-specific hazards that supported the development of the CERP. BGM will complete a community hazard assessment that identifies industry and Project-specific hazards to the community so that BGM can prevent incidents and prepare for a community emergency event. BGM will prepare for an emergency through planning and ensuring that specialized equipment is on hand, and ensure key personnel know what services, expertise and capacities exist among local emergency service providers.

BGM will prevent and prepare for emergencies by implementing the following protocols (ODV 2022a):

- Clarify the hazard and risk that exists for a Project operation.
- Ensure that risk assessments are completed prior to the start of work and implement prevention measures.
- Identify potential emergency scenarios that could occur.
- Engage corporate support to ensure that appropriate support plans are in place to address identified risks. and communication protocols.
- Procure or contract resources to respond effectively to emergencies.
- Active and ongoing engagement with the local community and Participating Indigenous nations to discuss emergency planning including:
    1. Site-specific Safety and Evacuation Plan (s) for key job sites.
    2. Identifying who will fill primary and backup BGM and Contractor personnel and what their responsibilities will be to fill key Incident Command System roles.

Ensure that all plans comply with applicable government regulations and obtain regulatory approval prior to the start of activities. Response personnel will be trained in their roles and responsibilities at least annually, and more frequently if training needs are identified. Personnel will also practice responding to emergencies by participating in emergency preparedness exercises. BGM will invite community members who may play key roles in an emergency response, such as the Mayor, Council, Fire Chief, Police and BC Ambulance to participate in the drills. Emergency preparedness drills include:

- Emergency drills.
- Table-top exercises.
- Replicating a full-scale emergency.
- Building on capabilities through a cycle of activities.
- Focusing on exercises best suited to the operation's needs and risks.

The goals for the exercises will be clearly defined prior to running the exercise and then the emergency response will be evaluated against the goals.

Potential Hazards

To identify and assess potential mine-related hazards that have the potential to impact the community, BGM commits to having a Qualified Professional conduct a community hazard risk assessment in relation to the Project. A hazard risk assessment is a critical part of any emergency program and supports the preparation of emergency plans. The hazard risk assessment will reflect the local environment and articulate the relative risk of occurrence for emergencies or disasters and the potential impact on people and property.

The hazard risk assessment will support BGM to help identify their role in addressing vulnerabilities, mitigating hazards, and preparing to respond to, or recover from a variety of hazards events. BGM will also be able to use the assessment to prioritize hazards based on the level of risk from the assessment. The following steps will be taken as part of the community hazard risk assessment:

1. Hazard Identification: the purpose of hazard identification is to identify and develop a list of hazards that could affect the communities that are reasonably likely to expose people to injury, illness or disease if not effectively controlled.

2. Risk Assessment: the purpose of the risk assessment is to determine the relative risk posed by each hazard by calculating a risk score. Risk refers to the likelihood that a hazard will occur and the severity of an adverse effect to health, property, the environment, or other things of concern to the community. The risk assessment includes an assessment of both the likelihood and the severity of the potential consequences. BGM will include both scientific and local knowledge to inform the risk assessment.

3. Identify Risk Reduction Strategies: the purpose of identifying risk reduction strategies is to prevent or reduce the likelihood or consequence of hazard event to people, property, and the land. Risk reduction strategies also improve preparedness and provides an opportunity for early warning if an event were to occur. This step also requires collaboration and cooperation with Wells, other partners, and subject matter experts to decide which strategies are the most practical, achievable, and sustainable.

4. Generate and Assemble Report: the purpose of the report is to document the risks, the assessment, and the strategies for information and guidance.

5. Monitor and Review: the community hazard assessment will need to be reviewed regularly to identify if there are new risks or changes to the vulnerability of Wells.

The Project's Mine Emergency Response Plan (MERP) identifies mine-site hazards that could also be a hazard for the community (ODV 2022a). The hazard list was categorized according to BC Emergency Management Regulation.

Table 5.3-10: Lists of Hazards Identified in the Mine Emergency Response Plan

Atmospheric	Flooding
Heavy rain	Surface flood
High wind	Underground flood
Thunder and lightning storms	Underground in-rush of water
Snow and ice conditions	Uncontrolled Effluent Discharge from impoundment
Heat	Severe flooding
Fire	**Infrastructure Failure**
Surface or underground fire/heat or smoke	Structural failures
Wildfire	Dam breach
Geological	Unusual Conditions that could lead to a dam breach
Avalanche	Slope failure
Landslide	**Interruptions to Critical Services**
Seismic	Major power outage
Earthquake	**Security**
Hazardous Materials and Explosions	Bomb threat/armed threat/terrorism
Unexpected/unintentional explosion	Missing person(s)
Release of poisonous fumes, flammable, or explosive gases	Civil disturbance and/or distraught person
Flammable or poisonous liquid spill	Alarm of unknown origin
Propane leak	**Transportation**
Hydrological	Light vehicle accident
Drought	Underground equipment accident
	Bus accident
	Helicopter accident

Worst Case Event Casualty and Injury

The NH raised concerns that the current health infrastructure may struggle to meet the needs of the community if a Worst-Case Event Casualty and Incident were to occur. Through comprehensive prevention and preparation, the likelihood of a worst-case event casualty and injury event is unlikely (ODV 2022b). Although unlikely, a worst-case event such as an uncontrolled fire could result in injury to an estimated 10–20 workers or members of the public. This estimate was developed with the support of RAM Consulting, whose qualified personnel specialize in health and safety risk management and emergency response planning. The estimate is based on standard assumptions for peak site occupancy and potential exposure zones. A formal hazard assessment, conducted as part of the Community Emergency Response Plan, is currently underway and will be completed by December 31, 2025. The assessment will include estimates by injury type and severity and will be submitted to the EAO upon completion. The rating for worst-case event casualty and injury is outlined in the table below and reflects the projected severity of the emergency (ODV 2022a).

Table 5.3-11: Rating of Worst-Case Event Casualty and Injury

High	Medium	Low
• Fatality; • Long-term health impact • Permanent disability • Multiple lost time injuries • Evacuation of a community • >25% attrition and inability to hire • Lost time injury with immediate life-threatening potential • Long-term disability	• Lost time injury without the possibility of death • Restricted work or short-term health impact • Evacuation of a job site/facility • 5-25% attrition	• Medical aid case • No evacuations; and • 1-5% attrition • Minor injury or illness • First aid or less required • No evacuations; or

BGM workers have special training to respond to emergencies including first aid attendants and specialized firefighting personnel. BGM also has a mine rescue team on-site that has special training and expertise in responding to mine-site emergencies and coordinating an emergency response. As determined through the mutual aid agreement, if BGM's trained personnel do not have the capacity to respond to an emergency, local emergency services will be brought in to assist with responding to the emergency.

BGM also has specialized equipment to rapidly respond to emergency spills to prevent the spill from causing lasting harm. The Emergency Spill Response Kit contains:

- Set of material safety data sheets
- Dangerous goods initial emergency response guide

- Set of site plans and maps
- Delineators and rope
- BGM spill report sheets
- Note pad and writing tool
- Investigation bag
- Bags of floor dry
- Spill pads
- Spill booms
- Scoop shovels
- Long handle square shovels
- Long handle spade shovels
- Short handle flat shovels

Other specialized equipment that BGM has for preventing or responding to emergencies are:

- Portable air horns
- Smoke detectors
- Fire blankets
- Handheld radios
- Flashlights
- Fire extinguishers
- First aid kits

Worst-case events that have the potential to impact the community, the estimation of their occurrence and the emergency response is described in below in Table 5.3-12.

Table 5.3-12: Project Specific Emergency Events with the Potential to Impact Local Community and Mitigation Measures

Hazard and Potential Effect/Harm	Hazard Ranking/Likelihood Consequence[1]	Prevention Activities/Mitigation Measures
FIRE/EXPLOSION: Surface infrastructure fire, underground fire, forest fire and include release of fumes and dust. **Causes**: mine site operations **Impacts**: property damage, multiple injuries, fatality, effecting wildlife and local community.	Level 3 HIGH	• Activate BGM MERP emergency response plan. • Management team communicates with local authorities in the event of a wildfire to ensure proper line of communications and to coordinate response. • Identify the products used to extinguish a fire and inform the fire responders. • Do not approach fire involving toxic materials. (e.g. Hazardous waste). • Consider the directions and range of drift smoke and fumes when assessing the need to evacuate the public. • Mine Rescue (back up for crowd control) and Wells Volunteer Fire Brigade (for the • District)- will work together to respond to a small fire if safe and possible. • Medical/health authority, RCMPs, other outside agencies may be required depending on the reason for evacuation- BGM management will support coordination. • RCMP to assist in controlling traffic and notification.
FLOOD AND SPILLS: surface flood, underground spills, underground In-Rush of water. **Causes**: by accidental discharge of sediment and metals from tailings management facility or waste rock stockpile, Hazardous material release to land or water. **Impacts**: increase contaminants in the environment, effecting drinking water and aquatic life.	Level 2 MODERATE	• Activate the BGM emergency response plan and act consistently with the requirements of the Environment Management Act - Spill reporting regulations to minimize potential effects to the environment/human health. • Listed below are some of contaminants which should not be directed to the approved water treatment system: – Water collected from within the contact ditch system. – Mine water flowing out of the underground working via the decline portal. – Spills or release of dangerous goods and hazardous materials.

Hazard and Potential Effect/Harm	Hazard Ranking/Likelihood Consequence[1]	Prevention Activities/Mitigation Measures
VEHICLE INCIDENTS **Cause**: bus transporting personnel during shift changes **Impacts**: severe accident could cause temporary road closures, serious injuries, or fatalities at local community.	Level 1 MINOR If less harmed Level 2 MODERATE If it is severe	• No other personnel besides R.C.M.P, the On-Scene Supervisor, and First Aid/Medic are allowed at the scene unless otherwise instructed by BGM Management or the R.C.M.P. • Take whatever steps are needed to safely reduce or eliminate the risks to people, property, and process. • Personnel may require evacuation before the situation can be assessed for further action.
AVALANCHE/LANDSLIDES **Cause**: Failure of underground mine stability **Impacts**: major collapse could lead to temporary shut down, serious injuries or fatalities and property damage at local community.	Level 3 HIGH If major collapse occurs.	• Activate the BGM emergency response plan. • Shut down of the listed utilities in catastrophic events remains the responsibility of the facility maintenance personnel in conjunction with the Mine Rescue Team: – Propane/Natural gas – Fire Water system. – Process water system. – Electrical system
POWER OUTAGE **Cause**: mining operations. **Impacts**: less visibility, disrupt electrical resources at local community	Level 1 MINOR	• Ensure no one is in immediate danger. Activate the BGM emergency response plan. • Contact the site electrician for initial investigation. • Assess if it is an internal issue or external issue. • Contact BC hydro to determine nature and estimated duration of power outage.

[1]Refer to Table 5.3-13 for definitions of levels.

Definitions for the different levels of emergencies are described in the table below.

Table 5.3-13: Ratings Explanation for Emergency Levels, and typical Internal Notification/Initial Activation

Level	Definition/Criteria	Typical Internal Notification/Initial Activation (is a minimum example of notification types and communications)
1. Minor	Onsite incidents where control of the hazard has been obtained by the potential exists for the imminent loss of control due to deteriorating conditions. **Meets any of the following**: • Immediate control of the hazard has been established using available resources; however, conditions are not improving and/or resources are being depleted. • Injuries to onsite personnel that are of a medium impact (as per the Risk Matrix – Table 5.3-14). • Public Safety is not threatened, however there is, or may be, public perception of moderate risk to human health or the environment. • Environmental impacts are confined to the site and have limited potential to impact offsite. • All control systems are functioning normally.	**Notification to**: Local Supervisor/Incident Commander, Emergency Manager[1], Public/Media Affairs[1] **Plan/Team Activated**: Site-Specific Emergency Response Plan, Incident Command Team (ICT) and possibly Emergency Management Team (EMT)[1]
2. Moderate	An incident where control of the hazard has been lost but where imminent and/or intermittent control of the hazard is possible. **Meets any of the following**: • Control of the hazard has been lost, however, through the application of available resources intermittent control is being obtained or hazard control is imminent. • Injuries to onsite personnel that are of a high impact (as per Risk Matrix – Table 5.3-14). • Public Safety is not threatened, however, there is or may be a public perception of significant risk to human health or the environment. • Environmental effects extend offsite and are resulting in minor or short-term detrimental impacts. • Come control systems are not operational.	**Notification**: • Local Supervisor • Incident Commander • Emergency Manager • HSE Support • Public/Media or Government Affairs **Plan/Team Activated**: ERP and or Site-specific Emergency Response Plan, ICT, and EMT[2]

Level	Definition/Criteria	Typical Internal Notification/Initial Activation (is a minimum example of notification types and communications)
3. High	An incident where control of the hazard has been lost, imminent control is not possible and public safety is, or has the potential, to be threatened. **Meets any of the following**: • Control of the hazard has been lost and regaining control in not imminently possible. • Fatality and/or onsite personnel have sustained injuries with a High Impact (as per the Risk Matrix - Table 5.3-14)). • Public Safety is being, or has the imminent potential to be, jeopardized. • Environmental impacts are significant, extend offsite and have the potential to result in long-term environmental degradation. • Key control functions have failed and are not operating correctly.	**Notification**: • Local Supervisor • Incident Commander • Emergency Manager • HSE Support • Public/Media or Government Affairs • Executive Team **Plan/Team Activated**: ERP and Site-Specific Emergency Response Plan, ICT, EMT, and Executive Management Team.

[1]Discretionary notification and activation by Local Supervisor (Incident Commander) to Emergency Manager based on type and magnitude of the incident and if regulatory, public, or media contact has been made.

[2]Discretionary notification and activation by Emergency Manager to Executive Lead based on type and magnitude of the incident. If required, Incident Commander to ensure regulatory, public, or media contact has been made.

Table 5.3-14: Risk Matrix

LIKELIHOOD	CONSEQUENCE				
	Insignificant	Minor	Moderate	Major	Catastrophic
Certain	M	M	H	H	H
Likely	L	M	M	H	H
Possible	L	L	M	H	H
Unlikely	L	L	L	M	H
Rare	L	L	L	L	M

	High Risk:	STOP work and obtain senior mgmt. approval prior to proceeding. Extensive risk prevention and/or mitigation required. Highest priority items. RA completed.
	Moderate Risk:	Review RA, Risk prevention and/or mitigation required to reduce to ALARA. Priority items.
	Low Risk:	No further prevention or mitigation required where current safeguards or controls can be verified as functional. Some risk controls/safeguards may be justified.

Roles and Responsibilities BGM

BGM HSE personnel are responsible for developing, reviewing, and administrating components of this CERP. HSE personnel will ensure that the CERP gets implemented and aligns with the MERP. BGM's key personnel will know the services and activities of different emergency response parties so that they can be called to assist if required. For example, BGM personnel may need additional medical assistance, staging locations, logistics, supplies, and traffic management to coordinate a joint emergency response. BGM is responsible for engaging and creating agreements with parties that may be called upon to assist in responding to an emergency should the emergency exceed the capacity of BGM to respond to.

BGM is responsible for notifying the District, Barkerville Historic Site, and Participating Indigenous nations if an incident on site has the potential to create an emergency that has the potential to harm the health and wellbeing of Wells, tourists, and Indigenous communities close the mine. BGM will consider how an emergency may impact community health and wellbeing or Indigenous Interests.

Specific descriptions of BGM's internal emergency response team are provided in detail in the Community Effects Plan Public Strategy (Appendix B).

Local Government and District Emergency Response Parties

In the event that a mine site emergency has the potential to impact Wells or the Barkerville Historic Site, BGM's communication lead will notify the District's Emergency Coordinator to coordinate an emergency response for the community. BGM will also notify Barkerville Historical Site.

The Project has a toll-free number the public can call to notify the Mine of an emergency that may impact the Project. Calling the toll-free number will connect the caller immediately to a Project manager during business hours. After regular business the hours, the toll-free number will be managed by staff from the Community Relations team.

District of Wells

Under Emergency Measures Bylaw #10, the District of Municipal Council (Council) must establish and maintain an emergency management organization to provide a comprehensive management program to prepare for, respond to, and recovery from emergencies and disasters. The District Emergency Coordinator, appointed by the Council as head of the Wells Emergency Management Organization, facilitates emergency preparedness, response, and recovery measure. The Wells Emergency Executive Committee is composed of a Council member, the Principal Administrative Officer of the municipality, Emergency Coordinator, heads of selected functional departments or their designates, and other members the Council may determine (District of Wells 1999).

The roles and responsibilities of District of Well's Emergency Executive Committee are (District of Wells 1999):

- Prepare and present to the Council for annual review and approval a list of hazards and relative risk of occurrence; and
- Declare a state of local emergency.

Wells Volunteer Fire Brigade

The Wells Volunteer Fire Brigade (WVFB) is a small, rural, volunteer brigade assembled of town residents who train to and operate at the Exterior Operations Level in accordance with the Provincial Office of the Fire Commissioner. The WVFB serves the District of Wells within its jurisdictional boundaries and provides additional suppression support to Barkerville Historic Town & Park and select CRD properties through formal aid agreement. The WVFB has been providing the region of Wells-Barkerville with fire awareness, protection, and suppression since 1934.

Exterior Operations are designed principally for rural, residential fire suppression and the scope of the WVFB does not involve medical response, highway response, highway rescue, high-angle rescue, or any interior structure response. However, the WVFB coordinates with and may support the RCMP, BCES, or BCWS by specific special request through formal channels of authority.

In the future, the WVFB may be able to increase its scope and operations level with significant financial investment in training resources, equipment, maintenance, infrastructure, and a substantially increased volunteer base.

Regarding coverage of BGM assets, the WVFB provides service to the BGM community relations office, approximately eight BGM-owned community residences, and the BGM-owned former Hubs Motel as they are all located within the DOW jurisdictional boundaries and contribute to municipal taxes.

As of this time, the WVFB does not have an aid agreement with BGM to service any properties outside of jurisdiction. Therefore, the WVFB does not service the BGM staff camp at the Ballarat site nor does the WVFB service BGM assets at the Bonanza Ledge site. The WVFB does not service the offices across the Lowhee River bridge (outside of special request as they are mine site private property).

City of Quesnel

The City of Quesnel, fire police, other local emergency personnel, and support agencies have an emergency plan that can be activated for large-scale emergencies and disasters. Quesnel opens its Emergency Operations Centre (EOC) when an emergency occurs. The EOC activation levels range from one (small event or threat) to three (major event) and trained staff work in the EOC to respond to these emergencies (City of Quesnel 2024a).

The City of Quesnel has an active volunteer Emergency Social Services (ESS) Program. The primary responsibilities of ESS are registration and inquiry for the purposes of family reunification, referrals for food clothing, and lodging, communication services, and personal services. In Quesnel, the Arts and Recreation Centre is designated as the main reception centre to receive appropriate assistance, if residents were displaced from their homes and families (City of Quesnel 2024b).

Quesnel Volunteer Fire Department

The Quesnel Volunteer Fire Department provides services from three fire stations to a service area that includes the City of Quesnel, Red Bluff, and Quesnel District Area. Firefighters are dispatched by a regional 9-1-1 system in Prince George. The department employs four full-time staff and approximately 40 volunteer members. The full-time staff support, train and equip an effective volunteer fire service and to provide inspection and education services to the citizens of Quesnel (City of Quesnel 2024c).

Cariboo Regional District Emergency Program Services

BGM will seek the assistance of the CRD to ensure a coordinated response should the emergency become regional in nature. The CRD is responsible for supporting (CRD 2022a):

- Emergency Preparedness
  - Residents of the CRD can register for Emergency Notification and can follow the CRD
  - Emergency Operations Facebook page for updates and preparedness tips.
  - If residents are experiencing an emergency related to a flood or slide, they can contact 1-800-665-1636.
- Emergency Response
  - The CRD has an interactive ArcGIS map of all current evacuation orders and alerts.
- Disaster Recovery and Assistance
  - The CRD provided a summary link of financial resources, assistance, and contact information for residents, business, and property owners after a disaster.
  - The CRD provided a guide to re-entry after an evacuation.
- Search and Rescue
- Volunteers with the Central Cariboo Search and Rescue Unit assist the RCMP and BC Ambulance Services with responding to responding to motor vehicle accidents; searching for missing persons; locating missing aircraft; assisting at disaster scenes; and providing back up to agencies providing emergency support for disaster victims.

- Operations are based out of Williams Lake and may involve administrative/clerical, air search, auto extrication, communications, flat ice rescue, land search, and water rescue.

Volunteer Fire Departments

- The CRD oversees 14 volunteer fire departments, and all are recognized by the Fire Underwriters Survey for insurance purposes.
- The CRD has mutual aid agreements with fire departments, municipalities, and several First Nations within the region. The agreements allow equipment and labor from any of the departments to assist neighbouring services in the event of large fires or multiple incidents happening at the same time.

Cariboo Regional District Emergency Notification System

The Cariboo Chilcotin Emergency Notification Systems serves the CRD, 100 Mile House, Quesnel, Wells, and Williams Lake. This system is managed by each local government for their respective areas and allows residents to opt-in to receive notifications via phone calls, text messaging and email (CRD 2022b).

This system will be used to notify residents about emergency, significant, and time-sensitive emergency events affecting the area. The local Emergency Manager will send notifications regarding (CRD 2019):

- Critical emergency notifications; and
- Evacuations and other emergency events.

Health Emergency Management BC

BGM will support engagement with Health Emergency Management BC during an emergency by providing early notification as part of the communication protocols of the CERP.

Health Emergency BC (HEMBC) is a program of the Provincial Health Services Authority (PHSA) that provides emergency management leadership and support to the BC health system, including all regional health authorities, PHSA, and the Ministry of Health (PHSA 2024).

HEMBC has three primary program areas relevant to BGM's Community Emergency Response and include (PHSA 2024):

- Health authority emergency management and fire safety support;
- Provincial psychosocial services such as the Provincial Overdose Mobile Response Team and the Disaster Psychosocial Services Program;
- Provincial coordination and operations support for the activation of provincial response structures, multi-jurisdictional alignment, and deployment of emergency medical equipment, supplies, and temporary facilities.

The purpose of HEMBC is to provide expertise, education, tools, and support specifically for the BC Health Sector to effectively mitigate, prepare for, respond to, and recover from impacts of emergency events, while ensuring the continuity of health services. There is team for HEMBC for each of the regional health authorities in BC with the HEMBC-North specifically for Northern Health (NH 2022).

Roles and Responsibility HEMBC

The main roles and responsibilities of the HEMBC-North are to:

- Maintain a 24-hour emergency/on-call contact number for notification and activation of the health system in Northern BC; and
- Notify/activate the appropriate Northern Health Programs (i.e., public health, acute care, etc.) based on the nature of the emergency event.

Northern Health

During a major emergency/disaster, Northern Health will provide health care services and activate its emergency response management plan(s). The roles and responsibilities of Northern Health are split between preparedness (pre-event) and response:

Preparedness (Pre-event)

- Participate with industry, local authority, and other partners in the development of their Emergency Response Plans as it relates to health authorities' roles and responsibilities; and
- Participate in stakeholder training and exercises associated with activation of an Emergency Response Plan, in which Northern Health or HEMBC-North have a role and responsibility (as resources allow).

Partner Identification, Communication Protocols, and Health Emergency Management BC

Appendix I has the emergency response contact information for key partners including:

- Local Medical and Emergency Services;
- Local Government and Partners;
- Provincial Partners;
- Federal Partners; and
- Participating Indigenous nations

Communication Protocols

BGM has internal communication protocols detailed in the Mine Emergency Response Plan in the event of an emergency, disaster, or crisis that has the potential to impact the District (ODV

2022a). BGM's Communication Lead from the Emergency Management Team will liaise with the District Emergency Coordinator and collaborate on a joint response during and after a mine emergency.

Emergency Service Limitations

Existing emergency services serving Wells is detailed in the Local Government and District Emergency Services section.

Information provided in the Socio-Economic Baseline Study for the Project's EA indicated that there are existing limitations for emergency services in Wells. For example, when BC Emergency Health Services is called to an existing BGM site, they must be escorted at all times and cannot work underground. A person who is injured underground would have to be brought to the portal to receive emergency health services. Additionally, if BGM uses their emergency vehicle to transport someone to Quesnel, they will need to shut down their operations since they would no longer have a component of their emergency response on-site and transport by BC Emergency Health Service is preferred. BC Emergency Health Services cannot have a mutual aid agreement with BGM because their standards do not align (WSP 2021).

Emergency responder staff indicated that they experience challenges recruiting and retaining staff in northern and remote communities such as Wells. The current staffing model presents challenges for areas with low call volumes as it does not provide financial stability for people if this is their only source of income. BC EHS would like there to be eight people in the area who could be called on, as needed (WSP 2021).

In addition to staffing challenges, the ambulance service serving Wells also faces challenges related to infrastructure issues (e.g., water restrictions in the community can make washing the outside of the ambulance challenging) (WSP 2021).

Considering the capacity challenges faced by emergency services serving Wells, a mine-site emergency that results in more than a few injuries requiring hospital services or other emergency services has the potential to create a considerable burden on the existing services that exceeds their capacity.

On February 6, 2024, BGM participated in a meeting with the District, Emergency Management BC, Ministers, and several technical experts to discuss and update the emergency response plans, including evacuation procedures. An evaluation by an independent qualified person of the emergency service limitations for Wells and for the Project workforce will be conducted following the discussion on February 6, 2024, and subsequent updates and revisions to the emergency preparedness plan are complete.

Evacuation Procedures for the Community and Project's Workforce

Emergency preparedness is a priority for the District because Wells experienced two states of emergency in 2023. Fortunately, Wells is a tight knit community whose residents are known for taking care of each other and supporting each other through an emergency. Wells residents are familiar with two evacuation routes out of the community, one being Highway 26 (pers. comm., 2024).

Issuing evacuation orders in the CRD is the responsibility of local governments. When the population is determined to be at imminent risk (taking into account time of day, weather forecasts, type of risk and time required to evacuate and secure an area), local authorities issue an evacuation order and people must leave the area immediately. Local police or RCMP enforce evacuation orders. Entry permits allow access for residents of evacuated areas and are only issued for very specific reasons. When residents leave, they should not count on being able to return (CRD 2022c).

Should there be an emergency event that requires both the community and BGM workers to evacuate from the site, the Incident Commander will be responsible for communicating with the local authorities including the RCMP and Emergency Management BC who will support the management of an evacuation. The Incident Commander will also be responsible for coordinating offsite resources such as extra bussing, hotels, or flights to remove workers from the site.

On February 6, 2024, BGM participated in a meeting with the District, Emergency Management BC, Ministers, and several technical experts to discuss and update the emergency response plans, including evacuation procedures. An evaluation by an independent qualified person of the evacuation procedures for Wells and for the Project workforce will be conducted following the discussion on February 6, 2024, and subsequent updates to the plan.

Additional Health Assessment Studies

Project specific events with the potential to impact the health of the local community include the following scenarios:

- Fire/Explosion
- Flood and spills
- Vehicle incidents
- Avalanche/Landslides
- Power outage

BGM has monitoring plans for soil and vegetation, air, groundwater, surface water, sediment, and fish tissue. If one of the above scenarios occurs, environmental media will be monitored and response plans will be triggered if specific thresholds that indicate a potential negative impact to

human health is reached. If a specific threshold is reached as determined by a QP, BGM will initiate additional sampling of receptors. If there is evidence of contaminant uptake into receptors, BGM will conduct an ecological risk assessment of effected environmental media. Based on the results, a human health risk assessment considering exposure of individuals to contaminants will be initiated. To determine trigger levels, health-based environmental quality criteria from federal, provincial, or international regulatory agencies were considered for soil and vegetation, air quality, groundwater, surface water, sediment, and fish. Table 5.3-15 details the environmental media and parameter, the monitoring plan, and the response timeline. Detailed information can be found in the Human Health Monitoring and Management Plan (Appendix J).

Table 5.3-15: Human Health Monitoring

Environmental Media	Environmental Parameter	Trigger/Threshold
Soil and Vegetation	Metals, Polycyclic aromatic hydrocarbons (PAHs)	Environmental guidelines for the protection of human health from non-carcinogenic constituents are typically based on an allocation of 20% of the provisional tolerable daily intake of soil (i.e. assuming 20% of a person's tolerable daily intake of chemical comes from environment, and the remaining 80% comes from other sources of food and water). If the contaminant exceeds thresholds defined by federal, provincial, or international regulatory agencies, BGM will respond.
Air Quality	Metals, PAHs,	
Groundwater	Metals	
Surface Water	Metals, PAHs	Trigger levels for surface water screening prioritized health-based thresholds that were developed to protect water quality used for drinking water purposes and can be applied to rivers, lakes, and streams.
Sediment	Metals	Human health-based guidelines for sediment were unavailable from provincial, federal, and other jurisdictions and soil quality screening criteria for the protection of human health will be used for sediment.
Fish	Metals	Site specific fish tissue screening criteria used acceptable risk levels and fish ingestion rates appropriate for Indigenous populations based on Health Canada guidelines for ingestion of foods.

Response Timeline

If an exceedance is observed, BGM will act:

- Within one month of observed trigger exceedance. Time to act will depend on environmental media.
- Within next suitable field season.
- Within one month of verification monitoring.
- Within one month of obtaining verification monitoring results.

Mitigation Measures

This CERP provides details on how BGM plans to mitigate community concerns BGM's emergency response to the District of Well and the Barkerville Historic Site. BGM has engaged in comprehensive emergency planning which is detailed in their Mine Emergency Response Plan and their Site-Specific Emergency Plans (ODV 2022a, ODV 2022b). Table 5.3-16 summarizes the communities' concerns related to BGM's community emergency response and associated evacuation procedures and BGM's response.

Table 5.3-16: BGM's Response and Plan to Address Community Concerns Related to Emergencies

Community Concern	Mitigation/ BGM Response
A serious mine-site emergency may overwhelm existing emergency services.	• If a serious accident occurs, the mine rescue team will coordinate a response with the municipalities and emergency response departments. • Trained personnel will be deployed on-site to respond. Additional assistance from local emergency services will be requested if the emergency exceeds the personnel's capacity to respond. • If injuries do occur, BGM will reduce the stress placed on existing health services in the community by having comprehensive first aid facilities and qualified first aid attendants trained to handle major incidents on site. On site emergency medical vehicles will also be available to transport injured • person who cannot receive the necessary medical care on-site to the nearest hospital.
Transportation routes are limited within and in proximity of the Wells when residents need to evacuate the community during a mine-related emergency. Highway 26 is the only major public transportation corridor.	• A new highway bypass will be built west of Wells from Highway 26 to connect to the Main Access Road. During an emergency evacuation, the bypass will allow traffic to exit the highway. • The existing helipad is being upgraded to serve as a medivac and commuter helicopters. • There are many Forest Service Roads (FSRs) that are well maintained and in good condition. Although FSRs are not maintained to the same standards of public highways, these roads can be used as an evacuation option for people that have experience with backcountry driving and off-roading. • The Unified Command Centre / Mutual Aid will liaise with the Ministry of • Transportation and Infrastructure to provide a coordinated traffic evacuation plan from the District.

Community Concern	Mitigation/ BGM Response
Collaboration between BGM and the District on a joint emergency preparedness plan with clear roles and protocols for notifications and other communication.	• As part of the Project's Emergency Response Plans, there is a 24/7 notification system. If triggered, BGM will notify municipalities and emergency response departments to ensure that the District and other members of the public are notified in a timely manner. • BGM, District, Barkerville Historic Site, Ministers, and many technical experts are collaborating to develop an emergency preparedness and response plan. • BGM has clear roles, responsibilities, and communication protocols outlined in their Mine Emergency Response Plan. The Mine Rescue Team, Incident Commander, and Communications Lead are all responsible for managing communications and notifications with stakeholders, including the District. • BGM has an individual available on site 24/7 that can be notified when an emergency occurs. • BGM has a toll-free number that any member of the public can call to report an emergency related to the mine. • BGM will create agreements with local governments and service providers to facilitate a joint emergency response.

BGM will work with a qualified occupation health and safety assessor to identify additional risks and hazards related to the Project and the community. The occupational health and safety assessor will also be tasked with evaluating BGM's community emergency response and evacuation procedures.

5.3.2.2 Monitoring, Evaluation and Reporting

The Community Effects Plan Public Strategy is about building positive relationships with the community through effective engagement, communications, and reporting, financial contributions that support meaningful and active engagement, and collaborating with the local community and local service providers on keeping the community safe.

The following table summarizes how BGM will monitor and assess the effectiveness of the mitigation strategies designed to address public concerns related to effective engagement with the public, community financial support, and keeping the community safe.

Table 5.3-17: Monitoring, Evaluation, and Reporting Plan

Objective/Outcome	Implementation Strategy	Monitoring Process	Evaluation and Reporting Methods
BGM will use effective engagement, communications, and reporting methods to ensure that the public actively engages with BGM and provides input into the mitigations designed to address public concerns	• BGM will implement the Community Effects Plan Engagement, Communication and Reporting Strategy (Appendix G). • BGM will develop methods that ensure that individuals providing feedback to BGM can maintain their confidentiality.	• Review the issues tracking table and identify any themes or outstanding grievances related to engagement, communications, and reporting. • Assess the quality and strength of the relationships BGM has with Participating Indigenous nations, the local community, and partners. • Assess if feedback gathered from Participating Indigenous nations, the local community, and partners is meaningfully supporting the adaptive management of the Community Effects Plan to address community concerns. • Assess if Participating Indigenous nations, the local community, and partners are actively engaged, participating, and collaborating with BGM on the implementation of the Community Effects Plan to address community concerns.	• If the engagement and participation is low from the public, the local community, and Participating Indigenous nations, BGM will specifically reach out to representatives of the public, local community, and Participating Indigenous nations to seek guidance on how they can do a better job of engaging the public and what the barriers might be. • BGM will share information in their Community Effects Plan Annual Report on the effectiveness of their engagement efforts. • Information raised during discussions with the community during the first year of Construction will serve as baseline data with which to evaluate mitigations and adjust if needed in collaboration with the community.

Objective/Outcome	Implementation Strategy	Monitoring Process	Evaluation and Reporting Methods
		• Assess if Participating Indigenous nations, the local community, and partners are receiving information in a timely and accessible manner. • Measure and track if the public is accessing information related to the Community Effects Plan on the website. • Measure and track through the issue tracking table if concerns continue to be raised or if they are being • adequately addressed.	
BGM will effectively engage with diverse populations to gain meaningful feedback on how BGM may be impacting different population groups and how BGM could better address the needs of diverse or vulnerable populations.	• BGM will implement the Community Effects Plan Employee Strategy (Section 5.3.1) • BGM will work with a qualified person on strategies, policies, and programs to understand how the Project impacts different population groups. • BGM will seek guidance from the Amata Transition House Society on how to effectively engage with diverse populations including those that are historically • underrepresented in the mining industry.	• BGM will survey their employees to understand if they are hiring and retaining diverse populations and if there are any demographic population shifts in their employees over time. • BGM will seek guidance and input from partners, community liaisons, and local service providers on whether historically underrepresented populations groups are actively participating in aspects of the Project that interest them.	• BGM will provide a report on their employee demographics and the effectiveness of their Community Effects Plan Employee Strategy (Section 5.3.1) in their Community Effects Plan Annual Report. • BGM will provide a summary of their efforts to engage with diverse populations in their Community Effects Plan Annual Report. • Information will be collected on workers during the first year of Construction through surveys and discussions with partners, community liaisons, and service providers will serve as baseline data to evaluate mitigations and adjust if needed in collaboration with the community.

Objective/Outcome	Implementation Strategy	Monitoring Process	Evaluation and Reporting Methods
BGM has signed an agreement with the District to provide financial support for a Community Liaison position with the District to improve the District of Well's capacity to participate in providing meaningful input to BGM related to the Project.	• BGM and the District will work together to define the roles and responsibilities of the Community Liaison position. • With the District, BGM will establish the terms of the Community Liaison position.	• The effectiveness of the Community Liaison position will be reviewed on an annual basis against the terms developed for the position.	• BGM and the District will collaboratively evaluate the effectiveness of the Community Liaison position.
BGM will provide $15,000 annually for a mental health support worker to address community concerns about the Project's impact on the mental health and wellbeing of Wells and Quesnel residents.	• TBD	• The effectiveness of the Mental Health Support Worker will be reviewed on an annual basis. • BGM will seek input from their partners on whether the mental health support worker is having a positive impact on the mental health and wellbeing in the communities of Wells and Quesnel residents.	• BGM will report the impact of the Mental Health Support Worker in their Community Effects Plan Annual Report and will evaluate against the terms of the agreement. • Information raised during discussions with partners during the first year of Construction will serve as baseline data with which to evaluate mitigations and adjust mitigations if required.

Objective/Outcome	Implementation Strategy	Monitoring Process	Evaluation and Reporting Methods
BGM has signed a funding agreement with the Amata Transition House Society in response to concerns related domestic and sexual abuse, substance use and to learn how to make Project employment opportunities more accessible for populations historically underrepresented in the mining industry.	• BGM will contribute • $10,000 per quarter to the Amata Transition House Society	• BGM will have regular meetings with the Amata Transition House Society where the Amata Transition House Society will report back to BGM how they are using the financial contribution.	• BGM will evaluate the activities of the Amata Transition House Society against the terms of the financial contribution. • BGM will report in the Community Effects Plan Annual Report how the financial contributions to the Amata Transition House Society are being used.
BGM will prepare for a mine site emergency that has the potential to impact Wells by implementing the Community Emergency Response Plan and working with local service providers on emergency preparedness.	• BGM will review the Community Emergency Response Plan with the District, Ministries, Barkerville Historical Site, and experts and seek feedback. • BGM will establish agreements with Wells and local service providers related to community emergency response.	• BGM will review the Community Emergency Response Plan annually with the District, Barkerville Historic Site, and local service providers and adapt the plan to current conditions.	• BGM will engage in a lessons learned debriefing process following an emergency event that impacted the community to understand the effectiveness of plan, identify additional preventive activities, and improve the effectiveness of the plan in preparation of a future emergency event.

5.3.2.3 Public Strategy Adaptive Management

BGM will respond to monitoring observations that indicate non-compliance, reduced mitigation effectiveness, or emerging issues by altering existing or developing new mitigation measures to avoid, reduce and/or remediate the effects. Baseline conditions for relevant public-related indicators—such as community participation levels, diversity in employment, mental health status, and emergency readiness—will be established during the first year of Construction or drawn from existing socio-economic baseline studies. Monitoring results will be compared against these baseline conditions to determine whether:

- Mitigations are being achieved to the extent contemplated in the Application;

- Effects differ from those predicted in the Application; or
- Identified quantitative or qualitative triggers have been exceeded.

The monitoring process detailed in Table 5.3-17 will detect if there is a qualitative or quantitative trigger. Table 5.3-17 outlines the process and timing to follow if a trigger is exceeded or monitoring identifies underperformance or unexpected effects of mitigations. This includes identifying and implementing altered or new measures in collaboration with Participating Indigenous nations, the local community, and other partners, and reporting back on progress.

The Community Effects Plan: Engagement, Communication, and Reporting Strategy (Appendix G) is the primary method that will be used to determine if any altered or new mitigations measures and/or remediation activities are effectively mitigating or remediating effects and/or avoiding potential effects. Table 5.3-17 also identifies specific indicators, triggers, and response processes for each public-related issue, along with the rationale for each measure.

Table 5.3-18: Public Strategy Adaptive Management for Altered or New Mitigations

Adaptive Management Incident	Monitoring Program	Proposed Indicators	Trigger/Threshold	Response/Process to Develop Triggers/Thresholds	Implementation and Reporting Back
Public does not provide input into mitigations designed to address public concerns.	Community Effects Plan: Engagement, Communications and Reporting Strategy (Appendix G)	• Participation in public engagement events.	• Poor or declining participation in public engagement events.	BGM will reach out to representatives of the local community, stakeholders, and Participating Indigenous nations to determine whether public participation levels warrant an adaptive management response. If a response is required, BGM will seek guidance on how they can improve public participation. Levels of participation will be reported a minimum of once per year. If new or adjusted mitigations are identified, BGM will implement them immediately.	BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year.

Adaptive Management Incident	Monitoring Program	Proposed Indicators	Trigger/Threshold	Response/Process to Develop Triggers/Thresholds	Implementation and Reporting Back
Member of diverse population groups indicate that there are inequitable barriers to employment with BGM.	Community Effects Plan: Engagement, Communications and Reporting Strategy (Appendix G) Onboarding Program – completion of confidential demographic survey upon hiring.	• Percent of workforce that is Indigenous. • Percent of workforce that is female. • Percent of workforce that is from a visible minority group	• Less than 5% of the BGM workforce is Indigenous. • Less than 20% of the workforce is female. • Less than 5% of the BGM workforce is from a Visible Minority group • Or as determined in collaboration with the local community, stakeholders, and Participating Indigenous nations.	BGM will engage with the local community, stakeholders, and the Participating Indigenous nations to adjust, modify, or design new mitigations to improve the diversity of the workforce.	BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year.
District is unable to meaningfully participate in the planning for the Project.	Community Effects Plan: Engagement, Communication, Reporting Strategy (Appendix G) Evaluation and Reporting results of the District of Wells Community Liaison position	• District satisfaction with their participation in Project planning throughout all phases.	• District indicates dissatisfaction in their involvement in the Project. • District of Wells Community Liaison receives a poor evaluation and is deemed ineffective.	BGM will engage with the District to identify new or adjust existing mitigations to improve their meaningful participation in the Project.	BGM will implement modified or new mitigations as soon as possible and evaluate District satisfaction with their participation in the Project during monthly meetings.

Adaptive Management Incident	Monitoring Program	Proposed Indicators	Trigger/Threshold	Response/Process to Develop Triggers/Thresholds	Implementation and Reporting Back
Community mental wellbeing declines in the community as a result of the Project.	Reports submitted to BGM by the Mental Health Workers that indicate whether or not the Project is affecting mental wellbeing in the local community.	• Number of people served by the Mental Health worker because of mental wellbeing concerns associated with the Project.	• In collaboration with the District and the mental health worker BGM determines that the Project is having a significant effect on mental wellbeing.	BGM will engage with the District and the Mental Health worker to identify new or adjust existing mitigations to support mental wellbeing in the local community.	BGM will implement any modified or new mitigations as advised by the Mental Health worker and the District. The Mental Health worker will report to BGM on the effectiveness of the mitigations on a bi-annual basis so that ODV can report back to the local community at a minimum once per year.

Adaptive Management Incident	Monitoring Program	Proposed Indicators	Trigger/Threshold	Response/Process to Develop Triggers/Thresholds	Implementation and Reporting Back
Reports of increased domestic violence, sexual abuse, and substance use in the community associated with the Project.	Community Effects Plan: Engagement, Communication, and Reporting Strategy (Appendix G) Confidential report submitted to BGM by the Mental Health Worker indicating that domestic violence, sexual abuse, or substance use are issues in the community.	• Changes in domestic violence, sexual abuse, and/or substance that can be associated with the Project.	• Any report of increased domestic violence, sexual abuse, and substance use in the community associated with the Project.	BGM will engage with the District, Amata Transition House Society, the Mental Health worker, and/or Participating Indigenous nations to obtain guidance and collaborate on adjusting or developing new mitigations.	BGM will implement modifed or new mitigations as soon as possible and report back to the District, stakeholders, and Participating Indigenous nations annually at a minimum.

Adaptive Management Incident	Monitoring Program	Proposed Indicators	Trigger/Threshold	Response/Process to Develop Triggers/Thresholds	Implementation and Reporting Back
BGM's workforce does not reflect the diversity of the regional population or there are reports that there are barriers to employment at the Project for different population groups.	Community Effects Plan: Engagement, Communication, and Reporting Strategy (Appendix G) Engagement with the Amata Transition House Society Onboarding Program – completion of confidential demographic survey upon hiring.	• Percent of workforce that is Indigenous. • Percent of workforce that is female. • Percent of workforce that is from a visible minority group. • Engagement feedback from Amata Transition House, District, other Stakeholders, or Participating Indigenous nations that community members belonging to diverse populations face barriers to employment with the Project.	• Less than 5% of the BGM workforce is Indigenous. • Less than 20% of the workforce is female. • Less than 5% of the BGM workforce is from a Visible Minority group • Or as determined in collaboration with the local community, stakeholders, and Participating Indigenous nations.	BGM will engage with the local community, stakeholders, and the Participating Indigenous nations to adjust, modify, or design new mitigations to improve the diversity of the workforce and reduce barriers to employment for historically underrepresented population groups.	BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year.

Adaptive Management Incident	Monitoring Program	Proposed Indicators	Trigger/Threshold	Response/Process to Develop Triggers/Thresholds	Implementation and Reporting Back
BGM's response to a mine emergency is inadequate resulting in unacceptable adverse effects to Wells.	Community Effects Plan: Engagement, Communications and Reporting (Appendix G)	N/A – BGM will request Feedback, or emergency lessons learned debriefs with the District that will identify specific issues and concerns with BGM's community emergency response plan and execution.	N/A	N/A – BGM will engage with the District to resolve any issues and will collaboratively work with the District and local emergency organizations to improve BGM's emergency response to events that negatively impact the community.	BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year.

5.3.2.4 Reporting

The Community Effects Plan Engagement, Communications and Reporting Strategy (Appendix G) outlines how BGM will report back to the public, the local community, Participating Indigenous nations, and partners regarding the effectiveness of the mitigations designed to address community concerns.

During community meetings, and face-to-face meetings with the local community, Participating Indigenous nations, and partners, BGM will seek advice on best practices for engagement, communications, and reporting and share what they have learned works or does not work for active and meaningful engagement.

The Community Effects Plan Annual Report will include information how financial contributions to the community are addressing community concerns.

The Community Effects Plan Annual Report will also include information about activities, partnerships, and the existence of partnerships and agreements with local services providers that are designed to keep the community safe.

5.3.2.5 Implementation Workplan

Table 5.3-19: Public Strategy Implementation Workplan

Public Strategy Activity	Planning/ Pre-Construction	Construction	Operations	Closure
Community Engagement				
District of Wells Community Liaison*				
Mental Health Support Worker*				
Support Amata Transition House Society to address adverse social effects that may result from the Project and improve access to employment opportunities for population groups historically underrepresented in mining				
Hazards Assessment				
Collaborative Community Emergency Response Plan with the District, Barkerville Historic Site, and local service providers				
Community Effects Plan Annual Report				

*Positions will be reviewed annually potentially leading to changes in the terms of the financial contributions.

5.3.3 Traffic Strategy

The purpose of the Community Effects Plan Traffic Strategy is to address concerns raised by the local community and Participating Indigenous nations regarding the impact of Project-related traffic on safety and peaceful enjoyment of the community.

The Project Traffic Impact Assessment outlines baseline conditions for existing road networks, existing traffic volumes, and historical collision data between 2009 and 2018. This study concluded that morning commuter traffic peaked in the morning between 7:15 am and 8:15 am while afternoon peaked between 3:45pm and 4:45 pm at the Highway 26 and 500 Nyland Lake Rd Intersection. August is the peak traffic month throughout the year, resulting in 20% more traffic than in September. A total of eight collisions in proximity to the Project were identified adjacent to the Highway 26 and 500 Nyland Road intersection. Two of these collisions resulted in injuries due to driving too fast and improper turning technique (WSP 2021a).

Engagement with the public and with the District identified concerns that mine-related traffic entering Wells could have a detrimental effect on the safety of residential traffic and could negatively affect both tourists and residents using local transportation infrastructure. Concerns were also raised regarding the potential impacts to air quality caused by dust created by traffic. The local community is also concerned that traffic may impact the peaceful enjoyment of the local environment because of increased noise and light effects (ODV 2022c, ODV 2022j). Air quality changes resulting from traffic will be addressed in Fugitive Dust Management Plan. The air quality monitoring plan will be posted on the BGM website. Noise concerns will be addressed below in the Noise Strategy (Section 5.3.4), and light effects will be addressed in the Visual Impact Strategy (Section 5.3.5).

Xatśūll First Nation shared that cumulative effects of traffic on access roads to the QR Mill may have a potential impact on their traditional land use and that Xatśūll Nation members may be discouraged from using the land due to contamination. Xatśūll First Nation is also concerned that increased traffic from outside the community has become increasingly dangerous due to increasing and unsafe vehicle speeds (ODV 2022h). As requested by Xatśūll First Nation, BGM commits to providing details about traffic movements, vehicle types, and changes to traffic patterns at formal meetings, one-on-one, or community meetings as it becomes available. The mitigations designed to address concerns about safety related to vehicle speeds are listed in Table 5.3-22 in Section 5.3.3.4. Concerns about dust and contamination to harvesting sites because of increased traffic will be addressed in the Fugitive Dust Management Plan.

Lhtako Dené Nation expressed concerns regarding wildlife mortality and the ability to access their Traditional Territory as a result of Project-related traffic (ODV 2022g). The mitigations listed in Table 5.3-22 in Section 5.3.3.4 identify how BGM will control traffic to mitigate the potential

negative effects caused by Project-related traffic on wildlife and the Lhtako Dené Nation members access to their traditional territory.

Williams Lake First Nation members expressed concerns regarding impacts to road use and the cumulative effects of traffic on access roads to the QR Mill on their use of the land. Williams Lake First Nation members fear that increased human and vehicle traffic will negatively impact the suitability of the land for camping or gatherings and could also discourage community members from harvesting due to concerns about dust contamination. Furthermore, Williams Lake First Nation members shared that traffic has increased from outside the community and the area has become more dangerous due to increasing vehicle speeds and volumes (EAO 2020b, ODV 2022i). The Williams Lake First Nation's concerns related to contamination to plants caused by traffic will be addressed in the Vegetation Management Plan or the Fugitive Dust Management Plan. Mitigations to address increased speed are listed in in the Implementation Workplan (Table 5.3-22)

A comprehensive Traffic Control Plan (Appendix C) for the Project describes how BGM will address traffic-related concerns raised by the local community and Participating Indigenous nations. The mitigations in the Traffic Control Plan will:

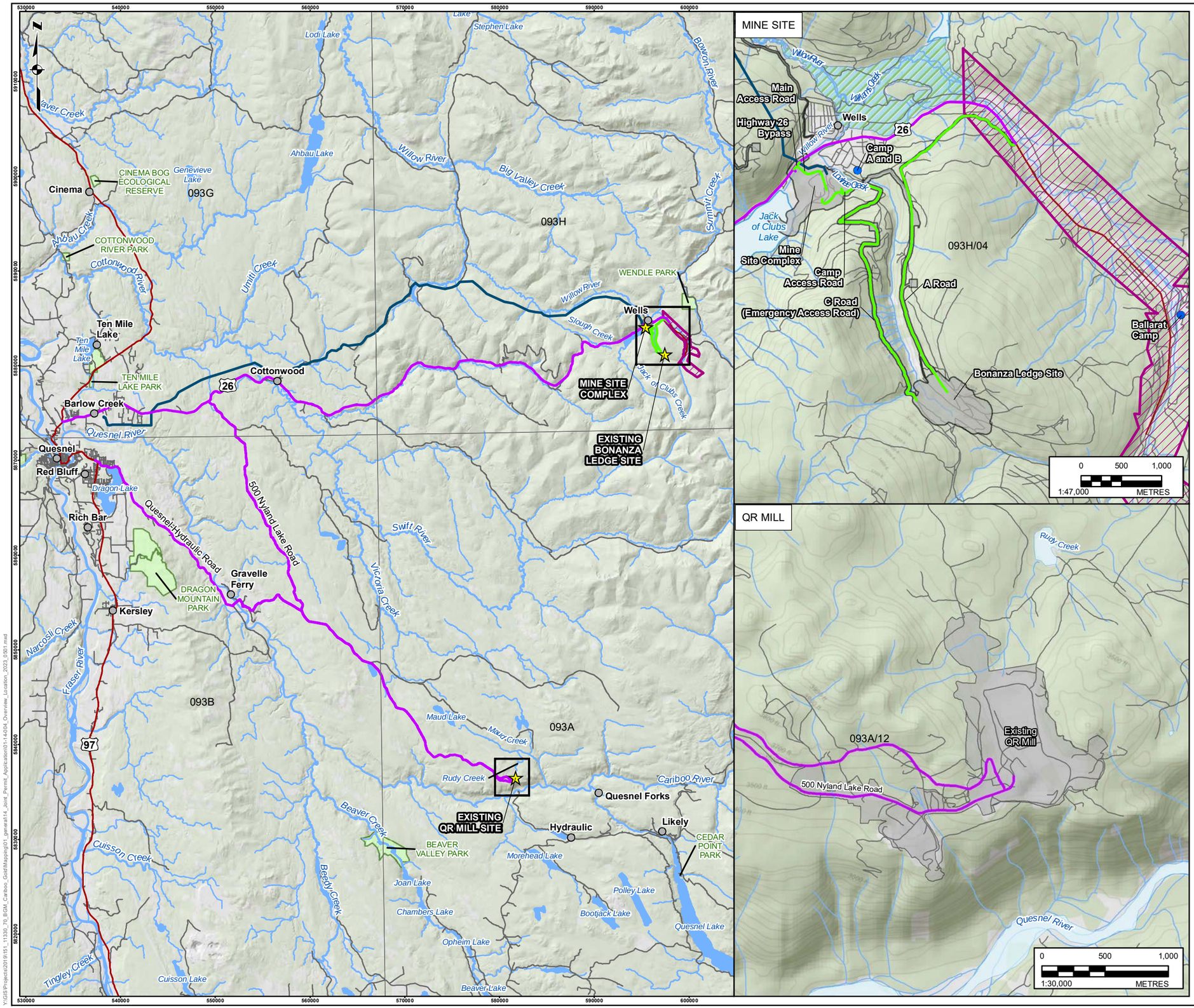
- Control and manage access to and within the Project sites;
- Minimize risk of accidents and incidents from the Project activities involving vehicles and equipment to BGM employees, contractors, and the public; and
- Minimize adverse effects on the environment and wildlife.

A full list of Traffic control-related mitigations and measures are listed below in the Traffic Implementation Workplan (Table 5.3-22).

5.3.3.1 Traffic Strategy and Implementation Plan

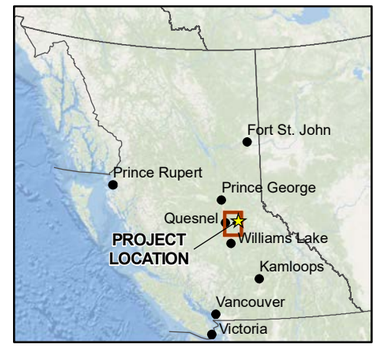
Traffic Control during Operations

BGM will minimize disruptions caused by Project-related traffic by transporting employees, goods, and contractors to Wells from Quesnel, BC, along Highway 26 by building a new highway bypass west of Wells from Highway 26. The new highway bypass will prevent mine-related traffic from entering Wells.



LEGEND

- POPULATED COMMUNITY
- PROJECT INFRASTRUCTURE LOCATION
- TEMPORARY EARLY CONSTRUCTION CAMP
- ROAD
- HIGHWAY
- WATERCOURSE
- WATERBODY
- PARKS/PROTECTED AREA
- BARKERVILLE HISTORIC TOWN AND PARK
- TRANSPORTATION ROUTE
- TRANSPORTATION ROUTE (MINE SITE ACCESS ROADS)
- TRANSMISSION LINE ROUTE
- SURFACE DISTURBANCE AREA



REFERENCE(S)

1.WATER FEATURES, TRANSPORTATION FEATURES OBTAINED FROM CANVEC © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
2. CITIES/TOWNS, INDIAN RESERVES, FEDERAL LANDS AND PARK/PROTECTED AREAS OBTAINED FROM BC MINISTRY OF FORESTS, LANDS NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
3. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

NAD83 CSRS
UTM Zone 10N

0 5 10 15
1:400,000 KILOMETRES

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

LOCATION AND ACCESS

REV.	DESCRIPTION	DATE	INITIALS
A		5/1/2023	MY

PROJECT NO. 151-11330-70 | PHASE 00 | REV. B | FIGURE **5.3-1**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

Y:\GIS\Projects\2019\151_11330_70_BGM_Cariboo_Gold\Mapping\01_general\14_Joint_Permit_Application\01\14-0\04_Overview_Location_2023_0501.mxd

In addition, BGM will implement the following mitigations, policies, protocols, and regulations to improve community safety and support peaceful enjoyment in the Wells area:

- Drivers using the roads to and from site will have proper safety training for the vehicle they are operating.
- All BGM employees and contractors will be required to observe BC traffic regulations, as per the Transportation Act (2004) including speed limits.
- For travel on Forest Service Roads, BGM employees and contractors will follow BC regulations, as per Forest Service Road Use Regulation (2004) of the Forest and Range Practices Act (2002).
- BGM will adhere to the Health, Safety and Reclamation Code for Mines in British Columbia (EMLI 2022).
- All personnel will adhere to the Ore Transport Standard Operation Procedure (SOP) when travelling A Road during active ore concentrate transport along A Road.
- All employees and contractors must adhere to the Road Use Policy (Appendix B in Appendix C) attached to the Traffic Control Plan (Appendix C), which states:

> *The maximum speed limit within the District of Wells is 30 km/h unless otherwise posted. The local speed limits MUST be followed at all times. Pedestrians have the right of way in the District of Wells. Certain traffic restrictions apply for BGM within the District of Wells. No traffic is permitted on Mildred Ave as this road is the access to the Wells Elementary School and grounds.*
>
> *To access the A and B Camp and Office Compound turn off Highway 26 onto Ski Hill Rd and up the hill. To access the Ballarat Camp, turn off of Highway 26 on the Bowron Lake Park Road and immediately right into the Ballarat Camp. To access the A road follow Ski Hill Road (Rd) down the hill to Highway 26. Travel along the highway until the A Rd turn-off. No traffic is permitted along Lowhee Drive. To access the H/S Road use Margaret Ave to enter the H/S Rd and follow forest service road regulations as posted on the sign entering the H/S Road]. Remember to drive appropriately for the conditions.*

Traffic and Vehicle Protocols

In addition to the Traffic Strategy and Implementation Plan, BGM will also implement the following specific traffic and vehicle protocols to support community safety and minimize disruption to the peaceful enjoyment of Wells.

- Maximum Allowable Speeds – conditional depending on road, weather, and traffic conditions.
  - The maximum allowable speed limit in Wells is 30 km/h, including the highway.
  - 40 km/h speed limit signs will be posted along the A road.
  - The maximum allowable speeds (40 km/h on company owned and maintained roads) are conditional depending on road, weather, and traffic conditions. For example, reduced speeds of 25 km/h will be followed when there is more than 2 mm of rain per hour, there is accumulation of 5 cm or more unplowed snow, or temperatures are less than 5°C. Employees will be informed of expectations related to driving to weather conditions during Employee orientation. These thresholds were selected for the following reasons:
    - There is a risk of hydroplaning with 2.5 mm or more water on road surfaces (Bridgestone 2021).
    - British Columbia guidelines require snow removal for an accumulation of 5 cm or more snow (BC Shared Services 2025).
    - Ice may form on road surfaces when temperatures fall below 5°C (Road Safety at Work N.D.).
- Rules for Passing
  - BGM will enforce a rule that prohibits same direction passing when both vehicles are in motion on haul roads within the Project Mine Site. Passing another vehicle is only allowed when the overtaking vehicle makes radio contact with the vehicle being passed and the drivers jointly agree that is it safe to pass.
- Traffic Patterns and Signage
  - All traffic on the Project site is right-hand drive.
  - Signage will be posted at intersections, active portal entrances, one-way traffic situations, and for direction to site infrastructure locations. Truck crossing signs will be added to the junction of any site access road and highway.
  - Traffic signs are placed along the A road between Highway 26 and Bonanza Ledge site, including:
    - Stop signs at the junction prior to exiting the A road to enter onto Highway 26.
    - Stop sign prior to entering the Bonanza Ledge Site.
    - Speed limit signs.
    - Truck crossing signs at junctions along Highway 26.
    - Traffic signs will also be placed along the Main Office Compound Access Road and Camp Access Road the Mine Site Complex.

- The A road access to the Mine Site from Highway 26 and the 500 Nyland Lake FSR access to the QR Mill Site are radio controlled.
- Emergency response vehicles and wildlife always have the priority right-of-way.

BGM's Commitment of a maximum of 25 haul truck roundtrips on Highway 26 per day

BGM estimates that there will be a maximum of 25 haul truck roundtrips on Highway 26 per day during the Operations phases of the Project. Through the implementation of the Traffic Control Plan (Appendix C), BGM will manage the number of haul truck round trips on Highway 26.

Table 5.3-20 outlines the estimated range of roundtrips on Highway 26 in 24 hours.

Table 5.3-20: Estimated Roundtrips on Highway 26 per 24 Hours

Roads	Estimated Range of Round Trips per day (trips per 24 hours)			
	Construction Phase	**Operation Phase 1**	**Operation Phase 2**	**Closure Phase3**
Highway 26 (From A Road Exit to Junction with 500 Nyland Lake FSR)				
Ore concentrate haul truck trailers (25 – 40t)	0	18 – 25	0	0
Highway 26 - (From Mine Site Complex Exit to Junction with 500 Nyland Lake FSR)				
Ore concentrate haul truck trailers (25 – 40t)	0	0	18 – 25	0

5.3.3.2 Traffic Strategy Evaluation

As part of the Traffic Strategy and Implementation Plan BGM will monitor the implementation of their traffic control measures through periodic assessments and compliance inspections. BGM will work with the local law enforcement to verify that speed limits are followed as posted. If the traffic control measures are found to be ineffective, BGM will adjust their mitigations as required.

As part of the Traffic Strategy Evaluation process BGM will evaluate the Community Effects Plan's traffic strategy by requesting feedback during engagement with the public, local community, Participating Indigenous nations, and partners. Information collected from community feedback, early assessments and compliance inspections will serve as baseline information to compare against to determine if traffic control measures are effective. BGM will also know if their traffic measures are effectively addressing community concerns by monitoring the Issues Tracking Table for traffic- related issues.

5.3.3.3 Traffic Strategy Adaptive Management

BGM will respond to monitoring observations that indicate non-compliance, reduced mitigation effectiveness, or emerging issues by altering existing or development new mitigations to avoid, reduce and/or remediate effects. Baseline conditions for traffic-related indicators—such as existing traffic volumes, collision history, wildlife-vehicle interactions, vehicle speed compliance, and community-reported concerns—will be drawn from the Project Traffic Impact Assessment and data collected during the first year of Construction. Monitoring results will be compared against these baseline conditions to determine whether:

- Mitigations are being achieved to the extent contemplated in the Application;
- Effects are different than those predicted in the Application; or
- Identified quantitative or qualitative triggers have been exceeded.

The monitoring process detailed in section 5.3.3.2 will detect both qualitative and quantitative triggers. Table 5.3-21 outlines the process and timing to be followed if a trigger is exceeded or monitoring identifies underperformance or unexpected effects. This includes working collaboratively with Participating Indigenous nations, the District of Wells, and other partners to identify and implement altered or new mitigation measures, followed by timely reporting on progress.

The Community Effects Plan: Engagement, Communication, and Reporting Strategy (Appendix G) is the primary method that will be used to determine if any altered or new mitigations measures and/or remediation activities are effectively mitigating or remediating effects and/or avoiding potential effects. Table 5.3-21 also specifies the indicators, triggers, and response actions for each traffic-related issue, along with the rationale for each measure.

Table 5.3-21: Traffic Strategy Adaptive Management for Altered or New Mitigations

Adaptive Management Incident	Monitoring Program	Proposed Indicators	Trigger/Threshold	Response/ Process to Develop Triggers/Thresholds	Implementation and Reporting Back
Vehicle incidents resulting from Project-related traffic (vehicle, wildlife, pedestrian, biker)	Traffic Control Program monitoring Community Effects Plan: Engagement, Communication, Reporting Strategy (Appendix G)	• Number of traffic incidents	• To be determined in collaboration with the District, stakeholders, and Participating Indigenous nations.	• BGM will engage with the District, stakeholders or Participating Indigenous nations to adjust existing, or design new mitigations.	BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year.
Reports from the local community or Participating Indigenous nations that Project-related traffic is problematic	Community Effects Plan: Engagement, Communication, Reporting Strategy (Appendix G).	• Observations of unsafe road conditions resulting from Project-related traffic. • Observations of unsafe driving by BGM workers. • Speeding tickets issued to BGM workers	• To be determined in collaboration with the District, stakeholders, and Participating Indigenous nations.	• BGM will engage with the District, stakeholders, or Participating Indigenous nations to adjust existing or design new mitigations.	BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year.
Unauthorized access to the Project site.	Traffic Control Program monitoring	• Number of times there is unauthorized access to the Project site.	• To be determined with the District, stakeholders, and Participating Indigenous nations.	• BGM will engage with the District, stakeholders, or Participating Indigenous nations to adjust existing or design new mitigations.	• BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year.

5.3.3.4 Traffic Strategy Reporting

A key component of the Traffic Strategy and Implementation Plan outlines commitments regarding how BGM will report to the public, the local community, District Community Liaison, Participating Indigenous nations, and partners regarding traffic-related considerations. Communication from BGM will address how they are addressing community traffic-related concerns by including traffic in their Community Effects Plan Annual Report that will be posted to the Project website, reviewed at community meetings, and shared with representatives of the local community, Participating Indigenous nations, and partners.

The following incidents involving mine-related traffic will be reported immediately to the Mine Manager:

- Vehicle collisions or near misses involving single vehicles, multiple vehicles, or wildlife.
- Evidence of unauthorized access to the Project sites by a vehicle.
- Evidence of unauthorized hunting, fishing, trapping, or any other prohibited activity on Project sites.

Weekly and monthly reports will be completed by the Health, Safety, and Environmental (HSE) staff as part of overall site safety reporting. All departmental managers and operations supervisors are required to review HSE reports.

Near-miss and incident reports will be assigned a unique identifier number and filed electronically and in hard copy at the Project site offices. Records will be kept for the life of the Project.

- Workplan

The Traffic Control Plan (Appendix C), including the components of this Community Effects Plan Traffic Strategy, apply to all phases of the Project. The Traffic Control Implementation Workplan (Table 5.3-22) outlines when specific traffic control-related mitigations will be implemented.

Table 5.3-22: Traffic Control Implementation Workplan

Mitigation Measure (obtained from the CGP EAC)	Phase (C, O, CL, PC)[1]			
	C	O	CL	PC
A new highway bypass will be built before Wells so that Project related traffic does not travel through the community.	✓	✓		
All vehicle and machinery travel will be restricted to designated road surfaces.	✓	✓	✓	✓
Communicate to workers and contractors the key transportation related bylaws or regulations in Wells and include these in the Traffic Control Plan.	✓	✓		

Mitigation Measure (obtained from the CGP EAC)	Phase (C, O, CL, PC)[1]			
Complete a functional design study for the Highway 26/Nyland Lake Road intersection to determine appropriate improvements to sightlines for this location and work with MOTI to implement recommendations.	✓			
Develop and implement a Traffic Control Plan and provide contractors, sub-contractors, workers, etc. with a copy of the Plan, including key highway and roadway regulations and roadway regulations upon on-boarding.	✓	✓		
Discuss appropriate mitigation and access requirements with users of recreations trails near the Mine Site.	✓	✓	✓	
Drivers will be appropriately trained by the training department, trained in Project codes of conduct, and require authorization prior to use of mobile equipment.	✓	✓	✓	✓
Engage with the community on concentrate transport schedules during operations.		✓		
Existing infrastructure will be utilized (e.g., for the Mine Site haul road, Transportation Routes, Transmission Line, and associated access roads).	✓	✓		
Gates at all BGM properties will be locked when not operating, unless circumstances for which this is not required are outlined in an appropriate Management Plan (e.g., in an emergency, identified in the Project Emergency Response Plan).	✓	✓	✓	✓
Heavy vehicles travelling to and from Project components will follow designated heavy vehicle routes.	✓	✓	✓	
Implement and enforce the Traffic Control Plan, which will include consideration of shift start and ends times.	✓	✓	✓	
Implement and enforce transportation and access management outlined in BGM's Traffic Control Plan, which will include the development of driver training materials and strategies to limit potential conflicts.	✓	✓	✓	
Implementation of and strict adherence of communication procedures on roads.	✓	✓	✓	✓
Implementation of and strict adherence to mandatory seatbelts use.	✓	✓	✓	✓
Implementation of and strict adherence to speed limits.	✓	✓	✓	✓
Inform Quesnel, the District, CRD, and MOTI regarding potential project traffic during closure.			✓	
Monitor incidents involving Project related vehicles and work to identify measures to reduce incidents.	✓	✓	✓	
Move large loads at non-peak traffic times.	✓	✓		
Move workers to site by shuttle bus so that there are limited personal vehicles in the area.	✓	✓		
Place signage if there is the potential for conflicts with Project activities.	✓	✓	✓	

Mitigation Measure (obtained from the CGP EAC)	Phase (C, O, CL, PC)[1]			
Place signage on recreational trails and public roads if there is the potential for conflicts with Project activities.	✓	✓	✓	
Project drivers will yield to wildlife observed along the highways and designated vehicle routes.	✓	✓		
Provide and make mandatory that contractors and workers have a copy of the Traffic Control Plan, including key highway and roadway regulations.	✓	✓	✓	
Provide shuttle service from sites in Prince George and Quesnel to transport workers to and from the Mine Site and the QR Mill, including fly-in fly-out workers as needed.	✓	✓		
Provide workers, contractors, and sub-contractors a copy of the Traffic Control Plan and communicate that they are to be aware of and follow the transportation related bylaws or regulations in Wells.	✓	✓	✓	✓
Regular maintenance of Project roads.	✓	✓	✓	✓
Road Design Best Management Practices Development and Implementation of Traffic Control Plan.	✓	✓	✓	✓
Road design will incorporate clear lines of site.	✓	✓		
Schedule regular traffic coming to the Mine Site or QR Mill (e.g., regular deliveries) so that it is spread out throughout the month and does not coincide with existing peak traffic times.	✓	✓		
Upgrade forest service roads, as required, to ensure that they are suitable for Project use.	✓	✓		
Vehicle traffic mitigation measures in the Traffic Management Plan will incorporate wildlife management measures, including mowing roadside vegetation.	✓	✓	✓	
Waste rock will be moved to the Bonanza Ledge Site on mine roads and will not travel through Wells.		✓		
Wildlife-vehicle collisions will be documented and reported to Wildlife Accident Reporting System if on a Ministry of Transportation and Infrastructure (MOTI) managed road.	✓	✓	✓	
Work with MOTI to relocate the 50 km/h posted speed limit slightly to the west to allow the new access to the Mine Site Complex to be located within the 50 km/h zone.	✓			
Planning shift changes: • Plan shift changes so that traffic does not correspond with existing peak times. • Time shift changes so that they do not all occur on the same day or time.	✓	✓	✓	

Mitigation Measure (obtained from the CGP EAC)	Phase (C, O, CL, PC)[1]			
Use of recreational vehicles: • The use of off-road or recreational vehicles (All Terrain Vehicles or snowmobiles) for personal use is prohibited by personnel within the Surface Footprint (including Transmission Line and at Facilities). • Use of recreational vehicles for personal use at the Project sites will be prohibited.	✓	✓	✓	✓

Notes:

1 C: Construction Phase; O: Operations Phase; CL: Closure Phase; PC: Post-Closure Phase

5.3.4 Noise Strategy

SoftdB developed a noise strategy for BGM to minimize the impact of Project-related noise on residents or tourists in Wells with the intention of achieving sustained compliance with the applicable noise limit for the Project (Appendix D). This strategy was developed by a project team from SoftdB that specializes in mining and mineral exploration projects. SoftdB will continue to support BGM in their review of noise impacts on the community and revise the noise strategy as the Project evolves.

5.3.4.1 Noise Strategy and Implementation

The metric to evaluate compliance of the Project will be the 1-hour A-weighted equivalent sound level (LAeq) measured in decibels (dBA). Compliance will be based on the estimated sound contribution of the Project without the influence of the background acoustic environment that is made up of noises such as natural sounds, wildlife and community activity measured at the nearest Dwelling.

Computer noise modelling of the noise impact will be completed for the Construction and Operation phases of the Project in order to aid in the planning of administrative and physical noise abatement measures.

The LAeq limit to be applied to the Project is 40 dBA during any single 1-hour time period, day, or night, unless otherwise authorized by the EAO.

Multiple Class 1 noise monitoring stations have been deployed in order to monitor the noise levels in the community and aid in assessing compliance with the sound level limit that are applicable to the Project.

Prior to Construction, Project activities will be modeled to assess the sound contribution during both the Construction and Operations phases. Modelling helps to identify the need for mitigation measures, as well as sound treatment that are necessary for the Project to adhere to the condition that the maximum contribution of the project will be 40 dBA during the Construction and

Operations phases. Mitigations will be reviewed and adjusted to meet the sound criterion at Wells' residences.

Baseline Noise Monitoring

Baseline noise monitoring was conducted by using the Soft dB ProStation monitoring stations. to record the 1-hour A-weighted equivalent sound level, as well as other relevant metrics. The sound levels were measured for more than one-year to establish the existing background sound level prior to the start of BGM's Project related activities. The data collected will assist in assessing Project compliance and to plan for future phases.

Monitoring Locations – Representative Sensitive Receptors

Throughout Wells there are numerous noise sensitive points of reception. BGM will continuously conduct noise monitoring, with monitoring stations placed strategically in the community at locations that are expected to hear the most noise from the Project. One location is selected to represent the background sound in Wells and one location is at the Cow Portal area, close to the Wells Apartments located above the Light Vehicle shop. Three of the four noise monitors are attached to residences. The data recorded by the monitoring stations estimate the Project noise contribution to the overall sound level observed in the community. Background noise not associated with BGM activities will be removed from the measurements to assess BGM's contribution.

It is not feasible to conduct monitoring at all possible sensitive receptors in an area. The chosen monitoring locations represent many sensitive receptors in each of the impacted areas. These Representative Sensitive Receptors (RSR) are summarized in Table 5.3-23, below, and shown in Figure 5.3-2.

Table 5.3-23: RSR Monitoring Locations List and Details

ID	Receptor Description
P1	2338 Bowman Crescent (Residential area)
P2	Baker Street (Background Noise/ Residential area)
P3	3968 Mooney Lane (Residential area)
P4	Ski Hill Road (Residential area)

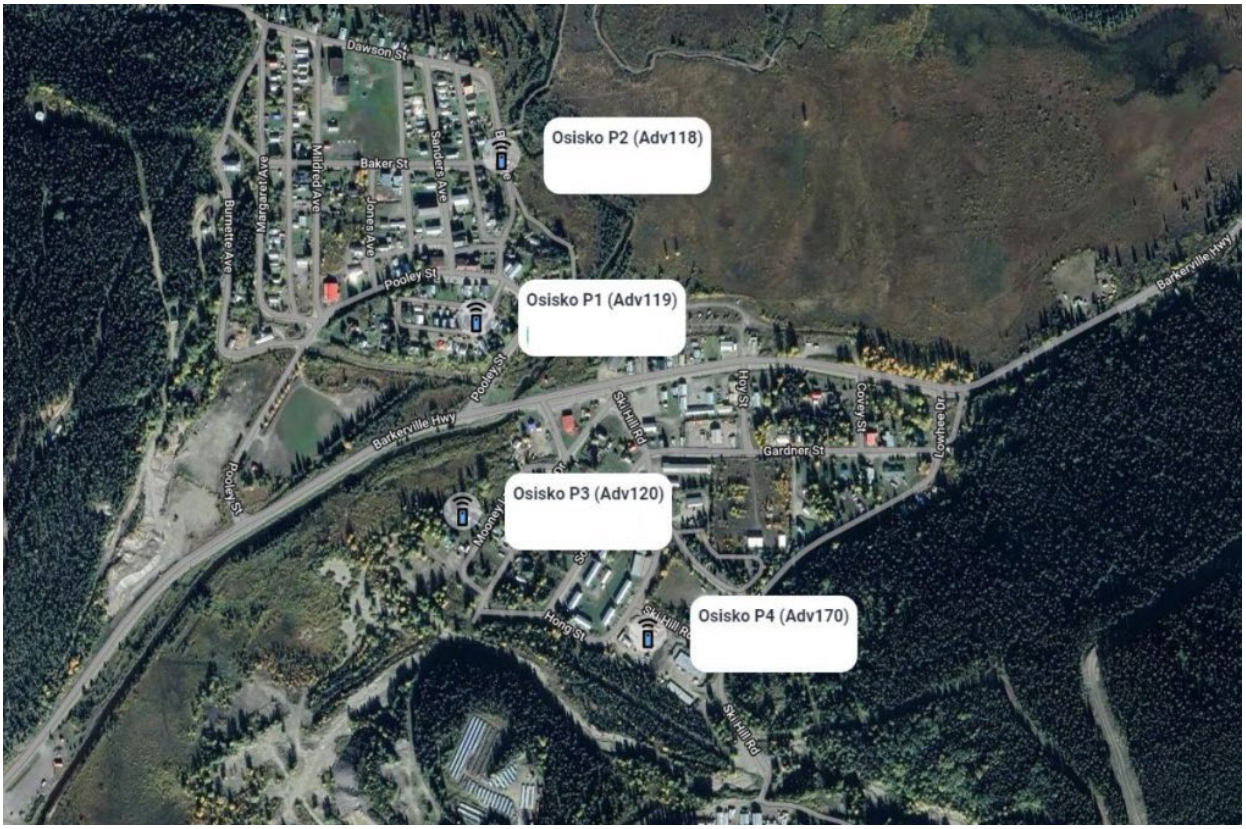


Figure 5.3-2: Monitoring Location Map

The locations of the monitors will be adjusted in response to changes in Project activity to capture the highest noise exposure level. As the Project moves through different Project phases, an Acoustical Consultant may add or remove RSRs to a location where a predicted noise level may result in a concern from a nearby building occupant. RSRs may also be moved in response to concerns raised by the public.

Monitoring Equipment

Sound level meters will be used to measure significant noise sources and measure sound levels at or near RSR locations. Soft dB will use Class 1 integrating sound level meters that meet the IEC Standard 61672 at the Soft dB ProStation monitoring station. Each meter is laboratory certified prior to initial use and re-certified annually. Additionally, the meters are field calibrated monthly using a portable acoustic calibrator. When performing measurements in the field a windscreen will be used.

The measurement microphones will be installed at a height up to 4.5 metres and no less than 1.5 metres above grade. Microphones are placed to have a clear line of sight to the Project or activity being monitored and installed at least 3 metres away from any reflecting surfaces, when possible. Microphones installed at distances less than 3 metres from a reflecting surface may experience

constructive interference that could artificially increase the recorded noise level. If microphones are installed at a distance less than 3 metres away for technical or security reasons (i.e., theft prevention) will be documented in the monitoring reports.

Blasting during Construction and Operations

Blasting will be restricted to the hours between 0600 and 1800 hours during the Construction and Operation phases of the Project.

5.3.4.2 Noise Strategy Evaluation

BGM will evaluate the effectiveness of the noise mitigations by spot checking measurements at the monitoring locations of concern to measure the noise contribution of the Project. Soft dB will submit a noise summary report to BGM every three months in accordance with the reporting requirements outlined in the Community Effects Plan Engagement, Communications and Reporting Strategy (Appendix G).

If non-compliance is verified through noise monitoring processes, BGM and Soft dB will review the results of the noise monitoring stations and correlate the measures to Project activities and determine the source of non-compliance. An action plan will be developed to reduce the noise level contribution to achieve compliance in a timely manner.

BGM will know whether the noise mitigations are addressing community concerns by tracking comments and concerns received by the public, local community, and Participating Indigenous nations. The processes for engaging and consulting with the public, local community and Participating Indigenous nations is outlined in the Community Effects Plan Engagement, Communications, and Reporting Strategy (Appendix G).

BGM will track and document noise concerns on the Issue Tracking Table. Concerns will be submitted to the Acoustical Consultant to review with BGM so that they can be addressed in a timely manner. BGM will note the action taken and address the concerns after the review is completed. Actions to address the concerns will be communicated in the Community Effects Plan Annual Report.

5.3.4.3 Noise Impact Adaptive Management

BGM will respond to monitoring observations that indicate non-compliance, reduced mitigation effectiveness, or community concern by altering existing mitigations or developing new measures to avoid, reduce, and/or remediate noise-related effects. Baseline conditions for noise-related indicators, such as pre-construction noise levels, modelling results, and community-reported concerns, will be established using noise modelling, site-specific monitoring, and data collected during the first year of Construction. Monitoring results will be compared against these baseline conditions to determine whether:

- Mitigations are being achieved to the extent contemplated in the Application;
- Effects are different than those predicted in the Application; or
- Identified quantitative or qualitative triggers have been exceeded.

The monitoring process detailed in Section 5.3.4.1 outlines the approach for detecting both qualitative and quantitative triggers. Table 5.3-24 details the process and timing for adjusting or designing new mitigations if there is an event that activates adaptive management for the Noise Impact Strategy. This includes working collaboratively with Participating Indigenous nations, the District of Wells, and other partners to identify and implement altered or new mitigation measures, followed by timely reporting on progress. Table 5.3-24 also specifies the indicators, triggers, and response actions for each noise-related issue, along with the rationale for each measure.

The Community Effects Plan: Engagement, Communication, and Reporting Strategy (Appendix G) is the primary method that will be used to determine if any altered or new mitigations measures and/or remediation activities are effectively mitigating or remediating effects and/or avoiding potential effects. Table 5.3-24 also specifies the indicators, triggers, and response actions for each noise-related issue, along with the rationale for each measure.

Table 5.3-24: Noise Impact Strategy Adaptive Management for Altered or New Mitigations

Adaptive Management Incident	Monitoring Program	Proposed Indicators	Triggers/Thresholds	Response/Process to Develop Triggers/Thresholds	Implementation and Reporting Back
Noise levels exceed acceptable limits or cause disturbance despite mitigations.	• Community Effects Plan: Engagement, Communication and Reporting Strategy • Noise Monitoring Program	• Noise levels (dBA). • Number and nature of noise-related complaints from residents of Wells. • Number of noise related issues raised from public engagement.	• Noise levels exceed 40 dBA during any 1-hour period at monitoring stations. • To be determined in collaboration with the District.	• BGM will engage with the District and a qualified person to adjust existing or design new mitigations.	• BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year at community meetings and in annual reports.
Noise generated outside permitted hours causes disturbance.	• Community Effects Plan: Engagement, Communication and Reporting Strategy • Noise Monitoring Program	• Number of verified complaints or reports of noise outside 0600–1800 hours.	• Any verified noise event occurring outside permitted hours. • To be determined in collaboration with the District.	• BGM will engage with the District to adjust existing or design new mitigations.	• BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year at community meetings and in annual reports.

Adaptive Management Incident	Monitoring Program	Proposed Indicators	Triggers/Thresholds	Response/Process to Develop Triggers/Thresholds	Implementation and Reporting Back
Noise mitigation equipment or controls fail or become ineffective.	• Community Effects Plan: Engagement, Communication and Reporting Strategy • Noise Monitoring Program	• Number of community complaints indicating ongoing noise problems. • Observations of equipment failure.	• Noise levels exceed 40 dBA during any 1-hour period at monitoring stations. • To be determined in collaboration with the District.	• BGM will engage with the District and a qualified person to adjust existing or design new mitigations.	• BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year at community meetings and in annual reports.

5.3.4.4 Noise Strategy Reporting

A summary of noise monitoring results will be included as part of the Community Effects Plan Annual Report. As described in the Community Effects Plan Engagement, Communications, and Reporting Strategy (Appendix G), this report will be reviewed by the local community, Participating Indigenous nations, and partners. The report will also be available to the public on the Project website.

5.3.4.5 Implementation Workplan

Table 5.3-25: Noise Strategy Workplan

Noise Strategy Activity	Project Planning/ Permitting	Project Start up/ Design	Construction	Operations
Baseline Data Collection	✓			
Acoustic Modelling of Construction			✓	
Noise Management Plan for Construction		✓	✓	
Acoustic Modelling of Facility	✓	✓	✓	
Facility Design	✓	✓		
Noise Management Plan for Operations		✓	✓	✓
Reporting			✓	✓
Spot Check Measurements			✓	✓
Community Engagement	✓	✓	✓	✓

5.3.5 Visual Impact Strategy

Residents of Wells have expressed concerns that the visibility of the project during different seasons will impact residents and tourists' peaceful enjoyment of Wells. In response to these concerns, BGM will monitor, measure, and use strategies designed to address negative visual impacts of the Mine Site. BGM is working under the guidance of WSP who have qualified experts in reducing the visual impacts of industrial projects and identifying methods for integrating projects into their surrounding environments.

5.3.5.1 Visual Impact Strategy and Implementation

In an effort to understand the visibility of the Project within Wells, BGM used 3D visualization tools and mapping. The results of the 3D visualization and mapping informed mitigations that address the potential visual impacts of the project. 3D visualization tools simulate how the Mine Site is seen from various viewpoints in and around Wells and allowed BGM to prototype different mitigation ideas through photo simulations. Photo simulations supported BGM to evaluate the effectiveness of proposed mitigations before implementation. For example, photo simulations allowed BGM to assess how mitigations such as siding colours, optimal infrastructure placement, and vegetation growth change over the life of the Project.

The probability of a visual impact occurring was also identified using high precision topography data such as Light Detection and Ranging (LiDAR), which is a remote sensing method that uses light in the form of a pulsed laser to measure ranges (variable distances) to the Earth. LiDAR creates a point-cloud of data that accurately depicts existing conditions on site. Maps of areas in Wells where the Mine Site has a high probability of being visible are available in the Visual Impact Assessment (Appendix E).

BGM also produced a shadow study that provided simulations of shadows at different times during the year, such as the winter and summer solstice, to understand how the infrastructures will project shadows on surrounding areas in different seasons.

During early phases of the project, BGM will take efforts to optimize the site layout and position the planned infrastructures using topography as a natural screen. Building height scenarios and building configurations were considered to reduce their visibility. BGM will construct berms that will support both re-vegetation and serve as a screen to reduce visibility of the Project in Wells. However, geotechnical considerations such as ground stability will constrain where infrastructure can be located. Wherever possible and as an initial measure, infrastructure will be placed as far from the main road as possible.

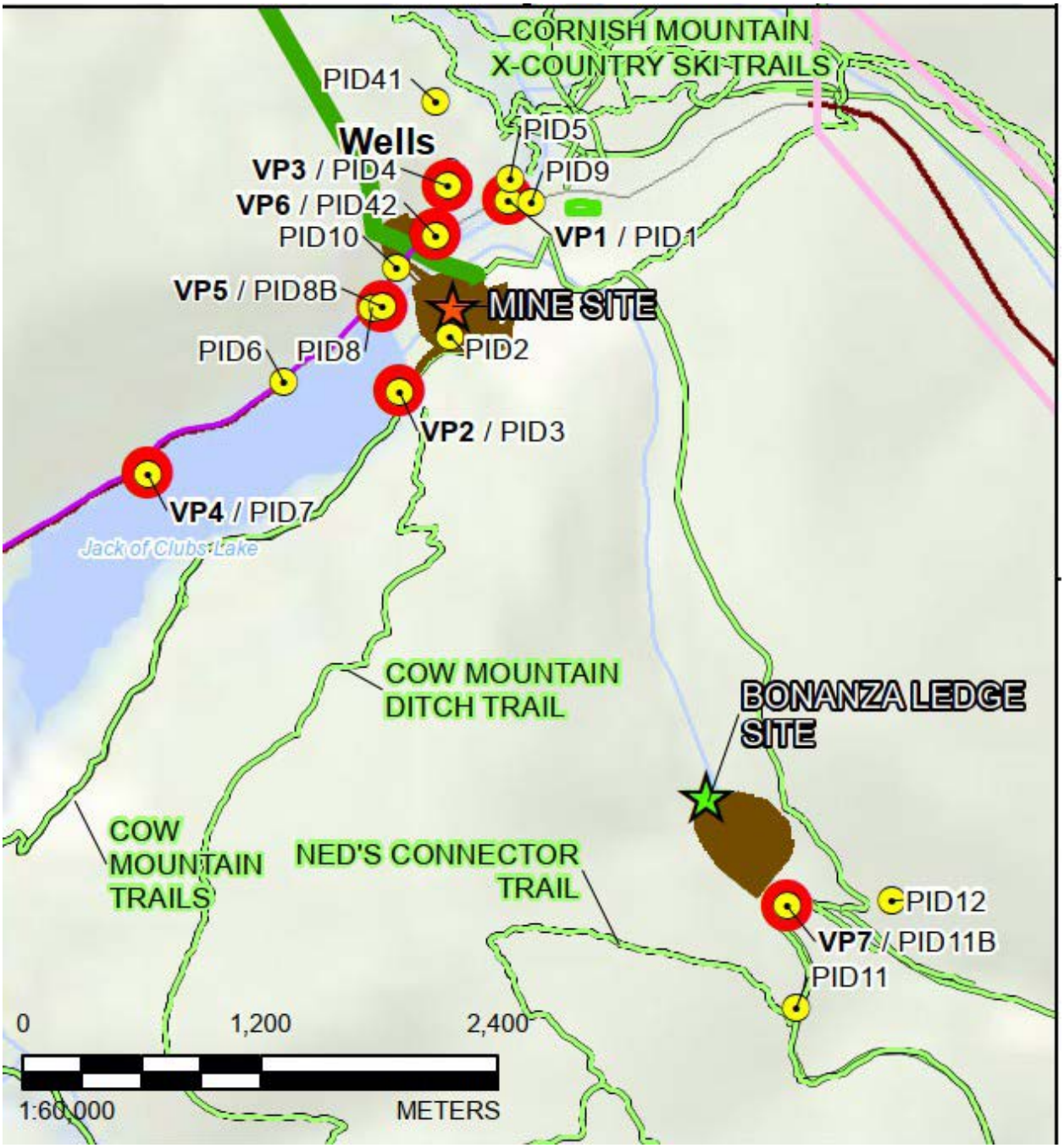


Figure 5.3-3: Map of Viewpoints

Mitigations based on site revegetation will become more effective over time as the plants grow and reach maturity. Key areas that create natural screens and hide the Mine Site will be planted with local indigenous plant species early in the Project's development. Using local indigenous plant species assures that the plants will grow rapidly and are suitable to the local climate and

conditions. Natural reseeding will increase vegetation density and create a more effective natural screen.

Unfortunately, some of the Project's infrastructure will be visible and cannot be completely integrated into the surrounding environment. For example, linear infrastructures such as powerlines create visual openings at certain angles.

Light pollution resulting from Project infrastructure will be measured twice per year and compared to baseline measures. Illuminance is a measure of the total "amount" of visible light present, or the intensity of illumination. Illuminance baseline measures were taken during the summer and in the winter. Measurements were taken where light could affect the environment (biological and human). When light measurements were taken in the summer during the night in the vicinity of Wells, actual light sources were related to road and houses in the foreground, but the background was very dark a few meters away. At ground level, illuminance was less than 0.1 lux at all Point of Reception (POR) locations, including POR locations in Wells near Project sites and on Blair Street. The light trespass impact is considered negligible even if light is generated outside BGM's private land (surface rights) for some sector (ex. Island Mountain Portal). A very minor effect is anticipated on the sky quality and star visibility in the immediate sector of the two sites. A slight halo of light will be visible in the sky, more visible when clouds are present since clouds reflect the artificial night light emitted by the ground. However, light emitted from the Project should merge with the reflection of light already visible from Wells.

BGM will mitigate light effects by implementing a lighting plan that will minimize light pollution resulting from the project. The lighting plan includes recommendations that consider the location, season, mounting, orientation, fixture type, and power of lighting. Lighting for the Project will be planned to provide a level of light required for worker safety and equipment security while minimizing light spillover. Lights, including mobile lighting sources, will be turned off during the Construction and Closure phases when they are not needed. With the implementation of mitigation measures, a very minor effect is anticipated outside the developed site and neighbouring areas at the Mine site.

To monitor the effectiveness of light mitigations, light will be measured and monitored at POR1 and POR2 located in Wells. The level of light at ground level will be measured twice per year and compared to baseline measurements. Light measurements will be taken during the summer new moon phase because the sky is darker and the leaves are in the trees, which blocks light dispersion. Measurements will also be taken during winter with snow on the ground and when there is less vegetation, and light reflects on the snowy ground. If an adverse visual impact is identified, the problematic light source will be assessed and modified or relocated based on the assessment findings.

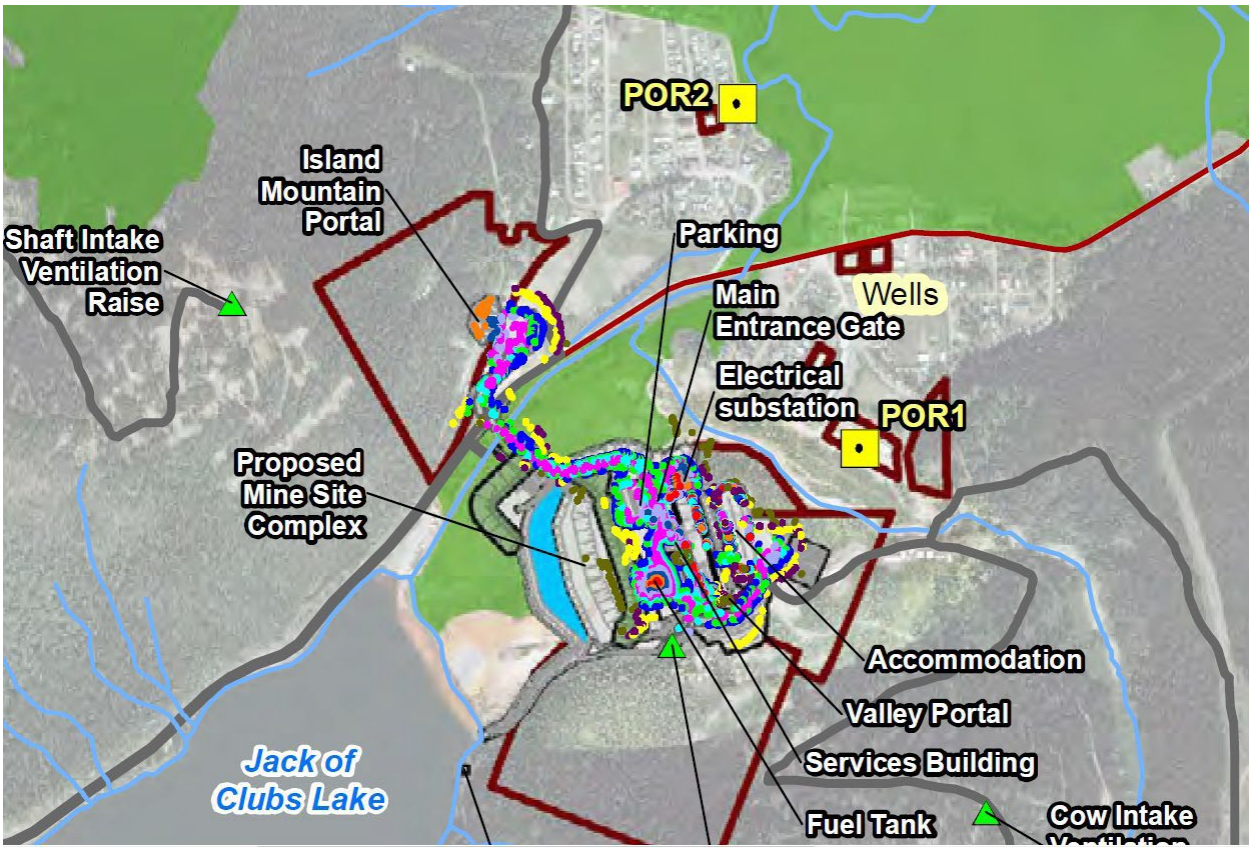


Figure 5.3-4: Map of Point of Receptions

Emissions of light towards the sky resulting from lighting at the Mine site will be reduced by using lighting that produces a low and uniform lighting that meets operational lighting needs and will not exceed angles above 90 degrees. If adherence to this requirement poses a risk to worker health and safety, such as there is inadequate visibility to safely perform work tasks, lighting angles may be increased temporarily or additional lighting may be used to ensure worker safety for the duration that the work task is being performed. BGM will follow a lighting plan that was designed specifically for the Project that recommends the position, and the fixture and model (colour and power) for light sources. During the Construction phase, light sources will be installed as per the recommendations from the lighting plan.

5.3.5.2 Visual Impact Evaluation

Prior to implementing any visual impact mitigations, BGM used photo simulation methods described in Section 5.3.5.1 to evaluate different mitigation options. To support future visual impact evaluations, the Visual Quality Assessment (Appendix E) provides baseline landscape ratings for key viewpoints that can be replicated during future visual impact audits to evaluate changes in the landscape ratings. Through engagement and consultation, BGM will evaluate if

visual impact mitigations address concerns raised by Indigenous nations about impacts to cultural transmission and sense of place.

Mitigations designed to address concerns raised by the community about the visual impact of the Project will be monitored throughout the Construction and Operation phases to ensure that that the measures are effective. For example, monitoring will ensure that areas where vegetation and contouring are used to create a screen are established appropriately and the plants are growing as expected. A suitably qualified landscape design practitioner will conduct a visual audit every year to determine if the mitigations are effective and if additional mitigations may be required. Monitoring will also occur through the Post-Closure phase to confirm that visual mitigation measures are maintained.

BGM will know whether the visual impact mitigations are addressing community concerns by tracking comments and concerns received by the public, local community, and Participating Indigenous nations. The processes for engaging and consulting with the public, local community and Participating Indigenous nations is outlined in the Community Effects Plan Engagement, Communications, and Reporting Strategy (Appendix G).

BGM will track and document concerns related to visual impacts in the Issue Tracking Table. Concerns will be discussed during formal meetings and community meetings and BGM will share input to the landscape design practitioner to so that they can be addressed during the audit and with adjusted mitigations. Actions that address the concerns will be communicated in the Community Effects Plan Annual Report.

5.3.5.3 Visual Impact Adaptive Management

BGM will respond to monitoring observations or community feedback that indicate non-compliance, reduced mitigation effectiveness, or emerging issues by altering existing mitigations or developing new measures to avoid, reduce, and/or remediate visual-related effects. Baseline conditions for visual indicators, such as the Visual Quality Assessment ratings for key viewpoints, baseline light measurements, and vegetation screening coverage, will be established using visual impact audits, photo simulations, and data collected during the first year of Construction. Monitoring results will be compared against these baseline conditions to determine whether:

- Mitigations are being achieved to the extent contemplated in the Application;
- Effects are different than those predicted in the Application; or
- Identified quantitative or qualitative triggers have been exceeded.

The monitoring process detailed in Section 5.3.5.2 will detect both qualitative and quantitative triggers. Table 5.3-26 outlines the process and timing to be followed if a trigger is exceeded or monitoring identifies underperformance or unexpected effects. This includes working collaboratively with Participating Indigenous nations, the District of Wells, and other partners to

identify and implement altered or new mitigation measures, followed by timely reporting on progress.

The Community Effects Plan: Engagement, Communication, and Reporting Strategy (Appendix G) is the primary method that will be used to determine if any altered or new mitigations measures and/or remediation activities are effectively mitigating or remediating effects and/or avoiding potential effects. Table 5.3-26 also specifies the indicators, triggers, and response actions for each noise-related issue, along with the rationale for each measure.

Table 5.3-26: Visual Impact Strategy Adaptive Management for Altered or New Mitigations

Adaptive Management Incident	Monitoring Program	Proposed Indicators	Triggers/Thresholds	Response/Process to Develop Triggers/Thresholds	Implementation and Reporting Back
Visual impacts of the Project interfere with resident of Wells or tourists peaceful enjoyment of the land.	• Community Effects Plan: Engagement, Communication and Reporting Strategy • Visual Impact Audit	• Number of complaints or concerns raised by residents of Wells or the public about the appearance of the Project infrastructure in Wells. • Number of visual indicators that did not pass the audit.	• To be determined in collaboration with the District.	• BGM will engage with the District, to adjust existing, or design new mitigations.	• BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year at community meetings and in annual reports.
Light pollution from the Project causes unacceptable impacts on night sky or environment.	• Community Effects Plan: Engagement, Communication and Reporting Strategy • Visual Impact Audit	• Number of complaints or concerns about night sky visibility, light trespass, or glare. • Number of visual indicators that did not pass the audit.	• To be determined in collaboration with the District.	• BGM will engage with the District to adjust existing or design new mitigations.	• BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year.

Adaptive Management Incident	Monitoring Program	Proposed Indicators	Triggers/Thresholds	Response/Process to Develop Triggers/Thresholds	Implementation and Reporting Back
Vegetation or berm effectiveness declines, leading to increased visibility.	• Community Effects Plan: Engagement, Communication and Reporting Strategy (Appendix G) • Visual Impact Audit	• Number of complaints or concerns raised by the residents of Wells about the effectiveness of the vegetation berms on reducing the visual impact of the Project infrastructure. • Number of visual indicators that did not pass the audit.	• To be determined in collaboration with the District.	• BGM will engage with the District to adjust existing or design new mitigations.	• BGM will implement modified or new mitigations as soon as possible and report back on progress a minimum of once per year.

5.3.5.4 Visual Impact Reporting

A summary of results from visual impact audits will be included as part of the Community Effects Plan Annual Report. As described in the Community Effects Plan Engagement, Communications, and Reporting Strategy (Appendix G), this report will be reviewed by the local community, Participating Indigenous nations, and partners. The report will also be available to the public on the Project website.

5.3.5.5 Implementation Workplan

Table 5.3-27: Visual Impact Strategy

Noise Strategy Activity	Project Planning/ Permitting	Project Start up/ Design	Construction	Operations
Baseline Landscape Rating	✓			
Mitigation Photo Simulations	✓			
Visual Impact Audit			✓	✓
Reporting			✓	✓
Community Engagement	✓	✓	✓	✓

6. ADAPTIVE MONITORING AND MANAGEMENT

Adaptive monitoring and management is an iterative process designed to improve outcomes when the environment or context may be uncertain or changing (Rogers and Macfarlan 2020). Adaptive monitoring and management supports decisions and management practices using the best available information and, in the case of the Community Effects Plan, supports collaboration and a sense of ownership with the District, Participating Indigenous nations, local community, and partners. The successful implementation of an adaptive monitoring and management plan supports BGM's efforts to demonstrate a high degree of accountability (ENV 2022).

6.1 Adaptive Process

The BC Ministry of Environment and Climate Change Strategy outlines the following key stages of an adaptive management cycle (ENV 2022):

Assess: define the issue and identify how the actions to mitigate the issue will be evaluated.

Design: design the plan that will achieve the desired outcomes.

Implement: implement the plan and document if there are deviations from the plan.

Monitor: monitor the effectiveness of the plan and assess whether changes are needed to improve the effectiveness of the plan.

Evaluate: assess results against the predictions and determine if the desired outcome was achieved or if there were unexpected outcomes. Identify learnings to support decision making and reduce uncertainty in management practices.

Adjust: based on the results of the evaluation, make changes to the management practices to better achieve the desired outcomes. Refine monitoring strategies to improve future evaluations and make any necessary revisions to the Community Effects Plan.

Figure 6.1-1 illustrates an adaptive management and monitoring approach.

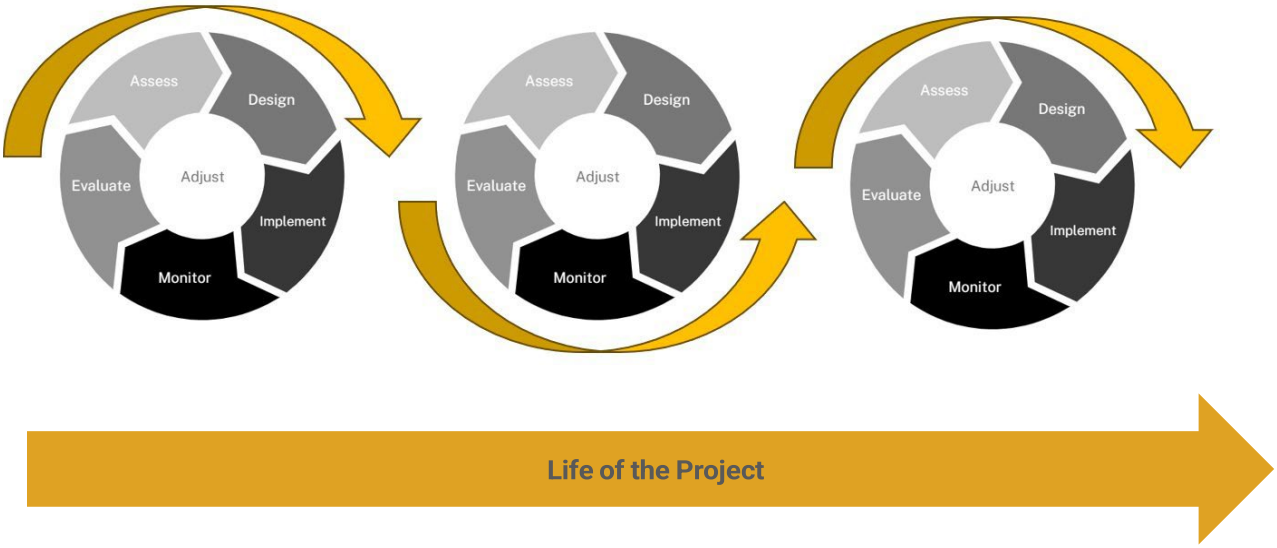


Figure 6.1-1: Adaptive Management Process

The benefits of applying an adaptive monitoring and management approach to the Community Effects Plan is that rather than applying universal best practices, local knowledge and responses to the local context can be applied to ensure that the mitigations used are effective (Rogers and Macfarlan 2020).

The adaptive monitoring and management cycle for the Community Effects Plan will begin during the Construction phase and will continue throughout the life of the Project.

Figure 6.1-2 provides a summary of the strategies and expected evolution of the Community Effects Plan over early phases of the Project. In the Pre-Construction phase and environmental assessment phase, community issues and concerns were considered related to the project, which led to proposed mitigations that were integrated into the Employee Strategy, Traffic Strategy, Public Strategy, Noise Strategy, and Visual Impact Strategy (sections 6.3.1-6.3.5). Engagement, Communication, and Progress Reporting processes will facilitate further engagement with Participating Indigenous nations, the local community, and partners on community effects informing actions that continuously improve BGM's efforts to address community concerns. Early engagement on the Community Effects Plan during the Pre-Construction and Construction phases are expected to inform the Indigenous Partnership Plan and the Community Involvement Plan that will be further developed after the review of this Community Effects Plan.

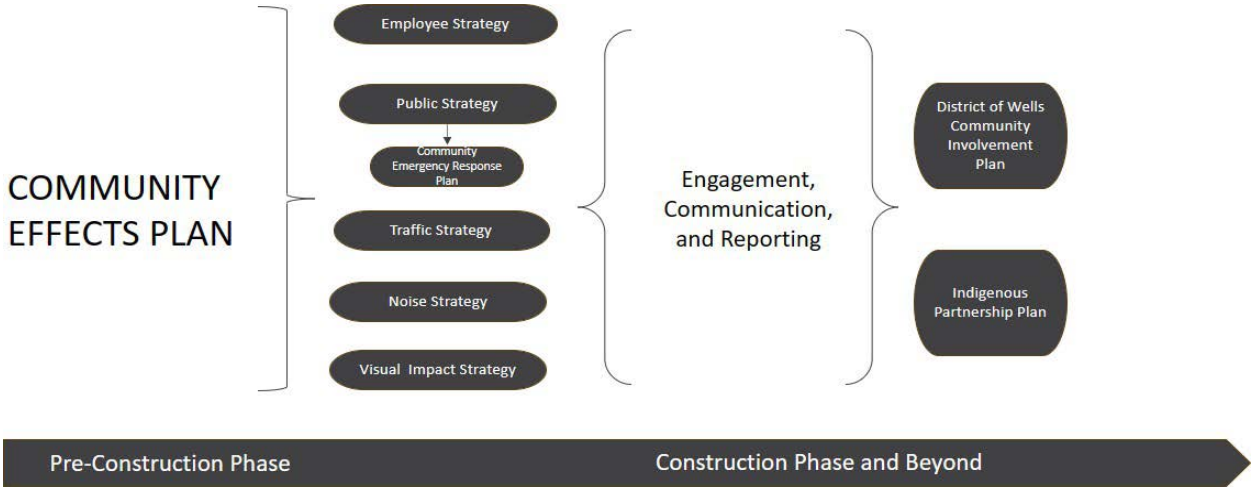


Figure 6.1-2: Visual Summary of the Community Effects Plan

6.1.1 Strategic Outcomes

The strategic outcomes of implementing the Community Effects Plan through an adaptive monitoring and management process include:

- Improve the effectiveness of the mitigations designed to address the concerns of the local community, Participating Indigenous nations, and partners.
- Improve long-term outcome of the mitigations addressed in the Community Effects Plan.
- Provide an effective and efficient manner for decision-makers at BGM to adjust their strategies in response to new information and changing conditions.
- Collaborate with the local community, Participating Indigenous nations, and partners to obtain relevant, timely, and meaningful feedback related to the mitigations addressed in this Community Effects Plan.
- Strengthen relationships with the local community, Participating Indigenous nations, and partners and support BGM's efforts to support community wellbeing and sustainability.
- Facilitate real-time evaluation and adjustment of the Community Effects Plan.
- Establish guidelines regarding the Community Effects Plan review and amendment process, including timelines and triggers for reviewing and adapting the Community Effects Plan.

6.1.2 Key Results

The key results of the Community Effects Plan are that the local community, Participating Indigenous nations, and partners are satisfied with BGM's mitigations identified in the Employee Strategy, Public Strategy, Traffic Strategy, Noise Strategy, and Visual Impact Strategy.

6.1.3 Success Indicators

BGM will know that the Community Effects Plan is successfully mitigating the communities' concerns related to the Project when:

- Concerns addressed by the Community Effects Plan are no longer raised through grievance mechanisms, or if concerns are raised, they are resolved quickly.
- The local community, Participating Indigenous nations, and partners have a positive relationship with BGM.
- BGM successfully implements the management plans associated with the Community Effects Plan.
- There are high levels of community engagement throughout all phases of the Project.

6.1.4 Tools, Processes, Structures, and Strategies for Adaptive Management

The Community Effects Plan Engagement, Communications and Reporting Strategy (Appendix G) outlines the processes and strategies that will support the implementation of the Community Effects Plan. BGM will facilitate lessons learned and reflect on the effectiveness of the Community Effects Plan with the local community, Participating Indigenous nations, and partners throughout the life of the Community Effects Plan. Feedback informing adjustments or outstanding issues will be formally tracked through meeting minutes, the issues tracking table or the Community Effects Plan Comment Review Tracker.

BGM will provide reports and updates to the local community, Participating Indigenous nations, and partners during engagement and consultation. Additionally, BGM will publicly report on the progress of the Community Effects Plan annually through the Community Effects Plan Annual Report.

6.1.5 Frequency of Data Collection and Analysis

Data, obtaining information, and analysis will occur throughout the life of the Community Effects Plan as it is received by BGM and as outlined in the Employee, Traffic, Public, Noise, and Visual Impact Strategy. The Community Effects Plan Annual Report will report on monitoring efforts and the effectiveness of the mitigations discussed in the Employee, Public, Traffic, Noise, and Visual Impact strategies that are described in detail in sections 6.3.1-6.3.5.

6.1.6 Community Effects Plan Updates

The Community Effects Plan will be updated annually to reflect any changes in mitigations or development of new mitigations in response to community input. BGM will produce an annual report that summarizes the engagement feedback received throughout the year and how BGM responded.

BGM will obtain feedback to guide the adaptive management of the Community Effect Plan through an iterative Community Effect Plan reporting and feedback cycle. Feedback and guidance from Participating Indigenous nations, the local community and partners will be incorporated into the Community Effect Plan through the following five phases:

6.1.6.1 Community Effect Plan Monitoring

Once the Community Effect Plan is fully implemented, the mitigations will be monitored. Details about monitoring activities for the Community Effect Plan are detailed Community Effect Plan's Strategies (Section 5.3 of the Community Effect Plan).

6.1.6.2 Report Back to Participating Indigenous Nations, Local Community, and Partners

The results from monitoring efforts will be reported to the Participating Indigenous nations, the local community, partners, and the public through their preferred engagement, communication, and reporting methods.

6.1.6.3 Engagement, Assessment, and Evaluation

BGM will engage with the public, Participating Indigenous nations, the local community, and partners to understand their assessment of the Community Effect Plan related to the effectiveness of the mitigations. Methods for engaging and obtaining input into the assessment and evaluation of the Community Effect Plan's strategies will be done through the methods detailed in Appendix G (Community Effects Plan: Engagement, Communication and Reporting Strategy). Engagement and communication tactics include:

- Electronic methods (social media posts, Cariboo Gold Project website, e-mail, and phone calls); print methods.
- Face-to-face methods (formal meetings, community meetings, one-on-one meetings, community events, mine site visits, community relations office)
- Community Liaison: BGM supports a Lhtako Dené Nation Community Liaison and a District of Wells Community Liaison for the purpose of improving capacity to participate in the Project.

6.1.6.4 Adjust Mitigations

Based on feedback and guidance from the Participating Indigenous nations, the local community, and partners, BGM will make necessary adjustments to the mitigations to ensure that they are effectively and appropriately mitigating community concerns.

6.1.6.5 Community Effect Plan Implementation and Community Effect Plan Monitoring

BGM will implement adjusted mitigations and monitor their effectiveness, with plans to report back to the public, Participating Indigenous nations, local community, and partners annually.

The engagement, communication, and reporting cycle that supports adaptive management through this Community Effect Plan ECR Strategy is outlined in Figure 6.1-3.

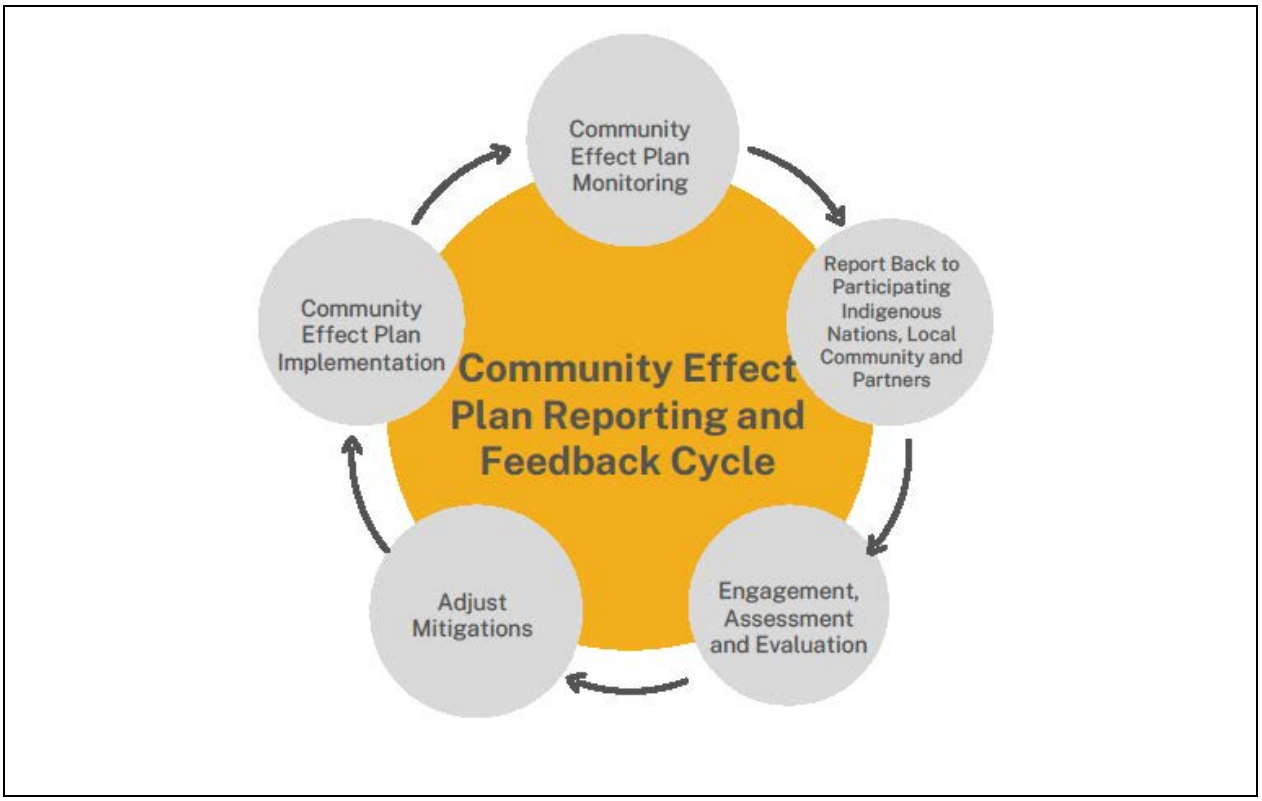


Figure 6.1-3: Cycle for Adjusting Mitigations Based on Feedback

BGM is currently in the process of developing the Community Involvement Plan to specifically address and respond to feedback provided by the District about the Project. BGM is also in the process of developing an Indigenous Partnership Plan that specifically responds to the concerns and issues of the Participating Indigenous nations.

7. ADDITIONAL CONSIDERATIONS

The concept of "Ethical Space" offers a useful framework through which differing worldviews and perspectives can be validated and respectfully considered, when implemented in practice. Ethical Space is described as a space that is formed when differing perspectives from different groups, are poised to engage with each other. The framework considers the space in between groups with different values, goals, and needs that contributes to the development of a framework for dialogue between human communities" (Ermine 2007). "Ethical Space" is worthy of consideration to support successful engagement and collaboration with the local community, Participating Indigenous nations, and partners. Consideration of "Ethical Space" is the invitation to step outside of one's own worldview, assumptions, and values and step into an "undefined neutral zone that is an abstract space of possibility" (Bannister et al 2019). Ethical Space is presented for consideration in this Community Effects Plan to promote meaningful engagement, authentic relationships, and true collaboration.

BGM and the communities also must consider that the success of the Community Effects Plan hinges on BGM's ability to navigate unique risks or situations that may accompany an adaptive monitoring and management plan such as this one. This Community Effects Plan and the associated strategies are designed to run through the life of the project and will be time consuming, and resource intensive. This Community Effects Plan requires a high degree of coordination, technical expertise, and relationship management.

BGM is prepared to continually and meaningfully invest in the monitoring and evaluation of the Community Effects Plan in collaboration with the local community, Participating Indigenous nations, and partners to ensure that the outcomes are achieved. However, throughout the life of the project, BGM may encounter that the local community, Participating Indigenous nations, and partners have competing interests and priorities, varying ability to engage, or there may be expectations for aggressive timelines that BGM will need to navigate. Unforeseen social, political, economic, or environmental events may also undermine the success of the Community Effects Plan.

Despite the challenges that come with implementing an adaptive monitoring and management plan with the community, BGM is committed to collaborating, listening, and responding to community concerns to ensure that the community is satisfied. Working to enhance shared prosperity for all within the CRD is essential to overall Project success and is a key priority for BGM.

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APPENDIX A WORKFORCE POLICIES AND PROGRAMS

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

APPENDIX 1.0-14: WORKFORCE POLICIES AND PROGRAMS

July 2021



OSISKO DEVELOPMENT

Barkerville Gold Mines Division

PO Box 250
3700 Ski Hill Road
Wells, BC V0K 2R0

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Appendix A Osisko Development Corporation's Health and Safety Policy (signed)

1.0-14.1 Hiring Policy

Osisko Development Corporation (ODV) is a committed equal opportunity employer for all of its projects. The Company believes in promoting from within and in expanding individuals' work experience through lateral job moves, provided that individuals' skill sets, and capacities meet the job requirements. In addition, ODV will utilize other methods to attract the best candidates including online tools, referrals, agencies, or other niche networks. Our recruitment strategy is therefore designed to achieve the following:

- Attracting the best person for each position (internally or externally);
- Ensuring equality of opportunity for all applicants;
- Promoting our corporate vision and culture and Values; and
- Meeting the organization's operational requirements and strategic objectives.

The Company relies upon the accuracy of information in each candidate's application and the accuracy of other data presented throughout the hiring process and employment. Any misrepresentations, falsifications, or material omissions in any of this information or data may result in exclusion of the individual from further consideration for employment or, if the person has been hired, termination of employment.

The hiring program for the Project is currently being developed and will be incorporating recommendations and mitigative measures outlined in the Cariboo Gold Project (the Project) Application for an Environmental Assessment Certificate (the Application), where appropriate. This includes, but is not limited to, the following:

- Providing training opportunities to local residents, as appropriate, to increase the skills of the local and regional workforce to enable ODV to maximize hiring from the local and regional area. This will also help expand the pool of potential employees and will help facilitate hiring of individuals from segments of society generally not well represented in mining projects;
- Holding a community open house to inform people about the types of opportunities, requirements, and training available;
- Encouring contractor companies to hire local or regional residents; and
- updating and further developing proactive employment policies and programs.

ODV will work to communicate employment opportunities through a variety of communication means, which may include:

- Project website;
- Project newsletter;
- Social media;
- Email list serve;
- Recruitment events;
- Newspapers (local and regional);
- Open houses and workshops; and

- Local and regional employment centres.

1.0-14.2 Workplace Policies and Programs

The Company has a code of ethics that all staff must sign and comply with. The code includes the topics of:

- Laws and regulations;
- Dealing with public or government officials;
- Environment, health and safety;
- Public communications and disclosure;
- Conflict of interest;
- Protection and use of corporation's assets;
- Human resources and community;
- Corporate records;
- Compliance; and
- Review and monitoring.

The Company has a drug and alcohol policy that includes zero tolerance. All staff must read and sign off on the policy. Every employee and contractor on site has a duty to attend work "fit for duty." A positive and respectful camp environment will be created through a '' One Team, One Company, One Family'' approach.

An anti-bullying and harassment policy is in place, and staff must also sign and comply with this policy, which outlines that the Company has zero-tolerance for:

- Sexual harassment;
- Racial or national origin harassment;
- Harassment based on gender, race, colour, religion, age, national origin, disability or sexual orientation; or
- Retaliation against anyone for making a good-faith complaint of such harassment or for cooperating in the Company investigations of such complaints.

The Company has an open-door policy. The key principles of this policy are:

- To be open and honest with our employees;
- To be honest in answering employee concerns;
- To be receptive to employee concerns by responding in a timely manner;
- To provide access to higher levels of Management to achieve resolution; and
- To strive to resolve issues or concerns at the front-line Supervisor level. However, staff are encouraged to discuss employment-related concerns, questions, or suggestions with any member of Management or Human Resources.

1.0-14.3 Equal, Diverse and Inclusive Employment Opportunity

It is a Company Policy to provide equal opportunity to all existing employees and applicants for employment. Osisko Development Corporation is governed by laws where the Company operates projects following Federal and Provincial Labor Laws and Human Rights Laws, which protect employees from discrimination and harassment. When considering applicants for positions within our Company, only job-related criteria such as ability, merit and responsibility are used to evaluate applicants and employees. Osisko Development Corporation embodies the principle that all persons should be assessed on individual merit and not on criteria unrelated to job performance.

The Company values differences and is working to mitigate pay disparities. The Company is committed to encouraging the respect of individuals, their integrity and their dignity by ensuring that the working environment and relations between employees shall be free of discrimination or harassment.

The Company is currently developing a process for hiring under-represented groups, with the support and advice of qualified professionals, and where applicable, members of the under-represented groups. This is set to be in place in time for the Project hiring process.

Osisko Development Corporation will work with gender-based analysis plus (GBA+) groups and segments of society currently underrepresented to understand how they can be more involved in the Project.

1.0-14.4 Priority for Local and Indigenous Peoples

Osisko Development Corporation will continue to engage with local communities. An important element of the Company values is to maximize local recruitment and actively work to provide local community members the opportunity for employment and training where possible. A critical aspect of this is the ongoing engagement and agreements (underway or in place) with Indigenous communities in recognition of the importance of recruiting and training local Indigenous Peoples.

One of ODV's core values is to recruit and provide training opportunities to local and Indigenous communities. It is our commitment to local communities, Indigenous groups and our Indigenous partners to promote and provide opportunities for qualified candidates to find employment with our Company, while also maintaining adherence to our existing and future agreements.

Communication will continue regarding employment with local communities and Osisko Development Corporation will hold or participate in events such as open houses or job fairs.

1.0-14.5 Workplace Safety Programs

Osisko Development Corporation's signed Health and Safety Policy is attached (Appendix A).

All employees will be required to complete mandatory training including, but not limited to:

- Health and Safety Orientation and Training, including:
  - Occupational health and safety, including safe work practices,
  - Health and wellness,
- Site-specific Orientation;
- Code of Conduct Training;

- Training on the anti-bullying and harassment policy, and
- Cultural Training and Awareness.

This training will be completed at the beginning of employment and designed to meet occupational health and safety requirements. As well, training will be completed as conditions require (e.g., renewal of safe work practices training, refreshing the training materials, or new positions that require new safety training).

In addition to required training, ODV strives to invest in the professional development of its employees and will work closely with direct hires and contracting agencies to support skills development. An employee performance review will be conducted annually for each employee to set goals for professional development with a manager or senior staff. Professional development and training will be available as appropriate, and on-site and off-site courses will be potential training opportunities for employees. As well, first aid training opportunities will be provided to employees to fulfill the Project's on-site first aid safety needs.

1.0-14.6 Cultural Training and Awareness

The Company is currently developing a cultural training and awareness policy, with the support and guidance of qualified professionals, that will be implemented and enforced in all aspects of the Company's operations and conduct. This policy and program will be in place prior to the Construction Phase of the Project.Investment in Training Opportunities

Osisko Development Corporation is investing in the people of Wells and the Cariboo region through the Sustainable Workforce Initiative (SWI). The SWI will ensure the residents of the region can share in the success of the Project by providing access to recognized and accredited training for high-quality, safe, well-paid jobs.

Osisko Development Corporation has partnered with the College of New Caledonia, Vista Training, ITA BC and the Centre of Training in Excellence in Mining to develop a variety of training options to support career opportunities for the Project.

Osisko Development Corporation has also collaborated with Work BC, the Cariboo Chilcotin Aboriginal Training employment Centre and local Indigenous communities to recruit participants into training programs and ensure that ODV's programs address and remove critical barriers for participation of vulnerable populations.

Some examples include:

- The first training program for professional ore truck drivers was delivered in January 2021 with 72% of students securing full time sustainable employment with ODV;
- Programming and curriculum have been developed for Heavy Equipment Operators and is anticipated for delivery in August 2021; and
- Curriculum for underground miner training is in the development stages, and hope to launch this program in early fall.

Additional training initiatives are being developed with local and regional partners.

Key values of our workforce initiative include:

- Ensuring that training is accessible for participants from vulnerable populations;
- Incorporating Gender-based Analysis Plus (GBA+) as a key competency to the programs and existing workforce;
- Preparing unemployed individuals for the labour market through a combination of employer partnerships, in-classroom training, job shadowing, work experience, and/or mentorship;
- Understanding the cultural considerations in recruitment and retention of Indigenous peoples; and
- Supporting existing and new employees in the labour force to explore opportunities with ODV and to learn new skills and competencies.

1.0-14.7 Employee Assistance Programs and Benefits

The Company will aim to provide competitive compensation and benefit packages for all employees, consistent with mining industry standards in BC. The Company currently has a group insurance benefit program to provide to employees that will extend to the Project employees. In addition to health, dental, life and disability coverage, this includes counselling that can cover a range of personal issues and family support. Osisko Development Corporation provides succession planning and posts new job postings internally before going externally. Osisko Development Corporation is currently working to develop career planning, transition planning, and pension plans for employees for the Project.

APPENDIX A: OSISKO DEVELOPMENT CORPORATION'S HEALTH AND SAFETY POLICY (SIGNED)

OSISKO DEVELOPMENT

OSISKO DEVELOPMENT CORP
HEALTH AND SAFETY POLICY

Osisko Development is committed to the health and safety of our employees, contractors, and visitors to our sites. We demonstrate this commitment by:

- providing a work environment that protects all employees and personnel from undue health and safety risks arising from any activities on our sites.
- promoting and practicing a culture of health and safety.
- embracing the workers' rights to refuse any work that is not safe; and
- ensuring that employees and other personnel are equipped and trained to achieve our health and safety goals and priorities.

All personnel on our sites have a role in safeguarding the health, safety, and welfare of those who work at or visit our sites.

1. As President of Osisko Development Corp, I am committed to providing active leadership in maintaining a safe and healthy workplace which complies with applicable health and safety laws, our corporate commitments, and the mining industry's best practices.

2. Supervisors and managers have specific roles, including responsibility for ensuring the health and safety of all personnel under the supervisor's or manager's supervision and ensuring that personnel comply with all applicable health and safety laws, legislative requirements, and the highest industry standards and guidelines.

3. Every employee, contractor and visitor are responsible for protecting their own health and safety by complying with applicable health and safety laws, regulations, health and safety plans, safe work practices and procedures established by Osisko Development and its subsidiaries, and by speaking up and reporting unsafe work practices or environments.

Our success requires active participation and a shared commitment to this policy by all personnel. Therefore, all employees, including senior management, contractors and visitors to our sites must be dedicated to our commitment to continuously improve and reduce risk of injury, incidents, and illnesses at our work sites.

Signed: 

Chris Lodder

President of Osisko Development Corp

Adopted by Barkerville Gold Mines Inc. June 2021

APPENDIX B COMMUNITY EFFECTS PLAN: PUBLIC STRATEGY

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

Appendix B: Community Effects Plan: Public Strategy

June 2025



OSISKO DEVELOPMENT

Cariboo Gold Project

PO Box 250
3700 Ski Hill Road
Wells, BC V0K 2R0

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ABBREVIATIONS

Terminology used in his document has been defined where it is first used, while the following list has been presented to assist readers that choose to review only portions of the document.

Abbreviation	Description
BC	British Columbia
CERP	Community Emergency Response Plan
CISD	Critical Incident Stress Debriefing
CRD	Cariboo Regional District
District	District of Wells
EAC	Environmental Assessment Certificate
EAO	Environmental Assessment Office
EMT	Emergency Management Team
ENV	Ministry of Environment and Climate Change Strategy (BC)
EOC	Emergency Operations Centre
ERP	Emergency Response Plan
ESS	Emergency Social Services
HEMBC	Health Emergency Management British Columbia
HRVA	Hazard Risk and Vulnerability Analysis
HSE	Health, Safety, and Environment
ICC	Incident Command Centre
ICS	Incident Command System
ISP	Infrastructure and service providers
MERP	Mine Emergency Response Plan
NGO	Non-governmental Organization
ODV	Osisko Development Corp.
PMIR	Public Media Inquiry Room
Project	Cariboo Gold Project
WVFB	Wells Volunteer Fire Brigade

1. INTRODUCTION

On October 10, 2023, pursuant to Section 29(4)(c) of the British Columbia Environmental Assessment Act, 2018, the Minister of Environment and Climate Change Strategy and the Minister of Energy, Mines and Low Carbon Innovation, issued an Environment Assessment Certificate (EAC) for the Cariboo Gold Project (the Project). A condition of the EAC is a Community Effects Plan which is a legally binding requirement to which Barkerville Gold Mines Ltd. (BGM) must adhere to through the life of the Project. This Community Effects Plan Public Strategy (Appendix B) supplements the Community Effect Plan by providing details regarding how BGM will implement mitigations to address concerns or questions raised by the Public, in addition to effects resulting from the Project which could have a potential impact on the public. BGM is a wholly owned subsidiary of Osisko Development Corp. (ODV).

The Community Effects Plan Public Strategy provides a blueprint for implementing an adaptive monitoring and management process that addresses public concerns (both Indigenous and non-Indigenous) related to the Project. Engagement, communication, and reporting are key processes for successful implementation and adaptive management of the Community Effects Plan Public Strategy. Additional engagement, communication, and reporting strategies are outlined in the Community Effects Plan Engagement, Communications, and Reporting Strategy (Appendix G).

The Community Effects Plan Public Strategy describes how mitigations will be implemented related to BGM's relationship with the local community, Participating Indigenous nations, and partners (including infrastructure and service providers (ISP)) to address community concerns. The Public Strategy specifically focuses on topics related to:

- Description of how BGM will engage with the public, Participating Indigenous nations, and ISP.
- Monitoring for Project effects and the effectiveness of mitigation measures for diverse populations.
- BGM's process for responding to community and Participating Indigenous nations concerns.
- Financial contributions BGM will make to the community and Participating Indigenous nations to monitor and manage adverse effects.
- Engagement, Communication and Reporting processes for the local community, Participating Indigenous nations, and partners, which includes infrastructure and services.
- How BGM will respond if there is a Project-related emergency that has the potential to impact the community and/or Participating Indigenous nations.

2. ENGAGEMENT STRATEGY

Successful implementation of this Community Effects Plan Public Strategy is interdependent with the successful implementation of the Community Effects Plan Engagement, Communications and Reporting Strategy (Appendix G). This Community Effects Plan Public Strategy provides relevant details on how BGM will engage with the public, Participating Indigenous nations, the local community, local governments, and partners (including ISP) regarding Project activities and actions related to the implementation of mitigation measures and how BGM will monitor effectiveness.

The following sections outline the varied methods which BGM will utilize to engage, communicate, and share information with the public, the local community – including local governments and ISP, and Participating Indigenous nations.

2.1 Electronic Methods:

2.1.1 Social Media

Social media channels such as Instagram and Facebook allow BGM to quickly share information related to the Community Effects Plan. Social media is a useful tool for sharing information about upcoming events, announcements, or reporting back to the local community and Participating Indigenous nations on highlights related to the Community Effects Plan. Social media will be used to share information about public events and opportunities for engagement.

2.1.2 Cariboo Gold Project Website

Members of the public can find information about the Project and Community Effects Plan annual reports on the Project website. The Project website provides public information about the Project and BGM in general. The official project webpage is https://osiskodev.com/cariboo-gold-project. The website provides a place to communicate with the public about how their concerns are considered and addressed by BGM. BGM commits to keeping the official website updated to ensure the public can easily access up-to-date information.

2.1.3 E-mail and Phone

BGM uses emails to share newsletters to those on a contact list developed specifically for CGP, and to share information or obtain feedback from specific groups or individuals about a specific topic. BGM also has developed a dedicated email address and phone line so the public can provide input, raise concerns, or ask questions. The phone number (778-414-8493) and email address (feedback@osiskodev.com) will be advertised with all communication materials.

2.2 Print Methods:

2.2.1 Mail-outs, Newsletters, Local Newspaper

In addition to electronic communications, BGM will use physical mail-outs, newsletters, and include project information and announcements in the local newspaper so information related to the Project reaches a wide and diverse audience within the local community.

2.2.2 Formal Document Review

BGM will produce formal documents to report back on the effectiveness of the Community Effects Plan and changes made through the adaptive management and monitoring process or in response to feedback and guidance from the local community or Participating Indigenous nations. Information will be shared through formal reports and engagement will be obtained through the review of formal documents. For example, BGM will distribute the Community Effects Plan Annual Report to representatives of the local community, Participating Indigenous nations, and partners including ISP.

2.3 Face-to Face Methods

2.3.1 Formal Meetings

Formal meetings, both virtual and face-to-face, allow BGM to share targeted information regarding the Community Effects Plan with members and key representatives of the local community or Participating Indigenous nations. Formal meetings also allow BGM to engage and obtain feedback and guidance on how to advance the Community Effects Plan. Table 2.6-1 outlines BGM's engagement schedule with the public, the local community, Participating Indigenous nations, and ISP.

2.3.2 Community Meetings

Community meetings, both virtual or face-to-face, in the local community or with Participating Indigenous nations provide BGM with an opportunity to share information through presentations and engage in discussions for gathering feedback and guidance on how to advance the Community Effects Plan. BGM will establish and chair quarterly community meetings for the first year of Construction and Operations to discuss Project effects, mitigation measures that address social and economic effects, future project development plans, and the implementation of the Community Effects Plan. After the first year of the Operations phase, BGM commits to hosting a minimum of two community meetings per year through the Operations phase.

2.3.3 One-on-One Meetings

When specific feedback is required from subject matter experts, or to improve accessibility for diverse populations, BGM will organize targeted one-on-one meetings.

2.3.4 Community Events

In order to enable communication with a diverse audience BGM will host community events, such as a Christmas Dinner to build and strengthen positive relationships with the local community and Participating Indigenous nations. Strong positive relationships with the local community and Participating Indigenous nations facilitates trust which leads to deep engagement and participation so that meaningful feedback and guidance is provided to BGM.

2.3.5 Mine Site Visits

Similar to community events, mine site visits provide an opportunity for representatives and members of the local community and Participating Indigenous nations to experience and observe BGM's efforts to mitigate concerns raised during the EA process. Mine site visits also provide community members opportunities to communicate meaningful feedback and guidance related to the Community Effects Plan based on their experience at the mine site.

2.3.6 Community Relations Office

To provide community members a physical location to visit for collecting information and communicate their perspectives, BGM has a Community Relations Office in Wells located at 4270 Sanders Avenue. The community Relations Office provides a point of contact for the public and is staffed during regular business hours Monday to Friday.

2.3.7 Lhtako Dené Nation Community Liaison

In order to maintain ongoing and active communication with the Lhtako Dené Nation, BGM currently provides financial support for employing a Community Liaison position within the Lhtako Dené Nation. The Community Liaison is responsible for engaging with community members and providing updates related to the Community Effects Plan, and other CGP updates.

2.3.8 District of Wells Community Liaison

To maintain ongoing and active communication with the District of Wells (District), BGM has signed an agreement with the District to provide financial support in the amount of $140,004 to employ a Community Liaison position during the Construction and Operations phases. The District Community Liaison will review documentation, represent the community and District, and relay concerns back to BGM. The Community Liaison will participate in community meetings in the District. BGM and the District will evaluate the roles and responsibilities of the position and the terms of the agreement annually and adjust as needed.

2.4 Public Engagement Strategy

BGM is committed to engaging with the public (non-Indigenous and Indigenous) by establishing and chairing a minimum of quarterly community meetings for the first year of Construction and first year of Operations. BGM commits to establishing and chairing a minimum of two community

meetings per year throughout the remainder of the Operations phase. The purpose of community meetings is to discuss:

- Effects from the project in the local area.
- Mitigation measure to address social and economic effects.
- Future project development plans.
- Address comment and questions raised by the public and facilitate discussion.
- Obtain feedback from the public that will inform the adaptive management of the Community Effects Plan.

In addition to community meetings, the Public can engage with BGM by reporting grievances, perspectives, and concerns about the Project through the Project feedback e-mail feedback@osiskodev.com or phone line at 778-414-8493. Comments can also be submitted through the Project website: https://www.cariboogold.com/. The Public can also visit the Community Relations Office in Wells and share concerns during regular business hours. If there is an emergency, the Project has a toll-free number that the public can call that will connect them immediately to a manager during business hours. The toll-free number is managed by staff from the Community Relations team after hours.

BGM will share information with the public about the Project through their social media channels, posting information on the website, delivering mail outs, or sending information through an email contact list, or posting information in the local newspaper.

2.4.1 Tailoring Messages and Methods to Diverse Audiences

To ensure that BGM effectively engages and communicates to diverse audiences about the Project, BGM will adapt their engagement, communication, and reporting methods to reach seniors, youth, people experiencing unemployment, people with disabilities, low-income, women, immigrants, LGBTQ2, and families.

In order to meet the unique needs of diverse groups BGM will follow the guidance and advice from local social and community services on appropriate and best practices for engaging diverse populations in the region. For example, BGM has a positive relationship with the Amata Transition House Society. The Amata Transition House Society serves women experiencing vulnerabilities and relays information back to BGM on potential project impacts related to domestic violence, sexual exploitation, and abuse issues. BGM will also seek guidance from the Amata Transition House Society on how to improve opportunities for diverse groups to participate in employment opportunities created by the Project.

Specific strategies which BGM may use to obtain meaningful feedback and a comprehensive understanding of community impacts directly from diverse populations, are to host one-on-one

meetings and allow individuals or groups from diverse populations to identify spaces for engagement that they feel are comfortable and accessible.

2.5 Indigenous Engagement Strategy

Leading up to Construction, BGM will meet with the Participating Indigenous nations on a weekly basis to discuss effects from the Project in the local area, mitigation measures to address social and economic effects, and their Indigenous Interests regarding future project development plans and the implementation and adaptive management of the Community Effects Plan. The Participating Indigenous nations also participate on the Environmental Monitoring Board that meets twice a year, where relevant topics from the Community Effects Plan will be raised at those meetings when required. BGM will report progress on the Community Effects Plan annually to the Participating Indigenous nations during meetings and through an annual report. Participating Indigenous nations will have an opportunity to comment on and inform adjustments to the plan.

BGM currently provides support for a Community Liaison position within the Lhtako Dené Nation. The Community Liaison is responsible for engaging with community members, representing the community, and providing updates related to the Community Effects Plan.

2.6 Infrastructure and Service Provider Engagement Strategy

In addition to engaging with the public and Participating Indigenous nations, BGM will engage with ISP. This engagement will be conducted by inviting representatives to community meetings, or hosting meetings to discuss Project effects, mitigation measures, or future development plans. Information about the Community Effects Plan and the Project will be shared via email distribution, posting on social media channels, and posting updates on the Project website. Local ISP such as Northern Health and Interior Health will be invited to comment on formal documents related to the Community Effects Plan such as annual reports. Annual reports will include information about the monitoring and the effectiveness of mitigations identified in Employee Strategy, Traffic Strategy, Public Strategy, Noise Strategy, and Visual Impact Strategy. The Community Effects Plan Annual Report will also include information about the estimated number of employees and anticipated increases in population to the local area so that service providers such as the school boards can plan ahead.

To mitigate concerns related to gender-based violence BGM currently meets with the Amata Transition House Society on a regular basis and provides a financial contribution to the organization to further understand and address any Project contributions to domestic violence, sexual exploitation, and abuse issues. The Amata Transition House Society will also advise BGM on barriers that may be limiting individuals from all groups, including diverse groups from participating in Project employment opportunities.

The BGM Community Relations team will be responsible for facilitating the coordination and implementation of the Community Effects Plan, including establishing and chairing community meetings on a quarterly basis.

Table 2.6-1 outlines the general methods that BGM will use to achieve their engagement goals related to the Community Effects Plan during the Construction and Operation phases of the Project.

Table 2.6-1 Community Effects Plan Engagement Methods

Participating Indigenous Nation, Partner, or Stakeholder	Goal	Method	Frequency
Participating Indigenous nation: Lhtako Dené First Nation Xatśūll First Nation Williams Lake First Nation	Engagement	Formal Meetings: Depending on topic and action required, BGM will meet with leadership or the natural resources team.	Weekly
		Environmental Monitoring Board	Bi-annual
		Formal Document Review (i.e. annual reports)	Annually or as required
		E-mail and phone Community meetings Community events Mine-Site Visits Community Relations Office	As required
		Community Liaison (Lhtako Dené Nation)	As required
	Communication/ Information Sharing	Mail-outs, newsletters, newspaper	Bi-annually
		Social media e-mails website Community Liaison (Lhtako Dené Nation)	As required
	Reporting	Formal Meetings Formal document Review (i.e. annual reports)	Annually
		Community Meetings Website Community Liaison (Lhtako Dené Nation)	As required

Participating Indigenous Nation, Partner, or Stakeholder	Goal	Method	Frequency
District of Wells	Engagement	Formal meetings	Every two weeks
		Formal Document Review (i.e. annual reports)	Annually or as required
		Community Meetings	Quarterly
		E-mail Community events Mine-Site Visits Community Relations Office Community Liaison	As required
	Communication/Information Sharing	Mail-outs, newsletters, newspaper Social media e-mails website Community Liaison	As required
	Reporting	Formal meetings Formal Document Review (i.e. annual reports)	Annually or as required
		Community Meetings Website Community Liaison	As required
Interior Health	Engagement	Formal Meetings Formal Document Review (i.e. annual reports)	Annually or as required
	Communication/Information Sharing	E-mail	As required
	Reporting	Formal Meetings Formal Document Review (i.e. annual reports)	Annually or as required
Northern Health	Engagement	Formal Meetings Formal Document Review (i.e. annual reports)	Annually or as required
	Communication/Information Sharing	E-mail	As required
	Reporting	Formal Meetings Formal Document Review (i.e. annual reports)	Annually or as required

Participating Indigenous Nation, Partner, or Stakeholder	Goal	Method	Frequency
Social and Community Services	Engagement	Formal Meetings One-on-One Meetings	As required
	Communication/Information Sharing	E-mail	As required
	Reporting	Formal Meetings	As required
Public	Engagement	Community Meetings	Quarterly during the Construction and Operations phase
		Community Events Community Relations Office Email	As required
	Communication/Information Sharing	Mail-outs, newsletters, newspaper Social media e-mails website	As required
	Reporting	Community Events	Quarterly

3. EFFECTS MONITORING

3.1 Public Effects Monitoring

Ongoing and active public engagement is key to ensuring the Project's success, and BGM therefore prioritizes providing opportunities for the public to review and comment on their annual Community Effects Plan report. The Annual Community Effects Plan Report will highlight how the Community Effects Plan is advancing, the effectiveness of the mitigations, and future adjustments. BGM will further monitor effects on the Public resulting from the Project by:

- Requesting that the public assess the effectiveness of the Community Effects Plan and the mitigations identified in the Employee, Public, Traffic, Noise, and Visual Impact Strategies.
- Tracking issues raised during community meetings designed to share information about the Project and obtain feedback on the effectiveness of mitigations addressed through the Community Effects Plan.
- Tracking issues that members of the public bring forward through the Project email (feedback@osiskodev.com) or phone line 778-414-8493.
- Monitoring effects through the methods outlined in the Employee, Public, Traffic, Noise, and Visual Impact Strategies.
- Obtaining input about the Community Effects Plan from the District Community Liaison

To ensure BGM understands Project effects and the effectiveness of mitigation measures for diverse groups, BGM will tailor their engagement, communication, and reporting methods and use best practices for engaging with diverse audiences. Throughout the life of the project, BGM will conduct targeted consultation and engagement strategies to engage with disadvantaged, marginalized, and under-represented populations including, but not limited to seniors, youth, people experiencing unemployment, people with disabilities, low-income, women, immigrants, LGBTQ2, and families. BGM will seek out and follow the guidance and advice from social and community services on appropriate and best practices for engaging diverse populations in the region, as well as seeking their feedback in identifying and addressing adverse Project effects among the populations they serve. Some strategies that BGM may use to obtain meaningful feedback from diverse populations directly are to host one-on-one meetings and allow individuals or groups to identify spaces for engagement that are comfortable and accessible.

Issues raised by the public will be tracked through the Issues Tracking Table and managed by the Project's Community Relations team. Comments specifically related to the Community Effects Plan will be tracked on the Community Effects Plan Comment Review Tracker (Appendix J), which is also managed by the Community Relations team.

As early feedback from the public on the Community Effects Plan is received and public priorities are identified, BGM will develop a tailored District of Wells Community Involvement Plan that builds from the Community Effects Plan. The District of Wells Community Involvement Plan addresses BGM's commitments to the community members, stakeholders, and the public during all phases of the Project.

3.2 Indigenous Effects Monitoring

Building meaningful and trustful relationships with Partnering Indigenous Communities requires addressing Project effects in a collaborative and transparent manner. Therefore, BGM will invite the Participating Indigenous nations to review and comment on their annual Community Effects Plan report. Processes for monitoring effects from the Project raised by Participating Indigenous nations include:

- Requesting that Participating Indigenous nations assess the effectiveness of the Community Effects Plan, and the mitigations identified in the Employee, Public, Traffic, Noise, and Visual Impact Strategies.
- Tracking issues raised during community meetings designed to share information about the Project and the Community Effect Plan's implementation.
- Tracking issues raised in formal meetings with leadership, the natural resource teams, or consultants hired by the Participating Indigenous nations to support their involvement in the Project.
- Tracking issues raised through email correspondence with the Participating Indigenous nations.
- Obtaining feedback from the Lhtako Dené Nation Community Liaison.
- Monitoring effects through the methods outlined in the Employee Strategy (Appendix A), Traffic Strategy (Appendix C), Noise Strategy (Appendix D), and the Visual Impact Strategy (Appendix E).

Issues raised by Participating Indigenous nations will be tracked on the Issues Tracking Table monitored by the Project's Community Relations Team. Comments specifically related to the Community Effect Plan will be tracked on the Community Effect Plan Comment Review Tracker (Appendix J), which will also be managed by the Community Relations Team.

As early feedback from the Participating Indigenous nations on the Community Effect Plan is considered and Indigenous priorities are identified, BGM will develop a tailored Indigenous Partnership Plan. The Indigenous Partnership Plan will build from the Community Effect Plan and address BGM's commitments to the Participating Indigenous nations during all phases of the Project.

3.3 Infrastructure and Service Provider Effects Monitoring

BGM will share their Community Effect Plan Annual Report with representatives of ISP and invite their feedback. The processes that BGM will use to monitor effects on ISP, and the effectiveness of mitigations include:

- Requesting that representatives for ISP assess the effectiveness of the Community Effect Plan and the mitigations identified in the Employee, Public, Traffic, Noise, and Visual Impact Strategies.
- Tracking issues raised during community meetings designed to share information about the Project and obtain feedback on the effectiveness of mitigations addressed through the Community Effect Plan.
- Tracking issues identified through email correspondence with representatives of infrastructure and services.
- Tracking issues raised during formal meetings about the Community Effect Plan with representatives of infrastructure and services.
- Monitoring effects through the methods outlined in the Employee, Public, Traffic, Noise, and Visual Impact Strategies.
- Issues raised by representatives of ISP will be tracked on BGM's Issue Tracking Table that will be managed by the Community Relations Team. Comments specifically related to the Community Effects Plan will be tracked on the Community Effects Plan Comment Review Tracker (Appendix J), which will also be managed by the Community Relations Team.

4. ADDRESSING COMMUNITY CONCERNS

Maintaining ongoing and active communication with the public, Partnering Indigenous nations, and ISP is critical to the overall success of CGP. Therefore, BGM aims to respond to comments that are brought forward through their public communication channels within 24 hours of receiving them. However, when that is not possible, BGM commits to providing a meaningful response to the public commentor within five business days. All comments and concerns received through the public communication channels will be organized by theme or topic and summarized and shared at the community meetings. The following table details how BGM will respond to concerns from the public depending on the public communication channel that they were received from. Public concerns may help guide future iterations of the Community Effects Plan.

Table 4-1 BGM's Process for Responding to Public Concerns

Manner that Comments or Question was Received by BGM	BGM's Response
Comments through social media channels	Comments received through social media channels will be monitored by the Community Relations Team.
E-Mail or Phone	Comments received through feedback@osiskodev.com will be answered within 5 business days. If the issue cannot be resolved over email or clarification is required, the issue will be brought forward to the next community meeting for further discussion. The commentor will be notified via email when the next community meeting is scheduled. When comments are received through the phone line 778-414-8493, a member of the Community Relations Team will call the commentor back to discuss their concern within 5 business days. If the commentor cannot be reached, a member of the Community Relations Team will leave a message inviting the commentor to attend the next community meeting where their comment will be raised for discussion or BGM will provide a resolution. If the commentor did not provide a return phone number, BGM will raise the concern at the next scheduled community meeting.
Letter	The public are welcome to send written comments, concerns, and issues about the Project to the Community Relations Office located in Wells at 4270 Sanders Avenue, Wells, BC, V0K 2R0. If return contact-information and contact preference is provided, a member of the Community Relations Team will respond to the concern by email, phone, or letter within 5 business days. If the concern or issue cannot be resolved, the commentor will be invited to attend the next community meeting, where the issue and concern will be raised for discussion.
Community Meeting	BGM will provide advance notice and broadly advertise through their social media channels, email distribution lists, newspaper, and website the time and location (in-person or virtual) of their community meetings. BGM will share comments and concerns that have been raised by the public through their social media channels, in-person meetings, feedback email, or phone line to everyone that attends the community meeting. BGM will facilitate a discussion about the concern and issue and seek a resolution.

Manner that Comments or Question was Received by BGM	BGM's Response
One-on-One Meeting (virtual or in-person)	BGM will address concerns raised by the public during one-on-one meetings in that meeting or will commit to responding to the individual according to their preference within 5 business days. BGM will anonymously bring the individual's concern forward at the next scheduled community meeting.
Website	Concerns received through the website will be addressed by the Community Relations Team within 5 business days if return contact information is provided. If a comment was shared anonymously, the comment will be raised at the next scheduled community meeting for discussion.

Concerns received by the public will be themed, summarized, and posed as a question that will be posted to the FAQ tab of the Project website (https://www.cariboogold.com/faqs). Updates to website will be made on a quarterly basis.

4.1 Respecting confidentiality

Over the past several years, BGM has worked hard to build strong relationships with the local community and Participating Indigenous nations that are built on a foundation of mutual trust and respect. BGM commits to keeping the identity of individuals from the public that submit questions or concerns confidential and provides many options to the public to anonymously submit questions or concerns. Comments and questions that are received by BGM will be themed and summarized and posted to the FAQs on the Project Website (www.cariboogold.com). No identifying information about the commentor will be included on the website. During the Construction and Operations phases, questions or comments from the public can be anonymously submitted to BGM through the following methods:

- Comment boxes; and
- Sending anonymous letters to the Community Relations Office though Canada Post.
    - BGM will have a mailbox and comment box located at their Community Relations Office in Wells that the public will be able to access anonymously to submit written comments, questions, or concerns to BGM. Comment boxes will also be available at the band offices of Participating Indigenous Nations.
    - A comment box will be available at all community meetings. BGM will invite participants who wish to remain anonymous to submit their comments or questions through the comment box at the beginning of the community meeting. BGM will also invite commentors to include what community they are from for the purpose of analysing if there are common comments or questions coming from a specific community. BGM will address comments provided through the comment boxes later in the meeting after an opportunity to comment has been provided. Comments that cannot be addressed at the community meetings will be anonymously posted to the Project website as an FAQ.

4.2 Website

The Project website will have a “contact us” form where the public can anonymously submit their comments and questions. Prompts will ask people to voluntarily identify what community or if an individual wishes to self-identify as Indigenous by asking what Indigenous Nation the individual is a member of. Answering the prompts will not be mandatory for submitting a comment or question and option to leave self-identifying information blank will be provided. Comments and questions submitted through the website will be directed to feedback@osiskodev.com, which is managed by BGM’s Community Relations Team. Responses to comments received through the website will be summarized, themed with other comments and questions received by BGM through other feedback mechanisms and posted to the website under FAQs. New comments and questions will be posted to the website FAQs quarterly.

4.3 Community Liaison Position

The Community Liaisons for the Lhtako Dené Nation and the District are responsible for bringing comments and question from their communities back to BGM. The Community Liaisons will protect the community members’ confidentiality and theme feedback unless the individual requested to be identified so that BGM can respond directly.

5. FINANCIAL CONTRIBUTIONS

BGM will provide financial contributions to community partners in their efforts to strengthen their relationships with the community and mitigate adverse social effects of the Project. BGM has signed an agreement with the District to fund a Community Liaison position that will support the District on Project-related matters and a Mental Health Support Worker that will support the communities of Wells and Quesnel. BGM has also signed an agreement to provide financial support to the Amata Transition House Society.

Community Liaison

BGM has signed an agreement with the District to provide funding in the amount of $140,004 annually for a full-time Community Liaison position. The Community Liaison will support the District to engage with BGM and participate in Project-related matters during both the Construction and Operations phases. Their responsibilities include reviewing documentation provided by BGM or the EAO and representing the community's interests. The Community Liaison will engage with the community and the District on Project-related matters and provide community feedback to BGM. The Community Liaison will attend community meetings in the District. BGM and the District will evaluate the position and the terms of the agreement annually and adjust as needed.

Mental Health Support Worker.

BGM will contribute $15,000 annually towards a Social Worker to provide confidential mental health support to residents of Wells and Quesnel with preventing or responding to mental health issues that are Project-related. The Mental Health Support Worker/Social Worker will be required to attend Project-related community events to provide mental health support and guidance to BGM regarding local community mental health concerns if necessary. BGM will fund the position for four years and evaluate the position annually in order to make adjustments when required.

Amata Transition House Society

BGM signed an agreement to provide $10,000 per quarter to the Amata Transition House Society to help them address issues that may be caused by the Project that relate to domestic violence sexual exploitation, and abuse issues. Financial contributions can also be directed towards supporting individuals from underrepresented groups in the mining industry participate in Project employment opportunities. Financial contributions will begin with the Construction phases and will continue through out the life of the mine.

6. COMMUNITY EMERGENCY RESPONSE PLAN

Results of engagement with the local community revealed that due to the Project's location in Wells, the community is concerned that a mine emergency may also be an emergency for the community. Additionally, the local community expressed concern that the Project may exacerbate an existing emergency such as a fire or flood because the main evacuation route for residents of Wells and tourists in the area is Highway 26, which is currently in disrepair due to erosion from swollen creeks (ODV 2021). In response to these community concerns, the Community Effects Plan Public Strategy includes the Community Emergency Response Plan (CERP) that describes emergency procedures if there is event that endangers the health and safety of personnel, property, equipment, and infrastructure that may also endanger the health and safety of the surrounding community. Similar to the objectives of the Project's Mine Emergency Response Plan, the CERP aims to: (ODV 2022a)

- Protect lives.
- Know and identify site specific hazards and risks.
- Know and identify site specific rescue equipment.
- Effectively rescue and treat casualties.
- Minimize environmental impacts.
- Minimize damage to company, contractors, public and private property.
- Facilitate rapid recovery and restoration from emergency occurrences.

The CERP addresses community concerns by:

- Providing details on how BGM will protect the public from a mine-site related emergency.
- Identifying industry and Project-specific hazards that may require specialized equipment, services, expertise, or capacities among service providers.
- Detailing worst-case event casualty and injury, including types and estimates.
- Evaluating the capacity of emergency services serving Wells
- Evaluating existing evacuation procedures for the community and Project's workforce and procedures for notifications.
- Identifying the scenarios that would trigger BGM to fund additional health impact assessment studies.
- Describing mitigation measures that address impacts to evacuation procedures.

6.1 Prevention and Preparation

BGM has prepared a Mine Emergency Response Plan that identifies industry and Project-specific hazards that supporting the development of the CERP. BGM intends to complete a community hazard assessment that identifies industry and Project-specific hazards to the community so that BGM can prevent incidents and prepare for a community emergency event. BGM will prepare for an emergency through planning and ensuring that specialized equipment is on hand, and ensure key personnel know what services, expertise and capacities exist among local emergency service providers.

BGM will prevent and prepare for emergencies by implementing the following protocols (ODV 2022a):

- Clarify the hazard and risk that exists for a Project operation.
- Ensure that risk assessments are completed prior to the start of work and implement prevention measures.
- Identify potential emergency scenarios that could occur.
- Engage corporate support, if required, to ensure that support plans exist that address risk and communication protocols.
- Procure or contract resources to respond effectively to emergencies.
- Active and ongoing engagement with the local community and Participating Indigenous nations to discuss emergency planning including:
    - Site-specific Safety and Evacuation Plan (s) for key job sites.
    - Identifying who will fill primary and backup BGM and Contractor personnel and what their responsibilities will be to fill key Incident Command System roles.
- Ensure that plans comply with applicable government regulations and if required, approved by regulatory agencies prior to the start of activities.

Response personnel will be trained in their roles and responsibilities at least annually, or more frequently if required. Personnel will also practice responding to emergencies by participating in exercises such as:

- Emergency drills,
- Table-top exercises,
- Replicating a full-scale emergency,
- Building on capabilities through a cycle of activities,
- Focusing on exercises best suited to the operation's needs and risks.

The goals for the exercises will be clearly defined prior to running the exercise and then the emergency response will be evaluated against the goals.

6.1.1 Potential Hazards

To identify and assess potential mine-related hazards that have the potential to impact the community, BGM commits to having a qualified professional conduct a community hazard risk assessment in relation to the Project. A hazard risk assessment is a critical part of any emergency program and supports the preparation of emergency plans. The hazard risk assessment will reflect the local environment and articulate the relative risk of occurrence for emergencies or disasters and the potential impact on people and property.

The hazard risk assessment will support BGM to help identify their role in addressing vulnerabilities, mitigating hazards, and preparing to respond to, or recover from a variety of hazards events. BGM will also be able to use the assessment to prioritize hazards based on the level of risk from the assessment. The following steps will be taken as part of the community hazard risk assessment:

1. Hazard Identification: the purpose of hazard identification is to identify and develop a list of hazards that could affect the communities that are reasonably likely to expose people to injury, illness or disease if not effectively controlled.

2. Risk Assessment: the purpose of the risk assessment is to determine the relative risk posed by each hazard by calculating a risk score. Risk refers to the likelihood that a hazard will occur and the severity of an adverse effect to health, property, the environment, or other things of concern to the community. The risk assessment includes an assessment of both the likelihood and the severity of the potential consequences. BGM will include both scientific and local knowledge to inform the risk assessment.

3. Identify Risk Reduction Strategies: the purpose of identifying risk reduction strategies is to prevent or reduce the likelihood or consequence of hazard event to people, property, and the land. Risk reduction strategies also improve preparedness and provides an opportunity for early warning if an event were to occur. This step also requires collaboration and cooperation with Wells, other partners, and subject matter experts to decide which strategies are the most practical, achievable, and sustainable.

4. Generate and Assemble Report: the purpose of the report is to document the risks, the assessment, and the strategies for information and guidance.

5. Monitor and Review: the community hazard assessment will need to be reviewed regularly to identify if there are new risks or changes to the vulnerability of Wells.

The Project's MERP identifies mine-site hazards that could also be a hazard for the community (ODV 2022a). The hazard list was categorized according to BC Emergency Management Regulation.

Table 6.1-1 List of Hazards Identified in the Mine Emergency Response Plan

Atmospheric	Flooding
Heavy rain	Surface flood
High wind	Underground flood
Thunder and lightning storms	Underground in-rush of water
Snow and ice conditions	Uncontrolled Effluent Discharge from impoundment
Heat	Severe flooding
Fire	**Infrastructure Failure**
Surface or underground fire/heat or smoke	Structural failures
Wildfire	Dam breach
Geological	Unusual Conditions that could lead to a dam breach
Avalanche	Slope failure
Landslide	**Interruptions to Critical Services**
Seismic	Major power outage
Earthquake	**Security**
Hazardous Materials and Explosions	Bomb threat/armed threat/terrorism
Unexpected/unintentional explosion	Missing person(s)
Release of poisonous fumes, flammable or explosive gases	Civil disturbance and/or distraught person
Flammable or poisonous liquid spill	Alarm of unknown origin
Propane leak	**Transportation**
Hydrological	Light vehicle accident
Drought	Underground equipment accident
	Bus accident
	Helicopter accident

6.2 Worst Case Event Casualty and Injury

The NH raised concerns that the current health infrastructure may struggle to meet the needs of the community if a Worst-Case Event Casualty and Incident were to occur. Through comprehensive prevention and preparation, the likelihood of a worst-case event casualty and injury event is unlikely (ODV 2022b). Although unlikely, in a worst-case event such as an uncontrolled fire, there is a possibility that 10-20 workers or the public has the potential to be injured. BGM will provide estimates for worst-case event casualty and injury, including type and

estimates as part of their community hazard assessment that will be completed by a qualified professional. The rating for worst-case event casualty and injury is described in the table below and depends on the severity of the emergency (ODV 2022a).

Table 6.2-1 Type of Worse-Case Event Casualty and Injury

High	Medium	Low
• Fatality; • Long-term health impact • Permanent disability • Multiple lost time injuries • Evacuation of a community • >25% attrition and inability to hire • Lost time injury with immediate life-threatening potential • Long-term disability	• Lost time injury without the possibility of death • Restricted work or short-term health impact • Evacuation of a job site/facility • 5-25% attrition	• Medical aid case • No evacuations; and • 1-5% attrition • Minor injury or illness • First aid or less required • No evacuations; or • Less than 5% attrition

BGM employs teams that have special training to respond to emergencies including first aid attendants and specialized firefighting personnel. BGM also has a mine rescue team on-site that has special training and expertise in responding to mine-site emergencies and coordinating an emergency response. If BGM's trained personnel do not have the capacity to respond to an emergency, local emergency services will be brought in to assist.

ODV also has specialized equipment to rapidly respond to emergency spills to prevent the spill from causing lasting harm. The Emergency Spill Response Kit contains:

- set of material safety data sheets
- dangerous goods initial emergency response guide
- set of (MFO) site plans and maps
- delineators and rope
- BGM spill report sheets
- note pad and writing tool
- investigation bag
- bags of floor dry
- spill pads
- spill booms
- scoop shovels
- long handle square shovels
- long handle spade shovels

- short handle flat shovels

Other specialized equipment that BGM has to prevent or respond to emergencies are:

- portable air horns
- smoke detectors
- fire blankets
- handheld radios
- flashlights
- fire extinguishers
- first aid kits

Worst-case events that have the potential to impact the community, the estimation of their occurrence and the emergency response is described in below in Table 6.2-2 (ODV 2022b).

Table 6.2-2 Worst-Case Scenarios, Estimated Occurrence, and BGM's Response

Worse-Case Event	Description	Estimate of occurring	Emergency Response
Fire	Major uncontrolled fire at the Mine Site or the QR Mill in an occupied building or in the underground portions of the mine at the Mine Site. In addition to danger to human life, an uncontrolled fire could include the release of fumes and dust	BGM has a number of controls in place that will prevent the likelihood of an uncontrolled fire from occurring. BGM has on-site fire fighters who are trained in how to use specialized emergency equipment such as fire extinguishers. Flammable substances are also in a safe storage space. Based on historical trends in the Province of BC, the likelihood of a fire is assessed as unlikely. Between 2013 and 2015, fires accounted for 6% of incident reports to the BC Ministry of Energy, Mines, and Low Carbon Innovation and none of these fires spread to the surrounding areas.	Although it is unlikely that a major uncontrolled fire would occur at the Mine Site or QR Mill, BGM is prepared to respond through their MERP. BGM has its own trained mine rescue and fire fighters on-site who can respond to extinguish a fire. However, if the BGM staff do not have the capacity to contain a fire, emergency services from the local community will be requested to help. If injuries do occur, BGM will reduce the stress placed on existing health services in the community by having comprehensive first aid facilities and qualified first aid attendants trained to handle major incidents on site. On site emergency medical vehicles will also be available to transport injured person who cannot receive the necessary medical care on-site to the nearest hospital.

Worse-Case Event	Description	Estimate of occurring	Emergency Response
Explosives Accident	Detonation of a fully stocked explosives magazine may be momentarily loud and may temporarily release smoke. A worst-case explosives accident could potentially kill or injure a worker.	Explosive accidents are rare (0- <5% chance of occurring) and adherence to the Explosive Management Plan reduces the likelihood that an incident would occur. The Explosives Management Plan was developed in collaboration with explosives experts. The objectives of the Explosives Management Plan are to: • Guide the safe and secure transportation, storage, and use of explosives required for the Project. • Minimize adverse environmental effects from the transportation, storage, and use of explosives. • Reduce nitrogen release to the receiving environment while sustaining an efficiently operating mine.	A mine rescue team is trained to handle major incidents, qualified first aid attendants, and a comprehensive first aid facility is available on-site to address an explosives accident and reduce pressures on local services that injuries resulting from an explosion.
Flood – Accidental discharge of sediment and metals from tailings management facility or waste rock stockpile.	Release of sediment and metals associated with tailings supernatant water. A worse-case accidental discharge could increase contaminants in the receiving environment, effecting drinking water and aquatic life.	Due to the existing mitigations to prevent the accidental discharge of sediment and metals from a tailings management facility or waste rock stockpile, it is unlikely.	The mine rescue team will coordinate the response with BGM, municipalities, and emergency response departments. If an incident (malfunction or accident) associated with the Project occurs that triggers the Project Emergency Response Plan, this plan will be implemented, including notification of appropriate authorities and deployment of trained personnel.

Worse-Case Event	Description	Estimate of occurring	Emergency Response
Spill – Hazardous materials release to land or water	Vehicle accidents, containment leaks or ruptures or poor storage and handling could result in a spill of a hazardous material. A spill may result in a road closure, which could temporarily affect transportation for the public, and emergency services.	Although a spill could occur, existing management plans that mitigate the potential for a spill reduce the likelihood. The effects caused by a spill would also be temporary. It is unlikely that a spill to the land or water would have an impact on human health, however, there could be effects to fish and wildlife.	As part of the Emergency Response Plans, there is a 24/7 notification system. BGM will notify municipalities and emergency response departments to ensure that the District and other members of the public are notified in a timely manner of an event. In addition to notifying the appropriate authorities, trained personnel will be deployed to contain and manage spills.
Vehicle or Equipment Accidents	BGM anticipate that there will be minor collisions on-site, however, the worst-case would be an accident involving bus transporting personnel during shift changes. This could lead to a temporary road closure and if the accident is severe, there could be severe injuries or fatalities, and pressure may be temporarily placed on the emergency services.	Due to the mitigation measures and management plans, it is very unlikely that there would be a serious vehicle or equipment accident. However, BGM anticipates that there will be minor collisions on-site, but they will not have an effect on the community.	If an accident occurs, the mine rescue team will coordinate a response with the municipalities and emergency response departments. As part of the Emergency Response Plans, there is a 24/7 notification system. BGM will notify municipalities and emergency response departments to ensure that the District and other members of the public are notified in a timely manner. In addition to notifying the appropriate authorities, trained personnel will be deployed. If injuries do occur, BGM will reduce the stress placed on existing health services in the community by having comprehensive first aid facilities and qualified first aid attendants trained to handle major incidents on site. On site emergency medical vehicles will also be available to transport injured person who cannot receive the necessary medical care on-site to the nearest hospital.

Worse-Case Event	Description	Estimate of occurring	Emergency Response
Failure of underground mine stability	Failure of underground mine stability would mean that there is a collapse. The worse-case scenario would result in injuries or fatalities. The community could be impacted if a collapse led to a temporary shut down and local workers were temporarily unemployed.	Due to considerable efforts to ensure the mine was built safely and continuous monitoring of mine stability will occur, it is very unlikely that there would be a mine collapse incident.	If an accident occurs, the mine rescue team will coordinate a response with the municipalities and emergency response departments. As part of the Emergency Response Plans, there is a 24/7 notification system. BGM will notify municipalities and emergency response departments to ensure that the District and other members of the public are notified in a timely manner. In addition to notifying the appropriate authorities, trained personnel will be deployed. If injuries do occur, BGM will reduce the stress placed on existing health services in the community by having comprehensive first aid facilities and qualified first aid attendants trained to handle major incidents on site. On site emergency medical vehicles will also be available to transport injured person who cannot receive the necessary medical care on-site to the nearest hospital.

6.3 Roles and Responsibilities

6.3.1 BGM

BGM HSE personnel are responsible for developing, reviewing, and administrating components of this CERP. HSE personnel will ensure that the CERP gets implemented and aligns with the MERP. BGM's key personnel will know the services and activities of different emergency response parties so that they can be called to assist if required. For example, BGM personnel may need additional medical assistance, staging locations, logistics, supplies, and traffic management to coordinate a joint emergency response. BGM is responsible for engaging and creating agreements with parties that may be called upon to assist in responding to an emergency should the emergency exceed the capacity of BGM to respond to.

BGM is responsible for notifying the District, Barkerville Historic Site, and Indigenous Nations if an incident on site has the potential to create an emergency situation that has the potential to harm the health and wellbeing of Wells residents, tourists, and Indigenous communities close the mine. BGM will consider how an emergency may impact community health and wellbeing or Indigenous Interests.

6.3.1.1 Incident Command System and Incident Command Team

BGM has an Incident Command (ICS) structure for the Project that describes the response procedures and preventative measures that are essential for effective and timely management of a mine emergency. The response facilities for BGM's ICS are described as follows (ODV 2022a):

1. On-Site Command Post (OSCP) manages all operations on-site related to the incident (except for public safety) that includes control and containment, monitoring to define hazard area, establishing roadblocks at the perimeter of hazard zone, and liaison with on-site government representative(s).
2. Incident Command Centre (ICC) manages overall incident support, provides support to the OSCP, and manages communication and sheltering/evacuation activities.
3. Emergency Operations Centre (EOC) provides support and advice to local response personnel.
4. Unified Command Centre/Mutual Aid involves unified decision-making process with other agencies or companies that have jurisdictional or functional responsibilities for the incident.

The subsections below describe the roles and responsibilities of BGM's key personnel for an Incident Command Team (ICT) (ODV 2022a).

24/7 First Point of Contact

The First Point of Contact receives notification from the field 24/7 and notifies Incident Commander and remains available to support Incident Commander throughout the incident.

Supervisor

The Supervisor ensures that an Incident Action Plan is carried out in the field and works with BGM ICT contractor personnel on-site to manage emergency response activities.

On-Scene Commander

The On-Scene Commander, appointed by and reporting to the Incident Commander, is responsible for direct management of all incidents, tactical activities, and priorities, and the safety and welfare of personnel in the Mine Operations section.

They are responsible for ensuring that all operational activities are carried out in a manner which is consistent with company policy and government regulations, considering the concerns of all affected agencies or individuals. Personnel in this position must be familiar with BGM operational and safety procedures.

Incident Commander

The Incident Commander is responsible for the overall management of incident activities including building a command structure that matches the organizational needs to achieve the tactical priorities determined to mitigate escalation of the incident and assist in recovery to normal operations. The Incident Commander oversees the incident response and remains in close communication with the Emergency Manager.

Logistics Lead

The Logistics Lead, appointed by and reporting to the Incident Commander, is responsible for acquiring personnel, equipment, facilities, supplies, and services to support emergency operations.

Planning Engineer

The Planning Engineer, appointed by and reporting to the Incident Commander, is responsible for the collection, display, and distribution of information in support of emergency operations.

The Planning Engineer is also responsible for analyzing and evaluating information related to the incident, including the status of resources, and planning for future events (Incident Action Plan). In more significant incidents, the Planning Engineer s also responsible for managing technical specialists.

Finance and Administration Coordinator

The Finance and Administration Coordinator provides emergency funding and ensures that proper authorizations and accounting controls are established for costs incurred because of the incident. For example:

- Recording time of personnel;
- Equipment and rental supply contracts;
- Compensation claims and records; and
- Collect cost information, provide cost estimates.

Environmental Coordinator

The Environmental Coordinator reports to the On-Scene Supervisor and is responsible for organizing site Environmental support staff and external support requirements for monitoring damage from incident/response activities. They will also work with the Communications Lead to

ensure all relevant ministries and organizations are updated, as well as stakeholders and officials are kept informed.

The Environmental Coordinator will also advise the On-Scene Supervisor regarding the impact of any emergency, which poses an immediate threat to the environment. Personnel filling this position should be familiar with Environmental standards, safe operating practices, and safety procedures related to emergency operations.

Communications Coordinator

The Communications Coordinator provides advice on contacts and relations in the region of the event. They work to facilitate actions or strategies the Incident Command Team recommends to the Communications Lead.

The Communication Lead might also be the Liaison Officer who is appointed by and reports to the Incident Commander and is responsible for notification of and communication with the local community government, regulatory agencies, and local and regional public authorities, as appropriate. This person may also act as a point of contact for assisting and cooperating with other non-governmental organization (NGO) agencies. Personnel filling this position should be familiar with regulatory/governmental departments and structure.

Safety Advisor

The Safety Advisor reports to the On-Scene Supervisor and is responsible to ensure the health and safety of emergency personnel and the safety of site operations. The Safety Advisor will also advise the On-Scene Supervisor about any potential to alter or suspend any emergency operation or activities, which pose an immediate threat to life and health.

For other activities that are considered unsafe, the Safety Advisor may recommend corrective actions to the On-Scene Supervisor. Personnel filling this position should be familiar with company health and safety procedures, safe operating practices, and safety procedures related to emergency operations.

Information Technology Coordinator

The Information Technology (IT) Coordinator, reporting to the Incident Commander and providing support to the Information Technology Lead, is responsible for providing IT support during emergency operations.

Scribe(s)

The Scribe appointed by and reporting to the Incident Commander and other positions as required, is responsible for keeping detailed logs of information in support of emergency operations. The Scribe(s) will normally be assigned to support the Incident Commander and/or the On-Scene Commander.

6.3.1.2 Emergency Management Team

BGM has an EMT in place to facilitate a coordinated response and recovery process by senior corporate management and staff to any incident or set of circumstances that have the potential to significantly damage the organization and its employees, operations, financial condition, or reputation. The EMT function is to assess both short-term and long-term impacts. The team's areas of responsibility include (ODV 2022a):

- Supporting the ICT.
- Managing corporate risk, impacts, and consequences of the incident.
- Notification of on-going communication with the Executive Lead/Emergency Management Team, as required.
- Managing key business issues and strategic implications because of the incident that include legal and insurance issues, financing arrangements, support to personnel, contractors, and their relatives, alternative marketing sources, business resumption planning, and technical/engineering and media relations support.

The subsections below describe the roles and responsibilities of BGM's key personnel for an EMT (ODV 2022a).

Emergency Manager

The Emergency Manager possesses the ultimate decision-making authority of the Emergency Management Team (EMT) and manages the corporate response. The Emergency Manager also reviews all tactical decisions of other operating members of the EMT.

Executive Lead

The Executive Lead is the person in charge. He or she will decide the extent and method of senior executive notification as required, notify, and provide briefing to the Executive Management Team (EMT), address Company policy issues as needed, approve major capital financial support as required, provide additional update briefings to Executive Team, as necessary, and provide advice and support to the Emergency Manager in his or her duties.

Communications Lead

The Communications Lead provides advice on dealings with all internal or external communications including media, investor, public/community, and employee communications. He or she may designate his or her alternate to be present at or perform any internal or external briefings. The Communications Lead will also be responsible for establishing/leading a Public Media Inquiry Room, as required.

Media Spokesperson

The Media Spokesperson provides advice, through the Communications Lead, on dealings with the media. He or she may designate his or her alternate to brief the press in some instances, to prevent the accidental revelation of sensitive information to which he or she is privy.

Health and Safety Lead

The Health and Safety Lead is responsible for accessing resources (internal and external) to provide timely and accurate analyses of environmental, health, and safety issues.

Finance and Business Lead

The Finance/Business Lead is responsible for finance and other administrative issues. In the case of security-related incidents, he or she is responsible for liaising with banking institutions.

Legal Advisor

The Legal Advisor works to shield the Company from legal problems in the location which the emergency has taken place. They also are responsible for keeping a chronological record of the EMT's actions.

Logistics Lead

The Logistics Lead, appointed by and reporting to the Emergency Manager, is responsible for supporting ICT Logistics Coordinator in acquiring equipment, facilities, supplies, and services to support emergency operations and as requested by the Emergency Manager.

Information Technology Lead

The Information Technology (IT) Lead is responsible for providing IT support and resources to the EMT throughout any emergency.

Scribe

The Scribe is responsible for keeping detailed sequential log of information in support of emergency operations. The Scribe will normally be assigned to support the Emergency Management Team.

6.3.2 Local Government and District Emergency Response Parties

In the event that a mine site emergency has the potential to impact Wells or the Barkerville Historic Site, BGM's communication lead will notify the District's Emergency Coordinator to coordinate an emergency response for the community. BGM will also notify Barkerville Historical Site.

The Project has a toll-free number the public can call to notify the Mine of an emergency that may impact the Project. Calling the toll-free number will connect the caller immediately to a Project

manager during business hours. After regular business the hours, the toll-free number will be managed by staff from the Community Relations team.

District of Wells

Under Emergency Measures Bylaw #10, the District of Municipal Council (Council) must establish and maintain an emergency management organization to provide a comprehensive management program to prepare for, respond to, and recovery from emergencies and disasters. The District Emergency Coordinator, appointed by the Council as head of the Wells Emergency Management Organization, facilitates emergency preparedness, response, and recovery measure. The Wells Emergency Executive Committee is composed of a Council member, the Principal Administrative Officer of the municipality, Emergency Coordinator, heads of selected functional departments or their designates, and other members the Council may determine (District of Wells 1999).

The roles and responsibilities of District's Emergency Executive Committee are (District of Wells 1999):

- Prepare and present to the Council for annual review and approval a list of hazards and relative risk of occurrence; and
- Declare a state of local emergency.

Wells Volunteer Fire Brigade

The Wells Volunteer Fire Brigade (WVFB) is a small, rural, volunteer brigade assembled of town residents who train to and operate at the Exterior Operations Level in accordance with the Provincial Office of the Fire Commissioner. The WVFB serves the District of Wells within its jurisdictional boundaries and provides additional suppression support to Barkerville Historic Town & Park and select CRD properties through formal aid agreement. The WVFB has been providing the region of Wells-Barkerville with fire awareness, protection and suppression since 1934.

Exterior Operations are designed principally for rural, residential fire suppression and the scope of the WVFB does not involve medical response, highway response, highway rescue, high-angle rescue, or any interior structure response. However, the WVFB coordinates with and may support the RCMP, BCES, or BCWS by specific special request through formal channels of authority.

In the future, the WVFB may be able to increase its scope and operations level with significant financial investment in training resources, equipment, maintenance, infrastructure, and a substantially increased volunteer base.

Regarding coverage of BGM assets, the WVFB provides service to the BGM community relations office, approximately eight BGM-owned community residences, and the BGM-owned former Hubs Motel as they are all located within the DOW jurisdictional boundaries and contribute to municipal taxes.

As of this time, the WVFB does not have an aid agreement with BGM to service any properties outside of jurisdiction. Therefore, the WVFB does not service the BGM staff camp at the Ballarat site nor does the WVFB service BGM assets at the Bonanza Ledge site. The WVFB does not service the offices across the Lowhee River bridge (outside of special request as they are mine site private property).

City of Quesnel

The City of Quesnel, fire police, other local emergency personnel, and support agencies have an emergency plan that can be activated for large-scale emergencies and disasters. Quesnel opens its Emergency Operations Centre (EOC) when an emergency occurs. The EOC activation levels range from one (small event or threat) to three (major event) and trained staff work in the EOC to respond to these emergencies (City of Quesnel 2024a).

The City of Quesnel has an active volunteer Emergency Social Services (ESS) Program. The primary responsibilities of ESS are registration and inquiry for the purposes of family reunification, referrals for food clothing, and lodging, communication services, and personal services. In Quesnel, the Arts and Recreation Centre is designated as the main reception centre to receive appropriate assistance, if residents were displaced from their homes and families (City of Quesnel 2024b).

Quesnel Volunteer Fire Department

The Quesnel Volunteer Fire Department provides services from three fire stations to a service area that includes the City of Quesnel, Red Bluff, and Quesnel District Area. Firefighters are dispatched by a regional 9-1-1 system in Prince George. The department employs four full-time staff and approximately 40 volunteer members. The full-time staff support, train and equip an effective volunteer fire service and to provide inspection and education services to the citizens of Quesnel (City of Quesnel 2024c).

Cariboo Regional District Emergency Program Services

If required BGM will seek the assistance of the Cariboo Regional District (CRD) to ensure a coordinated response should the emergency become regional in nature. The CRD is responsible for supporting (CRD 2022a):

1. Emergency Preparedness

- Residents of the CRD can register for Emergency Notification and can follow the CRD Emergency Operations Facebook page for updates and preparedness tips.
- If residents are experiencing an emergency related to a flood or slide, they can contact 1-800-665-1636.

2. Emergency Response

   - The CRD has an interactive ArcGIS map of all current evacuation orders and alerts.

3. Disaster Recovery and Assistance

   - The CRD provided a summary link of financial resources, assistance, and contact information for residents, business, and property owners after a disaster.
   - The CRD provided a guide to re-entry after an evacuation.

4. Search and Rescue

   - Volunteers with the Central Cariboo Search and Rescue Unit assist the RCMP and BC Ambulance Services with responding to responding to motor vehicle accidents; searching for missing persons; locating missing aircraft; assisting at disaster scenes; and providing back up to agencies providing emergency support for disaster victims.
   - Operations are based out of Williams Lake and may involve administrative/clerical, air search, auto extrication, communications, flat ice rescue, land search, and water rescue.

5. Volunteer Fire Departments

   - The CRD oversees 14 volunteer fire departments, and all are recognized by the Fire Underwriters Survey for insurance purposes.
   - The CRD has mutual aid agreements with fire departments, municipalities, and several First Nations within the region. The agreements allow equipment and manpower from any of the departments to assist neighbouring services in the event of large fires or multiple incidents happening at the same time.

6.3.2.1 Cariboo Regional District Emergency Notification System

The Cariboo Chilcotin Emergency Notification Systems serves the CRD, 100 Mile House, Quesnel, Wells, and Williams Lake. This system is managed by each local government for their respective areas and allows residents to opt-in to receive notifications via phone calls, text messaging and email (CRD 2022b).

This system will be used to notify residents about emergency, significant, and time-sensitive emergency events affecting the area. The local Emergency Manager will send notifications regarding (CRD 2019):

- Critical emergency notifications; and

- Evacuations and other emergency events.

6.3.3 Health Emergency Management BC

BGM will support engagement with Health Emergency Management BC during an emergency by providing early notification as part of the communication protocols of the CERP.

Health Emergency BC (HEMBC) is a program of the Provincial Health Services Authority (PHSA) that provides emergency management leadership and support to the BC health system, including all regional health authorities, PHSA, and the Ministry of Health (PHSA 2024).

HEMBC has three primary program areas relevant to BGM's Community Emergency Response and include (PHSA 2024):

1. Health authority emergency management and fire safety support;
2. Provincial psychosocial services such as the Provincial Overdose Mobile Response Team and the Disaster Psychosocial Services Program;
3. Provincial coordination and operations support for the activation of provincial response structures, multi-jurisdictional alignment, and deployment of emergency medical equipment, supplies, and temporary facilities.

The purpose of HEMBC is to provide expertise, education, tools, and support specifically for the BC Health Sector to effectively mitigate, prepare for, respond to, and recover from impacts of emergency events, while ensuring the continuity of health services. There is team for HEMBC for each of the regional health authorities in BC with the HEMBC-North specifically for Northern Health (NH 2022).

6.3.3.1 Roles and Responsibility

HEMBC

The main roles and responsibilities of the HEMBC-North are to:

- Maintain a 24-hour emergency/on-call contact number for notification and activation of the health system in Northern BC; and
- Notify/activate the appropriate Northern Health Programs (i.e., public health, acute care, etc.) based on the nature of the emergency event.

Northern Health

During a major emergency/disaster, Northern Health will provide health care services and activate its emergency response management plan(s). The roles and responsibilities of Northern Health are split between preparedness (pre-event) and response:

Preparedness (Pre-event)

- Participate with industry, local authority, and other partners in the development of their Emergency Response Plans as it relates to health authorities' roles and responsibilities; and
- Participate in stakeholder training and exercises associated with activation of an Emergency Response Plan, in which Northern Health or HEMBC-North have a role and responsibility (as resources allow).

6.4 Stakeholders Identification, Communication Protocols, and Health Emergency Management BC

Contact information for key partners is identified in Appendix J of the Community Effects Plan and include information for:

- Local Medical and Emergency Services,
- Local Government and Partners,
- Provincial Partners,
- Participating Indigenous nations.

6.4.1 Communication Protocols

BGM has internal communication protocols in the Mine Emergency Response Plan (ODV 2022a) in the event of an emergency, disaster, or crisis that has the potential to impact Wells. BGM's Communications Lead from the Emergency Management Team will liaise with the community during and after a mine emergency.

The type of information shared during the liaison includes:

- Nature of the emergency,
- Extent of the emergency,
- The protections being put in place,
- The status of the emergency response,
- Actions taken to resolve the situation,
- Actions the community should take to stay safe,
- Steps taken to address concerns,
- Steps the team will take to prevent similar emergencies in future,
- Contact details for sources of more information.

6.5 Emergency Service Limitations

Existing emergency services serving Wells is detailed in *section 6.3.2 Local Government and District Emergency Services*.

Information provided in the Socio-Economic Baseline Study for the Project's EA indicated that there are existing limitations for emergency services in Wells. For example, when BC Emergency Health Services is called to an existing BGM site, they must be escorted at all times and cannot work underground. A person who is injured underground would have to be brought to the portal to receive emergency health services. Additionally, if BGM uses their emergency vehicle to transport someone to Quesnel, they will need to shut down their operations since they would no longer have a component of their emergency response on-site and transport by BC Emergency Health Service is preferred. BC Emergency Health Services cannot have a mutual aid agreement with BGM because their standards do not align (WSP 2021).

Emergency responder staff indicated that they experience challenges recruiting and retaining staff in northern and remote communities such as Wells. The current staffing model presents challenges for areas with low call volumes as it does not provide financial stability for people if this is their only source of income. BC EHS would like there to be eight people in the area who could be called on, as needed (WSP 2021).

In addition to staffing challenges, the ambulance service serving Wells also faces challenges related to infrastructure issues (e.g., water restrictions in the community can make washing the outside of the ambulance challenging) (WSP 2021).

Considering the capacity challenges faced by emergency services serving Wells, a mine-site emergency that results in more than a few injuries requiring hospital services or other emergency services has the potential to create a considerable burden on the existing services that exceeds their capacity.

On February 6, 2024, BGM participated in a meeting with the District, Emergency Management BC, Ministers, and several technical experts to discuss and update the emergency response plans, including evacuation procedures. An evaluation by an independent qualified person of the emergency service limitations for Wells and for the Project workforce will be conducted following the discussion on February 6, 2024, and subsequent updates and revisions to the emergency preparedness plan are complete.

6.6 Evacuation Procedures

6.6.1 Evacuation Procedures for the Community and Project's Workforce

Emergency preparedness is a priority for the District because Wells experienced two states of emergency in 2023. Fortunately, Wells is a tight knit community whose residents are known for taking care of each other and supporting each other through an emergency. Wells residents are

familiar with two evacuation routes out of the community, one being Highway 26 (pers. comm., 2024).

Issuing evacuation orders in the CRD is the responsibility of local governments. When the population is determined to be at imminent risk (considering time of day, weather forecasts, type of risk and time required to evacuate and secure an area), local authorities issue an evacuation order and people must leave the area immediately. Local police or RCMP enforce evacuation orders. Entry permits allow access for residents of evacuated areas and are only issued for very specific reasons. When residents leave, they should not count on being able to return (CRD 2022c).

Should there be an emergency event that requires both the community and BGM workers to evacuate from the site, the Incident Commander will be responsible for communicating with the local authorities including the RCMP and Emergency Management BC who will support the management of an evacuation. The Incident Commander will also be responsible for coordinating offsite resources such as extra bussing, hotels, or flights to remove workers from the site.

On February 6, 2024, BGM participated a meeting with the District, Emergency Management BC, Ministers, and several technical experts to discuss and update the emergency response plans, including evacuation procedures. An evaluation by an independent qualified person of the evacuation procedures for Wells and for the Project workforce will be conducted following the discussion on February 6, 2024, and subsequent updates to the plan.

6.7 Additional Health Impact Assessment Studies

BGM commits to conducting additional health impact studies (or human health risk assessments) for Project-related incidents that exceed thresholds for contaminants that negatively impact human health. Additional health impact studies will inform appropriate health and social service responses. BGM is also in the process of developing a Human Health Monitoring and Management Plan as requested under Condition 19 of the EAC for the Project (EAO 2023).

6.8 Mitigation Measures

This CERP provides details on how BGM plans to mitigate community concerns BGM's emergency response to the District of Well and the Barkerville Historic Site. BGM has engaged in comprehensive emergency planning which is detailed in their Mine Emergency Response Plan and their Site-Specific Emergency Plans (ODV 2022a, ODV 2022b). Table 6.8-1 summarizes the communities' concerns related to BGM's community emergency response and associated evacuation procedures and BGM's response.

Table 6.8-1 BGM's Response and Plan to Address Community Concerns Related to Emergencies

Community Concern	Mitigation/BGM Response
A serious mine-site emergency may overwhelm existing emergency services.	• If a serious accident occurs, the mine rescue team will coordinate a response with the municipalities and emergency response departments. • Trained personnel will be deployed on-site to respond. Additional assistance from local emergency services will be requested if the emergency exceeds the personnel's capacity to respond. • If injuries do occur, BGM will reduce the stress placed on existing health services in the community by having comprehensive first aid facilities and qualified first aid attendants trained to handle major incidents on site. On site emergency medical vehicles will also be available to transport injured person who cannot receive the necessary medical care on-site to the nearest hospital.
Transportation routes are limited within and in proximity of the Wells when residents need to evacuate the community during a mine-related emergency. Highway 26 is the only major public transportation corridor.	• A new highway bypass will be built west of Wells from Highway 26 to connect to the Main Access Road. During an emergency evacuation, the bypass will allow traffic to exit the highway. • The existing helipad is being upgraded to serve as a medivac and commuter helicopters. • There are many Forest Service Roads (FSRs) that are well maintained and in good condition. Although FSRs are not maintained to the same standards of public highways, these roads can be used as an evacuation option for people that have experience with backcountry driving and off-roading. • The Unified Command Centre/Mutual Aid will liaise with the Ministry of Transportation and Infrastructure to provide a coordinated traffic evacuation plan from the District.
Collaboration between BGM and the District on a joint emergency preparedness plan with clear roles and protocols for notifications and other communication.	• As part of the Project's Emergency Response Plans, there is a 24/7 notification system. If triggered, BGM will notify municipalities and emergency response departments to ensure that the District and other members of the public are notified in a timely manner. • BGM, the District, Barkerville Historic Site, Ministers, and many technical experts are collaborating to develop an emergency preparedness and response plan. • BGM has clear roles and responsibilities, and communication protocols outlined in their Mine Emergency Response Plan (Appendix A). The Mine Rescue Team, Incident Commander, and Communications Lead are all responsible for managing communications and notifications with stakeholders, including the District. • BGM has an individual available on site 24/7 that can be notified when an emergency occurs. • BGM has a toll-free number that any member of the public can call to report an emergency related to the mine. • BGM will create agreements with local governments and service providers to facilitate a joint emergency response.

BGM will work with a qualified occupation health and safety assessor to identify additional risks and hazards related to the Project and the community. The occupational health and safety assessor will also be tasked with evaluating BGM's community emergency response and evacuation procedures.

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APPENDIX C TRAFFIC CONTROL PLAN

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

TRAFFIC CONTROL PLAN

May 2025



OSISKO DEVELOPMENT

Cariboo Gold Project

PO Box 250
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Wells, BC V0K 2R0

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Appendix B ODV Road Use Policy

List of Project Specific Attachments

Attachment 1: Mine Site Site-Specific Traffic Control

Attachment 2: Quesnel River Mill Site Site-Specific Traffic Control

REVISION HISTORY

Rev. No.	Date	Author	Description
A	February 22, 2023	Grace Mohan	Draft for internal PM review
A	February 26, 2023	Nicole Tennant	PM review draft to update with the Cariboo Gold Project
A	March 2, 2023	Grace Mohan	Addressed PM review
A	March 3, 2023	Grace Mohan	Final review before it goes to ODV
A	March 4, 2023	Paul Ratte	ODV review of draft Traffic Plan and addressing placeholders/edit requests for ODV.
B	March 8, 2023	Nicole Tennant	Address ODV comments and cleaned up
C	February 8, 2024	Alyssia Jebb	Updates to meet EAC Mitigations
D	May 7, 2025	Paula Salter	Updates to meet EAO requests

ABBREVIATIONS

Terminology used in his document has been defined where it is first used, while the following list has been presented to assist readers that choose to review only portions of the document.

Abbreviation	Description
%	Percent
BC	British Columbia
CRD	Cariboo Regional District
EAC	Environmental Assessment Certificate
EMS	Environmental Management System
km	kilometres
m	metre(s)
ODV	Osisko Development Corp.
ore	mineralized material
QR	Quesnel River
RACI	Responsible/Approve/Consults/Informed
t	Tonnes
the Code	Health, Safety and Reclamation Code for Mines in BC (EMLI 2022)
the Project	Cariboo Gold Project
WTP	Wastewater Treatment Plan

1. INTRODUCTION

1.1 Purpose and Overview

The purpose of the Traffic Control Plan is to provide the expectations of onsite vehicle traffic, traffic entering and exiting the Cariboo Gold Project (the Project) sites, and to guide how this traffic will be managed. The Project is owned and operated by Osisko Development Corp. (ODV) who will be responsible for the implementation of this plan at the Project location.

This plan is a component of the Environmental Management System (EMS) and will be reviewed periodically and revised as required. Site-specific management for the Project applicable to the plan are provided in the relevant attachments by site name, under the corresponding section that aligns directly with this plan. Included in each attachment is a description of each applicable access and site roads, their location, and their use, as well as figures presenting road and gate locations. Attachment 1 to this Traffic Control Plan is for the Mine Site site-specific additional information and Attachment 2 to this plan is Quesnel River (QR) Mill site specific information.

1.2 Project Overview

Osisko Development Corp. (ODV; the Proponent) is proposing to develop the Cariboo Gold Project (the Project), an underground gold mine with a maximum production capacity of 4,900 tonnes per day of mineralized material (ore) located in the District of Wells and Cariboo Regional District (CRD), British Columbia (BC). The Project includes the following sites and key components (Figure 1.2-1):

- **Mine Site:**
  - Mine Site Complex:
    - Underground extraction infrastructure, Valley Portal, Conveyor, and crushing facility;
    - Waste management facilities;
    - Water supply and management structures and facilities;
    - A Services Building containing a Surface Concentrator, Paste Backfill Plant, and other related infrastructure;
    - Electrical Substation (adjacent to the Services Building);
    - Camp (Worker Accommodation);
    - Water Treatment Plant (WTP); and
    - Underground Waste Haulage Route.
  - Cow Portal located along A Road between the Mine Site Complex and the Bonanza Ledge Site, and associated underground extraction infrastructure;

- Bonanza Ledge Site:
  - A Waste Rock Storage Facility and associated water management structures (including sumps, and ponds) and a new WTP;
  - Overburden Stockpiles;
  - Temporary Ore Stockpile;
  - Power plant; and
  - Ancillary infrastructure (e.g., Crusher, Screening Plant, Ore Sorter, Mine Offices, Garage).
- Access roads and infrastructure:
  - Main Access Road, including a Highway 26 bypass and Willow River Bridge;
  - Camp Access Road at the Mine Site Complex;
  - A Road between the Bonanza Ledge Site and Highway 26 access;
  - C Road (Emergency Waste Rock Storage Facility Access Road) between the Bonanza Ledge Site and the Mine Site Complex used as emergency and maintenance use;
  - Existing B Road (Fibre Optic Line Access Road) used for maintenance access only for the Fibre Optic Line between the Cow Portal and the Mine Site Complex;
  - Ventilation Raise Access Road to access the Shaft and Mosquito Ventilation Raises; and
  - Underground Waste Haulage Route connecting underground works between the Mine Site Complex and Cow Portal.

- **Quesnel River Mill (QR Mill):**
  - ODV's existing and associated infrastructure within the Project Surface Footprint, including use of the Worker Accommodation and upgrades to the existing QR Mill, water supply and management structures and facilities, access roads, concentrate storage, new WTP, and construction of a Tailings Dewatering Plant and a Filtered Stack Tailings storage facility.
- **Transportation Routes**:
  - Transportation of concentrate between the Mine Site and the QR Mill site along 56 kilometres (km) of Highway 26 and 59 km of the 500 Nyland Lake Forest Service Road, a forest service road maintained by West Fraser Mills Ltd.;
  - Transportation of workers, goods, and service providers to Wells from Quesnel, BC, along Highway 26. A new highway bypass will be built west of Wells from Highway 26 to connect to the Main Access Road to the Mine Site Complex to enable traffic to exit the highway before the community; and

- Transportation of workers and goods to the QR Mill from Quesnel along Highway 26 and the 500 Nyland Lake Road, and workers along the Quesnel Hydraulic Road to 2700 Road and the 500 Nyland Lake Road.

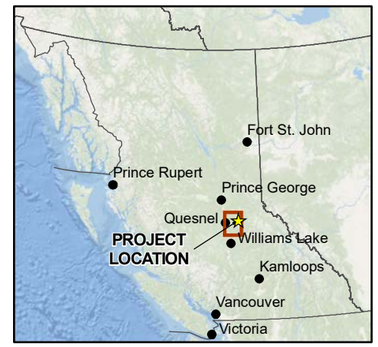
- **Transmission Line:** a new 69 kilovolt transmission line, 69.3 km in length, from Barlow Substation, near Quesnel to the Mine Site that follows a corridor north of Highway 26 along forest service roads or other disturbance areas, where possible.

MINE SITE

QR MILL

LEGEND

- POPULATED COMMUNITY
- PROJECT INFRASTRUCTURE LOCATION
- TEMPORARY EARLY CONSTRUCTION CAMP
- ROAD
- HIGHWAY
- WATERCOURSE
- WATERBODY
- PARKS/PROTECTED AREA
- BARKERVILLE HISTORIC TOWN AND PARK
- TRANSPORTATION ROUTE
- TRANSPORTATION ROUTE (MINE SITE ACCESS ROADS)
- TRANSMISSION LINE ROUTE
- SURFACE DISTURBANCE AREA



REFERENCE(S)

1.WATER FEATURES, TRANSPORTATION FEATURES OBTAINED FROM CANVEC © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
2. CITIES/TOWNS, INDIAN RESERVES, FEDERAL LANDS AND PARK/PROTECTED AREAS OBTAINED FROM BC MINISTRY OF FORESTS, LANDS NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
3. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

NAD83 CSRS
UTM Zone 10N

0 5 10 15
1:400,000 KILOMETRES

CARIBOO GOLD PROJECT

PROJECT LOCATION AND ACCESS

REV.	DESCRIPTION	DATE	INITIALS
A		2/24/2023	MY

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	1.2-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

Y:\GIS\Projects\2019\151_11330_70_BGM_Cariboo_Gold\Mapping\01_general\17_FMP\01-17-001_Project_Location_2020_0224.mxd

1.3 Objectives

The objectives of the Traffic Control Plan are to describe processes and procedures to:

- Control and manage access to and within the Project sites;
- Minimize risk of accidents and incidents from the Project activities involving vehicles and equipment to ODV employees, contractors, and the public; and
- Minimize adverse effects on the environment and wildlife.

1.4 Scope

This plan provides management procedures that will be implemented and adhered to along the Transportation Routes to, from, and at the Project sites, including protocols that road users will follow. This plan applies to all phases of the Project and will help ensure that existing site access is operated and maintained so that the safety of road users is maximized, access to the Project site is controlled, and adverse effects on the environment and wildlife are minimized.

2. ROLES AND RESPONSIBILITIES

2.1 Responsible/Approve/Consults/Informed

The RACI matrix is a responsibility assignment chart that maps tasks, milestone or key decision involved in completing a project and assigns which roles are *Responsible* for each action item, which personnel are required for *Approval*, and, where appropriate, who needs to be *Consulted* or *Informed*. The acronym RACI stands for the four roles that ODV personnel play at the Project sites.

Table 2.1-1 RACI (Responsible/Approve/Consults/Informed) Regarding the Contents of this Plan

	Mine Manager	Environmental Manager	Work Supervisors	All Employees
Reviews, Amendments to the Plan	A, C, I, R	C, I	C, I	I

R=Responsible; A = Approval; C= Consulted; I = Informed. See EMS for further explanation.

2.2 Identification of Roles and Responsibilities

Mine Manager: The Mine Manager (or designate) will ensure that the Project roads are inspected, maintained, and safe to travel on at all times of the year. If the road is deemed unsafe, the road will be blocked until repairs can be made.

The Mine Manager will ensure that all site vehicles carry appropriate license, insurance, and registration.

Environmental Manager: The Environmental Manager (or designate) will be responsible for the environmental monitoring of all ODV controlled roads and implement Standard Operating Procedures (SOPs) as it relates to wildlife.

Work Supervisors/Employee/Contractor: All personnel (employees and contractors) driving on any company properties or public roads will understand and follow this Traffic Control Plan. All personnel will follow all applicable provincial transportation rules and regulations.

All vehicle operators will have a valid Driver's License appropriate for the vehicle under their operation when travelling outside of mine property and vehicles will have valid insurance.

ODV does not maintain the highway. Regular highway travel rules apply.

2.3 Training

ODV requires that drivers using the roads to and from site have the proper safety training for the vehicle they are operating.

3. LEGISLATION AND STANDARDS

For travel on public roads/highways, ODV employees and contractors will observe BC traffic regulations, as per the *Transportation Act* (2004) including speed limits.

For travel on Forest Service Roads, ODV employees and its contractors will observe BC regulations, as per Forest Service Road Use Regulation (2004) of the *Forest and Range Practices Act* (2002).

For mining projects with traffic control, the Health, Safety and Reclamation Code for Mines in British Columbia (the Code; BC EMLI 2022) applies as well. The Code specifies traffic control requirements as defined in the section below:

> ***6.8.3*** *The manager shall prepare traffic control procedures, showing the maximum allowable speeds for the vehicles in use, rules for passing, "stop" and "yield rule", priority rules for various vehicles, rules for night operation, maximum operating grades, emergency run-off protection, shoulder barriers, and any other information that may be required to ensure the safe operation of all types of vehicles on the mine site.*

Certificate and permit conditions applicable to vehicle and traffic management for the Project will be known, tracked, and adhered to as applicable to all the Project certificates and permits.

4. ENVIRONMENTAL PROTECTION AND MANAGEMENT

See the site-specific attachments for additional information, in addition to those measures outlined in this plan.

4.1 Environmental Assessment Mitigations

Project-specific mitigations that will, and must, be applied as committed to in the Project's Environmental Assessment Certificate (EAC) Application submitted in October 2022 (ODV 2022), include those listed in Appendix A of this Project Traffic Control Plan. Mitigation ID's used in the EAC Application are included for reference, along with what phases and components the mitigations apply to.

4.2 Traffic and Vehicle Protocols

4.2.1 Maximum Allowable Speeds

Refer to the ODV Road Use Policy (Appendix B) for maximum allowable speeds. The maximum allowable speeds (40 km/h on company owned and maintained roads) are conditional depending on road, weather, and traffic conditions. Examples of when reduced speeds of 25 km/h will be followed when there is more than 2 mm of rain per hour, there is accumulation of 5 cm or more unplowed snow, or temperatures are less than 5°C. These thresholds were selected for the following reasons:

- There is a risk of hydroplaning with 2.5 mm or more water on road surfaces (Bridgestone 2021).
- British Columbia guidelines require snow removal for an accumulation of 5 cm or more snow (BC Shared Services 2025).
- Ice may form on road surfaces when temperatures fall below 5°C (Road Safety at Work N.D.).

Employees will be informed of driving expectations during their employee orientation.

4.2.2 Rules for Passing

There is a NO same direction passing rule when both vehicles are in motion on haul roads within the Project Mine Site.

Passing of another vehicle is allowed only when the overtaking vehicle makes radio contact with the vehicle to be overtaken and the drivers jointly agree that it is safe to pass.

4.2.3 Traffic Patterns and Signage

All traffic on the Project site is right-hand drive.

Signage will be posted at intersections, active portal entrances, one-way traffic situations, and for directions to site infrastructure locations. Signage will include speed limits, stop signs, stop sign ahead signs, yield signs, junction ahead, and other appropriate signs as needed. Truck crossing signs will be added to the junction of any site access road and highway. Signs will be posted in clear view for drivers to follow.

All drivers will use the “Back-in” or “Drive Through” protocol when parking their vehicle or bringing their vehicles to a stop for longer than 5 minutes. This is so that the first direction of travel is forward after parking or when initiating movement of a vehicle. Employees will be informed of expectations related to parking protocols during their employee orientation.

Additional site-specific traffic pattern and signage information is provided in Attachments to this plan, by site name, under the corresponding section of this plan.

4.2.4 Priority Vehicles Rules

The order of priority, from highest to lowest, of vehicle right-of-way is:

1. Emergency response vehicles,
2. Crew haul vehicles,
3. Trucks transporting dangerous goods (explosives, chemical reagents, etc.);
4. Loaded Haul trucks and delivery vehicles,
5. Empty haul trucks and delivery vehicles,
6. Heavy Equipment, and
7. All other vehicles.

Wildlife always have the right-of-way and vehicle traffic may pass when safe to do so.

4.2.5 Rules for Night Operation

All site vehicles will travel with their daytime running lights or low beam lights on at all times.

High beam lights are to be used at night when possible. High beams are not to be used within 60 metres (m) of following a vehicle or within 150 m of an approaching vehicle.

4.2.6 Maximum Operating Grade

Maximum operating road grade is 15 percent (%) with grades up to 20% allowable for short sections of road.

Road grades exceeding 5% will have runaway lanes or roadside barriers where conditions/risk warrant (see Section 4.2.7 of this plan for emergency run-off protections).

4.2.7 Emergency Run-off Protection

On roadways where the grade exceeds 5% ODV had installed and maintained runaway lanes or roadside barriers where conditions/risk warranted. Site-specific runways are provided in the site-specific attachments to this Project Traffic Control Plan. Safety berms on various site roads were also be installed on the downslope side of the haul roads to reduce the risk of run-off-road incidents.

4.2.8 Vehicle Visibility and Radios

All ODV site-based vehicles will have a visibly marked unit number for identification and tracking.

All light duty site vehicles (including snowmobiles and All Terrain Vehicles) will be equipped with a buggy whip and a beacon at the top. Buggy whips must be secured in truck beds and beacon lights turned off when not travelling on ODV controlled roads.

All site vehicles will be equipped with two-way radios. Individual radio frequencies will be assigned to respective operating units, though all two-way radios will be able to access every frequency on the Project sites. When travelling on company owned roads and special use roads used by the company, vehicles are required to call their location at set intervals as described by the signage once entering the road. Refer to ODV's Road Use Policy (Appendix B) for radio use requirements. Appendices to site-specific attachments are provided with the most current radio frequencies by road.

4.2.9 Shoulder Barriers

Shoulder barriers will be located and maintained along the edge of roads wherever a drop-off greater than 3 m exists. The barriers will be 1.2 m tall (at least ¾ of the height of the largest tire on any vehicle travelling on the road of the design vehicle).

Berms and meeting points (where vehicles can park to cross each other) are constructed as necessary so that the access roads are safe to use in all weather conditions.

The Project road maintenance will conform to road snow clearing requirements for wildlife management (e.g., road pullouts at regular intervals as these can provide refuge for wildlife caught along the road corridor) at the discretion of the Mine Manager. The Mine Manager may direct road maintenance crews to reduce snowbanks to a height of less than 1 m along roadways and provide wildlife crossing points in the ploughed snowbanks at regular intervals (e.g., every 500 m) along roadways (see the Project's Wildlife Management Plan).

4.3 Vehicle Movement and Traffic Estimates

4.3.1 Movement of Vehicles and Equipment

The frequency and movement patterns of vehicles and equipment associated with the Project is required to implement this plan. This information is dependent on site-specific activities and is provided in the associated attachments to this plan, by site name (see attachments by site name). The range of vehicles and equipment on the Project site include underground equipment, highway rated transport/haul trucks, front end loader, excavator, backhoe, maintenance vehicles, pickup trucks, dozers, graders, excavators, and other auxiliary equipment required to run the mine or mill.

The proposed routes to and from the Project sites will be primarily used by employees, contractors, and transport trucks. The transport trucks to be used to haul concentrate are regular dump truck and trailer combinations capable of hauling approximately 25 to 40 tonnes per load. There are no load restrictions for any road associated with the Project, except for Highway 26 where maximum axle weight is specified by the ministry of transportation dependent on seasonal conditions.

4.3.2 Total Traffic Estimates

The total traffic estimates associated with the Project is estimated and important to know for implementing this plan. This information is dependent on site-specific activities and is provided in the associated attachments to this plan, by site name (see attachment by site name). A summary of the estimated range in the number of round trips per day for ore concentrate haul transport truck traffic, non-ore haul traffic, and total traffic, for the Project Construction, Operations, and Closure Phases will be provided in a table format in the corresponding “Total Traffic Estimates” section of the site-specific attachments, as applicable.

4.3.3 Traffic Frequency

The vehicle traffic associated with the Project is estimated by vehicle type and the number of approximate round trips per day. This information is dependent on site-specific activities and is provided in the associated attachments to this plan, by site name.

4.4 Road and Access Maintenance

Project service roads will be maintained year-round, and maintenance of all the Project roads will be carried out as needed. The following outlines important measures and applicable information:

- The Project service road will be graded when ruts or potholes begin forming or rock spills occur.
- With prior reference to the ODV Metal leaching and Acid Rock Drainage Management Plan, non potentially acid generating waste rock of suitable size located on site, or delivered

material, will be used to smooth the roads on company property and fill any potholes that develop.

- Ditches and culverts will be regularly checked and cleared as necessary to maintain adequate drainage.
- Any spills from vehicles will be cleaned promptly, and reported to respective agencies if applicable, to reduce the chance of groundwater contamination.
- Contracted transport trucks will be instructed to use their load covers to reduce dust and the chance of ore spillage.
- Vehicles are to be inspected and maintained prior to using the Project access roads.
- Gates at the entrance to the Project site will be maintained; gates will be locked when not operating. Figures showing gate locations are provided in the site-specific attachments to this plan.
- Site maps will be readily accessible to all site employees, contractors, and visitors.
- Maintenance equipment such as graders may be required more frequently in certain months, especially after heavy snowfall and rainfall.
- Periodically inspecting and maintaining all roads being used will be carried out through operations.
- After operations cease, road access will be maintained for closure and monitoring activities to take place:
    - The width of the road at closure may be reduced to only allow pickup trucks or smaller vehicle traffic; and
    - Road deactivation and closure is discussed in greater detail in the Reclamation and Closure Plan.

5. MONITORING

ODV will conduct annual inspections of compliance and effectiveness of traffic control measures and implement adaptive management strategies as needed if traffic control issues are identified that violate the traffic control measures. As well, ODV will be monitoring for the effectiveness of dust control mitigations relating to Project traffic on roads adjacent to waterways, as part of the Waste (Refuse and Emissions) Management Plan (which includes a Fugitive Dust Control Plan).

6. REPORTING AND RECORDKEEPING

6.1 Related Health and Safety Reporting

ODV employees and contractors are to report all unsafe acts or incidents at the Project site or on-route to site to the Mine Manager. ODV will work with the local law enforcement to verify speed limits are followed as posted.

The following incidents will be reported immediately to the Mine Manager after the appropriate protocols identified in the respective management plans are enacted to control the situation:

- Vehicle collisions or near misses involving single vehicles, multiple vehicles, or wildlife;
- Evidence of unauthorized access to the Project sites by a vehicle, and
- Evidence of unauthorized hunting, fishing, trapping, or any other prohibited activity on Project sites.

Observations of wildlife are to be reported to the Environmental Department. Radios are to be used to report these observations so that others working in or driving by the area are also aware of the sighting.

Reporting will be done weekly and monthly by the Health, Safety, and Environmental staff as part of overall site safety reporting. Reports will be reviewed internally by all departmental managers and operations supervisors. Where required, reports will be forwarded to relevant government agencies as stipulated by regulations and permits.

6.2 Inspections and Record-Keeping

All site vehicles will be inspected before use and have the inspection recorded in each vehicle's logbook, with the vehicle's unit number verified and recorded. Any deficiencies will be appropriately noted and dealt with accordingly.

Regular inspections of the site and access roads will be completed by mine personnel while driving to and from the Project sites. A visual inspection of the culverts and ditches will be made regularly.

All individual near-miss and incident reports will be given a unique identification number and be filed both electronically and hard copy at the Project site offices. These records will be kept for the life of the Project.

7. REFERENCES

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APPENDIX A ENVIRONMENTAL ASSESSMENT CERTIFICATE APPLICATION MITIGATION COMMITMENTS

Table B-1 provides the mitigations that will and must be followed for the Project that were committed to in the EAC Application (ODV 2022).

Table B-1 Mitigation Commitments

Mitigation Measure	Phase (C, O, CL, PC)[1]	Project Component- Mine Site, QR Mill, Transmission Line, Transportation Route	Associated Mitigation ID's from the EAC Application[2]
A new highway bypass will be built before Wells so that Project related traffic does not travel through the community.	C, O	Mine Site, Transportation Route	7.12-29
All vehicle and machinery travel will be restricted to designated road surfaces.	C, O, CL, PC	All	7.6-22, 7.7-9, 7.8-54
Communicate to workers and contractors the key transportation related bylaws or regulations in Wells and include these in the Traffic Control Plan.	O	All	7.12-48
Complete a functional design study for the Highway 26/Nyland Lake Road intersection to determine appropriate improvements to sightlines for this location and work with MOTI to implement recommendations.	C	Transportation Route	7.12-28
Develop and implement a Traffic Control Plan and provide contractors, sub-contractors, workers, etc. with a copy of the Plan, including key highway and roadway regulations and roadway regulations upon on-boarding.	C, O	All	7.12-20
Discuss appropriate mitigation and access requirements with users of recreations trails near the Mine Site.	C, O, CL	Mine Site	7.11-12
Drivers will be appropriately trained by the training department, trained in Project codes of conduct, and require authorization prior to use of mobile equipment.	C, O, CL, PC	All	9.0-37
Engage with the community on concentrate transport schedules during operations.	O	Transportation Route	7.12-23
Existing infrastructure will be utilized (e.g., for the Mine Site haul road, Transportation Routes, Transmission Line, and associated access roads).	C, O	All	7.16-2
Gates at all ODV properties will be locked when not operating, unless circumstances for which this is not required are outlined in an appropriate Management Plan (e.g., in an emergency, identified in the Project Emergency Response Plan).	C, O, CL, PC	Mine Site, QR Mill	7.9-8
Heavy vehicles travelling to and from Project components will follow designated heavy vehicle routes.	C	All	7.8-64

Mitigation Measure	Phase (C, O, CL, PC)[1]	Project Component- Mine Site, QR Mill, Transmission Line, Transportation Route	Associated Mitigation ID's from the EAC Application[2]
Implement and enforce the Traffic Control Plan, which will include consideration of shift start and ends times.	C, O, CL	All	7.11-2, 7.11-11
Implement and enforce transportation and access management outlined in ODV's Traffic Control Plan, which will include the development of driver training materials and strategies to limit potential conflicts.	C, O, CL	All	7.11-3
Implementation of and strict adherence of communication procedures on roads.	C, O, CL, PC	All	9.0-36
Implementation of and strict adherence to mandatory seatbelts use.	C, O, CL, PC	All	9.0-35
Implementation of and strict adherence to speed limits.	C, O, CL, PC	All	7.4-37, 7.8-33, 7.6-16, 9.0-34
Inform Quesnel, Wells, CRD, and MOTI regarding potential project traffic during closure.	CL	All	7.12-54
Monitor incidents involving Project related vehicles and work to identify measures to reduce incidents.	C, O, CL	All	7.12-26
Move large loads at non-peak traffic times.	C, O	Transportation Route	7.12-22
Move workers to site by shuttle bus so that there are limited personal vehicles in the area.	C, O	All	7.8-61, 7.12-31
Place signage if there is the potential for conflicts with Project activities.	C, O, CL	All	7.11-16
Place signage on recreational trails and public roads if there is the potential for conflicts with Project activities.	C, O, CL	Transmission Line, Transportation Route	7.11-7
Project drivers will yield to wildlife observed along the highways and designated vehicle routes.	C, O	All	7.8-65
Provide and make mandatory that contractors and workers have a copy of the Traffic Control Plan, including key highway and roadway regulations.	CL	All	7.12-53
Provide shuttle service from a site in Quesnel to and from the Mine Site and the QR Mill, including fly-in fly-out workers as needed.	C, O	Mine Site, QR Mill, Transportation Route	7.8-60

Mitigation Measure	Phase (C, O, CL, PC)[1]	Project Component- Mine Site, QR Mill, Transmission Line, Transportation Route	Associated Mitigation ID's from the EAC Application[2]
Provide workers, contractors, and sub-contractors a copy of the Traffic Control Plan and communicate that they are to be aware of and follow the transportation related bylaws or regulations in Wells.	C	All	7.12-30
Regular maintenance of Project roads.	C, O, CL, PC	All	9.0-38
Road Design Best Management Practices Development and Implementation of Traffic Control Plan.	C, O, CL, PC	Mine Site, QR Mill, Transportation Route	10.0-1
Road design will incorporate clear lines of site.	C, O	Mine Site, Transmission Line	7.8-35
Schedule regular traffic coming to the Mine Site or QR Mill (e.g., regular deliveries) so that it is spread out throughout the month and does not coincide with existing peak traffic times.	C, O	Mine Site, QR Mill, Transportation Route	7.12-25
Upgrade forest service roads, as required, to ensure that they are suitable for Project use.	C	Transportation Route	7.12-24
Vehicle traffic mitigation measures in the Traffic Management Plan will incorporate wildlife management measures, including mowing roadside vegetation.	C, O, CL	Mine Site, QR Mill, Transmission Line	7.8-34
Waste rock will be moved to the Bonanza Ledge Site on mine roads and will not travel through Wells.	O	Mine Site	7.12-47
Wildlife-vehicle collisions will be documented and reported to Wildlife Accident Reporting System (WARS) if on a Ministry of Transportation and Infrastructure (MOTI) managed road.	C, O	Transportation Route	7.8-66
Work with MOTI to relocate the 50 km/h posted speed limit slightly to the west to allow the new access to the Mine Site Complex to be located within the 50 km/h zone.	C	Transportation Route	7.12-27
Planning shift changes: • Plan shift changes so that traffic does not correspond with existing peak times. • Time shift changes so that they do not all occur on the same day or time.	C, O, CL	All	7.12-57, 7.12-32

Mitigation Measure	Phase (C, O, CL, PC)[1]	Project Component- Mine Site, QR Mill, Transmission Line, Transportation Route	Associated Mitigation ID's from the EAC Application[2]
Use of recreational vehicles: • The use of off-road or recreational vehicles (All Terrain Vehicles or snowmobiles) is prohibited by personnel within the Surface Footprint (including Transmission Line and at Facilities). • Use of recreational vehicles at the Project sites will be prohibited.	C, O, CL, PC	Mine Site, QR Mill, Transmission Line	7.9-7, 7.8-36

Notes:

1 C: Construction Phase; O: Operations Phase; CL: Closure Phase; PC: Post-Closure Phase

2 Mitigation ID is from the Environmental Assessment Certificate Application (ODV 2022)

APPENDIX B ODV ROAD USE POLICY

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

ROAD USE POLICY

May 2023



OSISKO DEVELOPMENT

Cariboo Gold Project

PO Box 250
3700 Ski Hill Road
Wells, BC V0K 2R0

POLICIES AND PROCEDURES

ROAD USE POLICY	
POLICY NUMBER:	BGM-GEN-RU-003 (Applies to ODV)
SUBJECT:	Road Use Policy
SECTION:	General
APPLIES TO:	All Employees and Contractors
ORIGINAL ISSUE DATE:	July 18, 2017
ADMINISTERED BY:	Health and Safety Department
SEE ALSO:	Mine Health Safety and Reclamation Code 6.8.3
	Motor Vehicle Act Sec. 220

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4. Acknowledgement Of Receipt 4-5

1. PURPOSE

In accordance with 6.8.3 of the Mine Health Safety and Reclamation Code (herein referred to as THE CODE), Osisko Development Corp. (ODV) (herein referred to as THE COMPANY) will maintain a policy that ensures the safety of all COMPANY property, employees, and visitors, as well as the people in the community of Wells while travelling on mine business. THE COMPANY will strictly enforce this policy.

2. OBJECTIVE

The Mine Health Safety and Reclamation Code (THE CODE) 6.8.3 states:

> *6.8.3 Traffic Control*
>
> *The manager shall prepare traffic control procedures, showing the maximum allowable speeds for the vehicles in use, rules for passing, "stop" and "yield rules," priority rules for various vehicles, rules for night operation, maximum operating grades, emergency run-off protection, shoulder barriers, and any other information that may be required to ensure the safe operation of all types of vehicles on the mine site.*

3. POLICY

A valid Driver's License is required to operate any vehicle with a license plate that is permitted to be on public roads. Every employee is required to update their driver's abstract with Human Resources each year. Only those designated drivers who have read and been signed off on this policy are permitted to operate any COMPANY vehicle.

Seatbelt MUST be used in company vehicles at ALL times. Passengers and drivers in British Columbia are required to properly wear a seat belt and unrestrained occupants risk being faced with a violation ticket. In B.C., seat belt use has been mandatory since 1977.

The maximum speed limit within the District of Wells is 30 km/h unless otherwise posted. The local speed limits MUST be followed at all times. Pedestrians have the right of way in the District of Wells. Certain traffic restrictions apply for COMPANY within the District of Wells. No traffic is permitted on Mildred Ave as this road is the access to the Wells Elementary School and grounds. To access the A and B Camp and Office Compound turn off Highway 26 onto Ski Hill Rd and up the hill. To access the Ballarat Camp, turn off of Highway 26 on the Bowron Lake Park Road and immediately right into the Ballarat Camp. To access the A road follow Ski Hill Road (Rd) down the hill to Highway 26. Travel along the highway until the A Rd turn-off. No traffic is permitted along Lowhee Drive. To access the H/S Road use Margaret Ave to enter the H/S Rd and follow forest service road regulations as posted on the sign entering the H/S Road]. Remember to drive appropriately for the conditions.

The maximum speed limit on the COMPANY roads is 40 km/h. The speed limits MUST be followed at all times to ensure safe travel of all traffic using the road. Remember to drive appropriately for the conditions. In Camp/Accommodation Areas, the Office Parking Area, and the Office Compound the maximum speed limit is 15 km/h.

Pedestrians have the right of way in Camp/Accommodation Areas, the Office Parking Area, and the Office Compound. Vehicle traffic MUST stop at a safe distance and allow pedestrians to cross the bridge from the Office Parking Area to the Office Compound. Once pedestrians are clear, vehicle traffic may resume.

Radio use is required for all traffic on COMPANY roads including the 500 Road to QR Mill.

- A Rd RR31 or RR12A (frequency 151.52),
- H/S Rd, C Rd and F Rd use STD Drilling 3 (frequency 166.11),
- 500 Rd uses RR1 (frequency 151.52).

On steep and windy sections call every ¼ km, on straight roads call every ½ km or at a frequency as stated at the entrance of each road. Always call the direction of travel by calling “down” for heading toward town and “up” for when headed toward the mine site. Also, call the type of vehicle being operated. Ex. A pickup headed to town at the A ¼ km sign would call “A ¼ km Pickup Down.”

4. ACKNOWLEDGEMENT OF RECEIPT

I have read, understand, and agree, with Osisko Development Corp.'s Road Use Policy. This acknowledgement will be placed in your employee file. Failure or refusal to sign does not relieve any employee of his or her responsibilities under this policy.

Employee Name (Print)	Employee Signature	Date

ATTACHMENT 1: MINE SITE SITE-SPECIFIC TRAFFIC CONTROL

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

ATTACHMENT 1: MINE SITE SITE-SPECIFIC TRAFFIC CONTROL

May 2023



This document is not intended to be a stand-alone Traffic Control Plan. Reader must review the Project Traffic Control Plan prior to, and in tandem with, this Attachment, specific to the Mine Site.

OSISKO DEVELOPMENT

Cariboo Gold Project

PO Box 250
3700 Ski Hill Road
Wells, BC V0K 2R0

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Appendices

Appendix A Mine Site WRSF Access Road (A Road) Use and Channels

REVISION HISTORY

Rev. No.	Date	Author	Description
A	February 23, 2023	Grace Mohan	Updated existing BL Traffic Control Plan attachment to be consistent with Cariboo Gold Project
A	February 24, 2023	Nicole Tennant	PM review of this attachment prior to going to ODV for review and updating; made revisions to match Project description for Cariboo Gold Project
A	March 2, 2023	Grace Mohan	Addressed PM review comments
A	March 3, 2023	Nicole Tennant	Final check and update prior to going to ODV for review and updating; made revisions to match Project description for Cariboo Gold Project
B	March 4, 2023	Paul Ratte	ODV review
B	March 8, 2023	Nicole Tennant	Addressing ODV review comments to rev A

ABBREVIATIONS

Terminology used in his document has been defined where it is first used, while the following list has been presented to assist readers that choose to review only portions of the document.

Abbreviation	Description
BC	British Columbia
FSR	Forest Service Road
km	kilometre
km/h	Kilometre per hour
m	metre(s)
MHz	megahertz
ODV	Osisko Development Corp.
SOP	Standard Operating Procedure
QR Mill	Quesnel River Mill
t	tonne
the Project	Cariboo Gold Project
WRSF	Waste Rock Storage Facility

1. INTRODUCTION

1.1 Purpose and Overview

The Osisko Development Corp. (ODV) Traffic Control Plan includes the information needed for traffic mitigation and management that applies to the Cariboo Gold Project (the Project), located in the Cariboo Regional District in British Columbia (BC). This document is an attachment to the Project Traffic Control Plan that provides additional site-specific information on traffic management for the Mine Site (including Mine Site Complex, Bonanza Ledge Site, and access roads). This attachment is supplementary information to the Project Traffic Control Plan and is not a stand-alone plan.

Where additional information to the Project Traffic Control Plan is warranted that is specific to the Mine Site, it is included in this attachment. The Project Traffic Control Plan should be read before and in tandem with this attachment.

1.2 Scope

The total length of the concentrate haul route along the Transportation Route from the Mine Site to the QR Mill is approximately 115 kilometre (km) one way. The Project will use existing site access roads and the existing Transportation Route between the Mine Site and the QR Mill. Waste will be transported from underground to the surface Waste Rock Storage Facility (WRSF) via the Cow Portal, transported south along the A Road, to the Bonanza Ledge Site.

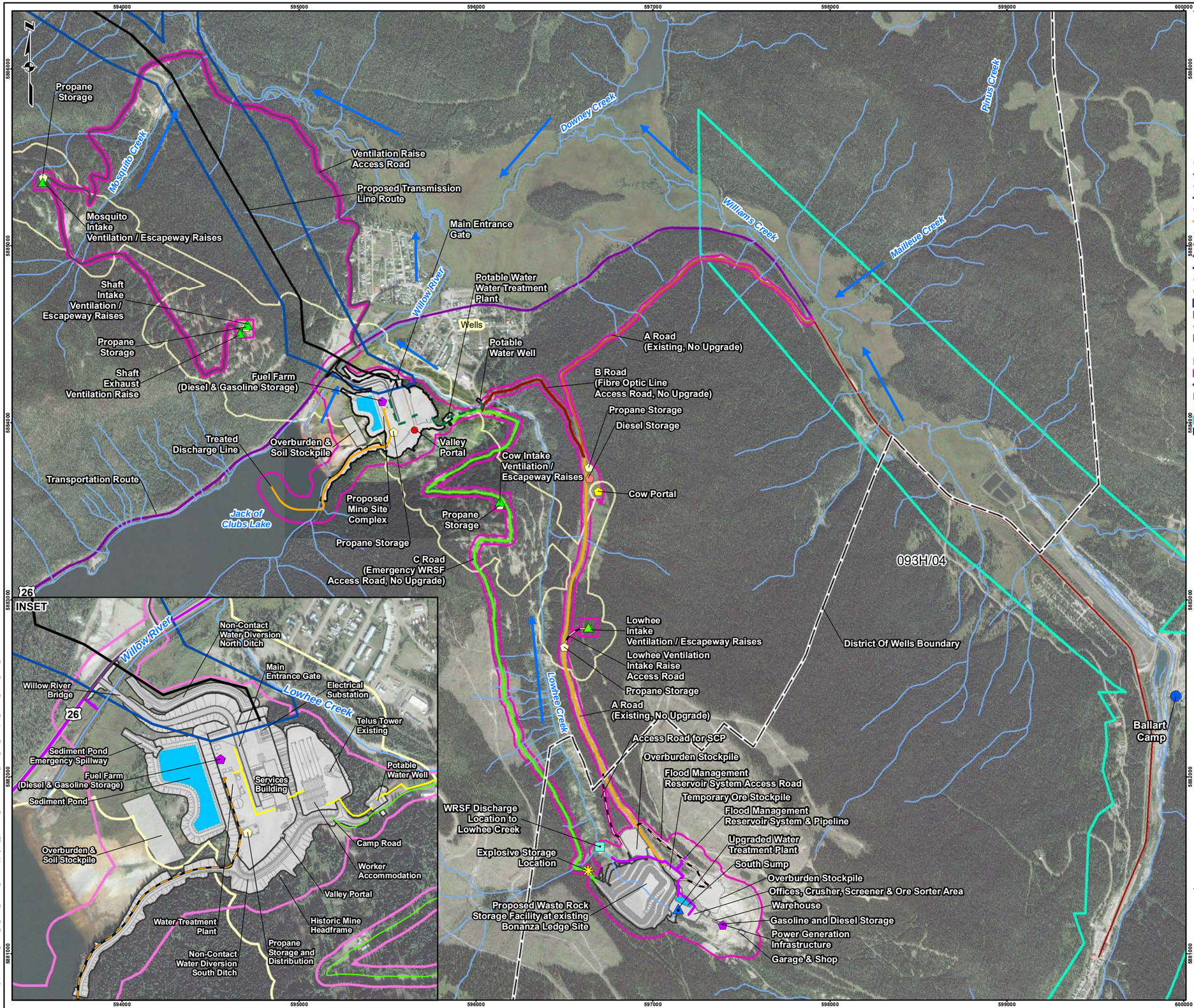
The Mine Site is accessed by road from Highway 26. The Mine Site Complex is immediately adjacent to the community of Wells and is 350 metres (m) west of the nearest residence, which is currently unoccupied. The Bonanza Ledge Site is 1 km east of Wells and accessed off Highway 26 via an existing 5 km-long gravel road, the A Road, that runs parallel to Lowhee Creek, which is the main haul road (for the first four years of mine life) and access in and out of Bonanza Ledge Site. In addition, there are the following Mine Site access roads (part of the overall Transportation Routes):

- C Road (Emergency WRSF Access Road) that is used for emergency and maintenance access only;
- Main Access Road at the Mine Site Complex, which connects the Mine Site Complex to Highway 26, and the main concentrate haul route beyond four years of mine life to end of operations;
- Camp Access Road at the Mine Site Complex, which will connect the mine Laydown Area with the new Worker Accommodation area;

- B Road (Fibre Optic Line Access Road) that will only be accessed for emergency or maintenance (e.g., for the fibre optic line);
- Access Road for the Sediment Control Pond at the Bonanza Ledge Site;
- Flood Management Reservoir System Access Road;
- Ventilation Access Road (i.e., to access the Mosquito and Shaft ventilation raises); and
- Lowhee Ventilation Intake Raise Access Road.

Figure 1.2-1 presents the access roads, site roads, and gate locations at the Mine Site.

This site-specific attachment to the Project Traffic Control Plan focuses on the access and traffic management on, to, and from Highway 26, but does not include access to/from the junction of Highway 26 and the connecting road to the QR Mill, which is a Forest Service Road (FSR) called 500 Nyland Lake FSR. That is, this attachment covers Mine Site roads, A Road, C Road, and along Highway 26 from the A Road exit to Highway 26 to the 500 Nyland Lake FSR, but not beyond that junction. Site-specific information on access and traffic for QR Mill is provided in a separate attachment to the Project Traffic Control Plan.



LEGEND

- PROPOSED BALLARAT CAMP
- PROPOSED MINE PORTAL LOCATION
- PROPOSED DIESEL STORAGE
- PROPOSED DIESEL / GASOLINE STORAGE
- PROPOSED PROPANE STORAGE
- PROPOSED VENTILATION RAISE
- EXISTING COW PORTAL
- UPGRADED WATER TREATMENT PLANT
- WRSF DISCHARGE LOCATION TO LOWHEE CREEK
- FLOW DIRECTION
- HIGHWAY
- WATERCOURSE
- VENTILATION RAISE ACCESS ROAD
- ACCESS ROAD
- BONANZA LEDGE SITE WRSF ACCESS ROAD (EXISTING A ROAD, NO UPGRADE)
- EMERGENCY WRSF ACCESS ROAD (EXISTING C ROAD, NO UPGRADE)
- ACCESS ROAD (EXISTING A-ROAD, NO UPGRADE)
- BONANZA FLOOD MANAGMENT SYSTEM PIPELINE
- TRANSPORTATION ROUTE
- PROPOSED BURIED POTABLE WATER LINE
- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED TRANSMISSION LINE CORRIDOR
- PROPOSED CAMP ACCESS ROAD
- PROPOSED TREATED DISCHARGE / DIFFUSER PIPELINE
- PROPOSED MINE SITE OVERBURDEN AND SOIL STOCKPILE
- PROPOSED MINE SITE SURFACE SEDIMENT POND
- PROPOSED SURFACE DISTURBANCE AREA
- PROPOSED SURFACE FOOTPRINT
- FIBRE OPTIC LINE ACCESS ROAD (EXISTING B ROAD, NO UPGRADE)
- BONANZA SOUTH SUMP
- PROPOSED UNDERGROUND FOOTPRINT
- BARKERVILLE HISTORIC TOWN AND PARK
- DISTRICT OF WELLS BOUNDARY

REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
2. HILLSHADE DERIVED FROM LIDAR DATA FLOWN BY MCELHANNAY CONSULTANTS LTD. JUNE 27, 2016.

NAD83 CSRS
UTM ZONE 10N

0 500 1,000
1:21,500 METRES

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CARIBOO GOLD PROJECT

MINE SITE TRANSPORTATION AND ACCESS ROADS

REV.	DESCRIPTION	DATE	INITIALS
A		5/18/2023	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	1.2-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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2. ENVIRONMENTAL PROTECTION AND MANAGEMENT

The following environmental protection measures are provided specific to the Mine Site in addition to those measures outlined in the Project Traffic Control Plan.

2.1 Traffic and Vehicle Protocols

Speed Limit in Wells is 30 km/h, including the highway. The A Road access is a single lane haul road that will be used year-round.

Traffic signs are placed along the A Road between Highway 26 and Bonanza Ledge Site. Existing traffic signs that will be used for the Project include:

- A stop sign ahead sign and a stop sign for traffic exiting the A road to enter onto Highway 26 (the stop sign is at the junction prior to turning onto Highway 26);
- A stop sign prior to entering the Bonanza Ledge Site;
- 40 km per hour (km/h) speed limit signs along A Road;
- All personnel will adhere to the Ore Transport Standard Operation Procedure (SOP) when travelling A Road during active ore concentrate transport along A Road.
- Truck crossing signs in the junction along Highway 26.

The A Road access to the Mine Site from Highway 26 is a radio-controlled road. The radio channels and frequencies are provided in Appendix A of this site-specific attachment. Appendix A will be communicated through site orientation and provided to all drivers on Project site roads. The 500 Nyland Lake FSR access to the QR Mill site is also radio-controlled and the channels and frequencies are provided in the QR Mill site-specific attachment to the Project Traffic Control Plan.

Traffic signs will be placed along the Main Office Compound Access Road and Camp Access Road at the Mine Site Complex:

2.2 Emergency Run-off Protection

Figure 2.2-1 provides the Mine Site A Road runaway lanes.

595000
596000
597000
598000
5885000
5884000
5883000

Ventilation Raise Access Road
Willow River
Wells
B Road (Fibre Optic Line Access Road, No Upgrade)
Runaway Lane
Williams Creek
Runaway Lane
A Road (Existing, No Upgrade)
Proposed Mine Site Complex
Valley Portal
Jack of Clubs Lake
Runaway Lane
C Road (Emergency WRSF Access Road, No Upgrade)
A Road (Existing, No Upgrade)
Lowhee Creek

LEGEND
- RUNAWAY LANES
- PROPOSED SURFACE DISTURBANCE AREA
- PROPOSED SURFACE FOOTPRINT
- DISTRICT OF WELLS BOUNDARY

REFERENCE(S)
1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
2. HILLSHADE DERIVED FROM LIDAR DATA FLOWN BY MCELHANNAY CONSULTANTS LTD. JUNE 27, 2016.

NAD83 CSRS
UTM ZONE 10N

0 200 400
1:12,000 METRES

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

MINE SITE CARIBOO GOLD PROJECT MINE SITE RUNAWAY LANES

REV.	DESCRIPTION	DATE	INITIALS
A		5/18/2023	TM

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	2.2-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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2.3 Vehicle Movement and Traffic Estimates

2.3.1 Movement of Vehicles and Equipment

Underground equipment at the Mine Site will transport waste to the Bonanza Ledge Site WRSF. Highway rated transport trucks will be loaded with concentrate using a front-end loader or excavator, or a conveyor, and will transport the material, which will be dumped at the QR Mill. Other equipment at the Mine Site may include maintenance vehicles, pickup trucks, dozers, graders, excavators, and other auxiliary equipment required for mining operations.

2.3.2 Total Traffic Estimates

Table 2.3-1 presents a summary of the estimated range in the number of round trips per day for ore concentrate haul transport truck traffic, non-ore haul traffic, and total traffic, for the Construction, Operations and Closure Phases of the Mine Site. The vehicle estimate is presented for the various road segments as shown on Figure 1.2-1. QR Mill estimates are in a separate site-specific attachment to the Project Traffic Control Plan.

The non-ore haul traffic category includes, but is not limited to, underground mining equipment, road maintenance equipment, equipment maintenance vehicles, crew shuttle buses, pick-up trucks, bulk explosive trucks, refuelling trucks, water trucks, snowplows, graders, garbage trucks, low-bed trucks, and emergency vehicles.

Table 2.3-1: Estimated Frequency of Round-Trip Traffic of Project Vehicles by Main Road Segments (24-hour)

Roads	Estimated Range of Round Trips per day (trips per 24 hours)			
	Construction Phase	Operation Phase 1	Operation Phase 2	Closure Phase[3]
A Road				
Ore concentrate haul truck trailers (25 – 40t)	0	18 – 25	0	0
Haul Vehicles	6 - 25	20 - 55	20 – 45	0
Non-haul vehicles [1]	0 – 7	0 – 20	0 – 20	0 – 7
A Road Total	0 – 7	38 – 100	20 - 65	0 – 7
Highway 26 (From A Road Exit to Junction with 500 Nyland Lake FSR)				
Ore concentrate haul truck trailers (25 – 40t)	0	18 – 25	0	0
Non-haul vehicles [1]	0 – 5	0 – 20	0	0
Highway 26 (A Road to 500 Rd) Total	0 – 5	0 - 45	0	0

Roads	Estimated Range of Round Trips per day (trips per 24 hours)			
	Construction Phase	Operation Phase 1	Operation Phase 2	Closure Phase[3]
Highway 26 - (From Mine Site Complex Exit to Junction with 500 Nyland Lake FSR)				
Ore concentrate haul truck trailers (25 – 40t)	0	0	18 – 25	0
Non-haul vehicles [1]	0	0	0 – 20	0
Highway 26 (Mine Site Complex to 500 Rd) Total	0	0	0 - 45	0
B Road [2]				
Non-haul vehicles [1]	0 – 5	0 - 1	0 - 1	0 – 1
B Road Total	0 – 5	0 - 1	0 - 1	0 – 1
C Road				
Non-haul vehicles [1]	0 – 5	0-1	0-1	0 – 1
C Road Total	0 – 5	0-1	0-1	0 – 1
Main Access Road				
Ore concentrate haul truck trailers (25 – 40t)	0	18 – 25	18 – 25	0
Haul vehicles	0 – 5	0 – 1	0 – 1	0 – 1
Non-haul vehicles [1]	0 – 5	5 – 12	5 – 12	0 – 1
Main Access Road Total	0 – 1	23 – 38	23 – 38	0 – 1
Camp Access Road				
Non-haul vehicles [1]	0 – 5	0 – 1	0 – 1	0 – 1
Camp Access Road Total	0 – 1	0 – 1	0 – 1	0 – 1
Access Road for the Sediment Control Pond				
Non-haul vehicles [1]	0 – 1	0 -1	0 – 1	0-1
Access Road for the Sediment Control Pond Total	0 – 1	0 -1	0 – 1	0-1
Flood Management Reservoir System Access Road				
Non-haul vehicles [1]	0 – 1	0 – 1	0 – 1	0 – 1
Flood Management Reservoir System Access Road Total	0 – 1	0 – 1	0 – 1	0 – 1
Ventilation Access Roads				
Non-haul vehicles [1]	0 – 1	0 – 1	0 – 1	0 – 1

Roads	Estimated Range of Round Trips per day (trips per 24 hours)			
	Construction Phase	Operation Phase 1	Operation Phase 2	Closure Phase[3]
Ventilation Access Roads Total	0 – 1	0 – 1	0 – 1	0 – 1

Notes:
1. Non-haul vehicles include shuttle bus, occasional worker personal vehicles, delivery trucks (material and food), maintenance vehicles.
2. B Road is closed but is available for emergency and maintenance use.
3. Traffic volumes during closure will be significantly less than during operations, and on a daily basis will be more variable. Less activity is anticipated during the winter.

2.3.3 Haul Traffic Frequency

The estimated vehicle traffic associated with hauling concentrate from the Mine Site to the QR Mill during operations is based on the following assumptions:

- Between 200,000 and 300,000 tonnes (t) of concentrate will be transported from Mine Site to the QR Mill each year;
- Transport trucks capable of hauling up to 40 t of concentrate will be used;
- Concentrate haulage will operate approximately 365 days per year; and
- An average of 18 to 20 transport truckloads/day (roundtrip) to a maximum of 25 trucks/day; therefore, between approximately 6,570 and 9,125 loads per year.

2.4 Road and Access Maintenance

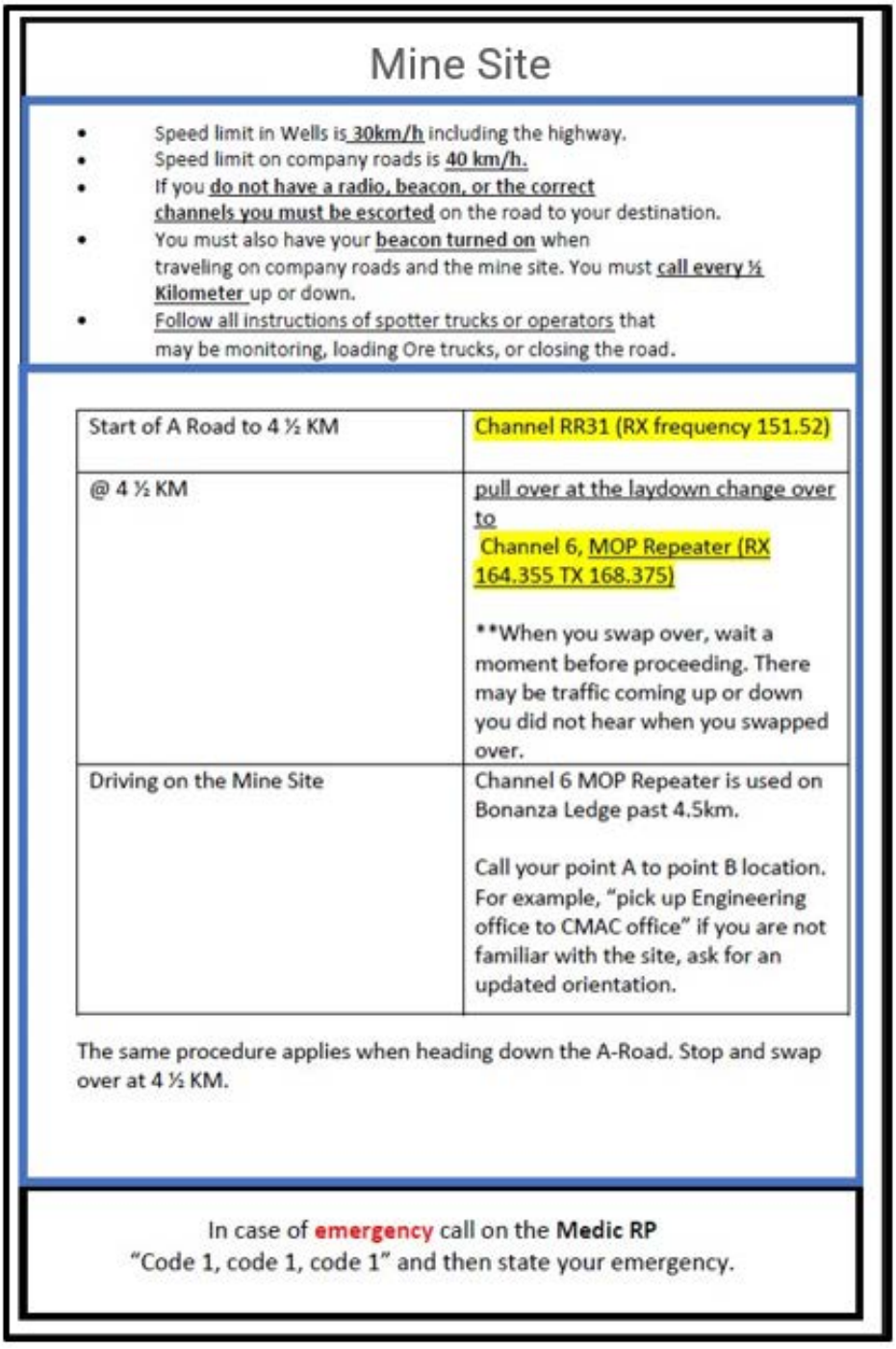
See ODV's Project Traffic Control Plan for the actions to avoid, control and mitigate traffic incidents and adverse effects applicable to all ODV projects, with some additional information provided here.

Gates at the entrance of Mine Site will be maintained and locked when the mine is not in operation as shown in Figure 1.2-1.

Maintaining the A Road as the main access road to the Bonanza Ledge Site and periodically inspecting and maintaining the other site access roads will be critical during operations of the Mine Site, since all concentrate will be transported from Mine Site to the QR Mill.

During winter months, motor vehicle traffic on all auxiliary roads will be minimized.

APPENDIX A MINE SITE WRSF ACCESS ROAD (A ROAD) USE AND CHANNELS



Mine Site

- Speed limit in Wells is 30km/h including the highway.
- Speed limit on company roads is 40 km/h.
- If you do not have a radio, beacon, or the correct channels you must be escorted on the road to your destination.
- You must also have your beacon turned on when traveling on company roads and the mine site. You must call every ½ Kilometer up or down.
- Follow all instructions of spotter trucks or operators that may be monitoring, loading Ore trucks, or closing the road.

Start of A Road to 4 ½ KM	Channel RR31 (RX frequency 151.52)
@ 4 ½ KM	pull over at the laydown change over to Channel 6, MOP Repeater (RX 164.355 TX 168.375) **When you swap over, wait a moment before proceeding. There may be traffic coming up or down you did not hear when you swapped over.
Driving on the Mine Site	Channel 6 MOP Repeater is used on Bonanza Ledge past 4.5km. Call your point A to point B location. For example, "pick up Engineering office to CMAC office" if you are not familiar with the site, ask for an updated orientation.

The same procedure applies when heading down the A-Road. Stop and swap over at 4 ½ KM.

In case of **emergency** call on the **Medic RP**
"Code 1, code 1, code 1" and then state your emergency.

ATTACHMENT 2: QUESNEL RIVER MILL SITE SITE-SPECIFIC TRAFFIC CONTROL

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CARIBOO GOLD PROJECT

ATTACHMENT 2: QUESNEL RIVER MILL SITE-SPECIFIC TRAFFIC CONTROL

May 2023



This document is not intended to be a stand-alone Traffic Control Plan. Reader must review the Project Traffic Control Plan prior to, and in tandem with, this Attachment, specific to the QR Mill.

OSISKO DEVELOPMENT

Cariboo Gold Project

PO Box 250
3700 Ski Hill Road
Wells, BC V0K 2R0

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ABBREVIATIONS

Terminology used in his document has been defined where it is first used, while the following list has been presented to assist readers that choose to review only portions of the document.

Abbreviation	Description
BC	British Columbia
FSR	Forest Service Roads
ODV	Osisko Development Corp.
QR Mill	Quesnel River Mill
t	tonne
TSF	Tailings Storage Facility
WRSF	Waste Rock Storage Facility

1. INTRODUCTION

1.1 Purpose and Overview

The Osisko Development Corp. (ODV) Traffic Control Plan includes the information needed for traffic mitigation and management that applies to the Cariboo Gold Project (the Project), located in the Cariboo Regional District in British Columbia (BC). This document is an attachment to the Project Traffic Control Plan that provides additional site-specific information on traffic management for the Quesnel River (QR) Mill. This attachment is supplementary information to the Project Traffic Control Plan and is not a stand-alone plan.

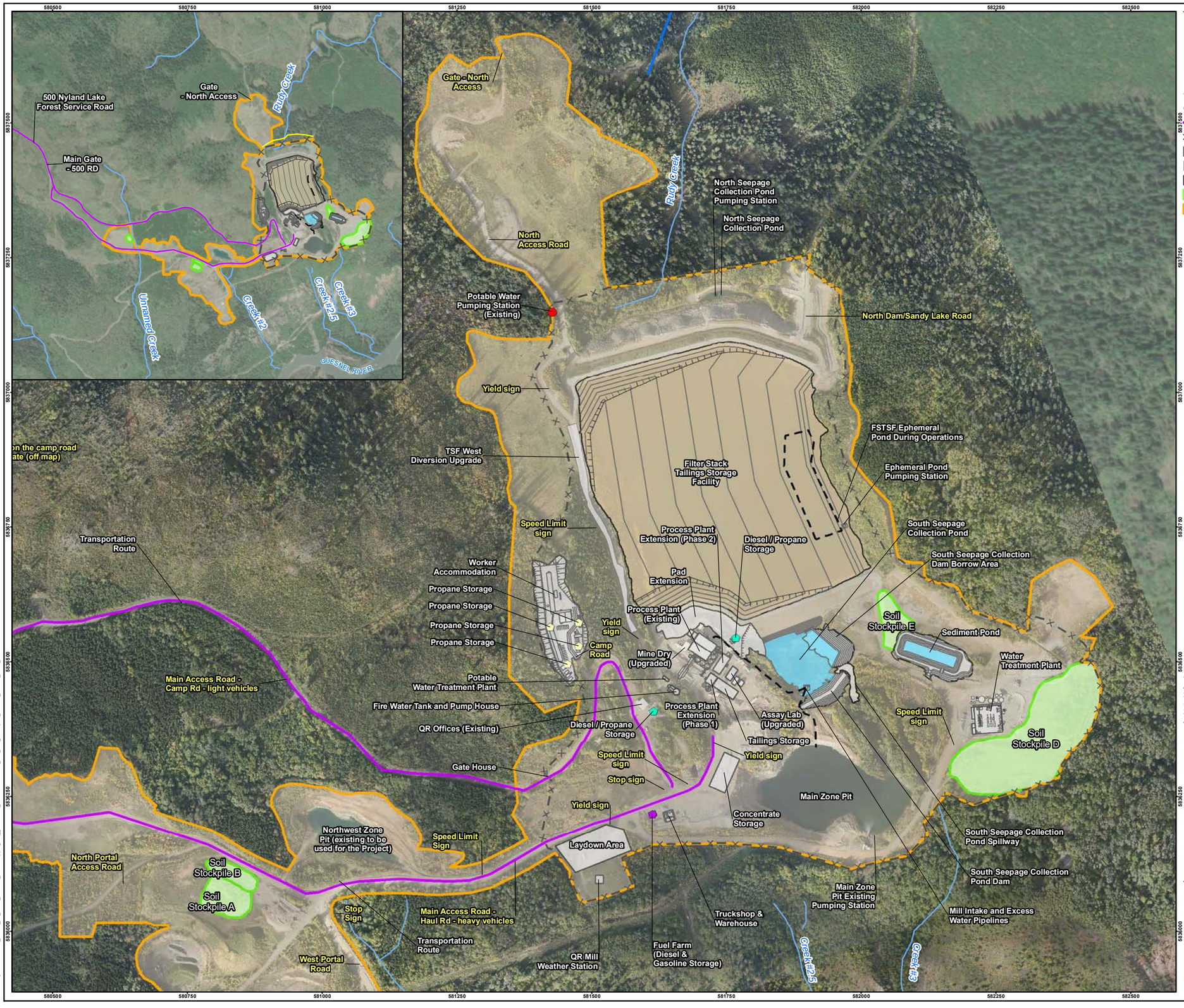
Where additional information to the Project Traffic Control Plan is warranted that is specific to QR Mill, it is included in this attachment. The Project Traffic Control Plan should be read before and in tandem with this attachment.

1.2 Scope

The total length of the concentrate haul route from the Mine Site to the QR Mill is approximately 115 km one way. Haul trucks access the QR Mill from the Mine Site via Highway 26 to the junction of the 500 Nyland Lake Forest Service Road (FSR) and travel the FSR 59 kilometers to the QR Mill.

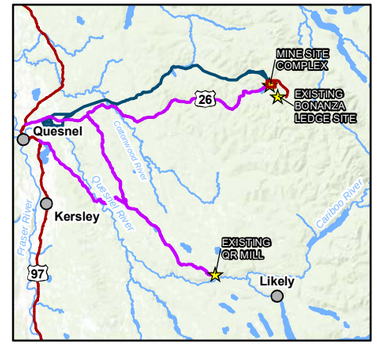
This site-specific attachment to the Project Traffic Control Plan focuses on the access and traffic management from the junction of Highway 26 and the 500 Nyland Lake FSR to the QR Mill. That is, this attachment does not cover the Mine Site site access roads, along Highway 26, or access between Highway 26 and the Mine Site, which is covered as part of the Mine Site project-specific attachment to the Project Traffic Control Plan.

No immediate modification of existing access roads is planned for the Project processing. Possibilities exist to do minor upgrades to the 500 Nyland Lake FSR consistent with ODV's current road use permit and is anticipated with the Project's potential permit. The 500 Nyland Lake FSR is radio-controlled, as it is heavily used by forestry companies. Figure 1.2-1 presents the Project location, access roads, site roads, and gate locations at the QR Mill. Note that the Mid-West and the North Zones, both underground workings, have their portals gated and locked. Both are flooded with no mining activities planned for these access points.



LEGEND

- POTABLE WATER WELL
- DIESEL / GASOLINE STORAGE (EXISTING TO BE USED FOR PROJECT)
- DIESEL / PROPANE STORAGE
- PROPANE STORAGE (EXISTING TO BE USED FOR PROJECT)
- WATERCOURSE
- FLOW DIRECTION
- PROPOSED TRANSPORTATION ROUTE
- FENCE LINE
- INFRASTRUCTURE
- SOUTH SEEPAGE COLLECTION POND
- FILTERED STACK TAILINGS STORAGE FACILITY
- APPROXIMATE EXISTING STOCKPILE TO BE USE FOR PROJECT
- PROPOSED SURFACE FOOTPRINT



NOTES:
THE PROPOSED FILTERED STACK TAILINGS STORAGE FACILITY WILL UTILIZE THE SAME FOOTPRINT OF THE DEWATERED EXISTING TAILINGS STORAGE FACILITY

REFERENCE(S)
1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
2. BASE DATA SOURCE: ESRI, GEOBASE, NRCAN, AND THE GIS USER COMMUNITY.
3. STOCKPILE SOURCE: BARKERVILLE GOLD MINES LTD. (BGM). 2020. QUESNEL RIVER MINE 2020 RECLAMATION AND CLOSURE PLAN. PREPARED FOR BGM. PREPARED BY GOLDER ASSOCIATES INC. NOVEMBER 5, 2020.

NAD83 CSRS
UTM ZONE 10N

0 100 200 300 400
1:7,000 METRES

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

QR MILL TRANSPORTATION AND ACCESS ROADS

REV.	DESCRIPTION	DATE	INITIALS
B		5/23/2023	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	**1.2-1**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

Y:\GIS\Projects\2019\151-11330_70_BGM_Cariboo_Gold\Mapping\01_general\19_TCMP\01-19-003_QR_Mill_Transport_Access_Roads_2023_05\23.mxd

QR Mill site roads include the following:

- **Main Access Road**: The Main Access Road starts at the end of the 500 Nyland Lake FSR and is split in two parallel access to the site. The Camp Road, to the north, passes by the camp facility and ends just beyond the QR Mill office. The Haul Road passes to the south and is reserved for haul and delivery trucks and ends and the Concentrate Storate area.Both roads are radio-controlled.
- **Filtered Tailings Haul Road**: This existing road will be used as a haul road between the Tailings Storage and the Filtered Stack Tailings Storage Facility to haul filtered tailings to the FSTSF.
- **Mine Roads**: Mine roads have been constructed over time to provide access to pits, Waste Rock Piles (WRPs), portal areas, the Mill, the existing Tailings Storage Facility (TSF) that will be the site of the Filtered Stack Tailings Facility (FSTSF) once constructed, and borrow pit areas. Most of these mine roads are currently used intermittently and infrequently for the inspections and monitoring purposes.
- **North Dam/Sandy Lake Road:** The North Dam/Sandy Lake Road provides access to the base of the TSF North Dam and monitoring stations to the north.
- **North Portal Access Road:** An access road was constructed to access the North Portal but currently, this road is used only for monitoring purposes for the QR Mine project and isn't anticipated to be used for the Project. The North Portal Access Road starts near the historic West Zone Borrow Area and traverses along the north bank of the Quesnel River, terminating at the North Portal. It is currently only drivable by truck to the 1.5 km mark. Note that the short spur road, **Pumphouse Access Road**, branches off the North Portal Access Road approximately 500 m before the North Portal (not shown in Figure 1.2-1). Currently, this road is used only for monitoring purposes for the QR Mine project and isn't anticipated to be used for the Project. It is currently only drivable by truck to the 1.5 km mark.
- **North Access Road**: The North Access Road starts north of the North Borrow Pit and provides alternate access to the QR Mill site (e.g., in an emergency with road blockage on the Main Access Raod).

2. ENVIRONMENTAL PROTECTION AND MANAGEMENT

The following environmental protection measures are provided specific to the QR Mill in addition to those measures outlined in the Project Traffic Control Plan.

2.1 Traffic and Vehicle Protocols

The 500 Nyland Lake FSR accessing the QR Mill from Highway 26 is accessible to the public for general use. West Fraser Mills Ltd. (West Fraser) has the Road Use Permit granted from the Ministry of Forests (formerly the Ministry of Forests, Lands, Natural Resource Operations and Rural Development) from mile marker 500 FSR to 536.5 and the 2700 Road along the 500 Nyland Lake FSR. ODV has a road use agreement with West Fraser enabling the company to access the road for its ore haul along this section of the road. ODV has the Road Use Permit from mile marker 536.5 to 556.

The 500 Nyland Lake FSR is a radio-controlled road and has signage posted at kilometre 0 describing the rules for calling every 2 km and the frequencies. The radio channels and frequencies are provided in Appendix A of this site-specifc attachment. Appendix A will be communicated through site orientation and provided to all drivers of the FSR and all Project site roads. The Mine Site roads are also radio-controlled and the channels and frequencies are provided in the Mine Site site-specific attachment to the Project Traffic Control Plan.

Company and contractor vehicles accessing the QR Mill via the 500 Nyland Lake FSR are to abide by the signs and radio use protocol by calling their location every 2 km as indicated by signage posted at the entrance of the 500 Nyland Lake FSR. ODV employees and contractors will respect all speed limits and signs and be cautious and aware that not all road users (i.e., the general public) are required to follow the radio protocol. In the absence of a posted speed limit on an FSR, the default maximum speed is 60 kilometres per hour.

Yield signs, stop signs, and speed limit signs posted at the QR Mill are shown in Figure 1.2-1.

2.2 Vehicle Movement and Traffic Estimates

2.2.1 Movement of Vehicles and Equipment

Highway rated transport trucks will transport the ore concentrate from the Mine Site and will dump the concentrate at the QR Mill. Equipment at the QR Mill may include maintenance vehicles, pickup trucks, dozers, graders, excavators, front-end loaders, and other auxiliary equipment required for milling operations.

2.2.2 Total Traffic Estimates

Table 2.2-1 presents a summary of the estimated range in the number of round trips per day for ore concentrate haul transport truck traffic, non-ore haul traffic, and total traffic, for the Construction, Operations, and and Closure Phases of the QR Mill. The vehicle estimates are presented for the various road segments as shown on Figure 1.2-1.

The non-ore haul traffic category includes, but is not limited to, road maintenance equipment, mechanics' trucks, crew buses, pick-up trucks, refuelling trucks, water trucks, snowplows, graders, garbage trucks, low-bed trucks, and emergency vehicles.

Table 2.2-1: Estimated Frequency of Round-Trip Traffic of Project Vehicles by Main Road Segments (24-hour)

Years	Estimated Range of Round Trips per day (trips per 24 Hours)		
	Construction Phase	Operations Phase	Closure Phase 1
QR Mill			
Ore concentrate haul truck trailers (25 – 40 t)	0	18 – 25	0
Non-haul vehicles	0 – 7	0 – 20	0 – 5
QR Mill Total	0 – 7	0 - 50	0 – 5
500 Nyland Lake FSR (from junction with Highway 26)			
Ore haul truck trailers (25 – 40 t)	0	18 – 25	0
Non-haul vehicles (company owned)	0 – 7	0 – 20	0
500 Nyland Lake FSR Total (company vehicles)	0 – 7	0 - 45	0

Notes:

1. Traffic volumes during closure will be significantly less than during operations, and on a daily basis will be more variable. Less activity is anticipated during the winter.

2.2.3 Haul Traffic Frequency

The estimated vehicle traffic associated with hauling ore concentrate from the Mine Site to the QR Mill is based on the following assumptions:

- Between 200,000 and 300,000 tonnes (t) of concentrate will be transported from Mine Site to the QR Mill each year;
- Transport trucks capable of hauling up to 40 t of concentrate will be used;
- Concentrate haulage will operate approximately 365 days per year depending on road conditions; and
- 18 to 20 transport truckloads/day (roundtrip) to a maximum of 25 trucks/day; therefore, between approximately 6,570 and 9,125 loads per year.

2.3 Road and Access Maintenance

See the Project Traffic Control Plan for the actions to avoid, control, and mitigate traffic incidents and adverse effects applicable to all Project sites.

Gates at the entrance of the QR Mill will be maintained and locked when not in operation as shown in Figure 1.2-1.

Maintaining the 500 Nyland Lake FSR, from KM 536.5 to the QR Mill, as the main access road, and as the responsibility of ODV, will be critical during operations. West Fraser Timber Co. Ltd. is responsible for KM 500 to KM 536.5.

APPENDIX D COMMUNITY EFFECTS PLAN: NOISE STRATEGY

Toronto, January 22, 2024

Paula Salter, MSW
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Project: Osisko – Community Effects Management Plan

Soft dB Reference: 23-11-15-PCMC

Mrs. Salter,

The aim of this letter is to provide content for the requested sections that will be included in Appendix D – Noise of the Community Effects Management Plan.

Do not hesitate to contact us if any clarifications are required,

Sincerely,

Ryan Matheson, MSc. Applied Physics, P.Eng.
Senior Project Manager

Pierre-Claude Ostiguy, Ph.D., P.Eng.
Director

1 Noise (Appendix D)

The noise strategy was developed by Soft dB for Osisko Development Corp (ODV) in order to minimize the impact of noise from the Project on the community of Wells, British Columbia with the intention of achieving sustained compliance with the applicable noise limit for the Project. Soft dB is Canada's largest acoustical consulting firm, with over 100 qualified professionals specializing in noise and vibration. The noise strategy was developed by a project team from Soft dB that specialize in mining and mineral exploration projects. Soft dB will continue to review the impact on the community and update the noise strategy as the Project evolves. The following sub-sections outline the general strategy that will be followed by ODV for the project duration.

1.1 Noise Strategy and Implementation (section 1.1.1.1)

The following sub-sections describe the applicable criteria for noise that will be applied to this project as well as the implementation of the noise monitoring equipment, locations, and methods that will be followed.

1.1.1 Applicable Criteria

The metric to evaluate compliance of the project will be the 1-hour A-weighted equivalent sound level (LAeq) measured in decibels (dBA). Compliance will be based on the estimated sound contribution of the Project without the influence of the background acoustic environment that is made up of noises such as natural sounds, wildlife and community activity measured at a Dwelling.

Computer noise modelling of the noise impact will be completed for the Construction and Operation phases of the Project in order to aid in the planning of administrative and physical noise abatement measures.

The LAeq limit to be applied to the Project is 40 dBA during any single 1-hour time period, day or night, unless otherwise authorized by the EAO.

Multiple Class 1 noise monitoring stations have been deployed in order to monitor the noise levels in the community and aid in assessing compliance with the sound level limit that are applicable to the Project.

1.1.2 Design phase

Before the commencement of construction and mining operations, a detailed modeling of activities will be carried out. During this phase, the sound contribution from both the construction and operational phases of the mine will be assessed.

These models will help identify required mitigation measures, as well as sound treatments necessary for the project to adhere to a maximum contribution of 40 dBA during construction and operations. Among the mitigation measures, those prescribed in sections 7.3-1 to 7.3-16 (EA mitigation tracker) will be considered or adjusted to meet the sound criterion at Wells residences.

1.1.3 Monitoring Locations – Representative Sensitive Receptors

Throughout the community there are numerous noise sensitive points of reception. In order to meet their environmental obligations, ODV shall perform continuous noise monitoring, with monitoring stations placed strategically in the community at locations that are expected to have the most impact from the Project, and one location selected to be representative of the background sound in the Town of Wells. The data recorded by the monitoring stations will be used to estimate the Project noise contribution to the overall sound level observed in the community. Background noise not associated with ODV activities will be removed from the measurements to assess Osisko's contribution.

It is not feasible to conduct monitoring at all possible sensitive receptors in an area, thus, the chosen monitoring locations are considered to be representative of the majority of sensitive receptors in each of the impacted areas. These Representative Sensitive Receptors (RSR) are summarized in Table 1-1, below, and shown in Figure 1-1.

Table 1-1: RSR Monitoring Locations List and Details

ID	Receptor Description
P1	2338 Bowman Crescent
P2	Baker Street (background noise)
P3	3968 Mooney Lane
P4	Ski Hill Road

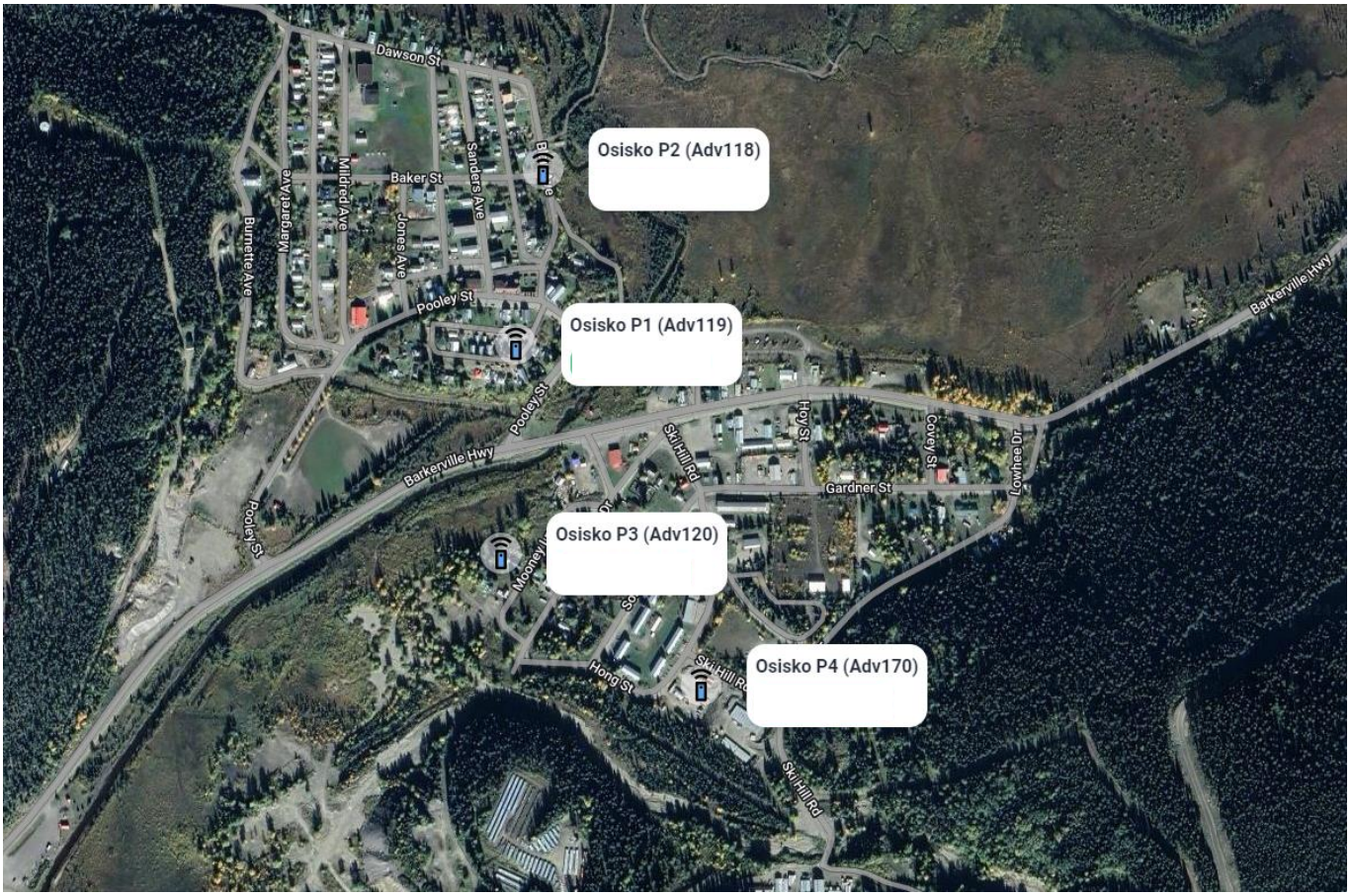


Figure 1-1: Monitoring Location Map

The locations of the monitors shall be adjusted in response to changes in Project Activity to capture the highest noise exposure level. RSRs may also be removed or added at the discretion of the Acoustical Consultant where a predicted noise level amplitude has the potential to result in a concern from nearby building occupants or in response to concerns from the public.

1.1.4 Monitoring Equipment

Sound level meters will be used for the measurement of significant noise sources and the measurement of sound levels at or near RSR locations. Soft dB will use Class 1 integrating sound level meters meeting the IEC Standard 61672 that are incorporated into the Soft dB ProStation monitoring station. Each meter shall be laboratory certified prior to its initial use and once per year thereafter. Additionally, the meters will be field calibrated on a monthly basis using a portable acoustic calibrator. When performing measurements in the field a windscreen will be used.

The measurement microphones are to be installed at a height of up to 4.5 metres and no less than 1.5 metres above grade. Microphones are placed to have a clear line of sight to the Project or activity being monitored and installed such that they are at least 3 metres away from any reflecting surfaces, when possible. Microphones installed at distances less than 3 metres from a reflecting surface may experience constructive interference that could artificially increase the recorded noise level. If microphones are

installed at a distance less than 3 metres away for technical or security reasons (theft prevention) this will be documented in the monitoring reports.

1.1.5 Baseline Noise Monitoring

Baseline noise monitoring was undertaken using the Soft dB ProStation monitoring stations. The stations were set to record the 1-hour A-weighted equivalent sound level, as well as other relevant metrics. The sound levels were measured over a period of greater than one year in order to establish the existing background sound level prior to the start of ODV's exploration or other Project related activities. This data will be used in order to aide in the assessment of compliance of the Project as well as for the planning of future operations and community engagement.

1.1.6 Blasting during construction and operations

Blasting will be restricted to the hours between 0600 and 1800 hours both during construction and operation phases of the Project.

1.2 Noise Strategy Evaluation – Community Concerns (section 1.1.1.2)

ODV will track and respond to community concerns. All concerns are to be documented with the following information:

- Full Name;
- Address;
- Contact Number and E-mail;
- Nature of Concern (noise, vibration, or both);
- Identified Cause of Concern (activities/noise source); and
- Time of Observed Concern.

These concerns will be submitted to the Acoustical Consultant for review with ODV and will be addressed in a timely manner. ODV will note the action to be taken to address the concern after the review is completed and will communicate the action to appropriate stakeholders. Actions may include spot check measurements by ODV and/or Soft dB at locations of concern in order to verify the noise contribution of the Project. The communication of the outcome or any follow up actions will be carried out through e-mail or letter if e-mail is not available.

1.3 Noise Strategy Reporting (section 1.1.1.3)

A noise monitoring report summarizing ODV's contribution at each monitoring station will be prepared and submitted by Soft dB to ODV every 3 months in accordance with the reporting requirements as outlined in the Engagement, Communications and, Reporting Strategy. After the reports have been reviewed by ODV, ODV will make the reports available to be shared with the local community and Participating Indigenous Nations upon request.

If non-compliance is verified, then ODV and Soft dB will review the results of the noise monitoring stations and correlate that to Project operations in order to determine the source of the non-compliance and determine an action plan to reduce the noise level contribution to below the applicable limit in a timely manner.

1.4 Workplan (section 1.1.1.4)

The major milestones for this project are as follows:

- Project Planning / Permitting
- Project Startup / Design
- Project Construction
- Project Operation

A general workplan of the project is presented below.

Noise Strategy Activity	Osisko Mine in Wells BC – Phasing			
	Project Planning / Permitting	Project Startup / Design	Construction	Mine Operation
Baseline Data Collection	X			
Acoustic Modelling of Construction			X	
Noise Management Plan for Construction		X	X	
Acoustic Modelling of Facility	X	X	X	
Facility Design	X	X	X	
Noise Management Plan for Mine Operation		X	X	X
Background Monitoring	X	X	X	X
Reporting			X	X
Spot Check Measurements			X	X
Community Engagement	X	X	X	X

APPENDIX E VISUAL QUALITY ASSESSMENT

GOLDER
MEMBER OF WSP

REPORT

Cariboo Gold Project

Visual Quality Assessment

Submitted to:

Osisko Development Corporation

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3700 Ski Hill Road
Wells, BC V0K 2R0

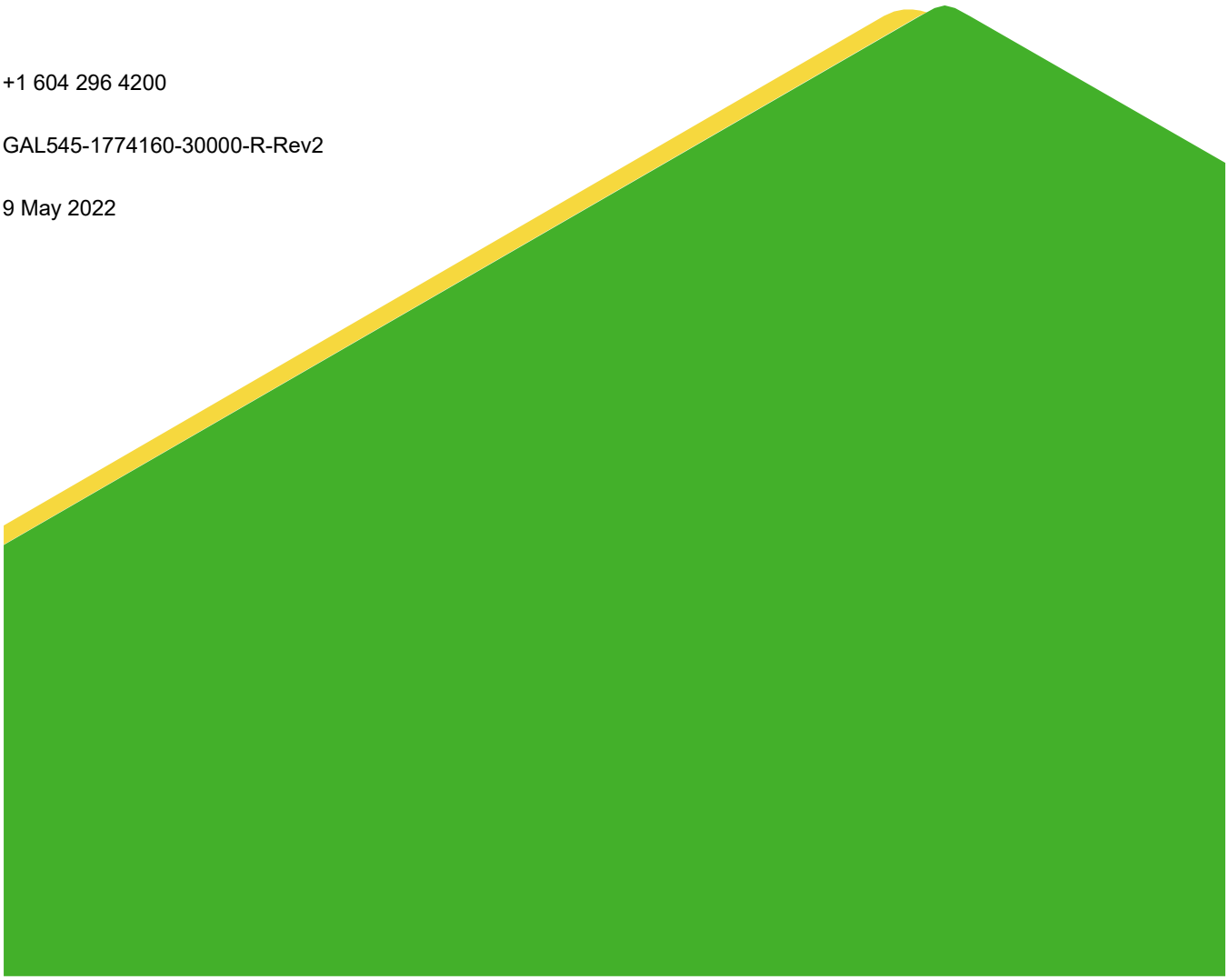
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GAL545-1774160-30000-R-Rev2

9 May 2022



Distribution List

e-copy - Osisko Development Corporation

Study Limitations

This report was prepared for the exclusive use of Osisko Development Corporation (ODV) and its assignees and representatives, and is intended to serve as a visual quality assessment for ODV's Cariboo Gold Project. This report is not intended to identify or evaluate conditions outside of the specified study areas.

The inferences concerning the conditions of the study areas are based on information obtained from a desktop review of available literature and information, as well as field programs. In developing this Report, Golder Associates Ltd. (Golder) has relied in good faith on information provided by ODV and other government agency resources. We accept no responsibility for any deficiency or inaccuracy contained in this Report as a result of our reliance on the aforementioned information.

The findings and conclusions documented in this Report have been prepared for specific application to this Report and have been developed in a manner consistent with the level of care normally exercised by environmental professionals currently practicing under similar conditions in the jurisdiction. Golder makes no other warranty, expressed or implied.

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Visual Quality Assessment Simulations

1.0 INTRODUCTION

1.1 Project Overview

Osisko Development Corporation (ODV) is proposing the development and operation of the Cariboo Gold Project (collectively the "Project"), an underground gold mine producing up to 4,750 tonnes per day of ore located in the District of Wells and Cariboo Regional District (CRD), British Columbia (BC). The Project includes the following:

- Mine Site infrastructure which includes the following:
  - Underground workings and an underground crusher;
  - A Mine Site Complex near the District of Wells that includes a Services Building (containing a surface concentrator, paste backfill plant, and other ancillary infrastructure), Mine Site accommodations (camp), and a Water Treatment System;
  - A Waste Rock Storage Facility (WRSF) at ODV's Bonanza Ledge Site;
  - Access and Haul Roads (including for the transport of waste rock from the Mine Site Complex to the Bonanza Ledge Site); and
  - An effluent pipeline between the Bonanza Ledge Site and the Mine Site Complex Water Treatment System (two proposed alignments for the pipeline were under consideration when existing conditions data was being collected).
- The existing ODV Quesnel River Mill (QR Mill) and associated infrastructure, including upgrades to the existing QR Mill and construction of the Filtered Stack Tailings Storage Facility (FSTSF), a dry stack tailings storage facility.
- Transportation Routes:
  - Transportation of concentrate between the Mine Site and the QR Mill along 56 kilometres (km) of Highway 26 and 59 km of the 500 Nyland Lake Forest Service Road, a gravel forest service road maintained by West Fraser Mills Ltd.
  - Transportation of workers, goods, and service providers to Wells from Quesnel along Highway 26. A new highway bypass will be built before Wells to enable traffic to exit the highway before the community.
  - Transportation of workers and goods to the QR Mill from Quesnel along Highway 26 and the 500 Nyland Lake Road, and along the Quesnel Hydraulic Road to the 2700 Road and the 500 Nyland Lake Road.
- Transmission Line: A new 69 kilovolt (kV) transmission line approximately 69 km in length, from Barlow Substation, near Quesnel, to the Mine Site that follows a corridor north of Highway 26 along forest service roads or other disturbance areas, where possible. Based on available information and sub-transmission design standards, 69 kV transmission structures will be single wood poles or H-Frame structures approximately 15 – 21 m in height and will be located within a 35 m area clear of vegetation.

Ore produced at the Mine Site will undergo crushing, ore sorting, milling, flotation, and dewatering before being trucked as a concentrate along the Transportation Route to QR Mill for processing. During the construction phase, the waste rock will be extracted and used as fill material at the Mine Site Complex. After the construction phase, the waste rock will be trucked from the Mine Site Complex to the WRSF at the existing Bonanza Ledge Site or used as backfill material in the underground mine workings.

Total ore resources (indicated and inferred) are currently estimated to be approximately 24 million tonnes. Based on these resources, the mine will have an approximate life of 16 years and will operate 24 hours per day, 365 days per year. Closure will occur over a period of 2 years after mining is completed.

The majority of Project infrastructure at the Mine Site will be located on brownfield sites that have been previously disturbed by historical mining operations. The Project will also utilize the QR Mill, and not require additional area outside of the existing footprint at this site.

2.0 PURPOSE

For the purposes of this study, the term *visual quality* refers to the quality and character of the natural and cultural features, or visual resources, that comprise the visual landscape surrounding the Project. The visual quality of the environment has a value to individuals, society, and the economy of a region, particularly in an area where scenic landscapes provide the backdrop for tourism and recreation activities such as in the Wells and Barkerville area. Visual quality has been consistently rated as a resource management priority by the general public of BC (BC MFML 2010) and has been defined as a value to be considered in sustainable resource planning (*Forest and Range Practices Act* [FRPA; 2002]). Visual quality of the landscape also supports Indigenous cultural use relative to values of cultural continuity and sense of place.

There is the potential for the visibility and visual characteristics of Project components and activities to change the visual quality of its landscape setting. Land clearing and vegetation removal, landform modifications (e.g., waste rock and tailings storage), and erection of mine infrastructure (e.g., surface infrastructure at the Mine Site, water management facilities, lighting) and an overhead transmission line could potentially result in visual disturbance and alterations during Project construction and operations that are inconsistent with the current character of the landscape setting. Project-related activity from haul truck traffic and air emissions (i.e., dust) along Transportation Routes could potentially result in temporary visual disturbance.

This technical memorandum has been prepared to support an Application for an Environmental Assessment Certificate (Application) for the Project under the BC *Environmental Assessment Act* (BCEAA; 2018). Visual Resources was identified as a sub-component of the Land and Resource Use Value Component (VC) in the Project Application Information Requirements (BC EAO 2021). This technical memorandum provides a detailed analysis of the Visual Resources sub-component by describing the current visual quality and character present in the areas that may be affected by the Project, predicts the potential level of change to visual quality of the landscape resulting from the Project, and identifies mitigation and potential monitoring activities to address potential visual effects of the Project.

3.0 STUDY BOUNDARIES

This section describes the methods used in identifying spatial, temporal, administrative, and technical boundaries for the Visual Resources sub-component assessment.

3.1 Spatial Boundaries

Spatial boundaries used for this study are based on the extent of area anticipated to experience visual effects from the Project. The boundaries consider viewing distances which affect the level of visible detail perceived by viewers, where visual elements of the landscape are more discernible and prominent the closer they are to the observer. Viewing distance zones were measured outward from the Project footprint and include foreground and middle-ground distance zones based on definitions consistent with the BC Visual Landscape Inventory Procedures and Standards documentation (BC MoF 1997), preliminary visibility analysis, consideration of the relative scale and nature of Project components, and research on visibility thresholds for key Project features (Driscoll et al. 1976; FHWA 2015). Spatial study areas are defined for the Visual Resources sub-component in Table 1.

Table 1: Study Areas for Visual Resources Sub-Component

Sub-Component	Spatial Study Area	Rationale
Visual Resources	The Local Study Area (LSA) boundary includes the area within: ■ An 8 km viewing distance from the Project Mine site boundary; ■ A 1 km viewing distance along the Transportation Route along Highway 26 and the 500 Nyland Lake Road; ■ A 3 km viewing distance from the Transmission Line route; and ■ 5 km viewing distances from the Bonanza Ledge site boundary and the QR Mill site boundary.	Represents the viewing opportunities within foreground and middle-ground viewing distances where visual details are most easily discernible by viewers.

km = kilometre; QR Mill = Quesnel River Mill

3.2 Temporal Boundaries

Temporal boundaries for the Visual Resources sub-component assessment were established based on the phases of the Project and potential Project effects to visual quality for each phase, as outlined below:

- **Existing Conditions (Pre-Project)**: The period before the start of construction that represents the existing conditions surveyed in 2018, 2019, and 2020. This phase characterizes cumulative effects from past and present developments and activities.
- **Construction Phase**: The period from the start of construction to the start of operations (1 year).
- **Operations Phase**: Encompasses operating activities throughout the life of the Project, assumed to be 16 years. This phase will represent the period with the largest anticipated effect to visual quality, both spatially (full build-out of Project components) and temporally.
- **Closure / Post-Closure Phase**: The period from the start of decommissioning (approximately 2 years) to the extent of post-closure active care and maintenance of the Project sites (5 years or more after closure).

3.3 Administrative Boundaries

The study of existing visual conditions overlaps multiple Visually Sensitive Unit (VSU)[1] boundaries as defined by the current BC Visual Landscape Inventory (VLI) database. VSUs are contiguous visible areas of the provincial landscape defined by common biophysical characteristics. Each VSU is characterized by Visual Quality Class (VQC) ratings and classes for variables that describe its visual condition, biophysical character, sensitivity to alteration, and visual quality management objectives. It is assumed that VSU characteristics and ratings are generally indicative of visual characteristics in the Visual Resources LSA.

3.4 Technical Boundaries

In BC, provincial policy for the management of visual quality on Crown lands exists as per FRPA (2002) and through policies within higher level strategic land and resource plans which identify scenic landscapes as a component in land and resource planning and development. The BC Ministry of Forests, Lands, Natural Resources Operations and Rural Development (FLNRORD) manages the BC Visual Resource Management (VRM) program to provide guidance in the management of visual quality within the province, primarily to manage visual resources and maintain timber supply within the provincial land base.

The BC VRM system provides a framework for the systematic inventory of visual resources and the assessment of visual impacts designed primarily for forestry applications (i.e., the visual effects of cutblocks and roads) and, as a result, the methods of this system are only partially suitable for assessing the effects of projects that consist of landform modification and infrastructure development, such as mining operations[2]. To address this limitation, a technical approach for the assessment of visual effects was developed that adapts elements of the United States Department of the Interior Bureau of Land Management's (USDI BLM) VRM rating systems to develop a characterization of existing viewing conditions and an assessment of potential visual effects of the Project (USDI BLM 1986a,b). This system provides a well-established framework for assessing visual effects that was developed for a variety of resource management planning applications. It draws on landscape design principles and public perception research, and uses identifiable qualities that can be consistently described and evaluated.

Limited information was available for the construction phase of the Project to accurately assess visual effects related to key viewpoints. As a result, potential effects during construction are characterized qualitatively with specific details related to location and schedule of construction activities, where available.

[1] Visually sensitive areas are identified through a broad inventory process and may be delineated and classified into VSUs with a more detailed inventory (BC MoF 1997).

[2] Legal requirement for use of the BC VRM system within the province is limited to forestry and is not explicitly required for other development applications.

4.0 METHODS

4.1 Existing Conditions

An inventory of the existing visual quality was established to identify, describe, and classify the physical and observed features of the existing landscape within the Visual Resources LSA, against which potential visual effects of the Project were assessed. The information is presented in the *Visual Quality Existing Conditions Report* (Golder 2021) which can be referred to for additional details. A summary of the methods and results for characterization of existing conditions is provided in Section 4.1 and Section 5.1, respectively.

4.1.1 Review of Existing Information

There is currently no provincial or federal legislation that regulates the effects of mine development in BC on visual quality. However, guidance for management of visual quality exists through a number of provincial, regional, and local policies and regulations applicable to the Visual Resources LSA. A review of existing relevant visual resource management information and strategic planning documents was conducted to understand the regional and local context for visual resource management. This included a review of BC VLI mapping data and visual resource management regulations and guidance, BC strategic land and resource plans, and local government land use plans within the District of Wells, the Barkerville Historic Town and Park, and Caribou Regional District areas, as well as the Big Valley Visual Impact Assessment conducted for BC Timber Supply cutblocks located near the District of Wells.

Spatial data describing the physical and cultural features within the Visual Resources LSA were collected from government databases and reviewed using a geographic information system (GIS). Data included topography, landcover, water features, transportation corridors, recreation sites, communities and settlements, and administrative boundaries. These data were used to conduct preliminary desktop analysis to support the definition of landscape character units (LCU) within the Visual Resources LSA. A descriptive profile was developed for each LCU which provides overview information on its extent, natural and cultural features, and general character.

4.1.2 Visibility Analysis and Viewpoint Identification

Viewing locations with a potential line-of-sight to the Project were identified from the results of preliminary visibility modelling and analysis. Visibility analysis identifies areas across a landscape that can be seen from one or more observation points, also known as a *viewshed*. A direct line-of-sight exists between each point within the viewshed and the original viewpoint from which the viewshed was generated. Visibility analysis was performed using a GIS (ESRI ArcGIS software) and digital data to model the physical terrain surrounding the Project (NRCan 2013).

Potential viewing locations were identified from the results of preliminary visibility analysis and datasets illustrating communities, roadways, established recreational features (e.g., recreation sites and trails), VLI viewpoints, and other land use locations within the Visual Resources LSA. While not all possible viewing opportunities were identified, potential viewpoints were further refined using criteria used for viewpoint identification defined by the BC VRM (BC MoF 1997):

- Accessibility to the public and ease of access;
- Proximity to roads, trails, rivers, waterbodies, and settlements;
- Use by recreational users; and
- Potential for least obstructed views of the Project.

Initial viewpoints were determined to support the gathering of photos of the landscape during a photographic field survey.

4.1.3 Photographic Survey

Photographic field surveys were used to gain an on-the-ground familiarity with the visible area of the Project from an observer's perspective, to confirm the validity of pre-selected viewpoints from initial visibility analysis, and to gather photographic images and related geographic data for each viewpoint. Photographs were taken within the Visual Resources LSA during 2018, 2019, and 2020 field surveys. Additional photographs were collected in August 2021 in relation to the views of the current mine plan.

Photographic survey locations were visited that represent public viewing opportunities related to tourists and local residents, recreational users, and motorists. At each surveyed viewpoint location, landscape photographs were captured and observational information of viewing conditions was recorded. Photographs were taken using a Nikon D3200 digital camera with a focal length of approximately 50 mm (35 mm equivalent[3]), which is consistent with the view perceived by the human eye (BC MoF 2001). The horizontal extent of these images approximates the active field of view of the human eye[4] to represent the viewing experience from each location. For each surveyed viewpoint, field staff also completed an observation log describing geographic information gathered using a global positioning system (GPS), camera settings, and details about viewing conditions.

4.1.4 Input from Consultation and Engagement

Consideration of concerns and interests related to visual quality raised by stakeholders and by Indigenous groups informed an understanding of local sensitivities to visual effects and Indigenous cultural value of the visual environment. Primary concerns were expressed by stakeholders in relation to visual impacts of the Mine Site Complex for residents in the District of Wells. Minimizing visual effects was identified as a priority by ODV and was addressed by subsequent design changes for the Service Building and Island Mountain Portal components. Concerns were also expressed about the potential visual effects of the Transmission Line.

Project-related traditional use studies were provided by Xatśūll First Nation, Williams Lake First Nation, and Lhtako Dene Nation which provide some perspective on Indigenous value of the landscape. Within these studies, it was expressed that there is Indigenous cultural value of the landscape surrounding the Project related to supporting cultural use, the transmission of traditional knowledge, and cultural identity (Xatśūll First Nation and Williams Lake First Nation 2020). As a result, Indigenous viewers may experience additional vulnerability to visual disturbance of the landscape relative to the cultural value of a landscape context that precedes current patterns of land use.

[3] 35 mm equivalent is a comparison between the field of view seen through a digital camera lens, which uses various sized image sensors, and the field of view seen through a 35 mm film camera, which uses a standard size film (35 mm). The use of the appropriate 35 mm equivalent focal length produces a field of view that is similar to the 35 mm film camera field of view.

[4] An estimated total horizontal viewing angle of between 100° and 120°.

4.1.5 Landscape Rating

A technical approach for the characterization and assessment of existing viewing conditions for representative key viewpoints was applied from elements of the USDI BLM Visual Inventory Rating system (USDI BLM 1986a) that systematically identifies dimensions of scenic quality, viewer sensitivity, and viewing distance.

The dimension of scenic quality is assessed through an evaluation of the overall scenic appeal of a view determined by the visual characteristics and relationship of its natural and cultural features. The analysis of scenic quality is based on established research in perceptual psychology and the premise that all landscapes have some scenic value, but those with visual diversity, with harmonious composition, and/or that contain distinct features have the greatest potential for high scenic quality (USDI BLM 1986a). The evaluation of scenic quality was informed by Existing Visual Condition (EVC) ratings of relevant VSUs, and analysis of images of the existing landscape from key viewpoints.

The dimension of viewer sensitivity is assessed through the identification of typical viewers and the associated potential for public concern related to change in visual quality at key viewpoints. The analysis of viewer sensitivity was based on factors related to viewing conditions (e.g., viewing frequency, duration, and exposure to Project features) and an understanding of the general public's concern for visual quality[5]. Viewer sensitivity for key viewpoints was informed by Visual Sensitivity Class (VSC) and/or Visual Quality Objective (VQO) ratings for relevant VSUs, input from engagement and consultation, and professional and local knowledge of land use activities in the Visual Resources LSA.

Viewing distance zones are established within the BC VRM system documentation (BC MoF 1997) and include foreground, middle-ground, and background distances. These zones are related to the visible level of detail in the landscape that may be discernible to the observer[6] and were considered relative to the distance Project components are located relative to key viewpoints. As viewing distance from the Project increases, visible detail and sensitivity to alteration decreases. Table 2 describes the viewing distance zones used for this assessment.

Table 2: Viewing Distance Zones

Viewing Distance Zone	Description
Foreground	Up to 1 km away provides discernment of detail for shape, patterns, texture, and colour of visible elements.
Middle-ground	From 1 km up to 8 km where overall shapes and patterns, and some texture and colour, are evident.

Source: BC Visual Landscape Inventory Procedures and Standards (BC MoF 1997)
km = kilometre(s)

A combination of the scenic quality and viewer sensitivity determinations, and viewing distance, was used to classify the relative condition and value of the landscape's existing level of visual quality for each key viewpoint. Landscape ratings of the existing visual quality were characterized using the following descriptive categories:

[5] A key assumption of this technical approach to determining viewer sensitivity is that it relates to typical, known, or likely values viewers place on the existing level of visual quality and that it is not related to potential viewer preferences or concepts of beauty.

[6] The level of detail discernible within viewing distance zones is relative to the scale and configuration of the landscape features.

- **Low** – indicates a view with relatively low scenic value and/or low vulnerability to visual alteration. The landscape may have minimal visual composition and little visual diversity. The view is of little importance to viewers and the public is unlikely be concerned if the area was visually altered.
- **Moderate** – indicates a view with some distinct dimension or character and/or that is moderately sensitive to visual alteration. The view may have evident visual composition of landscape features but contains few visually diverse characteristics. The area is moderately important to viewers and it is likely the public would be concerned if the area was visually altered.
- **High** – indicates a view with notable scenic value and/or vulnerability to visual alteration. The views typically have strong visual composition, a high degree of visual variety, and/or may contain distinct or unique features. The view is important to viewers and it is expected that the public would be concerned if the existing conditions were visually altered.

This characterizes the existing visual quality against which to assess the potential Project related visual effects.

4.1.6 Shade

The setting experienced by viewers in the Visual Resources LSA includes the current pattern of shadow cast by objects in the landscape such as landforms, built structures, and/or vegetation. Shade analysis evaluates the impact of shadows cast by a proposed development on its surroundings to determine potential changes to the current shade pattern in terms of the visible extent and form of shadows[7]. Shade may affect human receptors by reducing exposure to sunlight for residential or public areas (e.g., public spaces and community institutions), which may change the environmental setting experienced at these locations.

Analysis of shade conditions focused on the Mine Site Complex and a surrounding area to a distance of approximately 1 km[8]. Existing shade conditions analysis was based on the modelling results from a 3-dimensional (3D) Digital Surface Model (DSM) developed in 3D landscape modelling software (Autodesk 3D Studio MAX). Data used to create the DSM included the following:

- Terrain surface based on a combination of LiDAR[9] and 15 m resolution topographic data to represent the elevations of the pre-Project terrain.
- Vegetated landcover based on interpretation of orthographic imagery data to represent the extent and form of trees.
- Built structures based on building footprints and LiDAR data to represent the existing buildings within the District of Wells.

[7] Shade or shadow analysis is typically completed to meet zoning requirements to show how a new building has an impact on the existing conditions.

[8] This includes an area adequate to evaluate the length of shadows during key periods throughout the year and to produce a conservative estimate of the potential extent of shadows that may result from the Project seasonally.

[9] LiDAR stands for Light Detection and Ranging and is a remote sensing technology used for gathering digital 3-D data of the earth's surface commonly used to make high-resolution terrain models with are sub-metre accuracy.

The shade modelling environment allows for the sun to be positioned at specific locations throughout the year so that renderings of the landscape can represent the different shadows created during seasonal changes in the position of the sun. Modelling of existing shadow patterns was conducted to characterize the general extent, form, and duration of shadows during seasonal periods detailed in Section 4.2.4.1. A qualitative description is provided to characterize the existing shade conditions and the location of residential areas, public spaces, and community institutions near the Mine Site Complex.

4.2 Effects Assessment

The assessment of potential visual effects aims to evaluate how visible and/or prominent the Project may appear within the landscape, and how compatible it is with the existing visual quality so as to understand the potential visual impact to viewers at key viewpoints surrounding the Project. Key viewpoints were selected from surveyed locations to represent a range of viewing opportunities (i.e., viewing directions, distances, and duration) and types of viewers in the LSA, and that have a reasonably unobscured or representative view of the current mine plan. The following sections describe the approach to assessing these key factors from key viewpoints to determine the potential visual effects of the Project.

4.2.1 Landscape Modelling

To determine potential visual effects of the Project features, a computer-generated 3D landscape model was developed in advanced landscape modelling software based on available spatial data describing the terrain and Project components. This modelling allowed for the rendering of ground-based perspective images that include proposed Project landforms, vegetation clearing and planting, and built features to be located on the terrain. Simulation images rendered for key viewpoints were combined with site photography to create photo-composite images that illustrate the predicted Project visual effects.

The development of landscape modelling and simulated images followed established standards for visual assessment related simulations to provide accurate and verifiable modelling results to represent the Project (New Zealand Institute of Landscape Architects 2010, Landscape Institute 2019). This approach includes the following:

- High resolution LiDAR terrain data and geographic information to accurately locate Project components within the landscape.
- 3D modelling of Project components from engineering data and design information to produce scaled reproductions of Mine Site landforms (e.g., berms, portal area), surface infrastructure (e.g., service building, water treatment plant, camp), and transmission line features.
- Use of advanced landscape modelling software (i.e., Autodesk 3D Studio MAX) for high quality rendered simulations of the Project.
- Positioning of viewpoints within the modelling environment based on geographic data gathered during photographic field surveys.
- Registration between high resolution digital simulation renderings of the Project and landscape photographs for accurate photo-compositing.
- Presentation of simulations to represent the panoramic primary field of view that would be experienced by viewers to illustrate the viewing context of the Project.

Photo-composited images were used to support the visual effects assessment and are presented in Appendix A.

4.2.2 Visibility and Visual Prominence

The photo-composited images of the Project from key viewpoints (see Appendix A) were reviewed to identify the specific components that would be visible from each key viewpoint and to classify the level of visibility and visual prominence of Project components according to the following definitions:

- **Dominant** – visible object(s) of such large size that it occupies most of the visual field of view and is the major focus of visual attention.
- **Prominent** – visible object(s) is large in size and is a major focus of visual attention.
- **Obvious** – visible object(s) is a distinct feature of sufficient size to be plainly visible to a casual observer, but does not strongly attract viewer attention.
- **Noticeable** – visible object(s) is detectable and/or would be visible to most casual observers, but is subordinate in size to most landscape elements.
- **Inconspicuous** – visible object(s) is small in size and/or an indistinct feature.
- **Faint** – object(s) is very small in size and/or requires extended viewing to be discernible.

4.2.3 Visual Assessment

4.2.3.1 Visual Contrast and Dominance Rating

Qualitative assessment of the level of visual contrast and dominance introduced by Project components was used to determine the overall visual contrast of the Project in comparison to the existing landscape visible from key viewpoints. The physical characteristics of Project components were evaluated by visual design elements (i.e., colour, form, line, and texture) and compared to the existing landscape conditions. The contrast created by the visual elements of Project components was characterized using the following descriptive categories (USDI BLM 1986b):

- **None** - the element contrast is not visible or perceived.
- **Weak** - the element contrast can be seen but does not attract attention.
- **Moderate** - the element contrast begins to attract attention and/or begins to dominate the characteristic landscape.
- **Strong** - the element contrast demands attention, will not be overlooked, and/or is dominant in the landscape.

Scale and spatial dominance of the Project components were also considered as they contribute to the potential contrast with the existing landscape conditions. Scale is related to the size of the entire visible Project alteration relative to the landscape setting, while spatial dominance is related to the location of the entire visible Project

alteration within the landscape setting. The combined effect of scale and spatial dominance was characterized using the following descriptive categories:

- **Inconspicuous** – the alteration is a small object and occupies a very small area of the setting. The alteration requires extended viewing to be discernible.
- **Subordinate** – the alteration is notable in size and/or occupies a small to moderate part of the setting. The alteration is detectable to casual observers but is subordinate in size to most landscape elements.
- **Co-dominant** – the alteration is plainly visible as one of several major objects in the setting with features of equal visual importance and/or is located in a prominent position.
- **Dominant** – the alteration is the major object and/or occupies a large part of the setting and is located in a prominent position.

For each key viewpoint, the element contrast rating of Project components was combined with the dominance rating to define the level of overall visual contrast created by the Project. Table 3 describes the combination of these ratings used in determining a resulting overall visual contrast rating.

Table 3: Level of Visual Contrast Rating

Element Contrast and Dominance Rating Combination		Resulting Visual Contrast Rating
Element Contrast Rating [a]	Dominance Rating	
Weak	Inconspicuous	**Negligible**
Weak	Subordinate	**Low**
Weak	Co-dominant	**Moderate**
Moderate	Inconspicuous to Subordinate	
Weak	Dominant	**Strong**
Moderate	Co-dominant	
Strong	Inconspicuous to Subordinate	
Moderate to Strong	Dominant	**Severe**
Strong	Co-dominant	

Note: adapted from Yeomans 1983 and Shepard et al. 1979
a) An element contrast rating of 'None' indicates the Project is not visible within the landscape and will not result in any visual contrast.

The rating classes for the overall visual contrast are characterized as follows[10]:

- **Negligible** – the disturbance is barely perceptible without any noticeable contrast within the existing landscape character.
- **Low** – the disturbance is evident, but the contrast does not attract the attention of the viewer.
- **Moderate** – the disturbance provides a noticeable contrast that begins to attract attention, but is subordinate to the existing landscape character.

[10] Characterizations are based on BLM VRM Class Objectives (USDI BLM 1986b).

- **Strong** – the disturbance contrasts with the surrounding landscape elements in such a way that it attracts attention and is a dominant feature of the landscape.
- **Severe** – the disturbance highly modifies the surrounding landscape elements in such a way that it is the dominant element of the landscape, with a high degree of contrast to the existing landscape character.

4.2.3.2 Visual Impact Rating

A visual impact rating assessment was completed for each key viewpoint to determine how the predicted level of visual contrast expected from the Project is related to existing levels of scenic value defined by Landscape Ratings (Section 5.1.6). This resulted in a qualitative assessment of the level of visual impact that the Project-related disturbances are predicted to have on the existing visual quality and character within the Visual Resources LSA. Table 4 shows the combination of the Landscape Rating, which describes the overall scenic quality and sensitivity of the existing landscape to change, and the Contrast Rating, which describes the predicted level of visual contrast and dominance of the Project features and the resulting overall Visual Impact Rating of the Project.

Table 4: Visual Impact Rating

		Visual Contrast Rating				
		Negligible	**Low**	**Moderate**	**Strong**	**Severe**
Landscape Rating	**Low**	Negligible	Low	Low	Moderate	Moderate
	Moderate	Negligible	Low	Moderate	Moderate	High
	High	Low	Moderate	Moderate	High	High

Note: based on the Guidelines for Landscape and Visual Impact Assessment (LI/IEMA 2002)

The resulting ratings of visual impacts are defined as follows:

- **Negligible** – a very minor loss or alteration to one or more key elements/features of the existing landscape.
- **Low** – minor loss or alteration to one or more key elements/features of the existing landscape and/or introduction of elements that may be characteristic within the existing landscape.
- **Moderate** – partial loss or alteration to one or more key elements/features of the existing landscape and/or introduction of elements that may be prominent and may partially change the existing landscape character.
- **High** – a loss of or major alteration to key elements/features of the existing landscape and/or introduction of elements considered to change in the existing landscape.

4.2.4 Shade

4.2.4.1 Shadow Modelling

Similar to the modelling of existing shade conditions (Section 4.1.6), analysis of the pattern of shadows from the Mine Site components was based on the modelling results from a DSM which integrated 3D spatial data of Project landform features (i.e., the Mine Site Complex pad and berms) and built structures (e.g., service building, water treatment plant, camp). The DSM was developed to geographically model the shade conditions anticipated during the Project Operations phase. The modelling environment allowed for the sun to be positioned at specific locations throughout the year so that renderings of the landscape include shadow effects at solstice periods, when

the sun reaches its highest or lowest point relative to the equator, and at equinox periods, when the sun is more closely aligned with the equator. Shadow patterns of Mine Site Complex components were rendered for the following periods throughout the year:

- Spring Equinox (March 20);
- Summer Solstice (June 21);
- Autumn Equinox (September 22); and
- Winter Solstice (December 21).

For each of these dates, shadows were modelled at daily intervals of 9 AM (morning), 12 PM (noon), and 3 PM (afternoon).

4.2.4.2 Shade Analysis

The shadow patterns rendered for each seasonal period were used to inform the shade analysis of the Project. The form and timing of Project component shadows was evaluated to understand the extent and duration of shade effects. To understand the relationship of the shadow patterns on the surrounding community and public areas, shadows from Project components were assessed for the potential to overlap residential or public areas in the District of Wells. A qualitative description is provided to characterize the predicted shade conditions related to the Project components.

The Transmission Line shadow pattern was characterized based on the proposed dimensions of transmission structures (i.e., wooden poles up to 21 m in height) and desktop calculation of the shadow length for solstice and equinox periods. Shadow lengths were evaluated for the potential to interact with residential or public areas along the Transmission Line route. No analysis for the Transportation Routes, Bonanza Ledge WRSF, or QR Mill was conducted as these Project components either consist of mobile components that would not cast a fixed shadow, or they were located in locations with no residential or public areas within 1 km.

5.0 RESULTS

5.1 Existing Conditions

This section provides a summary of information detailed in the *Visual Quality Existing Conditions Report* (Golder 2021) to characterize existing conditions and support the assessment of visual effects.

5.1.1 Review of Existing Management Objectives

5.1.1.1 Land Use and Resource Planning

The Project is within the boundaries of the Cariboo-Chilcotin Land Use Plan (CCLUP; BC FLNRORD 1998) and the Quesnel Sustainable Resource Management Plan (QSRMP; BC FLNRORD 2007). Both strategic plans highlight the need to protect and enhance visual landscapes associated with tourism facilities and access corridors leading to key tourism activities areas, facilities, or protected areas. The CCLUP Recreation Corridor Management Strategy provides management direction and objectives to maintain visual quality for important recreation and tourism corridors, including Highway 26 and the Barkerville Historic Town and Park (BC FLNRORD 1998). In the QSRMP, visually important scenic areas have been mapped from designated viewpoints as Visual Resource Management Areas. Maintaining the visual quality of these areas involves the use of established VQOs that reflect a desired level of visual quality for an area and strategies to retain visual quality in scenic areas (BC FLNRORD 2019).

Maintaining the quality of the visual resource is identified as a key priority of the Wells Barkerville Community Forest (WBCF), as local citizens and businesses are concerned about the visual resource both for their own enjoyment and as an attraction to support the local tourism industry (District of Wells 2014).

5.1.1.2 Regional and Local Government Planning

The Visual Resources LSA is within Area C (Barlow/Barkerville) of the CRD and overlaps the District of Wells. Established regional policy and Official Community Plans (OCPs) within these planning areas provide direction for land use decisions in the region, including aspects of visual quality. The CRD supports the implementation of visual quality objectives developed by provincial agencies to reduce visual impacts along roadways and at other scenic locations, and to preserve the aesthetic quality of the natural setting along shoreline areas (CRD 2004; True Consulting 2014). The District of Wells OCP includes objectives for the preservation and protection of the environmental and aesthetic qualities of the District of Wells and surrounding area (District of Wells 2010). As of the time of reporting, the District of Wells is in the process of updating the OCP.

5.1.2 Existing Visual Environment Studies

A review of the Big Valley Visual Impact Assessment conducted for BC Timber Supply cutblocks A90167, A90168, and A90169 was conducted (Infinity-Pacific Stewardship Group 2013). This report was reviewed as it provides information on the existing visual environment within the Visual Resources LSA near the Mine Site.

5.1.3 Landscape Inventories

5.1.3.1 Visual Landscape Inventory

The Project is located within the boundaries of the Quesnel Natural Resource District (NRD), and the current approved VLI mapping data for the Quesnel NRD was analysed where it overlaps with the Visual Resources LSA. There are a number of viewpoints and related VSUs that overlap the Project area and the Visual Resources LSA. The Mine Site intersects four VSUs: #1170, #969, #872, and #1181. VSU #1170 and VSU #969, which surrounds the Mine Site Complex and Bonanza Ledge Site, are not considered visually sensitive. VSU #1181 overlaps a portion of the Mine Site Complex infrastructure and has an EVC rating indicating that no human-caused alterations are visible, a VSC rating which is described as having high sensitivity to human-made visual alteration, and a VQO rating which prescribes an altered forest landscape in which the alteration is difficult to see, small in scale, and indistinct in appearance. VSU #1170 has a VQO rating which specifies an altered forest landscape in which the alteration is difficult to see, small in scale, and indistinct in appearance. VSU #872 is classified as water and has no other VQC ratings. VLI data that overlaps the Transportation Route and Transmission Line portions of the Visual Resources LSA indicates that these most of these areas were not considered visually sensitive as part of the VLI process (BC MoF 2001).

Within the larger landscape setting of the Visual Resources LSA, the VLI mapping data identifies existing visual conditions that are predominately natural in appearance, with existing alterations that are not visually evident but that may be dominant is some locations. Sensitivity to human-made visual alteration in the Visual Resources LSA indicates that visual quality is generally important to viewers in the area, and that it is probable that the public would be concerned if the landscape was visually altered. The VQO ratings within the Visual Resources LSA generally range in classification from ‘Preserved’ to ‘Modification’, although most of the area prescribed with VQOs specifies objectives for visual quality in which the alteration may be evident, but not dominant as an element in the landscape.

Ratings provided in the VLI appear generally consistent with the conditions observed on the landscape from review of landscape features and results from the photographic field surveys.

5.1.4 Landscape Character

The character of the Visual Resources LSA varies across its extent related to variations in the landscape’s biophysical and land use setting, particularly for linear Project features (i.e., Transportation Routes and Transmission Line route). The landscape character generally consists of a predominantly natural setting of broad, rolling topography that includes a number of low mountainous landform features (e.g., Cow, Pinegrove, and Maud mountains), water features including streams, creeks, wetlands, and lakes (e.g., Cottonwood River, Lightning Creek, Willow River, Jack of Clubs Lake), and a predominately coniferous forested land cover.

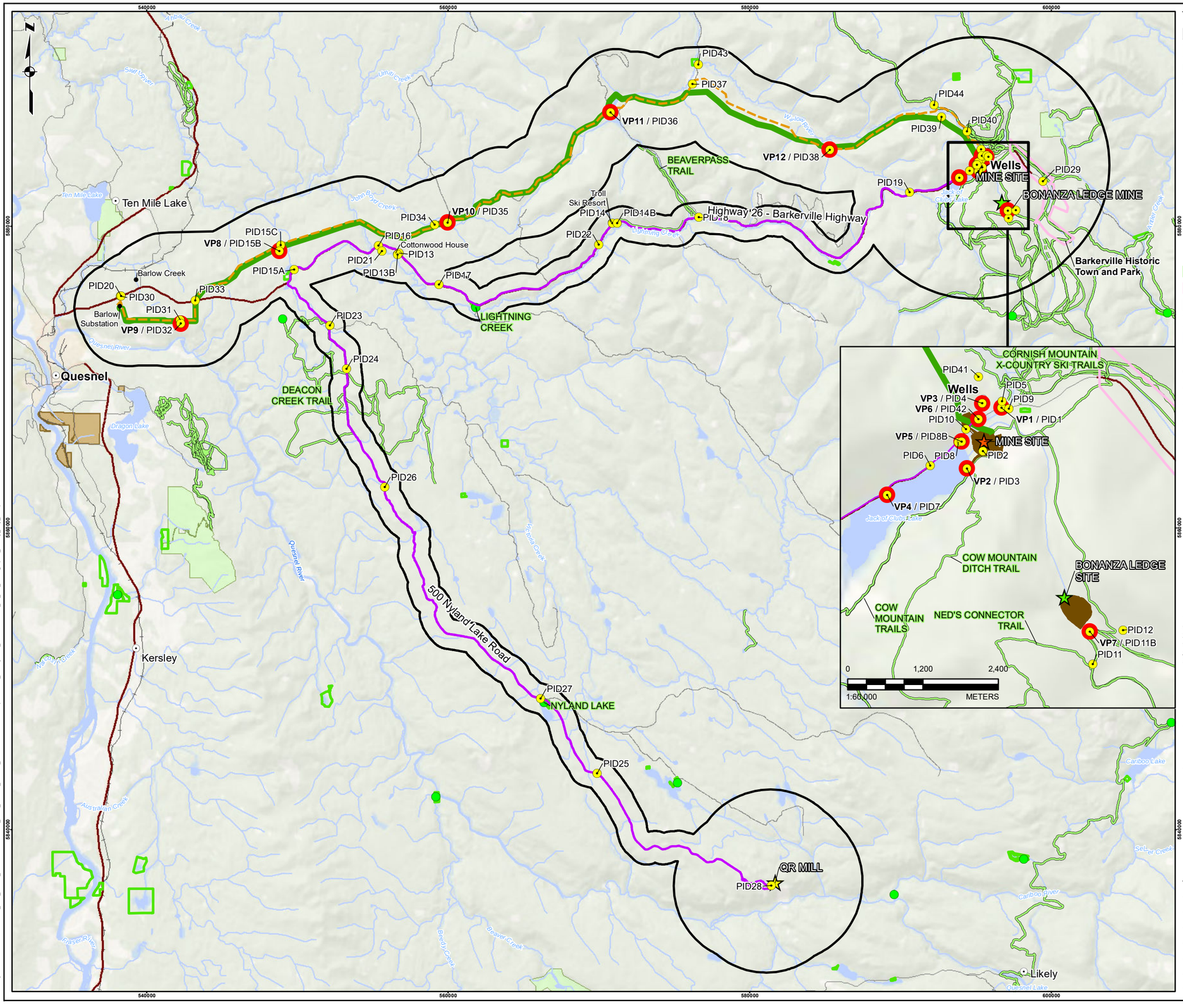
Although forestry, mineral exploration, and mining are key industrial land uses within the region, there is limited visible evidence of resource development activity surrounding the Mine Site. The Project Mine Site is proposed on brownfield sites that have been previously disturbed by historical mining operations. Forestry activity is more broadly evident throughout the Visual Resources LSA. Highway 26 is a paved roadway that connects the District of Wells and the Barkerville Historic Town and Park to the communities of Cottonwood and Barlow Creek, and the City Quesnel, in the west. A network of unpaved resource roads extending through the Visual Resources LSA provides access to resource development areas and recreation/tourism sites and areas (e.g., ski trails, hiking and mountain bike trials, snowmobile and ATV areas).

5.1.5 Photographic Survey

Three photographic surveys were undertaken between March 2018 and August 2020 to develop a photographic inventory of daytime and nighttime viewing conditions from 44 surveyed locations in the Visual Resources LSA. Additional photographs of viewing locations were collected in August 2021 to confirm views of the current mine plan. Photographs and observational information were collected to capture viewing opportunities of the Project area and surrounding landscape within the District of Wells, Cottonwood House, and Barlow Creek, along the Transportation Routes, and along the Transmission Line route. The inventoried photographic survey locations (identified by a unique photographic identifier, or *PID* number) are presented in Figure 1. Panoramic photographs and inventory information for surveyed viewpoints are presented in the *Visual Quality Existing Conditions Report* (Golder 2021).

5.1.6 Landscape Rating

Twelve key viewpoints were selected from the photographic survey locations to represent a range of public viewing opportunities within the Visual Resources LSA. Following procedures described in Section 4.1.5, dimensions of scenic quality and viewer sensitivity were assessed, along with viewing distance, for each of the 12 key viewpoints and combined into a Landscape Rating describing the existing level of visual quality at each location. The results of this assessment are summarized in Table 5. The locations of key viewpoints are presented in Figure 1.



LEGEND

- VISUAL QUALITY LOCAL STUDY AREA
- MINE SITE FOOTPRINT
- TRANSMISSION LINE ROUTE
- PREVIOUS TRANSMISSION LINE ALIGNMENT (2020)
- TRANSPORTATION ROUTE
- MINE SITE - MINE SITE COMPLEX
- MINE SITE - BONANZA LEDGE SITE
- QR MILL
- KEY VIEWPOINT
- SURVEY VIEWPOINT LOCATION (PID)
- TOWN
- RECREATION SITE
- RECREATION AREA
- BARKERVILLE HISTORIC TOWN AND PARK
- INDIAN RESERVE
- PARK/PROTECTED AREA
- WATERBODY
- WATERCOURSE
- RECREATION TRAIL
- HIGHWAY
- ROAD
- RAILWAY

REFERENCE(S)

1.WATER FEATURES, TRANSPORTATION FEATURES OBTAINED FROM CANVEC © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
2. RECREATION FEATURES, CITIES/TOWNS, INDIAN RESERVES AND PARK/PROTECTED AREAS OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
3. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

NAD83 CSRS
UTM Zone 10N

0 5 10
1:250,000 KILOMETERS

CARIBOO GOLD PROJECT

PHOTOGRAPHIC SURVEY AND KEY VIEWPOINTS

REV.	DESCRIPTION	DATE	INITIALS
0	FINAL - APPROVED	2021-11-18	R.S.
0	FINAL - REVIEWED	2021-11-18	D.H.
0	FINAL	2021-11-18	J.P.

PROJECT NO.	PHASE	REV.	FIGURE
1774160	36000	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm

0

Y:\burnaby\CAD-GIS\Client\BGM\BGM_Cow_Mtn\9p_PROJECTS\1774160_BGM_Cariboo_Gold\02_PRODUCTION\MXD\Report\Visual_QualityTech_Memo\1774160_01_VQ_Photographic_Survey_Key_Viewpoints.mxd

Table 5: Landscape Rating for Key Viewpoints

Viewpoint	Description of Scenic Quality	Description of Viewer Sensitivity	Viewing Distance Zone	Landscape Rating
VP1 (Sugar Creek Loop Access)	■ View of prominent feature (Cow Mountain) ■ Some variety of vegetation types (deciduous and coniferous forest) with relatively uniform pattern ■ Some variety of hues and texture in vegetation; complex textures in foreground structures ■ Paved roadway and brightly coloured built structures (houses, signs) evident in foreground	■ Local residents and tourists (motorists), recreational users (trail access) ■ Brief to sustained viewing opportunities ■ Overlapping VSU with no classified sensitivity to human-made visual alteration (VSC rating of 'UA'); the VSC ratings within the Mine Site portion of the LSA indicate that visual quality is important to viewers in the area ■ Objectives established to maintain visual quality for tourism corridors along Highway 26 ■ Engagement input indicates public in Wells is concerned about visual effects of the Project	Foreground (480 m)	High
VP2 (Cow Mountain Trailhead)	■ View of rolling topography ■ Visible portion of Jack of Clubs Lake ■ Some variety of vegetation types (deciduous and coniferous forest) with relatively uniform pattern ■ Some variety of hues in vegetation and exposed rock/soil ■ Gravel roadway and evident clearing and small built structures in the foreground and middle-ground	■ Recreational trail users ■ Brief to sustained viewing opportunities ■ Overlapping VSU rating of 'High' sensitivity to visual alteration; the VSC ratings within the Mine Site portion of the LSA indicate that visual quality is important to viewers in the area	Foreground (576 m)	High
VP3 (Burnett Ave.)	■ View of rolling topography; long ridgeline of Cow Mountain ■ Some variety of vegetation types (deciduous and coniferous forest) with relatively uniform pattern ■ Some variety of hues and texture in vegetation ■ Paved roadway and built structures (distribution poles, signs) evident in foreground	■ Local residents and tourists (motorists) ■ Permanent to sustained viewing opportunities ■ Overlapping VSU with no classified sensitivity to human-made visual alteration (VSC rating of 'UA'); the VSC ratings within the Mine Site portion of the LSA indicate that visual quality is important to viewers in the area ■ Engagement input indicates public in Wells is concerned about visual effects of the Project	Foreground (316 m)	High

Viewpoint	Description of Scenic Quality	Description of Viewer Sensitivity	Viewing Distance Zone	Landscape Rating
VP4 (VLI VP# 738)	■ View of rolling topography; long ridgeline of Cow Mountain ■ View of Jack of Clubs Lake ■ Some variety of vegetation types (deciduous and coniferous forest) with relatively uniform pattern ■ Some variety of hues in vegetation ■ Clearing and signage in foreground; roadway and clearing in middle-ground	■ Recreational users and tourists (motorists) ■ Brief to sustained viewing opportunities ■ Overlapping VSU with no classified sensitivity to human-made visual alteration (VSC rating of 'UA'); the VSC ratings within the Mine Site portion of the LSA indicate that visual quality is important to viewers in the area ■ Objectives established to maintain visual quality for tourism corridors along Highway 26	Middle-ground (1.9 km)	Moderate
VP5 (Taco Stand)	■ View of rolling topography ■ Some variety of vegetation types (deciduous and coniferous forest) with relatively uniform pattern ■ Some variety of hues in vegetation ■ Paved parking lot and built structures (building, signs) evident in foreground	■ Local residents and tourists (motorists) ■ Brief to sustained viewing opportunities ■ Overlapping VSU with no classified sensitivity to human-made visual alteration (VSC rating of 'UA'); the VSC ratings within the Mine Site portion of the LSA indicate that visual quality is important to viewers in the area ■ Objectives established to maintain visual quality for tourism corridors along Highway 26	Foreground (260 m)	Moderate
VP6 (Highway 26 / Wells)	■ View of rolling topography; prominent feature (Cow Mountain) ■ Visible water in slough ■ Some variety of vegetation types (deciduous and coniferous forest) with relatively uniform pattern ■ Some variety of hues in vegetation and exposed rock/soil ■ Clearing, paved roadway, and built structures (distribution poles, signs) evident in foreground	■ Local residents and tourists (motorists) ■ Brief to sustained viewing opportunities ■ Overlapping VSU with no classified sensitivity to human-made visual alteration (VSC rating of 'UA'); the VSC ratings within the Mine Site portion of the LSA indicate that visual quality is important to viewers in the area ■ Objectives established to maintain visual quality for tourism corridors along Highway 26 ■ Engagement input indicates public in Wells is concerned about visual effects of the Project	Foreground (100 m)	Moderate

Viewpoint	Description of Scenic Quality	Description of Viewer Sensitivity	Viewing Distance Zone	Landscape Rating
VP7 (Goldfields Ditch)	■ Enclosed view of ridgeline ■ Some variety of vegetation types (deciduous and coniferous forest) in foreground ■ Some variety of hues and texture in vegetation and exposed rock/soil ■ Evidence of existing mining operation; large clearing and gravel roadway in middle-ground	■ Recreational trail users ■ Brief to sustained viewing opportunities ■ Overlapping VSU with no classified sensitivity to human-made visual alteration (VSC rating of 'UA'); the VSC ratings within the Mine Site portion of the LSA indicate that visual quality is important to viewers in the area	Foreground (650 m)	Low
VP8 (Davey Lake)	■ Flat terrain ■ Visible portion of Davey Lake ■ Some variety of vegetation types (wetlands and coniferous forest) ■ Some variety of hues and texture in vegetation	■ Recreational users ■ Brief to sustained viewing opportunities ■ Overlapping VSU with low sensitivity to human-made visual alteration	Foreground (146 m)	Low
VP9 (Barlow ATV Access Road)	■ Flat terrain ■ Visible portion of wetland ■ Some variety of vegetation types (wetlands and coniferous forest) ■ Some variety of hues and texture in vegetation and exposed rock/soil ■ Gravel road in foreground	■ Recreational trail users ■ Brief viewing opportunity ■ Overlapping VSU with no classified sensitivity to human-made visual alteration (VSC rating of 'UA')	Foreground (220 m)	Low
VP10 (Norton Creek Cabin)	■ Flat terrain ■ Some variety of vegetation types (deciduous and coniferous forest) ■ Some variety of hues and texture in vegetation and exposed rock/soil ■ Clear and built structure (cabin) in foreground	■ Recreational users ■ Brief viewing opportunities ■ Overlapping VSU with no classified sensitivity to human-made visual alteration (VSC rating of 'UA')	Foreground (96 m)	Low
VP11 (Tregillus Lake)	■ View of rolling topography ■ Visible portion of Tregillus Lake ■ Some variety of vegetation types (deciduous and coniferous forest) with relatively uniform pattern ■ Some variety of hues in vegetation and exposed rock/soil ■ Noticeable forestry activity in background	■ Recreational users ■ Brief to sustained viewing opportunities ■ Overlapping VSU with no classified sensitivity to human-made visual alteration (VSC rating of 'UA')	Middle-ground (1.2 km)	Low

Viewpoint	Description of Scenic Quality	Description of Viewer Sensitivity	Viewing Distance Zone	Landscape Rating
VP12 (Slough Creek FSR)	■ Flat terrain; view of prominent feature ■ Some variety of vegetation types (deciduous and coniferous forest) ■ Some variety of hues in vegetation and exposed rock/soil ■ Gravel roadways in foreground	■ Recreational users ■ Brief viewing opportunity ■ Overlapping VSU with no classified sensitivity to human-made visual alteration (VSC rating of 'UA')	Foreground (179 m)	Low

Notes: m = metre; km = kilometre; VSU = Visual Sensitivity Unit; UA = Unclassified; VSC= Visual Sensitivity Class; VP=viewpoint; ATV = all-terrain vehicle; FSR=forest service road; LSA = local study area; foreground (less than 1 km); middle-ground (1 to 8 km); Brief = temporary and/or intermittent viewing opportunity (i.e., moving vehicle or hiker); Sustained = extended viewing opportunity (i.e., rest stop or lookout); Permanent = continual viewing opportunity (i.e., residence)

5.1.7 Shade

The shadow pattern in the area of the Mine Site Complex is influenced primarily by the local topography of the surrounding mountains and the predominately forested landcover. The topography casts large shadows when the suns angle is low. During autumn and winter months, this is most pronounced in the early to later hours of the day. The profile of trees (mostly 25 m to 30 m in height) contributes a jagged shadow pattern occurring along the edge of the District of Wells and in relation to smaller groves of trees located within the townsite. Development within the District of Wells has resulted in large, cleared areas for residential and commercial properties, playfields, and empty lots. The residential and commercial buildings in the townsite provide most of the shading in the townsite area. Most of these buildings have relatively small footprints and typically range from one to two storeys (approximately 6 m to 15 m in height). These cast mostly compact, geometric shadows around their perimeter. The District of Wells contains few tall buildings or infrastructure features.

Figure 2 to Figure 5 illustrate the general shadow patterns occurring within the 1 km area surrounding the Mine Site Complex, as represented by conditions experienced during solstice and equinox periods. Shadows generally remain compact in their extent during the spring and summer periods with no substantial shading of residences or public areas. Autumn and winter experience more noticeable shadow patterns, particularly during the early or late hours of the day when the sun is low in the sky and the topography shades part or most of the townsite. During midday, shadows are longer during winter and there may be some shading of residences.

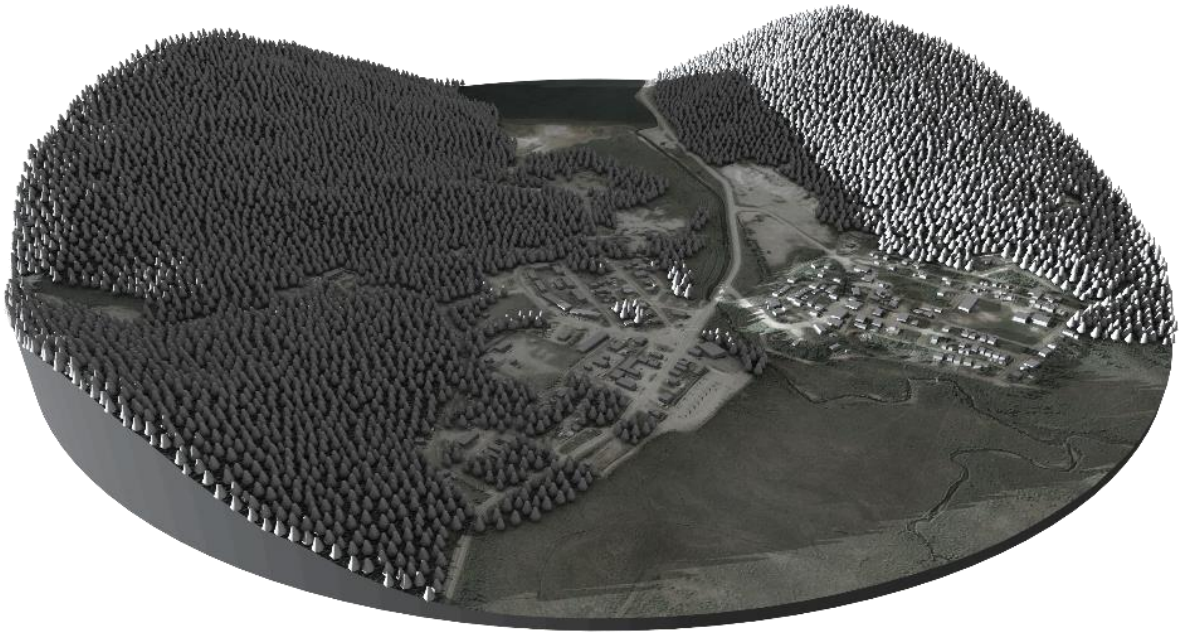


Figure 2: Illustration of the Existing Shade Pattern at the Mine Site Complex (Winter Solstice - December 21 at 3PM

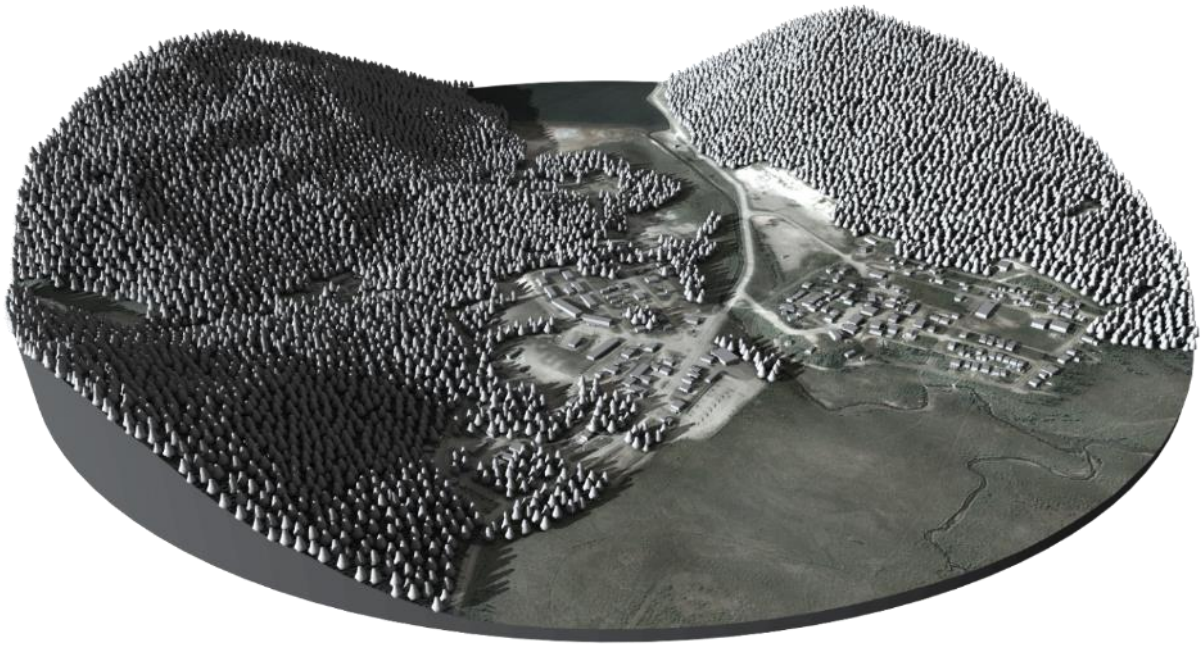


Figure 3: Illustration of the Existing Shade Pattern at the Mine Site Complex (Autumn Equinox – September at 9AM)

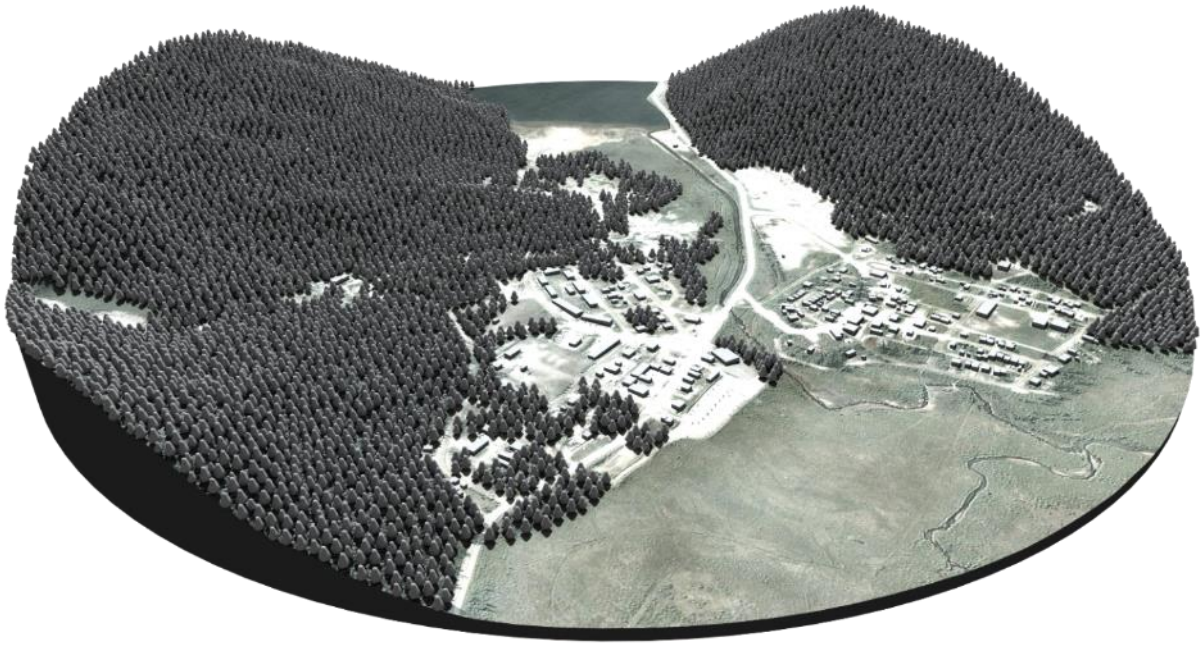


Figure 4: Illustration of the Existing Shade Pattern at the Mine Site Complex (Summer Solstice – June 21 at 3PM)



Figure 5: Illustration of the Existing Shade Pattern near the Mine Site Complex (Spring Equinox – March 20 at 12PM)

The area surrounding the Mine Site Complex includes nearby residences to the northwest on Mooney Lane, Gold Quartz Drive, Solibakke Drive, and Hong Street, as well as a playfield (baseball diamond) on the north side of Highway 26 near Pooley Street, and the museum beyond along Burnett Avenue. The Barkerville Gold Mine offices are located to the east of the Mine Site Complex along Ski Hill Road.

The shadow pattern along the Transmission Line is influenced by the local topography and forested landcover of a predominately natural environment. There are some built structures near the Barlow Creek portion of the Transmission Line route (e.g., transmission structures, residential buildings) and vegetation clearing (e.g., rural residential properties, right-of-way) that influence the shadow pattern in this area. Residential properties are located near portions of the Transmission Line route within Barlow Creek.

The Bonanza Ledge and QR Mill sites are located within natural settings where the shadow pattern is influenced by the local topography and forested landcover. Public access is restricted and there are little to no public receptors located near these sites[11].

The Transportation Route portion of the Project used for ore hauling extends from the Mine Site to the QR Mill along Highway 26 and the 500 Nyland Lake Forest Service Road. The shadow pattern in this area is influenced by the local topography and forested landcover, with development occurring at rural communities (e.g., Cottonwood House, Barlow Creek), roadside rest stops, and tourism sites (e.g., Trolls Resort), and in relation to the network of local access roads.

5.2 Effects Assessment

5.2.1 Constructions Phase

Construction of the Mine Site Complex and a new 69 kV transmission line will create temporary changes in visual quality from current daytime viewing conditions from pre-construction and construction activities. Upgrades to the QR Mill in preparation for the Project will occur prior to and during construction (e.g., surface water management system, treatment upgrades, management of tailings) and are not anticipated to result in visible changes to the facility. The WRSF at Bonanza Ledge will not develop during construction as its expansion is related to mining and waste rock deposition during operations.

At the Mine Site Complex, construction activities will focus on surface disturbances, including clearing vegetation and removing topsoil, stockpiling overburden and topsoil, grading of the Mine Site area, and construction of roads and surface infrastructure (e.g., portals, services buildings, bridge, camp, water treatment facilities). The new 69 kV transmission line will involve clearing vegetation for the right-of-way, development of access roads, erection of transmission poles, cable installation, and construction of a substation at the Mine Site Complex. The presence of construction equipment, facilities, and materials; staging and laydown areas; and temporary construction facilities will all temporarily alter existing viewing conditions. Mitigation included in the Project conceptual design or related to construction activities that addresses visual effects has been considered in the assessment and is detailed in Section 5.3.

[11] There is a local trail network that passes within approximately 0.2 km of the Bonanza Ledge WRSF.

Construction crews will work progressively through site preparation and construction in localized areas at the Mine Site and along the Transmission Line route. This will involve the temporary and intermittent visibility of construction equipment and activity at work sites. Fugitive dust from site preparation, grading, and material handling is also anticipated. Considering the scale and location of Project components being built, most activities and equipment would likely be visible only to viewers adjacent to the work sites. Where viewing locations are in foreground distances, and where there is limited screening by landforms or vegetation, construction activities will likely to be most discernible to viewers. Project components and construction activity will be most evident where located on top of landforms, and spanning watercourses or roadways, where they would be set against a backdrop of sky. The incremental assembly of the Mine Site Complex structures is anticipated to be visible from a greater distance due to the scale and relatively prominent location of the components. Construction is anticipated to occur over a 1 year period, with the duration of construction activity in any given area assumed to be for a number of months. Some visual disturbances are expected to remain for the subsequent Operations Phase.

Progressive reclamation during construction may be undertaken, where practical. Visual design was considered as part of progressive reclamation related to the Island Mountain Portal entrance. A landscape plan concept was developed that included prescriptive re-vegetation around the portal entrance to address concerns raised by the public. Re-vegetation is anticipated to increase in its effectiveness as a visual screen as the vegetation matures.

5.2.2 Operations Phase

The Operation Phase focuses on underground mining and processing, as well as progressive rehabilitation and maintenance. Surface structures features used for operations at the Mine Site Complex will include buildings for mineral processing, waste storage, offices, and accommodation. Waste rock storage will occur at the WRSF at Bonanza Ledge and ore will be transported to the QR Mill site. Visual disturbance during operations at the Mine Site Complex and along the 69 kV transmission line are detailed in the Sections 5.2.2.1, 5.2.2.2, and 5.2.2.3. Temporary or negligible visual disturbance anticipated along the Transportation Route from the Mine Site to QR Mill, and for the QR Mill, are described below.

Material generated at the Mine Site will be hauled along the Transportation Route (Highway 26 and 500 Nyland Lake Road) to the QR Mill site. Transport of workforce and construction materials, equipment delivery, and removal of wastes will involve small service equipment and pick-up trucks travelling along the Transportation Routes (primarily along the Quesnel Hydraulic Road to 2700 Road). Upgrades to the existing Transportation Routes are not required as part of the Project. The preferred option for hauling (i.e., 24 hours per day) would reduce the frequency of trucks during the daylight hours along the Transportation Route. Small service equipment and pick-up truck activity will result in the temporary visibility of vehicle traffic, which is likely similar to existing vehicle use along the Transportation Route. Haul trucks travelling along the Transportation Route from the Mine Site to the QR Mill will result in the temporary and intermittent visibility of large haul trucks and potential for dust, particularly along gravel portions of the route. Most of these operation activities and components would likely be visible only to those viewers adjacent to the Transportation Route and be short in duration.

Ore from Bonanza Ledge is trucked to facilities at QR Mill for processing as part of mining at that location unrelated to the Project. Project mineral processing and storage at the QR Mill site are anticipated to result in minimal visible changes related to the addition of a dewatering plant and dry stack tailings storage facility. There are restricted viewing opportunities of the QR Mill site as the facility is not open to the public and it is mostly screened from public viewing opportunities along the 500 Nyland Lake Road. There is potential for temporary and localized visual effects of fugitive dust from material handling.

5.2.2.1 Visibility and Visual Prominence

The analysis of simulated images and viewing distances for each key viewpoint provides a qualitative characterization of the visibility and visual prominence of Project components within the field of view at each location. Table 6 summarizes the results of the visibility and visual prominence analysis.

Table 6: Visibility Summary of Project Components

Viewpoint	Viewing Distance Zone	Description of Visible Features	Description of Visual Prominence
VP1 (Sugar Creek Loop Access)	Foreground (480 m)	A small portion of the surface infrastructure (i.e., service building) is visible; mostly screened by foreground vegetation.	Inconspicuous element within the view that is a small and indistinct feature.
VP2 (Cow Mountain Trailhead)	Foreground (576 m)	Portions of the surface infrastructure (i.e., water treatment plant), transmission line structures (i.e., poles and conductors), the Mine Site pad, and the Island Mountain Portal entrance are visible.	Noticeable elements within the view. The surface infrastructure is recognizable as a distinct but subordinate feature to the viewer.
VP3 (Burnett Ave.)	Foreground (316 m)	Portions of the transmission line structures (i.e., pole and conductors), and the Island Mountain Portal entrance are visible; mostly screened by foreground vegetation.	Inconspicuous elements within the view that are indistinct features.
VP4 (VLI VP# 738)	Middle-ground (1.9 km)	Portions of the surface infrastructure (i.e., service building and camp) and the Mine Site pad are visible.	The surface infrastructure is an obvious element within the view that begins to attract the attention of the viewer.
VP5 (Taco Stand)	Foreground (260 m)	Surface infrastructure (i.e., service building, camp, water treatment plant) and the Mine Site pad are visible; the Mine Site pad is mostly screened by vegetation.	Prominent elements within the view that attract the attention of the viewer.
VP6 (Highway 26 / Wells)	Foreground (100 m)	The Island Mountain Portal entrance and a portion of the transmission line right-of-way and structures (i.e., poles and conductors) are visible.	Dominant elements that occupy most of the viewer's visual field of view.
VP7 (Goldfields Ditch)	Foreground (650 m)	A portion of the waste rock storage facility is visible; partially screened by foreground landform and vegetation.	Noticeable element within the view that is an indistinct feature.
VP8 (Davey Lake)	Foreground (146 m)	A portion of the transmission line right-of-way clearing and structures (i.e., pole and conductors) are visible.	Noticeable but subordinate elements within the view.
VP9 (Barlow ATV Access Road)	Foreground (220 m)	A portion of the transmission line right-of-way clearing and structures (i.e., pole and conductors) are visible.	Noticeable but subordinate elements within the view.

Viewpoint	Viewing Distance Zone	Description of Visible Features	Description of Visual Prominence
VP10 (Norton Creek Cabin)	Foreground (96 m)	A small portion of the transmission line structures (i.e., pole and conductors) is visible; mostly screened by foreground vegetation.	Inconspicuous element within the view.
VP11 (Tregillus Lake)	Middle-ground (1km)	A portion of the transmission line right-of-way clearing and structures (i.e., poles and conductors) are visible.	Inconspicuous elements within the view.
VP12 (Slough Creek FSR)	Foreground (179 m)	A portion of the transmission line structures (i.e., pole and conductors) are visible.	Noticeable but subordinate elements within the view.

Note:
VP = viewpoint; km = kilometres; m = metres; FSR = forest service road; ATV = all-terrain vehicle; VLI = BC Visual Landscape Inventory

VP5 and VP6 are located within close viewing distance of the Mine Site and Island Mountain Portal areas, respectively, and are predicted to experience views where Project components are likely to be highly visible and appear visually prominent or dominant. VP2 and VP4 are located within relatively close viewing distance of the Mine Site and Project components are likely to be visually evident as distinct but subordinate features in the landscape. From VP7, the waste rock storage facility is predicted to be visually evident but a subordinate feature in the landscape. From most of the viewpoints related to the Transmission Line route (i.e., VP8, VP9, and VP12), the Project components are likely to be noticeable but subordinate feature in the landscape. From some of the viewpoint locations (i.e., VP1, VP3, VP10, and VP11), Project components will be inconspicuous elements within the view due to screening by foreground landforms or vegetation.

5.2.2.2 Landscape Modelling

Computer-generated 3D models of the Mine Site Complex and Transmission Line route were developed from Project design information to simulate the form and character of Project components. Simulated images of the Project component models were generated for key viewpoints based on the geographic coordinates and camera positions recorded during the photographic field surveys. To be conservative, simulations focus on an early period of the Operations Phase (Year 1 to 3) where mitigation, such as tree screening, would be established but not fully developed[12].

These images were used to characterize the visual effects of the Project during the Operations Phase and support the rating of the visibility and visual prominence, and visual contrast and dominance of the Project during daytime viewing (Section 4.2.3.1). Simulated images of the Project from key viewpoints are presented in Appendix A. Figure 6 provides an illustration of the 3D modelled components for the Mine Site Complex, including surface infrastructure (highlighted in blue) and landform modification.

[12] Simulations of the waste rock storage facility provided in Appendix A illustrate a later period of Operations to represent the period with the largest anticipated effect to visual quality (i.e., full build-out)

Re-vegetation applied as part of progressive reclamation is anticipated to increase in its effectiveness as vegetation matures by providing a better visual screen and further reducing the contrast of the Project on the landscape. Simulations characterizing the visual effects of mature vegetation at Year 15 are included in Appendix A to illustrate the longer-term visual effects of progressive reclamation.

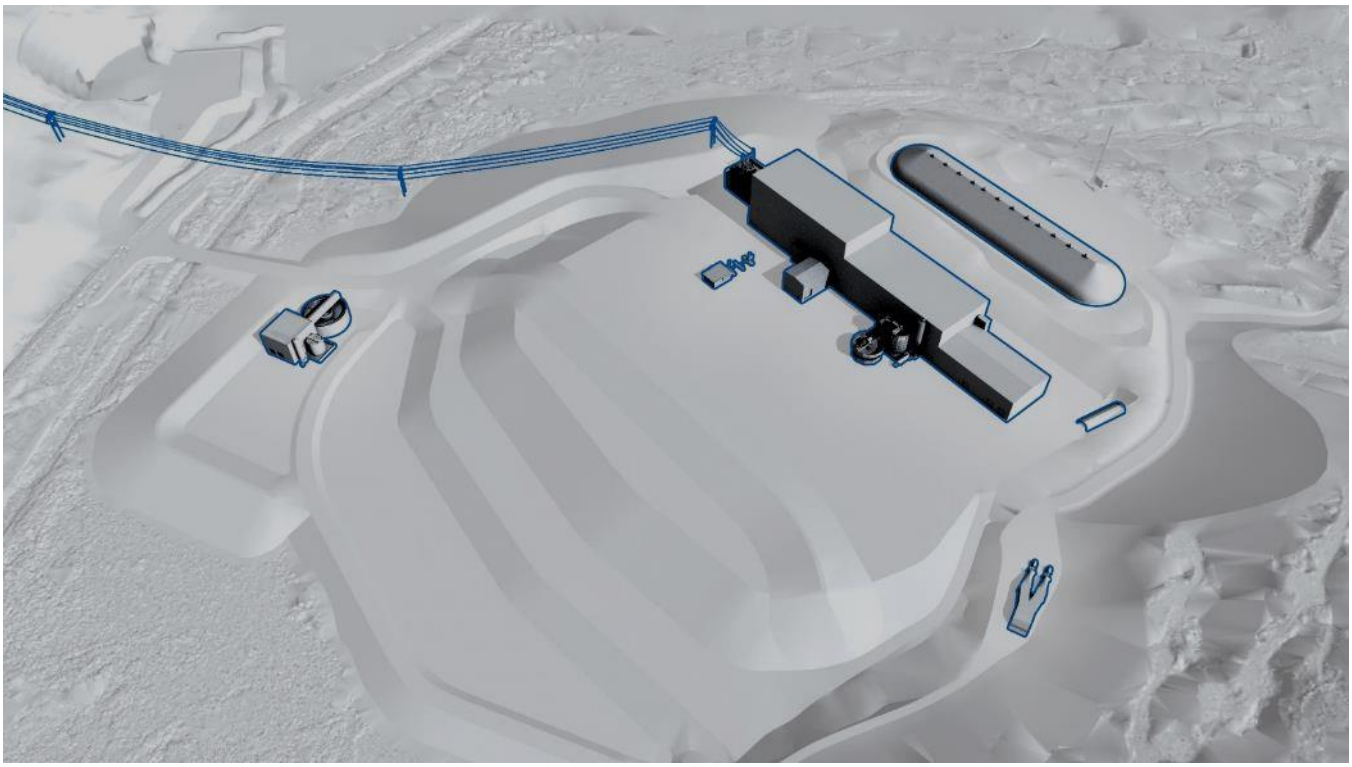


Figure 6: Illustration of Project Mine Site Modelling

5.2.2.3 Visual Impact Assessment

There is the potential for the Project to impact the visual quality and character of the LSA beyond the Construction Phase and into the Operations Phase. Vegetation clearing and maintenance, landform modifications (e.g., development of the waste rock storage facility and stockpiles), the presence of surface infrastructure at the Mine Site, and transmission structures and conductors along the Transmission Line, will potentially result in visual disturbance and alterations during operations that would be evident within the current character of the LSA's landscape setting. This would occur throughout the Project's operations activity period (16 years) and represents the period with the largest anticipated effect to visual quality. Mitigation included in the Project conceptual design that will address visual effects has been considered in the assessment and is detailed in Section 5.3.

Section 5.2.2.3.1 and Section 5.2.2.3.2 provide analysis of visible Project components to determine the visual contrast and overall visual impact of the Project in comparison to the existing landscape visible from key viewpoints.

5.2.2.3.1 Contrast Rating

Photo-composite images presented in Appendix A, representing the viewing conditions during early operations at representative key viewpoints, were evaluated using the methods detailed in Section 4.2.3 to determine the visual contrast exhibited by the Project components within the surrounding landscape. Ratings of visual element contrast and dominance, and an overall contrast rating, were assigned for each key viewpoint to summarize the degree to which the Project will visually fit within the existing landscape. Table 7 summarizes the element contrast, dominance, and overall contrast ratings for each viewpoint, and provides associated rationale.

Table 7: Contrast Rating Results

Viewpoint	Contrast Rating		Description
VP1 (Sugar Creek Loop Access)	Contrast Rating	Weak	Angular form of surface infrastructure (i.e., service building).
			Fine texture of building surface.
			Colours of building surface blend in with the natural surroundings[(a)].
	Dominance Rating	Subordinate	Portion of surface infrastructure extends above the existing vegetation.
	Overall Contrast for VP1	**Low**	
VP2 (Cow Mountain Trailhead)	Contrast Rating	Moderate	Geometric and angular form of surface infrastructure (i.e., water treatment plant) and transmission structures (i.e., poles and conductors). Landform alterations for Mine Site (i.e., pad for service buildings and camp) and Island Mountain Portal entrance.
			Fine texture of building surfaces and grassy slope of Mine Site and Island Mountain Portal areas; moderately course texture of treed slope for Mine Site and Island Mountain Portal entrance.
			Colours of building surface and ground cover blend in with the natural surroundings.
	Dominance Rating	Subordinate	Surface infrastructure and mass of landform modifications are evident in size, but occupy a minor part of the setting.
			Mine Site landform alteration seen against a backdrop of sky. Surface infrastructure (i.e., water treatment plant) is located between converging ridgelines, creating a focal feature.
	Overall contrast for VP2	**Moderate**	
VP3 (Burnett Ave.)	Contrast Rating	Weak	Diagonal line of transmission conductors. Horizontal landform alteration of the Island Mountain Portal entrance.
			Small areas of fine texture of grassy slope areas and moderately course texture of treed slope areas of the Island Mountain Portal entrance.
	Dominance Rating	Inconspicuous	Island Mountain Portal area is located at bottom of slope and seen against a backdrop of land.
			Mostly obscured by foreground vegetation.
	Overall contrast for VP3	**Negligible**	

Viewpoint	Contrast Rating		Description
VP4 (VLI VP# 738)	Contrast Rating	Moderate	Geometric and angular forms of surface infrastructure (i.e., service building and camp). Landform alteration for Mine Site (i.e., pad).
			Fine texture of building surfaces and grassy slope of Mine Site with some moderately course texture of trees on slope. Small amount of reduced texture from vegetation clearing upslope of Mine Site.
			Colours of building surface and ground cover blend in with the natural surroundings.
	Dominance Rating	Subordinate	Surface infrastructure (i.e., service building and camp) and mass of landform alterations are evident in size and occupy a small part of the setting.
			Mine Site area is located at bottom of slope in relation to converging ridgelines, creating a focal feature.
	Overall contrast for VP4	**Moderate**	
VP5 (Taco Stand)	Contrast Rating	Moderate	Large geometric and angular forms of surface infrastructure (i.e., service building, camp, water treatment plant). Landform alterations for Mine Site (i.e., pad).
			Fine texture of building surfaces and grassy slope of Mine Site and moderately course texture of trees on slope. Reduced texture from vegetation clearing upslope of Mine Site.
			Colours of building surface and ground cover blend in with the natural surroundings.
	Dominance Rating	Co-Dominant	Surface infrastructure (i.e., service building, camp, water treatment plant) and mass of landform alterations are major features within the view and similar in scale to existing elements in the landscape setting.
			Mine site features are located in a prominent position and seen against a backdrop of both land and sky.
	Overall contrast for VP5	**Strong**	
VP6 (Highway 26 / Wells)	Contrast Rating	Strong	Large area of vegetation clearing related to the Island Mountain Portal site and parallel sided corridor of the right-of-way. Large area of landform alteration related to Island Mountain Portal site (e.g., entrance, access road, laydown area). Horizontal form of benching at the Island Mountain Portal entrance. Geometric and angular form of transmission structures (i.e., poles and conductors).
			Fine texture of grassy right-of-way and Island Mountain Portal clearings. Moderately course texture of trees along roadway and along horizontal benches above the Island Mountain Portal entrance.
			Light colour of exposed rock at Island Mountain Portal entrance. Colours of ground cover blend in with the natural surroundings.

Viewpoint	Contrast Rating		Description
	Dominance Rating	Dominant	Project alterations occupy most of the visual field of view and are the major focus of visual attention.
			The Island Mountain Portal is located in a prominent position and has a broad horizontal composition with the distinct vertical form of the right-of-way.
	Overall Contrast for VP6	**Severe**	
VP7 (Goldfields Ditch)	Contrast Rating	Moderate	Broad, horizontal form of waste rock storage facility landform.
			Fine texture of waste rock.
			Dark colour and mottled pattern of exposed waste rock.
	Dominance Rating	Subordinate	Waste rock storage landform is evident in size and occupies a moderate part of the view.
			Broad horizontal form in scale with adjacent sloping ridgelines.
	Overall contrast for VP7	**Moderate**	
VP8 (Davey Lake)	Contrast Rating	Weak	Horizontally oriented transmission conductors and vertically oriented transmission structures.
			Interrupted texture from right-of-way clearing.
			Light colour of transmission structures (i.e., poles and conductors). Bright green colour of vegetation in right-of-way clearing.
	Dominance Rating	Subordinate	Project transmission poles are slightly smaller in size than existing trees. Right-of-way clearing occupies a minor part of the setting.
			Transmission structures are partially obscured by vegetation and seen against a backdrop of sky. Right-of-way clearing and transmission structures are located between converging shorelines, creating a focal feature.
	Overall contrast for VP8	**Low**	
VP9 (Barlow ATV Access Road)	Contrast Rating	Weak	Broad, horizontally oriented transmission conductors and vertically oriented transmission structures.
			Reduced texture from right-of-way clearing.
			Light colour of transmission structures (i.e., poles and conductors). Bright green colour of vegetation in right-of-way clearing.
	Dominance Rating	Subordinate	Project transmission poles are slightly smaller in size than existing trees. Right-of-way clearing occupies a minor part of the setting.
			Transmission structures (i.e., poles and conductors) are partially obscured by vegetation and mostly seen against a backdrop of land.
	Overall contrast for VP9	**Low**	

Viewpoint	Contrast Rating		Description
VP10 (Norton Creek Cabin)	Contrast Rating	Weak	Angular forms of transmission structures.
			Light colour of transmission structures (i.e., poles and conductors).
	Dominance Rating	Inconspicuous	Transmission structures (i.e., poles and conductors) are mostly obscured by vegetation.
	Overall contrast for VP10	**Negligible**	
VP11 (Tregill us Lake)	Contrast Rating	Weak	Broad, horizontally oriented transmission conductors and short vertically oriented transmission poles.
			Reduced texture from right-of-way clearing.
			Light colour of transmission structures (i.e., poles and conductors).
	Dominance Rating	Subordinate	Project transmission structures are smaller in size than existing trees. Right-of-way clearing and transmission structures occupy a minor part of the setting.
			Project transmission structures and right-of-way are located at the bottom of a slope and in between converging shorelines, creating a focal feature.
	Overall contrast for VP11	**Low**	
VP12 (Slough Creek FSR)	Contrast Rating	Weak	Horizontally oriented transmission conductors and short vertically oriented transmission pole.
			Light colour of transmission structure and conductors.
	Dominance Rating	Inconspicuous	Project transmission poles are smaller in size than existing trees. Transmission structures occupy a very minor part of the setting.
			Project transmission structures (i.e., pole and conductors) are partially obscured by vegetation and seen against a backdrop of land.
	Overall contrast for VP11	**Negligible**	

Notes: VP = viewpoint; FSR = forest service road; ATV = All-terrain vehicle; VLI = British Columbia Visual Landscape Inventory
a) Actual colour of building surface to be determined in final design.

5.2.2.3.2 Visual Impact Rating

The overall Contrast Rating (see Table 7) was compared to the baseline Landscape Rating (see Table 5) to determine the Project's level of visual impact for each key viewpoint in accordance with criteria defined in Section 4.2.3.2. Resulting Visual Impact Ratings for each key viewpoint are summarized in Table 8.

Table 8: Visual Impact Rating Results

Viewpoint	Landscape Rating	Contrast Rating	Visual Impact Rating
VP1 (Sugar Creek Loop Access)	High	Low	Moderate
VP2 (Cow Mountain Trailhead)	High	Moderate	Moderate
VP3 (Burnett Ave.)	High	Negligible	Low
VP4 (VLI VP# 738)	Moderate	Moderate	Moderate
VP5 (Taco Stand)	Moderate	Strong	Moderate
VP6 (Highway 26 / Wells)	Moderate	Severe	High
VP7 (Goldfields Ditch)	Low	Moderate	Low
VP8 (Davey Lake)	Low	Low	Low
VP9 (Barlow ATV Access Road)	Low	Low	Low
VP10 (Norton Creek Cabin)	Low	Negligible	Negligible
VP11 (Tregillus Lake)	Low	Low	Low
VP12 (Slough Creek FSR)	Low	Negligible	Negligible

Notes: VP = viewpoint,; FSR = forest service road; ATV = All-terrain vehicle; VLI = British Columbia Visual Landscape Inventory

Near Wells, where Landscape Ratings demonstrate a high sensitivity to visual change, the Contrast Rating of the Mine Site ranges from 'Low' to 'Severe', with some viewpoint locations (i.e., VP5 and VP6) experiencing substantial visual impacts where the Project components will attract attention and be dominant features of the landscape setting. For these key viewing locations, the Project results in alteration to the existing landscape, particularly where there is a high degree of contrast. Other key viewpoint locations in and near Wells will experience more modest visual effects where the Project results in a minor or partial alteration to the existing landscape.

The WRSF at Bonanza Ledge will likely attract the attention of viewers and result in a minor alteration to the landscape that will be characteristic within the context of an active mining site.

Key viewpoint locations along the Transmission Line are considered less sensitive to visual change and will experience minor visual effects from Contrast Ratings that range from 'Low' to 'Negligible'. Project components are anticipated to generally not attract the attention of viewers and will result in a minor alteration to the existing landscape setting, which would retain its existing overall visual character.

The visual contrast of the Project on the landscape during early operations is expected to notably decrease with progressive reclamation**,** particularly planting, which becomes more effective as vegetation matures. Simulations are presented in Appendix A to illustrate the longer-term visual effects of progressive reclamation near the Mine Site Complex at Year 15. Evaluation of these images indicates that for many key viewpoints (i.e., VP2, VP5, and VP6), the presence of surface infrastructure and/or landform alteration will become substantially less visible as a result of tree screening. The colour, texture, and composition of re-vegetated areas is expected to blend with the natural surrounding landscape. Project components that remain visible will present a minor alteration to the existing landscape.

The long-term visual effects of the Mine Site Complex are predicted to be consistent with regional and local strategic land use and resource planning policies that indicate scenic landscapes are important for recreation and tourism opportunities in the region (e.g., maintain visual quality in the Highway 26 corridor and from designated viewpoints). While visual impacts from early operations may present localized change in the existing landscape setting experienced by recreation users and tourists near the District of Wells, progressive reclamation will result in these visual impacts being temporary and the establishment of a more natural appearing landscape near the Mine Site Complex where alteration may be evident, but not a dominant element in the landscape.

5.2.2.4 Shade

Mine Site Complex surface structures (i.e., service building, water treatment plant, camp) and landform modifications consist of features whose form and size are likely to produce additional shadows within the existing shadow pattern near Wells townsite. Shade renderings from the modelling for solstice and equinox periods are presented in Figure 7 to Figure 18 to illustrate the anticipated shadow pattern of the Mine Site Complex components during operations and support further analysis of shade effects.



Figure 7: Project Shade Pattern at the Mine Site Complex - Spring Equinox (March 20 at 9AM)



Figure 8: Project Shade Pattern at the Mine Site Complex - Spring Equinox (March 20 at 12PM)



Figure 9: Project Shade Pattern at the Mine Site Complex - Spring Equinox (March 20 at 3PM)



Figure 10: Project Shade Pattern at the Mine Site Complex - Summer Solstice (June 21 at 9AM)



Figure 11: Project Shade Pattern at the Mine Site Complex - Summer Solstice (June 21 at 12PM)



Figure 12: Project Shade Pattern at the Mine Site Complex - Summer Solstice (June 21 at 3PM)



Figure 13: Project Shade Pattern at the Mine Site Complex - Autumn Equinox (September 22 at 9AM)



Figure 14: Project Shade Pattern at the Mine Site Complex - Autumn Equinox (September 22 at 12PM)



Figure 15: Project Shade Pattern at the Mine Site Complex - Autumn Equinox (September 22 at 3PM)



Figure 16: Project Shade Pattern at the Mine Site Complex - Winter Solstice (December 21 at 9AM)



Figure 17: Project Shade Pattern at the Mine Site Complex - Winter Solstice (December 21 at 12PM)



Figure 18: Project Shade Pattern at the Mine Site Complex - Winter Solstice (December 21 at 3PM)

Based on a review of shadow modelling renderings, it is expected that shadows produced by the Mine Site Complex components will not extend far beyond the Project site during most of the year and will not reach nearby receptors. During winter, there is the potential that longer shadows will extend beyond the Project site boundary, particularly during early morning or late afternoon hours. During this time, a small amount of shade may be experienced across Highway 26 near Pooley Street (see Figure 16) or on a small segment of Mooney Lane and Hong Street (see Figure 18).

Project-related 69 kV transmission structures are anticipated to cast narrow shadows at intermittent distances along the Transmission Line route. Based on desktop analysis of the shadow length cast by transmission structures of 21 m in height, it is expected these shadows will typically range between approximately 13 m to 35 m in length for the spring, summer, and autumn periods. Longer shadows (up to 76 m in length) will occur in the morning hours and during the winter (between 87 m to 305 m in length). For most of the year, the shadow pattern related to transmission structures will not extend far beyond the proposed 35 m width of the Transmission Line right-of-way. Since the Transmission Line route follows a relatively remote corridor north of Highway 26, it is not anticipated that shadows will reach nearby receptors, with the exception of some rural residential properties near Barlow Creek.

This assessment conservatively assumes a number of factors related to the modelling of shadows. The terrain modelling and shadow length calculations do not consider trees surrounding the Mine Site Complex or along the Transmission Line route that would potentially interrupt shadows cast by the Project components. The shadow modelling does not account for the nature of shadow density, which becomes more diffuse and, therefore, less perceptible with increasing distance from the object that is casting the shadow. Seasonal lighting also influences shadows, for example, during winter hours the intensity of lighting is often decreased by cloud cover and the effect of shadows may be diffused or eliminated.

Considering the generally small extent of shadows cast by Project component, the limited period they extend beyond the Project footprint, and the unlikely potential of the shadows to interact with residences or public spaces, shade effects of the Project are characterized as having a negligible effect on shade conditions.

5.2.3 Closure / Post-Closure Phase

Available Project conceptual reclamation and closure information details decommissioning and post-closure activities. This includes the following:

- Decommissioning and removal of facilities, and reclamation of the Mine Site Complex and QR Mill site, including re-contouring and re-vegetation;
- Decommissioning and removal of poles and conductors, and reclamation of the Transmission Line, including re-contouring and re-vegetation;
- Transport of workforce and materials required for closure and removal of equipment and wastes; and
- Post-closure care and maintenance and environmental monitoring.

Decommissioning will occur for approximately 2 years and active post-closure care and maintenance of the Project will occur for 5 years or more. Reclamation and closure planning is directed towards achieving target end land uses and mitigating long-term risks to the environment and social and Indigenous values of the land after mining. Development of reclamation and closure activities will occur with Indigenous partners.

Project reclamation is expected to result in the reduction of visible disturbances and re-establishment of landforms and vegetation patterns that are consistent with the surrounding natural landscape. Re-contouring landforms is anticipated to produce more complex topography and landform features (e.g., sloped benches, draws) that would be consistent in form and scale with the existing landscape. Re-vegetation of disturbed areas is anticipated to involve planting of native grasses, trees, and shrubs during the early stages of reclamation that would result in land cover that would be consistent in form, colour, and texture with the surrounding forest communities. Re-vegetation is anticipated to increase in its effectiveness as vegetation matures, which will further reduce the contrast of the Project on the landscape. Removal of surface structures and transmission infrastructure will eliminate the evidence of Project-related built features and reduce evidence of industrial activity that contrasts with the natural setting.

Post-closure maintenance and monitoring will occur during the reclamation period and until reclamation areas are considered compliant with permits and regulations. The goal is to design and reclaim areas to be self-sustaining at meeting target end land uses. A primary target end land use for the Project's reclaimable land is expected to be a forest ecosystem representative of pre-mining ecosystems, although this will be confirmed during development of a Reclamation and Closure Plan.

5.3 Mitigation Measures

Mitigation has been identified to address effects related to the visibility and levels of visual contrast exhibited by the Project components. These procedures are drawn from available best management practices (BMPs) for addressing visual impacts, particularly for mining, as well as visual design strategies. These were considered for their effectiveness for implementation and maintenance, as well as their feasibility and appropriateness within the context of the existing landscape of the Visual Resources LSA.

The following mitigation applies to the current Project conceptual design and was considered in the visual assessment:

- Minimizing the extent of disturbance areas to the extent practicable;
- Progressively rehabilitating disturbed land (e.g., revegetation)[13];
- Use of dust control measures (e.g., watering, chemical treatment, surfacing);
- Reduce the contrast of exposed rock and soils with re-vegetation by native grasses or non-persistent agronomics, trees, and shrubs;
- Use of non-reflective surfaces and colours for facility cladding to blend in with the natural surroundings[14];

[13] To achieve the results simulated in Appendix A, this will require coordination of mature nursery stock in advance of rehabilitation, as well as landscape design planning. Detailed landscape design, including elements such as soil handling, species mix, and planting prescriptions, will need to be completed as part of the final Project design.

[14] Colour of surface treatments will be determined as part of the final Project design. The colour presented in the simulations (see Appendix A) provides a reasonable approximation for the purposes of the assessment.

- Blend graded landform features and re-vegetation with the adjacent terrain and landcover by mimicking natural geomorphic and vegetation patterns;
- Site transmission line right-of-way and transmission structures, to the extent practicable, to take advantage of existing screening offered by topography and/or vegetation;
- Use of low-profile equipment and structures; and
- Use of berms and planting to decrease the visibility of newly disturbed facilities sites.

Additional mitigation is recommended to further reduce potential visual effects and support local cultural and Indigenous value of the landscape:

- Identify opportunities for mitigations to be established in offsite areas to address visual effects (e.g., vegetation screening adjacent to roadways or trails);
- Identify opportunities to develop cultural landscape features to support recreation and tourism activity and/or support Indigenous cultural use (e.g., signage, kiosks, landform design/surface treatment);
- Engagement with Indigenous communities to facilitate the identification of opportunities to address potential effects to the transmission of knowledge and practices, and sense of place, and to support the cultural use and histories of the surrounding area; and
- Develop monitoring and management procedures for reclamation activities to address potential visual effects over the life of mine and during active post-closure.

5.4 Consideration of Indigenous Peoples

The analysis of potential visual effects is representative of public viewing opportunities related to tourists and local residents, recreational users, and motorists surrounding the Project area. It is expected that the results of the analysis of potential visual effects will apply equally to the general population and to members of Indigenous communities within the Visual Resources LSA; the assessment of visual effects was based on established and objective criteria to measure the level of change to the existing visual quality of the landscape (i.e., visibility of the Project and visual contrast presented by Project components), which is anticipated to appear equally to individual viewers.

However, Project-related traditional use studies provide perspective on Indigenous value of the landscape context that precedes current patterns of land use and helps identify how this visual change may be experienced within this distinct cultural point of view. Current and future traditional use of land by Indigenous peoples is inextricably linked to culture and well-being. Although information on specific locations and viewing opportunities important for Indigenous peoples was not provided, available information related to the cultural value of the visual landscape for Indigenous peoples was integrated into the assessment of existing conditions and supports the assessment of visual impacts. As such, it’s acknowledged that Indigenous peoples may be vulnerable to the potential visual effects of the Project, and that Indigenous viewers may experience differential visual effects related to visual disturbance of the landscape in support of cultural use, the transmission of traditional knowledge, and cultural identity.

Proposed mitigation measures (Section 5.3) provide strategies to address the vulnerability of Indigenous peoples to the potential visual effects of the Project on cultural use.

5.5 Seasonal Effects

Visual assessment was provided for spring and summer viewing conditions when most viewers are anticipated to experience the landscape in the Visual Resources LSA (e.g., recreational users and tourists). District of Wells residents are present year-round, and the surrounding area does provide for winter recreation opportunities, such as skiing and snowmobiling, within a winter landscape setting.

Seasonal conditions will bring a change in the colour and texture of vegetation and overall character of the Visual Resources LSA. Autumn will bring about a temporary change in the colours of deciduous vegetation and groundcover. Reduction in the amount of foliage starting in autumn and continuing into winter will decrease the leaf cover and potentially decrease the amount of vegetation screening of Project components. Cleared areas of the Mine Site Complex will receive snow cover in winter that may highlight openings within otherwise vegetated landcover.

A preliminary photographic survey was conducted in October 2018 which included images that represent autumn viewing conditions of the Project site and surrounding landscape. Figures 19 to Figure 21 are provided to demonstrate the conditions observed during this photographic survey.



Figure 19: View from Jack of Clubs Lake (October 2018)



Figure 20: View from Highway 26 (October 2018)



Figure 21: View from Wells (October 2018)

Seasonal differences in the degree of vegetative screening have the potential to increase the visibility of Project components from some viewing locations during periods of the year where there is little to no vegetation screening provided by deciduous vegetation. The Mine Site Complex is surrounded by a mix of coniferous and deciduous vegetation species, which would provide a partial amount of screening year-round from most viewing angles where screening currently occurs. Section 5.3 details mitigation measures to address visual effects, including progressive rehabilitation of disturbed areas through re-vegetation and offsite vegetation screening adjacent to roadways or trails. These mitigation measures will need to consider seasonal variations in the foliage of species used for planting and potential effects to screening. Re-vegetation is anticipated to increase in its effectiveness as vegetation matures, which would contribute to more effective screening year-round.

5.6 Confidence

The level of confidence for predicted Project-related visual effects is based on professional judgement and consideration of key factors affecting confidence and uncertainty. The following are the key factors affecting confidence and uncertainty considered in the assessment of visual effects:

- The availability and quality of information defining the Project components and baseline characterization;
- The technical limits to conduct landscape modelling and support visual effects analysis;
- The level of understanding of public and Indigenous issues and concerns related to the visual landscape; and
- The level of certainty associated with the effectiveness of proposed mitigation measures.

The level of confidence in the visual effects assessment for the Project is moderate to high considering the key factors identified above. Information was made available describing concern and interest related to visual quality by public stakeholders and Indigenous groups. Detailed information and assumptions were provided for defining the Project components used for modelling. A systematic approach was applied to visual effects modelling and analysis. The effectiveness of mitigation measures was based on accepted and proven BMPs that have been applied to mining projects throughout North America.

Uncertainty in the assessment was reduced by:

- Collecting relevant and current spatial and observational data, where available;
- Conducting landscape model validation (e.g., calibration with baseline characterization conditions, comparison between visibility results and simulation results);
- Reviewing relevant established visual assessment studies and methods;
- Collecting local and regional data to facilitate understanding of the visual context, including landscape character and viewer sensitivity (e.g., engagement input, environmental and recreation inventories, provincial management plans, and municipal strategic plans);
- Identifying and applying appropriate BMPs and strategies as mitigation that responds to the Project design and context of the existing landscape setting; and
- Conservative assumptions that overestimated rather than underestimated potential effects of the Project.

5.7 Follow Up and Monitoring

Consistent with maintenance and monitoring aspects planned for post-closure of the Project, and in order to effectively manage landscape performance and potential visual effects of the Project over the life of mine (approximately 27 years), a visual impact mitigation monitoring program should be developed to verify that visual mitigation measures are effectively implemented and maintained.

Monitoring should be conducted throughout the Construction and Operation Phases related to progressive reclamation of temporarily disturbed areas (e.g., re-contouring and revegetation) to confirm that visual mitigation measures are being established appropriately. Material resulting from this monitoring will inform design information to be included in the Project's Reclamation and Closure Plan. A visual audit should be conducted at closure to establish that predicted visual effects have occurred, to assess effectiveness of mitigation already in place, and to identify unforeseen impacts. A suitably qualified landscape design practitioner should conduct this audit and assist in the definition of additional visual impact mitigation that may be required for closure planning and procedures. Monitoring should also continue through the active post-closure period to confirm that visual mitigation measures are being maintained and performing appropriately.

Should issues or concerns related to visual quality be raised through correspondence with affected public stakeholders or Indigenous communities, further engagement and consultation could help identify opportunities to address these. In particular, engagement with Indigenous communities could help identify opportunities to address vulnerability to effects to cultural use, identity, and sense of place from disturbance of the visual landscape.

6.0 CLOSURE

We trust that the information contained in this technical memorandum meets your present requirements. Please contact the undersigned if you have any questions or concerns.

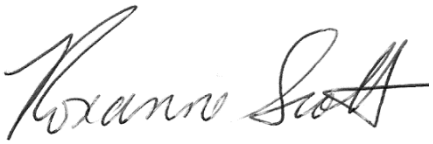
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7.1 Acts and Regulations

Note: S.B.C = Statute of British Columbia; c = chapter.

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APPENDIX A

Visual Quality Assessment Simulations

OSISKO DEVELOPMENT CORP.

VISUAL QUALITY ASSESSMENT SIMULATIONS

CARIBOO GOLD PROJECT

MAY 5, 2022



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VISUAL QUALITY ASSESSMENT SIMULATIONS

CARIBOO GOLD PROJECT

OSISKO DEVELOPMENT CORP.

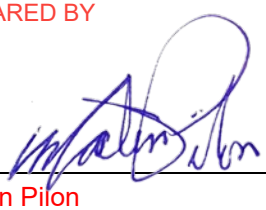
PROJECT NO.: 151-11330-70
DATE: MAY 5, 2022

WSP

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2022 - May 5

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Wells, British Columbia V0K 2R0

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1 INTRODUCTION

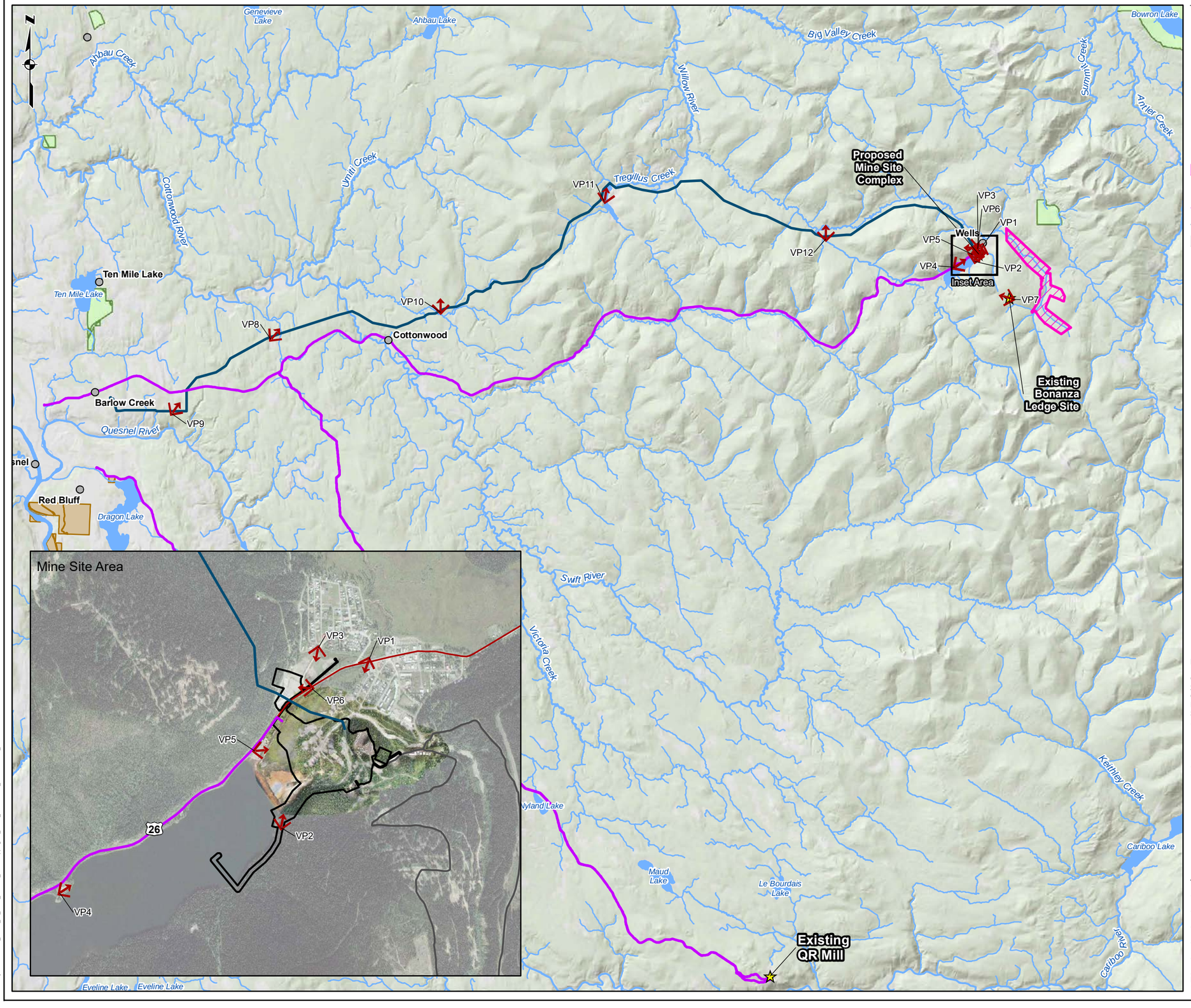
Simulations of the Cariboo Gold Project (the Project) related components were rendered in 3D modelling software from key viewpoints and composited with photographic images gathered during the photographic field surveys. These are presented in Figure 1 to Figure 28. Section 3 consists of photographic images that illustrate the existing landscape setting visible from key viewpoints, as well as simulated images of the same key viewpoint to illustrate the predicted visual character of Project-related components. To be conservative, simulations focus on an early period of the Operations Phase (Year 1 to 3) where mitigations, such as tree screening, would be established but not fully developed. These images were used for analysis of visual effects[1]. Figures 26-28 consist of simulated images at Year 15 of Operations that illustrate the predicted visual character of Project-related components with the effects of progressive reclamation.

Panoramic images presented in this report were cropped to a width for presentation on A3 paper size (i.e., 11 x 17) while minimizing edge distortion. The horizontal extent of these panoramic images represents a sufficiently wide field of view to depict the landscape context which an observer can view in a single viewing direction (generally, a horizontal viewing angle of between 100° and 120°). These images do not account for effects presented by seasonal atmospheric conditions (e.g., fog and haze) beyond those presented in the photographs and simulations. Due to variations in the calibration of different monitors, printers, and other media that may be used to display these images, consistent reproduction is not guaranteed.

[1] VP7 represents year 15 of operations when the waste rock storage facility illustrates a later period of Operations the period with the largest anticipated effect to visual quality (i.e., full build-out)'

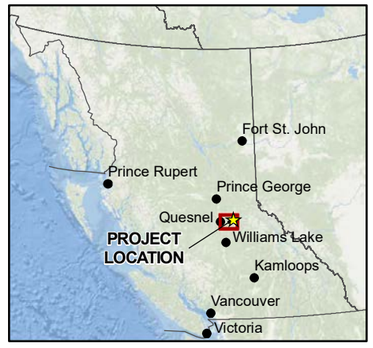
2 OVERVIEW OF VIEWPOINT LOCATIONS

Figure 1 below provides an overview of the viewpoints used in the assessment of Project-related visual effects.



LEGEND

- VIEWPOINT LOCATION
- POPULATED COMMUNITY
- HIGHWAY
- ROAD
- WATERCOURSE
- WATERBODY
- PARKS/PROTECTED AREA
- FIRST NATION RESERVE
- BARKERVILLE HISTORIC TOWN AND PARK
- PROPOSED PROJECT INFRASTRUCTURE LOCATION
- PROPOSED TRANSPORTATION ROUTE
- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED SURFACE DISTURBANCE AREA



REFERENCE(S)

1.WATER FEATURES, TRANSPORTATION FEATURES OBTAINED FROM CANVEC © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
2. CITIES/TOWNS, INDIAN RESERVES, FEDERAL LANDS AND PARK/PROTECTED AREAS OBTAINED FROM BC MINISTRY OF FORESTS, LANDS NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
3. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

NAD83 CSRS
UTM Zone 10N

0 5 10 15
1:250,000 KILOMETRES

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

VIEWPOINT LOCATIONS FOR SIMULATION OVERVIEW MAP

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	1

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3 LANDSCAPE PHOTOGRAPHS AND SIMULATIONS

Figures 2 - 25 provide landscape photographs and simulations from key viewpoints used in the assessment of Project-related visual effects that illustrate existing conditions and predicted future conditions with Project components.

Figures are provided to show the location, viewing direction and viewing extent for each viewpoint used in the visual assessment as well as the photographic images that illustrate the existing landscape setting visible from key viewpoints and simulated images of the Project components

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596000

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N

VP1

Island Mountain Portal

Wells

26

Accommodation

Sediment Pond

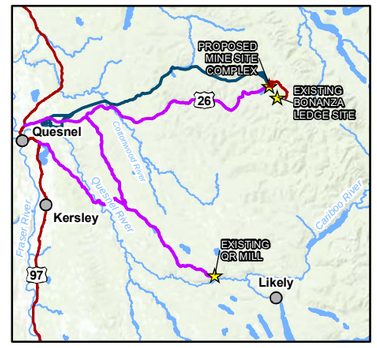
Services Building

Valley Portal

Jack of Clubs Lake

LEGEND

- VIEWPOINT LOCATION
- VIEWPOINT DIRECTION AND EXTENT
- HIGHWAY
- BONANZA LEDGE SITE WRSF ACCESS ROAD
- EMERGENCY WRSF ACCESS ROAD
- TRANSPORTATION ROUTE
- PROPOSED MINE PORTAL LOCATION
- PROPOSED DIFFUSER PIPELINE
- PROPOSED MINESITE DISTURBANCE OUTLINE
- PROPOSED EFFLUENT DISCHARGE LINE
- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED TRANSMISSION LINE ROUTE 40M ROW
- PROPOSED SERVICES BUILDING
- PROPOSED MITIGATION BERM
- PROPOSED MINE SITE SEDIMENT POND



REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
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3. BASE DATA SOURCE: ESRI, GEOBASE, NRCAN, AND THE GIS USER COMMUNITY.
4. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

NAD83 CSRS
UTM ZONE 10N

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OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

VIEWPOINT LOCATION AND VIEWING DIRECTION VP1 (SUGAR CREEK LOOP ACCESS)

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	2

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VP1 (Sugar Creek Loop Access) – Existing Conditions 2019



VP1 (Sugar Creek Loop Access) – Operations Phase Year 1 to 3



CARIBOO GOLD PROJECT

LANDSCAPE PHOTOGRAPHS
AND SIMULATIONS
VP1 (SUGAR CREEK LOOP ACCESS)
EXISTING CONDITIONS & OPERATIONS

OSISKO DEVELOPMENT

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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26

Jack of Clubs Lake

Sediment Pond

Services Building

Accommodation

Valley Portal

VP2

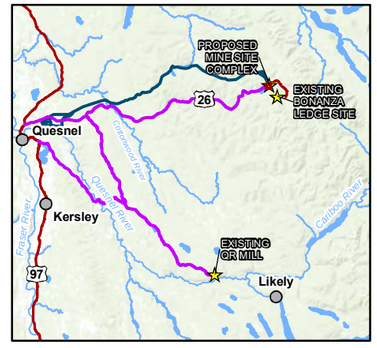
Treated Discharge Line

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5884000

LEGEND

- VIEWPOINT LOCATION
- VIEWPOINT DIRECTION AND EXTENT
- HIGHWAY
- BONANZA LEDGE SITE WRSF ACCESS ROAD
- EMERGENCY WRSF ACCESS ROAD
- TRANSPORTATION ROUTE
- PROPOSED MINE PORTAL LOCATION
- PROPOSED TREATED DISCHARGE LINE
- PROPOSED DIFFUSER PIPELINE
- PROPOSED MINESITE DISTURBANCE OUTLINE
- PROPOSED EFFLUENT DISCHARGE LINE
- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED TRANSMISSION LINE ROUTE 40M ROW
- PROPOSED SERVICES BUILDING
- PROPOSED MITIGATION BERM
- PROPOSED MINE SITE SEDIMENT POND



REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
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4. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

NAD83 CSRS
UTM ZONE 10N

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OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

VIEWPOINT LOCATION AND VIEWING DIRECTION VP2 (COW MOUNTAIN TRAILHEAD)

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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VP2 (Cow Mountain Trailhead) – Existing Conditions 2019



VP2 (Cow Mountain Trailhead) – Operations Phase Year 1 to 3



CARIBOO GOLD PROJECT

LANDSCAPE PHOTOGRAPHS
AND SIMULATIONS
VP2 (COW MOUNTAIN TRAILHEAD)
EXISTING CONDITIONS & OPERATIONS

OSISKO DEVELOPMENT

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	5

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VP3

Island Mountain Portal

Wells

Accommodation

Sediment Pond

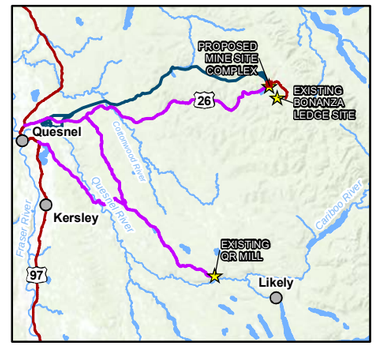
Services Building

Jack of Clubs Lake

26

LEGEND

- VIEWPOINT LOCATION
- VIEWPOINT DIRECTION AND EXTENT
- HIGHWAY
- BONANZA LEDGE SITE WRSF ACCESS ROAD
- EMERGENCY WRSF ACCESS ROAD
- TRANSPORTATION ROUTE
- PROPOSED MINE PORTAL LOCATION
- PROPOSED DIFFUSER PIPELINE
- PROPOSED MINESITE DISTURBANCE OUTLINE
- PROPOSED EFFLUENT DISCHARGE LINE
- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED TRANSMISSION LINE ROUTE 40M ROW
- PROPOSED SERVICES BUILDING
- PROPOSED MITIGATION BERM
- PROPOSED MINE SITE SEDIMENT POND



REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
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NAD83 CSRS
UTM ZONE 10N

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OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

VIEWPOINT LOCATION AND VIEWING DIRECTION VP3 (BURNETT AVE.)

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	6

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VP3 (Burnett Ave.) – Existing Conditions 2019



VP3 (Burnett Ave.) – Operations Phase Year 1 to 3



OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

LANDSCAPE PHOTOGRAPHS
AND SIMULATIONS
VP3 (BURNETT AVE.)
EXISTING CONDITIONS & OPERATIONS

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	7

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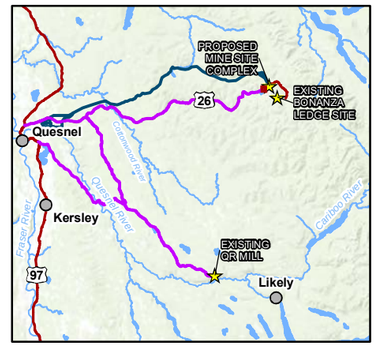
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LEGEND

- VIEWPOINT LOCATION
- VIEWPOINT DIRECTION AND EXTENT
- HIGHWAY
- TRANSPORTATION ROUTE



REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
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4. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

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OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

VIEWPOINT LOCATION AND VIEWING DIRECTION VP4 (VLI VP# 738)

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	8

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VP4 (VLI VP# 738) – Existing Conditions 2019



VP4 (VLI VP# 738) – Operations Phase Year 1 to 3



CARIBOO GOLD PROJECT

LANDSCAPE PHOTOGRAPHS
AND SIMULATIONS
VP4 (VLI VP# 738)
EXISTING CONDITIONS & OPERATIONS

OSISKO DEVELOPMENT

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
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Island Mountain Portal

VP5

Sediment Pond

Services Building

Accommodation

Valley Portal

26

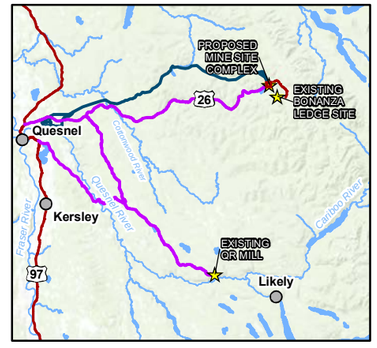
Jack of Clubs Lake

595000

5894000

LEGEND

- VIEWPOINT LOCATION
- VIEWPOINT DIRECTION AND EXTENT
- HIGHWAY
- BONANZA LEDGE SITE WRSF ACCESS ROAD
- EMERGENCY WRSF ACCESS ROAD
- TRANSPORTATION ROUTE
- PROPOSED MINE PORTAL LOCATION
- PROPOSED DIFFUSER PIPELINE
- PROPOSED MINESITE DISTURBANCE OUTLINE
- PROPOSED EFFLUENT DISCHARGE LINE
- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED TRANSMISSION LINE ROUTE 40M ROW
- PROPOSED SERVICES BUILDING
- PROPOSED MITIGATION BERM
- PROPOSED MINE SITE SEDIMENT POND



REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
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3. BASE DATA SOURCE: ESRI, GEOBASE, NRCAN, AND THE GIS USER COMMUNITY.
4. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

NAD83 CSRS
UTM ZONE 10N

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OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

VIEWPOINT LOCATION AND VIEWING DIRECTION VP5 (TACO STAND)

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
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VP5 (Taco Stand) – Existing Conditions 2019



VP5 (Taco Stand) – Operations Phase Year 1 to 3



CARIBOO GOLD PROJECT

LANDSCAPE PHOTOGRAPHS
AND SIMULATIONS
VP5 (TACO STAND)
EXISTING CONDITIONS & OPERATIONS

OSISKO DEVELOPMENT

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	11

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Island Mountain Portal

VP6

26

Jack of Clubs Lake

Sediment Pond

Services Building

Accommodation

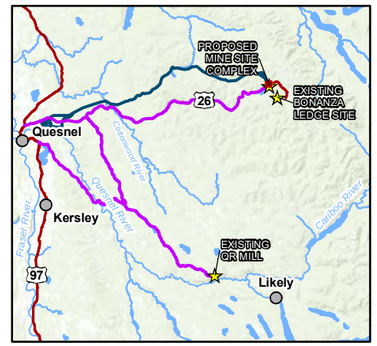
Valley Portal

8834000

595000

LEGEND

- VIEWPOINT LOCATION
- VIEWPOINT DIRECTION AND EXTENT
- HIGHWAY
- BONANZA LEDGE SITE WRSF ACCESS ROAD
- TRANSPORTATION ROUTE
- PROPOSED MINE PORTAL LOCATION
- PROPOSED DIFFUSER PIPELINE
- PROPOSED MINESITE DISTURBANCE OUTLINE
- PROPOSED EFFLUENT DISCHARGE LINE
- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED TRANSMISSION LINE ROUTE 40M ROW
- PROPOSED SERVICES BUILDING
- PROPOSED MITIGATION BERM
- PROPOSED MINE SITE SEDIMENT POND



REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
2. HILLSHADE DERIVED FROM LIDAR DATA FLOWN BY MCELHANNAY CONSULTANTS LTD. JUNE 27, 2016.
3. BASE DATA SOURCE: ESRI, GEOBASE, NRCAN, AND THE GIS USER COMMUNITY.
4. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

NAD83 CSRS
UTM ZONE 10N

0 100 200
1:4,500 METRES

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

VIEWPOINT LOCATION AND VIEWING DIRECTION VP6 (HIGHWAY 26 / WELLS)

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	12

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© THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm
0

VP6 (Highway 26 / Wells) – Existing Conditions 2019



VP6 (Highway 26 / Wells) – Operations Phase Year 1 to 3



CARIBOO GOLD PROJECT

LANDSCAPE PHOTOGRAPHS
AND SIMULATIONS
VP6 (HIGHWAY 26 / WELLS)
EXISTING CONDITIONS & OPERATIONS

OSISKO DEVELOPMENT

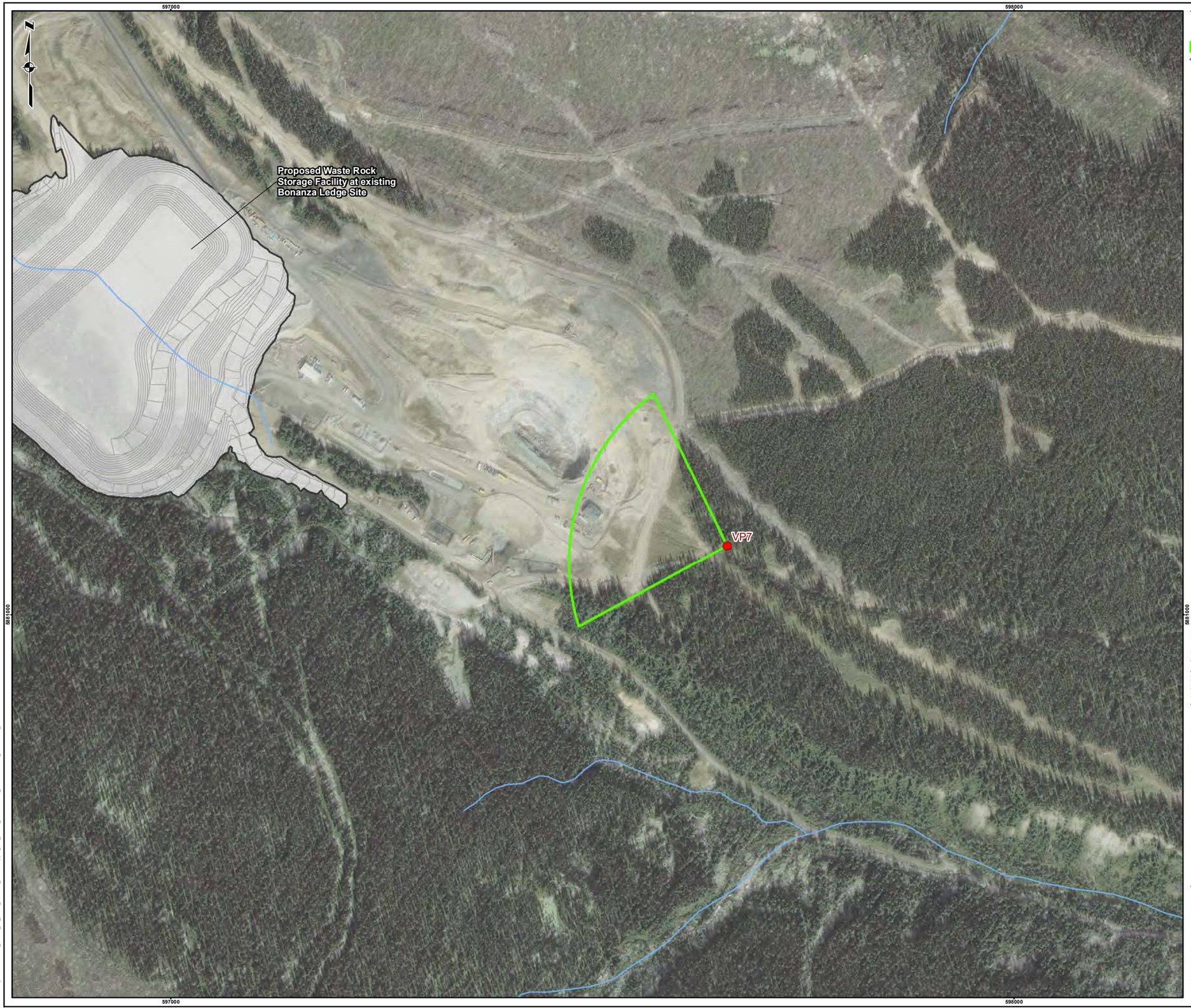
REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	13

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

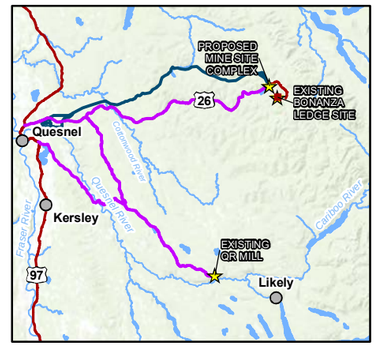
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LEGEND

- VIEWPOINT LOCATION
- VIEWPOINT DIRECTION AND EXTENT
- BONANZA LEDGE SITE WRSF ACCESS ROAD



REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
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3. BASE DATA SOURCE: ESRI, GEOBASE, NRCAN, AND THE GIS USER COMMUNITY.
4. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

NAD83 CSRS
UTM ZONE 10N

0 100 200
1:4,500 METRES

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

VIEWPOINT LOCATION AND VIEWING DIRECTION VP7 (GOLDFIELDS DITCH)

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	14

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

25mm
0

VP7 (Goldfields Ditch) – Existing Conditions 2019



VP7 (Goldfields Ditch) – Operations Phase Year 15



CARIBOO GOLD PROJECT

LANDSCAPE PHOTOGRAPHS
AND SIMULATIONS
VP7 (GOLDFIELDS DITCH)
EXISTING CONDITIONS & OPERATIONS

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	15

Y:\GIS\Projects\2019\151_11330_70_BGM_Cariboo_Gold\Mapping\10_visual_resource\03_EA\10-03-003_Landscape_photographs_Simulation.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

549000

5879000

N

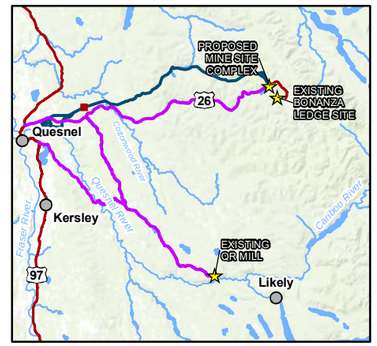
VP8

DAVEY LAKE

549000

LEGEND

- VIEWPOINT LOCATION
- VIEWPOINT DIRECTION AND EXTENT
- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED TRANSMISSION LINE ROUTE 40M ROW



REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
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4. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

NAD83 CSRS
UTM ZONE 10N

0 100 200
1:4,500 METRES

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

VIEWPOINT LOCATION AND VIEWING DIRECTION VP8 (DAVEY LAKE)

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	16

Y:\GIS\Projects\2019\151_11330_70_BGM_Cariboo_Gold\Mapping\10_visual_resource\03_EA\10-03-002_ViewPoint_Zoom.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

25mm

0

VP8 (Davey Lake) – Existing Conditions 2020



VP8 (Davey Lake) – Operations Phase Year 1



CARIBOO GOLD PROJECT

LANDSCAPE PHOTOGRAPHS
AND SIMULATIONS
VP8 (DAVEY LAKE)
EXISTING CONDITIONS & OPERATIONS

OSISKO DEVELOPMENT

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	17

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm

0

542000

543000

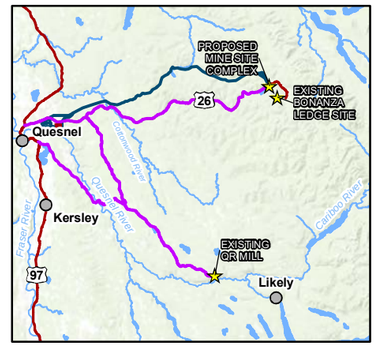
5874000

5874600

VP9

LEGEND

- VIEWPOINT LOCATION
- VIEWPOINT DIRECTION AND EXTENT
- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED TRANSMISSION LINE ROUTE 40M ROW



REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
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3. BASE DATA SOURCE: ESRI, GEOBASE, NRCAN, AND THE GIS USER COMMUNITY.
4. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

NAD83 CSRS
UTM ZONE 10N

0 100 200
1:4,500 METRES

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

VIEWPOINT LOCATION AND VIEWING DIRECTION VP9 (BARLOW ATV ACCESS ROAD)

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	18

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

0 25mm

VP9 (Barlow ATV Access Road) – Existing Conditions 2020



VP9 (Barlow ATV Access Road) – Operations Phase Year 1



CARIBOO GOLD PROJECT

LANDSCAPE PHOTOGRAPHS
AND SIMULATIONS
VP9 (BARLOW ATV ACCESS ROAD)
EXISTING CONDITIONS & OPERATIONS

OSISKO DEVELOPMENT

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	19

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

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560000

5881000

N

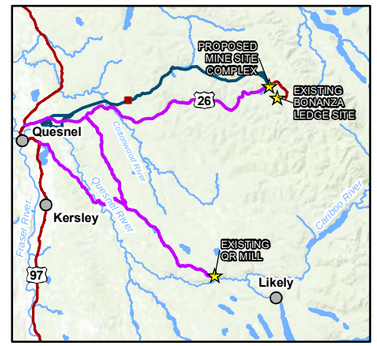
VP10

5880000

560000

LEGEND

- VIEWPOINT LOCATION
- VIEWPOINT DIRECTION AND EXTENT
- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED TRANSMISSION LINE ROUTE 40M ROW



REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
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4. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

NAD83 CSRS
UTM ZONE 10N

0 100 200
1:4,500 METRES

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

VIEWPOINT LOCATION AND VIEWING DIRECTION VP10 (NORTON CREEK CABIN)

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	20

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

0 25mm

VP10 (Norton Creek Cabin) – Existing Conditions 2020



VP10 (Norton Creek Cabin) – Operations Phase Year 1



CARIBOO GOLD PROJECT

LANDSCAPE PHOTOGRAPHS
AND SIMULATIONS
VP10 (NORTON CREEK CABIN)
EXISTING CONDITIONS & OPERATIONS

OSISKO DEVELOPMENT

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	21

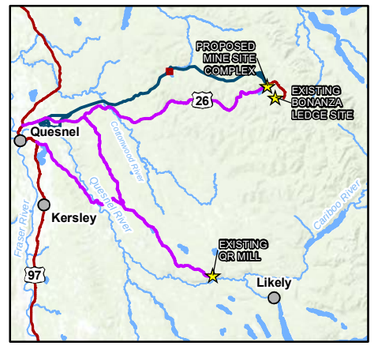
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

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570000
571000
572000
5889000
5887000
N
VP11

LEGEND
- VIEWPOINT LOCATION
- VIEWPOINT DIRECTION AND EXTENT
- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED TRANSMISSION LINE ROUTE 40M ROW



REFERENCE(S)
1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
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4. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

NAD83 CSRS
UTM ZONE 10N

1:9,000

0 100 200
METRES

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

VIEWPOINT LOCATION AND VIEWING DIRECTION VP11 (TREGILLUS LAKE)

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	22

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B
25mm
0

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VP11 (Tregillus Lake) – Existing Conditions 2020



VP11 (Tregillus Lake) – Operations Phase Year 1



CARIBOO GOLD PROJECT

LANDSCAPE PHOTOGRAPHS
AND SIMULATIONS
VP11 (TREGILLUS LAKE)
EXISTING CONDITIONS & OPERATIONS

OSISKO DEVELOPMENT

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	23

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

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585000

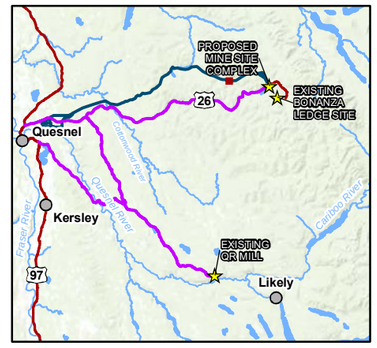
586000

5858000

VP12

LEGEND

- VIEWPOINT LOCATION
- VIEWPOINT DIRECTION AND EXTENT
- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED TRANSMISSION LINE ROUTE 40M ROW



REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
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3. BASE DATA SOURCE: ESRI, GEOBASE, NRCAN, AND THE GIS USER COMMUNITY.
4. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

NAD83 CSRS
UTM ZONE 10N

0 100 200
1:4,500 METRES

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

VIEWPOINT LOCATION AND VIEWING DIRECTION VP12 (SLOUGH CREEK FSR)

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	24

Y:\GIS\Projects\2019\151_11330_70_BGM_Cariboo_Gold\Mapping\10_visual_resource\03_EA\10-03-002_ViewPoint_Zoom.mxd

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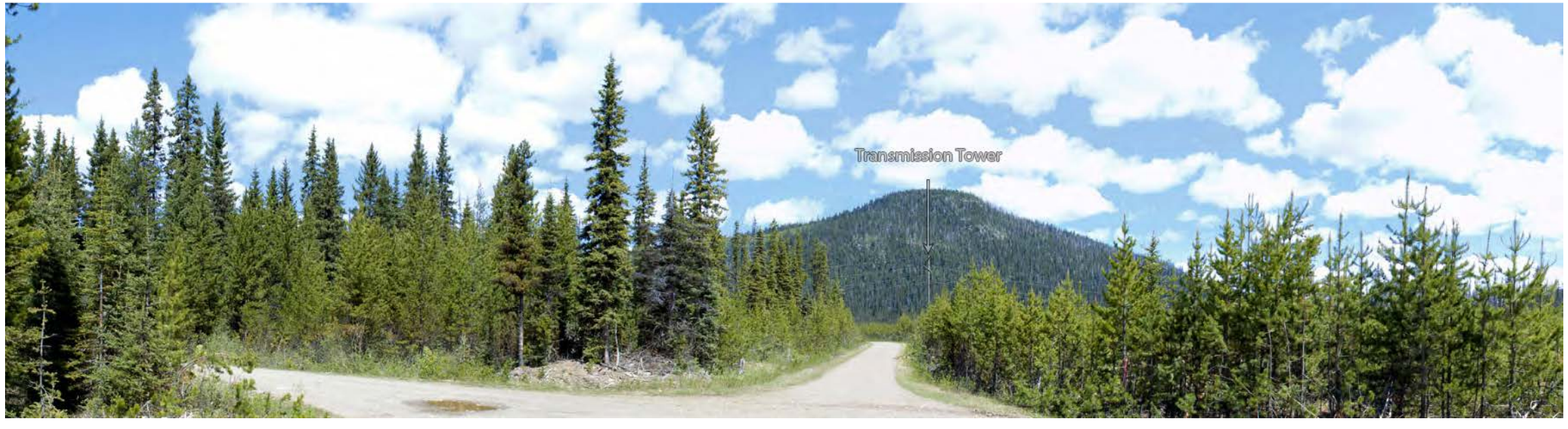
25mm

0

VP12 (Slough Creek FSR) – Existing Conditions 2020



VP12 (Slough Creek FSR) – Operations Phase Year 1



CARIBOO GOLD PROJECT

LANDSCAPE PHOTOGRAPHS
AND SIMULATIONS
VP12 (SLOUGH CREEK FSR)
EXISTING CONDITIONS & OPERATIONS

OSISKO DEVELOPMENT

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	25

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

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4 PROGRESSIVE RECLAMATION

Figures 26 - 28 represent simulations characterizing the visual effects of mature vegetation at Year 15 to illustrate the longer-term visual effects of progressive reclamation.

VP2 (Cow Mountain Trailhead) – Year 15



CARIBOO GOLD PROJECT

PROGRESSIVE
RECLAMATION SIMULATIONS
VP2 (COW MOUNTAIN TRAILHEAD)
OPERATIONS PHASE

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	26

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm

0

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VP4 (VLI VP# 738) – Year 15



CARIBOO GOLD PROJECT

PROGRESSIVE
RECLAMATION SIMULATIONS
VP4 (VLI VP# 738)
OPERATIONS PHASE

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	27

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B
0 25mm

VP5 (Taco Stand) – Year 15



CARIBOO GOLD PROJECT

PROGRESSIVE
RECLAMATION SIMULATIONS
VP5 (TACO STAND)
OPERATIONS PHASE

REV.	DESCRIPTION	DATE	INITIALS
A		2021-08-11	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	28

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

0 25mm

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5 COLOUR SCHEMES

Building design with regards to surface properties or two-dimensional qualities is ongoing and will involve further consultation with the public, stakeholders and Indigenous Nations. The colour of the buildings has been identified by the public, stakeholders and Indigenous Nations through the consultation and engagement process as an important element in rating the visual impact. Below are samples of colour choices that are being analysed and will be used in discussion during consultation, which is still underway to determine the final color scheme to be used for the building. The colour schemes provided in Figure 29 are potential alternatives for surface treatment of buildings which are provided in the rendering for this assessment. These alternative colour schemes provided are for example purposes only, and do not represent all potential colour schemes. Additional colour schemes will be assessed as required.

Figure 29 Potential Colour Schemes

Brown



Camouflage



Charcoal



Pale Green



Panorama





golder.com

APPENDIX F EA MITIGATION TRACKER

EA Mitigation ID	Section in EA Mitigation Relates to	EA Mitigation Measure Commitment	Associated Project Components (All =all Project components, including the Mine Site, QR Mill, Transmission Line, and Transportation Route or applies to the Project's corporate commitments)	Management Plan (as identified in EA)	JPAA Appendix #	Actual Management Plan Measure is addressed in	JPAA Appendix # (actual)	Corresponding Mitigation Location (Section of Plan)	Congruency	Company Responsible	Person Assigned To	Complete	Comments
7.4-4	Surface Water	In-stream work during road crossing construction may be required. If required, it will either be avoided or be limited to when watercourses within or adjacent to the construction area are not flowing or during low flow conditions.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.4-5	Surface Water	Contact water runoff (e.g., from areas with vegetation removal and ground disturbance) will be directed within the site water management system.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B	QR Mill Water Management Plan	Appendix 9-6B	Section 3.1 (page 3-38)	congruent	KCB			
7.4-6	Surface Water	Dust suppression measures along the unpaved haul roads, work areas, and storage piles will be used to control the dust generation potential from contruction/transport activities and dust depostion in nearby waterbodies.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B	Fugitive Dust Management Plan	Appendix 9-16A	Section 6.0	congruent	KCB			Section 6.0 of Appendix 9-16A (Fugitive Dust Management Plan)
7.4-7	Surface Water	Best management practices will be followed to minimize indirect or direct deposition of concrete, concrete fines, and/or concrete wash or contact water associated with construction activities to nearby watercourses as outlined in the Bonanza Ledge Mine Surface Erosion and Sediment Control Plan (BGM 2017).	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			Reference to Bonanza Ledge Mine Surface Erosion and Sediment Control Plan not found in the Management Plan.
7.4-8	Surface Water	Best management practices will be followed to minimize alteration in stream flows during in water works such as bridge construction or culvert installation as outlined in the Bonanza Ledge Mine Surface Erosion and Sediment Control Plan (BGM 2017).	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			Reference to Bonanza Ledge Mine Surface Erosion and Sediment Control Plan not found in the Management Plan.
7.4-9	Surface Water	Alteration in stream flows will be temporary and limited in duration and spatial scale.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.4-10	Surface Water	A surface management system, consisting of contact and non-contact conveyance infrastructure (berms, collection channels, pumps, pipelines, water ditches, and two sediment ponds) will be used.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.4-11	Surface Water	Infrastructure will be sized to safely convey or manage the surface runoff reporting from a 200-year, 24-hour storm event.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B	QR Mill Water Management Plan	Appendix 9-6B	Section 5.1.1 (page 23 of 48) from Permit No. 12601	congruent	KCB			
7.4-11	Surface Water	Infrastructure will be sized to safely convey or manage the surface runoff reporting from a 200-year, 24-hour storm event.	Mine Site, QR Mill, Transmission Line	Filtered Tailings Management Plan						KCB			
7.4-12	Surface Water	Storage capacity will be appropriate to provide a controlled rate of release during both routine and non-routine operation scenarios	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B			Section 5.1 (page 5-64)	not congruent	KCB			Available flood storage during and at the end of operations found in the Management Plan, not routine and non-routine operations
7.4-12	Surface Water	Storage capacity will be appropriate to provide a controlled rate of release during both routine and non-routine operation scenarios	Mine Site, QR Mill	Filtered Tailings Management Plan						KCB			
7.4-14	Surface Water	Routine inspection and maintenance of containment and conveyance structures (i.e., roadside ditches and culverts) will occur.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.4-14	Surface Water	Routine inspection and maintenance of containment and conveyance structures (i.e., roadside ditches and culverts) will occur.	Mine Site, QR Mill, Transmission Line	Filtered Tailings Management Plan						KCB			
7.4-18	Surface Water	Work in sensitive areas will be scheduled to occur outside of the periods (e.g., spring freshet) that may result in high flow volumes and/or increased erosion and sedimentation.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B	Construction Environmental Management Plan			congruent - in another plan	KCB			Added to CEMP
7.4-22	Surface Water	Water withdrawal volumes will be set at permitted or approved limits (i.e., minimum instream flow needs and lake water levels will be maintained).	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B				Not applicable	KCB			No water withdrawal is currently anticipated
7.4-23	Surface Water	Non-contact water will be directed around the Project disturbance areas.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B	QR Mill Water Management Plan	Appendix 9-6B	Section 3.1 (page 3-37)	congruent	KCB			
7.4-24	Surface Water	Best management practices will be followed to minimize alteration in stream flows during in water works such as bridge construction or culvert installation as outlined in the Bonanza Ledge Mine Surface Erosion and Sediment Control Plan (BGM 2017).	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			Reference to Bonanza Ledge Mine Surface Erosion and Sediment Control Plan not found in the Management Plan.
7.4-25	Surface Water	Surface water runoff and shallow seepage from the FSTSF, waste rock storage facilities, and overburden facilities or that has been in contact with mine waste materials will be captured through a series of perimeter collection ditches and sumps and treated to meet permit requirements prior to discharge to the environment.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.4-30	Surface Water	Aquatic effects monitoring programs will be conducted in the receiving environment to confirm the lack of adverse effects on aquatic life and to inform adaptive management.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B	QR Mill Water Management Plan	Appendix 9-6B	Section 4.1.1 (page 18 of 48) of Permit No. 12601	congruent	KCB			
7.4-31	Surface Water	Site contact water at QR Mill will be collected in existing water management infrastructure and new infrastructure to collect water runoff from the FSTSF. Excess water will be treated prior to discharge to Rudy Creek, if required, to meet permit and regulatory requirements. Water treatment will include chemical-physical processes to remove trace metals, sulphate, and other trace constituents from contact water.	QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.4-32	Surface Water	Development of a site water management plan that provides details of water management strategies and guidance on protecting natural waterways surrounding the Project to follow applicable BMPs, including references to water treatment, effluent discharge permits, and legislation.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			Reference to protecting natural waterways surrounding the Project not found in the Management Plan.
7.4-39	Surface Water	Water treatment facilities and associated water management infrastructure will remain active until permit and regulatory requirements are met in the contact water basins.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.4-43	Surface Water	Following release of supernatant water directly to the environment, the Mine Site Sediment Pond bottom sediments will be removed or covered and the retaining dike will be breached or removed.	Mine Site	QR Mill Water Management Plan	Appendix 9-6B				Not Applicable	KCB			The mitigation deals with the Mine Site so is not applicable to Appendix 9-6B
7.5-8	Groundwater	A liner will be placed over existing tailings and a cover will be placed over the final Filtered Stack tailings surface.	QR Mill	Filtered Tailings Management Plan						KCB			
7.5-9	Groundwater	The historical waste material will be covered by a non-potentially acid generating liner to separate it from the Bulk Fill Area that will be constructed on top of the covered historical material. It will be progressively reclaimed with an engineered cover.	Mine Site	QR Mill Water Management Plan	Appendix 9-6B			Section 2.1 and Table 2.1 (page 2-21)	not congruent	KCB			In the Management Plan: A portion of the South Lobe Pit has been historically backfilled with non-potentially acid generating rock and soil to creat a free draining surface.
7.5-10	Groundwater	Major site facilities will be lined, and seepage will be collected and managed within the Project water management system.	Mine Site	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.5-11	Groundwater	During post-closure, after active water treatment and management activities have ceased (passive care period), shallow seepage from stockpiles will be collected by perimeter ditching and passively conveyed to the receiving environment through the closure drainage systems.	Mine Site	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.5-12	Groundwater	A cover will be placed over the mine waste stockpiles at closure.	Mine Site	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			I don't believe there are mine waste stockpiles at QR at closure.
7.5-19	Groundwater	An alternative water supply from groundwater or surface water will be sourced for the Community of Wells.	All	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.6-27	Soil	Management of waste rock and tailings drainage.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.9-1	Freshwater Fish	Installation of a clear-span bridge.	Mine Site, Transportation Route	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			SW: Design mitigation
7.9-11	Freshwater Fish	Riparian areas (for wetlands and waterways) will be managed according to the recommended management zone setbacks and work practices provided in the *Mines Act* (1996) and *Forest and Range Practices Act* (2002).	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			Will be addressed in at least one plan
7.9-12	Freshwater Fish	Heavy equipment or vehicle crossings through watercourses, which include wetlands and ponds, is prohibited unless detailed under a special provision in a site-specific prescription or with specific regulatory agency approval.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.9-13	Freshwater Fish	Restrict debris from entering the high-water mark without specific regulatory agency approval.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.9-14	Freshwater Fish	Maintain groundcover and shrubs within 30 m of watercourses and waterbodies along the Transmission Line.	Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.9-15	Freshwater Fish	Trees will not be removed in steep gulches, unless identified as necessary by a Qualified Professional and/or where safety is a concern if not removed.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B	Vegetation Management Plan	Appendix 9-9		congruent - in another plan	KCB			Addressed in Vegetation Management Plan (Appendix 9-8)
7.9-16	Freshwater Fish	Time the works for when the channel is dry or frozen to the bottom, or during the least risk windows to protect fish, unless otherwise approved by the applicable provincial and or federal authority	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.9-17	Freshwater Fish	Controlling sediment and erosion downstream during Construction and Operations Phases through the use of Erosion and sediment control (ESC) measures such as riprap and silt fencing.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			Listed erosion and sediment control measures, riprap and silt fences, not included in the Management Plan.
7.9-18	Freshwater Fish	Maintaining fish passage.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.9-19	Freshwater Fish	Fall trees directionally away from watercourse banks to the extent allowed by the need to maintain safe working clearances from the electrical system.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.9-20	Freshwater Fish	Clearly flag or delineate riparian management zones where use of herbicides may be restricted, usually 15 m from watercourses or waterbodies.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.9-21	Freshwater Fish	Grubbing of stumps and roots in riparian habitat will not be conducted unless approved and under the guidance of a qualified professional.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.9-22	Freshwater Fish	Re-vegetate disturbed areas with native species.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B	QR Mill Water Management Plan	Appendix 9-6B	Section 4(a) (page 34 of 39) of QR Mine Approving Mine Plan and Reclamation Program	congruent	KCB			The Permittee must ensure the land is revegetated to a self-sustaining state using appropriate and/or native plant species including culturally important native species.
7.9-23	Freshwater Fish	Vegetation will be allowed to naturally regenerate. If there are bare areas or areas of sensitive soils or vegetation, site specific revegetation plans will be developed and implemented by a qualified professional.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.9-26	Freshwater Fish	Water Management Plan including diversion of contact water to sediment ponds and upgraded Water Treatment Plant prior to discharge into Rudy Creek.	QR Mill	QR Mill Water Management Plan	Appendix 9-6B			Section 1.2 (page 1-16)	not congruent	KCB			Diversion of contact water not found in the Management Plan. The following statement is in the Plan: The QR Mill must also adhere to water management regulations set out by the Health, Safety and Reclamation Code for Mines in BC which specifies minimum design criteria for tailings dams, sediment ponds and diversion structures.
7.9-27	Freshwater Fish	Storage of chemicals, fuel, and equipment, including refueling will be greater than 30 m away from watercourses and waterbodies.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
7.9-36	Freshwater Fish	Application of mitigation measures for water quantity and as outlined in Section 7.4.5.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B			Appendix C (page 8-81)	not congruent	KCB			Surface and Groundwater Monitoring Program at the QR Mill Site found in Appendix C of the Management Plan, not Section 7.4.5

EA Mitigation ID	Section in EA Mitigation Relates to	EA Mitigation Measure Commitment	Associated Project Components (All =all Project components, including the Mine Site, QR Mill, Transmission Line, and Transportation Route or applies to the Project's corporate commitments)	Management Plan (as identified in EA)	JPAA Appendix #	Actual Management Plan Measure is addressed in	JPAA Appendix # (actual)	Corresponding Mitigation Location (Section of Plan)	Congruency	Company Responsible	Person Assigned To	Complete	Comments
7.9-38	Freshwater Fish	At the QR Mill, the FSTSF collection ponds will be drained. Non-contact ditches will be upgraded to meet closure criteria. Both the South and North Seepage Collection Ponds will be reclaimed as open water bodies with vegetated riparian areas.	QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			Non-contact ditches not found in the Management Plan.
9.0-18	Malfunctions	If geotechnical issues are identified, preventative geotechnical stability measures will be implemented.	Mine Site, QR Mill	Filtered Tailings Management Plan						KCB			
9.0-20	Malfunctions	Regular monitoring of any associated water pond levels.	Mine Site, QR Mill	QR Mill Water management Plan	Appendix 9-6B	QR Mill Water management Plan	Appendix 9-6B	Section 6 of QR Mine Approving Mine Plan and Reclamation Program	congruent	KCB			
9.0-21	Malfunctions	Develop excess storage capacity in Main Zone Pit (MZP), should this contingency be required.	QR Mill	QR Mill Water management Plan	Appendix 9-6B	QR Mill Water management Plan	Appendix 9-6B	Section 6.1 (page 6-73)	congruent	KCB			
9.0-28	Malfunctions	Paste backfill will be placed in the historical underground workings during operations in larger mine openings within the paste backfill distribution network physical limits and without exposing workers to unsecure ground.	Mine Site	Filtered Tailings Management Plan						KCB			
9.0-52	Malfunctions	Identify the filtered tailings volume limits that can be safely stored.	QR Mill	Filtered Tailings Management Plan						KCB			
9.0-53	Malfunctions	Establish fail safe alarms for the FSTSF.	QR Mill	Filtered Tailings Management Plan						KCB			
9.0-54	Malfunctions	Manage surface water run-off/precipitation and ground water infiltration.	Mine Site, QR Mill	Filtered Tailings Management Plan						KCB			
9.0-54	Malfunctions	Manage surface water run-off/precipitation and ground water infiltration.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
10.0-4	Effects of the Environment on the Project	FSTSF design adopts and exceeds Best Available Technology (BAT) and Best Available Practices (BAP). FSTSF design adopts and exceeds Canadian Dam Association (CDA) design criteria for tailings dams and BC HSRCM, 2016.	QR Mill	Filtered Tailings Management Plan						KCB			
10.0-5	Effects of the Environment on the Project	Development and implementation of a Filtered Tailings Management Plan.	QR Mill	Filtered Tailings Management Plan						KCB			
10.0-6	Effects of the Environment on the Project	Collection of additional data, testing, and advancement to detailed design.	QR Mill	Filtered Tailings Management Plan						KCB			
10.0-9	Effects of the Environment on the Project	Water retaining structures design adopts and exceeds CDA design criteria for water dams and BC Health, Safety and Reclamation Code for Mines (HSRCM) 2016.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B			Section 5.1 and Table 5.1 (page 5-64)	not congruent	KCB			The Management Plan states the following: The site is designed to manage the Environmental Design Flood (EDF) without site discharge. We have selected the site wide EDF to be 1:50 Annual Exceedance Probability rain-on-snow event according to Canadian Dam Association guideline on EDF selection.
10.0-10	Effects of the Environment on the Project	Development and implementation of Water Management Plans (Mine Site and QR Mill).	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B	QR Mill Water Management Plan	Appendix 9-6B	Section 1.1 and Table 1.1 (pages 1-15 to 1-16)	congruent	KCB			
10.0-11	Effects of the Environment on the Project	Construction and monitoring in accordance with design recommendations.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
10.0-24	Effects of the Environment on the Project	Drainage systems will be adapted to projected values at least for the lifespan of the Project. Culverts on site will be sized using Intensity-Duration-Frequency (IDF) curves that consider future extreme precipitation.	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
10.0-45	Effects of the Environment on the Project	Monitor water management structures to increase the probability of detecting any damages that need to be repaired.	Mine Site , QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
10.0-50	Effects of the Environment on the Project	Adequate foundation drainage and sump pump control to manage excess water.	Mine Site , QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
10.0-51	Effects of the Environment on the Project	Keep flood mitigation supplies (spill kits/scrubbers) on hand to use in the event of a flood.	Mine Site , QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
10.0-52	Effects of the Environment on the Project	The Mine Emergency Response Plan, the Mine Site Water Management Plan and QR Mill Site Water Management Plan will consider potential flooding events.	Mine Site , QR Mill	QR Mill Water Management Plan	Appendix 9-6B			Section 5.4 (pages 5 67 to 5-68)	not congruent	KCB			Describes a flood event exceeding the EDF for the QR Mill Tailings and Water Management Permitting Design.
10.0-57	Effects of the Environment on the Project	Monitor site drainage and perform water quality tests in the event of a flood.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
10.0-58	Effects of the Environment on the Project	Monitor for water spills and perform water quality tests in the event of a flood.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
10.0-59	Effects of the Environment on the Project	The Mine Site Water Management Plan / QR Mill Site Water Management Plan, and Mine Aquatics Effects Management Plan will consider climate impacts on water quality.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
10.0-65	Effects of the Environment on the Project	The Mine Site Water Management Plan and QR Mill Site Water Management Plan will consider water management systems being overwhelmed by extreme precipitation and pluvial flooding events.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
10.0-87	Effects of the Environment on the Project	Water balance will incorporate future climate conditions, including drought events.	Mine Site, QR Mill	QR Mill Water Management Plan	Appendix 9-6B				not found	KCB			
11.0-9	Lhtako Dené Nation	Mitigation measures identified in Section 7.9 (Freshwater Fish)	All	QR Mill Water Management Plan	Appendix 9-6B	QR Mill Water Management Plan	Appendix 9-6B	Table 7.9-21 from Section 7.9 (pages 7-78 to 7-81)	congruent	KCB			
11.0-12	Lhtako Dené Nation	Mitigation measures identified in Section 7.2 (Air Quality) and Section 7.4 (Surface Water).	All	QR Mill Water Management Plan	Appendix 9-6B	QR Mill Water Management Plan	Appendix 9-6B	Table 7.2-12 from Section 7.2 (pages 7-31 to 7-34) and Table 7.4-9 from Section 7.4 (pages 7-47 to 7-48)	congruent	KCB			
11.0-17	Lhtako Dené Nation	Mitigation measures identified in Section 7.4 (Surface Water).	All	QR Mill Water Management Plan	Appendix 9-6B	QR Mill Water Management Plan	Appendix 9-6B	Table 7.4-9 from Section 7.4 (pages 7-47 to 7-48)	congruent	KCB			
11.0-18	Lhtako Dené Nation	Mitigation measures identified in Section 7.5 (Groundwater).	All	QR Mill Water Management Plan	Appendix 9-6B	QR Mill Water Management Plan	Appendix 9-6B	Table 7.5-28 from Section 7.5 (pages 7-85 to 7-86)	congruent	KCB			
12.0-10	Williams Lake First Nation	Mitigation measures identified in Section 7.9 (Freshwater Fish)	All	QR Mill Water Management Plan	Appendix 9-6B	QR Mill Water Management Plan	Appendix 9-6B	Table 7.9-21 from Section 7.9 (pages 7-78 to 7-81)	congruent	KCB			
12.0-14	Williams Lake First Nation	Mitigation measures identified in Section 7.4 (Surface Water).	Mine Site, QR Mill, Transmission Line	QR Mill Water Management Plan	Appendix 9-6B	QR Mill Water Management Plan	Appendix 9-6B	Table 7.4-9 from Section 7.4 (pages 7-47 to 7-48)	congruent	KCB			
12.0-15	Williams Lake First Nation	Mitigation measures identified in Section 7.5 (Groundwater)	All	QR Mill Water Management Plan	Appendix 9-6B	QR Mill Water Management Plan	Appendix 9-6B	Table 7.5-28 from Section 7.5 (pages 7-85 to 7-86)	congruent	KCB			
12.0-19	Williams Lake First Nation	Mitigation measures identified in Section 7.2 (Air Quality) and Section 7.4 (Surface Water).	All	QR Mill Water Management Plan	Appendix 9-6B	QR Mill Water Management Plan	Appendix 9-6B	Table 7.2-12 from Section 7.2 (pages 7-31 to 7-34) and Table 7.4-9 from Section 7.4 (pages 7-47 to 7-48)	congruent	KCB			
13.0-12	Xatśūll First Nation	Mitigation measures identified in Section 7.4 (Surface Water).	All	QR Mill Water Management Plan	Appendix 9-6B	QR Mill Water Management Plan	Appendix 9-6B	Table 7.4-9 from Section 7.4 (pages 7-47 to 7-48)	congruent	KCB			
13.0-13	Xatśūll First Nation	Mitigation measures identified in Section 7.5 (Groundwater)	All	QR Mill Water Management Plan	Appendix 9-6B	QR Mill Water Management Plan	Appendix 9-6B	Table 7.5-28 from Section 7.5 (pages 7-85 to 7-86)	congruent	KCB			

APPENDIX G COMMUNITY EFFECTS PLAN ENGAGEMENT, COMMUNICATIONS, AND REPORTING STRATEGY

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

Appendix G Community Effects Plan Engagement, Communications, and Reporting Strategy

June 2025



OSISKO DEVELOPMENT

Cariboo Gold Project

PO Box 250
3700 Ski Hill Road
Wells, BC V0K 2R0

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ABBREVIATIONS

Terminology used in his document has been defined where it is first used, while the following list has been presented to assist readers that choose to review only portions of the document.

Abbreviation	Description
BC	British Columbia
Community Effects Plan ECR Strategy	Community Effects Plan Engagement, Communication, and Reporting Strategy
CRD	Cariboo Regional District
District	District of Wells
EA	Environmental Assessment
EAC	Environmental Assessment Certificate
EAO	Environmental Assessment Office
IH	Interior Health
km	kilometre
kV	kilovolt
NH	Northern Health
ODV	Osisko Development Corp.
Project	Cariboo Gold Project
QR Mill	Quesnel River Mill
WRSF	Waste Rock Storage Facility
WTP	Water Treatment Plant

1. INTRODUCTION

Barkerville Gold Mines Ltd. (BGM) recognizes that frequent engagement with stakeholders to understand their interests and concerns is essential for the Cariboo Gold Project (the Project) to be successful. BGM is committed to engaging with the local community, Participating Indigenous nations, stakeholders, and government agencies that are impacted directly or indirectly by the Project to learn how to reduce potential environmental and social impacts. BGM recognizes that the satisfaction of these groups is integral for the long-term success of the Project and is committed to giving their stakeholders a voice that is both meaningful and practical (ODV 2021a). BGM is a wholly owned subsidiary of Osisko Development Corp. (ODV).

This document outlines engagement, communication, and reporting processes for supporting the implementation of the Project's Community Effects Plan with the local community, Participating Indigenous nations, and partners. For the purpose of this document, the local community refers to the local community of Wells and its residents, the District of Wells (District), and social and community services serving Wells. Participating Indigenous nations refers to the Lhtako Dené Nation, Xatśūll First Nation, and Williams Lake First Nation. Partners refers to Northern Health (NH) and Interior Health (IH). Other partners may include school boards serving Wells and Quesnel.

1.1 Cariboo Gold Project

BGM is constructing an underground gold mine with a maximum production capacity of 4,900 tonnes per day of mineralized material (ore) located in Wells and Cariboo Regional District (CRD), British Columbia (BC).

The Mine Site is approximately 80 kilometres (km) east of Quesnel, and approximately 350 metres (m) west of the nearest permanent residence in Wells (121° 34.37' W, 53° 5.82' N). The Quesnel River Mill (QR Mill) is located approximately 115 km from the Mine Site, 58 km southeast of Quesnel, and 17.5 km west-northwest of Likely (121° 47.49' W, 52° 40.28' N). Project infrastructure will be located at two main sites, the Mine Site and QR Mill, with a transportation route connecting them. A new transmission line will be built to deliver power to the Mine Site, while an existing transmission line will continue to deliver power to the QR Mill.

The Project includes the following sites and key components:

- Mine Site:
  - Mine Site Complex:
    - Underground extraction infrastructure, Valley Portal, Conveyor, and crushing facility;
    - Waste management facilities;
    - Water supply and management structures and facilities;

- A Services Building containing a Surface Concentrator, Paste Backfill Plant, and other related infrastructure;
- Electrical Substation (adjacent to the Services Building);
- Camp (Worker Accommodation);
- Water Treatment Plant (WTP); and
- Underground Waste Haulage Route.

- Cow Portal located along a road between the Mine Site Complex and the Bonanza Ledge Site, and associated underground extraction infrastructure;
- Bonanza Ledge Site:
  - A Waste Rock Storage Facility (WRSF) and associated water management structures (including sumps, and ponds) and a new WTP;
  - Overburden Stockpiles;
  - Temporary Ore Stockpile;
  - Power plant; and
  - Ancillary infrastructure (e.g., Crusher, Screening Plant, Ore Sorter, Mine Offices, Garage).
- Access roads and infrastructure:
- Main Access Road, including a Highway 26 bypass and Willow River Bridge;
- Camp Access Road at the Mine Site Complex;
- A Road between the Bonanza Ledge Site and Highway 26 access;
- C Road (Emergency WRSF Access Road) between the Bonanza Ledge Site and the Mine Site Complex used as emergency and maintenance use;
- Existing B Road (Fibre Optic Line Access Road) used for maintenance access only for the Fibre Optic Line between the Cow Portal and the Mine Site Complex;
- Ventilation Raise Access Road to access the Shaft and Mosquito Ventilation Raises; and
- Underground Waste Haulage Route connecting underground works between the Mine Site Complex and Cow Portal.

- **Quesnel River Mill (QR Mill)**:
  - BGM's existing and associated infrastructure within the Project Surface Footprint, including use of the Worker Accommodation and upgrades to the existing QR Mill, water supply, and management structures and facilities, access roads, concentrate storage, new WTP, and construction of a Tailings Dewatering Plant and a Filtered Stack Tailings storage facility.

- **Transportation Routes**:
  - Transportation of concentrate between the Mine Site and the QR Mill site along 56 kilometres (km) of Highway 26 and 59 km of the 500 Nyland Lake Forest Service Road, a forest service road maintained by West Fraser Mills Ltd.;
  - Transportation of workers, goods, and service providers to Wells from Quesnel, BC, along Highway 26. A new highway bypass will be built west of Wells from Highway 26 to connect to the Main Access Road to the Mine Site Complex to enable traffic to exit the highway before the community; and
  - Transportation of workers and goods to the QR Mill from Quesnel along Highway 26 and the 500 Nyland Lake Road, and workers along the Quesnel Hydraulic Road to 2700 Road and the 500 Nyland Lake Road.
- **Transmission Line:** a new 69 kilovolt (kV) transmission line, 69.3 km in length, from Barlow Substation, near Quesnel to the Mine Site that follows a corridor north of Highway 26 along forest service roads or other disturbance areas, where possible.

1.2 Community Effects Management Plan

On October 10, 2023, pursuant to Section 29(4)(c) of the British Columbia *Environmental Assessment Act,* 2018, the Minister of Environment and Climate Change Strategy and the Minister of Energy, Mines and Low Carbon Innovation, issued an Environment Assessment Certificate (EAC) for the Project. A condition of the EAC is a Community Effects Plan which is a legally binding requirements to which BGM must adhere to through the life of the Project.

The Minister noted that BGM engaged broadly and deeply with Participating Indigenous nations, the Technical Advisory Committee, the Community Advisory Committee, provincial agencies, and local governments to identify issues and seek ways to address issues and concerns (EAO 2023). Through BGM's engagement efforts during the development of the Project's EA, the BC Environmental Assessment Office (EAO) was able to identify the requirements for the Community Effects Plan.

Key themes identified in the EAO's Assessment Report that are relevant to the Community Effects Plan describe residual effects from the Project activities to air quality, water quality, infrastructure and services, wildlife, and human and community health. The EAO considered the potential Project effects on human health, Wells, and potentially adverse effects on access to the land for Indigenous peoples (EAO 2023a).

The Community Effects Plan serves as a blueprint for implementing an adaptive monitoring and management process that addresses community concerns related to the Project. The Community Effects Plan organizes and guides the strategies within this plan. The goal of the Community Effects Plan is to ensure that mitigation measures that address adverse community effects are effectively implemented. Engagement, communication, and reporting are key

processes for successful implementation and adaptive management of the Community Effects Plan.

The Community Effects Plan consolidates the mitigation measures identified in Condition 16 of the EAO's Certificate conditions and Table 20: Summary of Proposed Mitigation Measure for the Project. The Community Effects Plan provides guidance and direction through several strategies designed to address, monitor, and manage potential adverse effects of the Project on the local community and Participating Indigenous nations. The Community Effects Plan addresses the concerns raised by the community related to noise, employment, land and resource use, infrastructure and services, community health, malfunctions and accidents and will incorporate conditions imposed by the EAO through five strategies:

- Employee Strategy
- Public Strategy
- Traffic Strategy
- Noise Strategy
- Visual Impact Strategy

Through the strategies, commitments, and programs identified in the Community Effects Plan, the Community Effects Plan serves as guidance on how to implement the required actions or conditions to mitigate potential social effects, such as maximizing local hiring, implementing practices to address the potential for gender-based violence and increase diversity in employment, establishing corporate codes of conduct for workers, providing funding for a social worker to serve residents of Wells and Quesnel, a District Community Liaison position, and a financial contribution to an organization serving diverse populations (EAO 2023b).

1.3 Objectives of the Engagement, Communications, and Reporting Strategy

This Community Effects Plan Engagement, Communication, and Reporting Strategy (Community Effects Plan ECR Strategy) is guided by the EAO's Certificate conditions related to ongoing engagement with the public, the local community, Participating Indigenous nations, NH, and social and community services to support the development, implementation, and adaptive monitoring and management of the Community Effects Plan. The Community Effects Plan ECR Strategy outlines how BGM will facilitate the Community Effects Plan's adaptive management process by obtaining new information, feedback, and improve BGM's understanding of needs and priorities of the public, the local community, Participating Indigenous nations, and partners. This Community Effects Plan ECR Strategy also describes how BGM will share progress reports with the public, the local community, Participating Indigenous nations, and partners.

The objectives of the Community Effects Plan ECR Strategy are to:

- Facilitate and support the Community Effects Plan's adaptive management and monitoring process.
- Further develop and maintain reciprocal relationships with the local community and Participating Indigenous nations.
- Outline how BGM will obtain meaningful input and conduct meaningful engagement related to the Community Effects Plan's implementation.
- Outline how BGM will engage with the public, Participating Indigenous nations, local government, and partners and share information related to the Project's mitigation measures that address the local community and Participating Indigenous nations concerns, including Project-related social and economic issues or concerns.
- Outline how progress reporting conditions will be met related to Employees, Traffic, Public, Noise, and Visual Impacts.
- Outline how engagement, communication, and progress reporting will inform plans such as the Community Involvement Plan and the Indigenous Partnership Plan.
- Achieve compliance and meet the public requirements of the Community Effects Plan condition related to the Projects EAC.

1.4 Cariboo Gold Project Engagement Principles

BGM understands that meaningful engagement with the local community and Participating Indigenous nations is essential to the success of the Project. BGM will continue to build on the engagement activities that have already been completed and implement methods tailored for specific audiences that were learned through the development of the EA.

The guiding principles that inform the Community Effect Plan's ECR Strategy are:

- **Shared Process** – BGM's engagement program is developed based on a shared process that seeks and considers input from potentially affected parties.
- **Respect** – BGM commits to establishing positive, productive, and lasting relationships based on mutual respect and understanding, and supported by appropriate engagement opportunities.
- **Timeliness** – BGM commits to undertaking early engagement with the public and stakeholders, and to providing timely and accurate exchange of information about the Project and about opportunities to participate in engagement activities.
- **Relationships** – BGM establishes and maintains long-term relationships with those with an interest in the Project, with an understanding that these relationships will evolve through ongoing engagement.
- **Inclusiveness** – BGM is inclusive in its engagement activities and pro-actively works to identify those potentially affected by the Project in a manner consistent with the principles

of Gender-Based Analysis Plus (GBA+). BGM works with the public and stakeholders to identify means through which they feel comfortable being engaged and having their input reflected.

- **Responsiveness** – BGM considers and responds to input from the public and stakeholders and demonstrates how input had been considered in Project designs, including management and mitigation plans.
- **Open communication** – BGM is open and transparent in its operations. BGM openly listens to feedback and works with the public and stakeholders to address Project-related concerns. Input received is transparently reported.

1.5 Cultural Awareness and Diversity, Equity, Inclusion

BGM is committed to advancing meaningful reconciliation and acknowledges that the Project is located within the unceded Traditional territories of their Indigenous partners, Lhtako Dené Nation, Xatśūll First Nation, and Williams Lake First Nation (ODV n.d.).

BGM is committed to building and operating socially and environmentally sustainable mining operations that will support generations. One of BGM's core values is building and maintaining relationships that are based on reciprocity to ensure mutual benefits for all stakeholders and a legacy for future generations (ODV 2021a).

To ensure that engagement efforts are consistent with BGM's engagement principles and are effectively applied in the implementation of the Community Effect Plan ECR Strategy, BGM will provide employees with Cultural Awareness Training and Equal, Diverse, and Inclusive Policy training during their orientation. Cultural Awareness and Equity, Diversity, and Inclusion training is designed to raise awareness about cultural nuances, historical context, and unique perspectives or experiences to enhance employees' understanding and efforts to engage diverse populations, including Indigenous people, effectively and appropriately.

Cultural Awareness and Equity, Diversity and Inclusion training will inform the activities and strategies that BGM uses to engage with diverse groups to monitor for effects or the effectiveness of mitigation measures.

2. COLLABORATORS

To implement the Community Effect Plan, BGM will collaborate with Participating Indigenous nations and local community partners including Lhtako Dené Nation, Xatśūll First Nation, Williams Lake First Nation, the public, the District, IH, NH and local social and community services.

2.1 Lhtako Dené Nation

Lhtako Dené Nation is part of the Dakelh (or Southern Carrier) Nation in the Athapaskan language group. Lhtako Dené Nation, prior to 1988 was known as the Quesnel Indian Band, and as the Red Bluff Indian Band from 1988 to 2010, is located near the City of Quesnel (BCAFN 2023a.).

Lhtako Dené Nation has four reserves located within its traditional territory totalling 682.7 hectares (ha): Dragon Lake 3, Quesnel 1, Rich Bar 4, and Sinnce-Tah-Lah 2. The traditional territory is centred on the Fraser and Quesnel Rivers, and Lhtako Dené Nation ancestors lived in villages on Ahbau Lake, Bowron Lake, Punchaw Lake, Puntataenkut Lake, Ten Mile Lake, and Tzenzaicut Lake. The Dakelh people have occupied the vast area encompassing Barkerville, Wells, and the Bowron Lakes region since time immemorial (ODV 2022a).

The Community Effect Plan is intended to address the Lhtako Dené Nation's concerns and interests related to practicing their land-based rights and sustain their culture now and for future generations. Collaborative implementation of the Community Effect Plan through an adaptive management process supports their community well-being by including the integration of Lhtako Ecological Knowledge, Dakelh language and teaching, community and cultural cohesion, and intergenerational knowledge transfer. Collaborating with the Lhtako Dené Nation is integral for the success of the Community Effect Plan and future relationship with BGM. BGM's relationship with the Lhtako Dené Nation supports their efforts to uphold their stewardship systems, customs, beliefs, and values for the community to be healthy now and into the future. Access to transportation routes and cultural sites along with encroachment of non-community members have the potential to impact their community well-being and safety. The Lhtako Dené Nation anticipates economic gains from the current Project while ensuring that natural resources are maintained for the benefit of future generations.

During the EA process, the Lhtako Dené community members expressed their significant concerns about the associated negative effects of the Project on their traditional land use practices, water, caribou, and their community wellbeing. Through collaboration on the Community Effect Plan over the life of the Project, BGM commits to further discussion and information-sharing of the Project's technical nature and large-scale mining operations and can report back on the effectiveness of the mitigations and adjust mitigations accordingly (ODV 2022a).

BGM anticipates that through collaboration with the Lhtako Dené Nation on early development and implementation of the Community Effect Plan, the Indigenous Partnership Plan will be developed that more specifically addresses the Participating Indigenous Nations' Interests related to the Project.

BGM will continue to use the Lhtako Dené Nation Community Liaison to support engagement, communication, and reporting. The Community Liaison will be responsible for sharing information with the community and relaying their feedback to BGM.

2.2 Xatśūll First Nation

Xatśūll First Nation is a First Nation government belonging to the Secwépemc Nation located in the Central Interior BC near the City of Williams Lake. Xatśūll First Nation has two reserves located within its traditional territory totalling 2,093 ha: Deep Creek 2 and Soda Creek 1 (ODV 2022b). Xatśūll First Nation, along with Williams Lake First Nation, Stswēcemc Xgāt'tem (Canoe Creek/Dog Creek) and Tsq'ēsceń (Canim Lake), form the Northern Shuswap Tribal Council (Northern Secwépemc te Qelmucw). Xatśūll First Nation has traditionally occupied a vast territory in the BC Cariboo region, including the area on which a portion of the Project is proposed to be developed. Prior to the imposition of the Indian Reserve system, Xatśūll First Nation travelled, used, and occupied large tracts of land in their territory, extending from Mount Alex Graham in the west, to the Quesnel Lake and Horsefly areas in the east, and towards Bowron Lakes in the north (Landmark 2021).

The traditional land use study describes the important relationship Secwépemc people have with the land. Their ability to exercise their land-based rights is integral for practicing their culture and transmitting their culture across the generations. The importance of the land is expressed through Secwépemctsín, and is vital to the health, well-being, identity, and continuity of the Secwépemc culture (ODV 2022b).

Knowledge Keepers are concerned by an increasing presence of non-Indigenous harvesters in their traditional territory causing competition for subsistence resources, that diminishes their sense of safety on the land and can cause competition for the resources. Safety concerns were highlighted by Xatśūll First Nation, which are thought to be caused by cumulative effects in the region related to increased road traffic and vehicle speed. Xatśūll First Nation also expressed fears about addictions and substance abuse related to mining culture and its impacts on the community's health, safety, wellbeing, and land use practices (ODV 2022c).

During the EA process, Xatśūll First Nation raised concerns and interests that will be addressed through the Community Effect Plan and fall under four main categories: traditional land use and cultural heritage practices, land stewardship, economic development and opportunities, and community health and safety (ODV 2022b).

BGM anticipates that through collaboration with the Xatśūll First Nation on early development and implementation of the Community Effect Plan, an Indigenous Partnership Plan will be

developed that more specifically addresses the Participating Indigenous nations' interests related to the Project.

2.3 Williams Lake First Nation

Williams Lake First Nation is a First Nation government belonging to the Secwépemc Nation. Williams Lake First Nation is located in the Central Cariboo Region adjacent to the City of Williams Lake BC. Williams Lake First Nation has eight reserves located within its traditional territory totaling 1,983 hectares: Asahal Lake 2, Carpenter Mountain 15, Chimney Creek 5, Five Mile 3, James Louie 3A, San Jose 6, Tillion 4, and Williams Lake 2 (ODV 2022c).

Wellbeing is tied to Williams Lake First Nation members' ability to carry out socio-cultural activities, practices, and pursuits, including land use activities within their traditional territories. Williams Lake First Nation members have participated in social and cultural activities at locations in their traditional territory that have been used for generations. Social and cultural activities in culturally significant places promotes intergenerational transmission of culture, language, and knowledge from Elders to younger generations. Having the ability to exercise, retain, and renew cultural traditions and practices together, and in relationship with the surrounding territory, is vital to the health, wellbeing, identity, and continuity of Secwépemc community health (ODV 2022c).

Knowledge Keepers expressed concerns to BGM based on their observations of an increased presence of non-Indigenous harvesters in their traditional territory. Non-Indigenous harvesters cause competition for subsistence resources, diminishes safe and reliable use of the land for cultural activities and harvesting, and, in some instances, can result in confrontations. The protection of Indigenous women and girls is particularly important to the members of the Williams Lake First Nation.

During the EA process, Williams Lake First Nation raised concerns and interests related to Project impacts that fall under four main categories: traditional land use and cultural heritage practices, economic development/opportunities, land stewardship, and community health and safety (ODV 2022c).

BGM anticipates that through collaboration with the Williams Lake First Nation on early development and implementation of the Community Effect Plan, an Indigenous Partnership Plan will be developed that more specifically addresses the Participating Indigenous nations' interests related to the Project.

2.4 District of Wells

Wells is a mining and tourist town located along Highway 26 approximately 80 km east of Quesnel. Wells is a destination within the CRD known for its history, art, and adventure. Wells is the nearest municipality to both Barkerville and the Bowron Lakes, which are destinations for visitors to the Cariboo region (ODV 2021b). Community services in Wells include paramedics, volunteer fire department, nurse practitioner visits, one elementary school, and a federal police detachment staffed with officers who also service Quesnel (EAO 2023b).

During the EA Process, Wells' residents expressed concerns related to the socio-economic impacts on the community, including effects on the environment, tourism, arts, and the culture of Wells. Although the economic benefits of the Project were acknowledged by the residents of Wells, they feared that the community would be less peaceful, and a less desirable place to live or play and long-term residents would leave, or Wells would be a less desirable place to visit for tourists.

The Community Effect Plan addresses concerns from Wells through BGM's collaborations with the District on implementing and adaptively managing mitigations that address traffic, noise, tourism, and community health.

BGM anticipates that through collaboration and discussion with Wells on the early development and implementation of the Community Effect Plan, a District of Wells Community Involvement Plan will be developed that more specifically addresses Wells' interests related to the Project.

A District Community Liaison position funded by BGM will be employed during the Construction and Operations phase of the Project. The Community Liaison will be responsible for reviewing documentation and representing the community in their feedback to BGM. The Community Liaison will also be required to participate in community meetings.

2.5 Interior Health

IH is a regional health authority that provides integrated health services and program delivery to over 801,000 across BC's southern interior. The IH region covers 215,000 square kilometres that serves 59 incorporated municipalities, 54 First Nations communities and 16 Chartered Métis communities. The IH services a geographic region that spans sections of BC along the US/Canadian border to just north of Williams Lake. IH is located on the traditional territories of the Dãkelh Dené, St'át'imc, Syilx, Tŝilhqot'in, Ktunaxa, Secwépemc, and Nlaka'pamux Nations. Some Project activities fall within the borders of IH (IH 2020).

Based on comments made by the IH during the EA review process, IH was concerned about water quality and water contamination and resulting effects on human and ecological health. Additional concerns related to health that are not addressed through the Community Effect Plan will be addressed in the Health and Medical Services Management Plan, and the Human Health Monitoring and Management Plan.

BGM commits to sharing information with IH and seeking guidance from IH on how to adapt mitigations to effectively address individual and community health concerns addressed through the Community Effects Plan.

2.6 Northern Health

NH is a regional health authority providing a full range of health care services to residents of Northern BC, including Quesnel. NH is the largest geographic health region covering nearly 600,000 square kilometres and over two dozen communities (NH 2020). Within the Project area,

NH provides health services to Quesnel and surrounding areas. Residents of Wells typically travel to Quesnel for health and medical services.

Based on comments made by NH during the EA review process, the NH expressed concern about contamination to air and water that may affect human health. Concerns were also raised about the capacity of existing health infrastructure to meet increased demands resulting from the Project if there was ever an accident or influx of individuals requiring health services.

BGM commits to reviewing the Community Effects Plan with the NH and report on the effectiveness of mitigations. BGM will seek guidance from the NH on how to adapt mitigations to effectively address individual and community concerns addressed through the Community Effects Plan.

2.7 Social and Community Services

Residents of Wells and Quesnel, and Participating Indigenous nations are supported by a wide variety of non-profit and for-profit community providers that provide services aiming to address the needs of diverse populations. Support services are available for children, youth, adults, families, and seniors as well as other vulnerable populations. Some support services may also be provided by Participating Indigenous nations for their members (WSP 2021).

Available social and community services provide income support, or employment and training programs. Other initiatives address health and social issue or support efforts to build healthy communities (WSP 2021).

Representatives from social and community services expressed that potential impacts from the Project include increased stress on the capacity of social and community support services to serve an increased demand for services from population growth resulting from the Project's workforce. individuals experiencing vulnerabilities may be disproportionately impacted by the Project. In some cases, such as for schools, the population growth may help to maintain some of the funding that would otherwise be lost due an aging population and decline in student numbers (ODV 2022d).

Families needing daycare may experience challenges with Project related population growth as there is a lack of childcare throughout the Region. Recently, however, more Early Childhood Educators are being trained in the region, which may relieve some of the pressure on childcare providers (ODV 2022d).

BGM recognizes that there is limited capacity in the region for social and community services supporting human and community wellbeing. BGM's Health and Medical Services Plan for the Project's employees and contractors is intended to offset pressures put on the health services that the Project's workforce may create. The Health and Medical Services Plan includes strategies for improving mental health and reducing domestic violence to support healthy communities (ODV 2022d).

The Amata Transition House Society provides guidance and shares information with BGM if they observe that the Project is having adverse effects on vulnerable populations. The Amata Transition House Society also supports BGM in their understanding of local social and community services and how BGM could mitigate potentially adverse effects of the Project on the local community and vulnerable populations. BGM has signed an agreement to provide a financial contribution to the Amata Transition House Society to help them address and prevent issues related to substance abuse and domestic violence that may be related to mining culture and the Project.

3. METHODS

Understanding the engagement, communication, and reporting preferences of the public, local communities, Participating Indigenous nations, and partners is essential for the Community Effect Plan's success and adaptive management process. BGM is committed to engaging, communicating, and reporting through a variety of methods that aim to be inclusive. BGM's methods support the effective transfer of information related to the Community Effect Plan and supports BGM's goal of obtaining meaningful input for adaptive management.

Engagement, communication, and reporting methods used to advance the Community Effect Plan will build from established engagement methods that were effective during the development of the Project's EA. The specific methods that support communicating and sharing information, obtaining meaningful feedback through engagement, and reporting to the local communities, Participating Indigenous nations, and partners depends on BGM's engagement, communication, or reporting goal.

BGM currently uses electronic, print, and face-to-face methods for engaging, communicating, and sharing information about the Project.

3.1 Electronic Methods

3.1.1 Social Media

Social media channels such as Instagram (https://www.instagram.com/osiskodevcariboogold/) and Facebook (https://www.facebook.com/OsiskoDevCaribooGold) allow BGM to quickly share information related to the Community Effect Plan. Social media is a useful tool for sharing information about upcoming events, announcements, or reporting back to the public, local community and Participating Indigenous nations on highlights related to the Community Effect Plan. Social media will be used to share information about public events and opportunities for engagement.

3.1.2 Cariboo Gold Project Website

Members of the public can find information about the Project and Community Effect Plan annual reports on the Project website. The Project website provides public information about the Project and BGM in general. The official Project webpage is https://osiskodev.com/cariboo-gold-project. The website provides a place to communicate with the public about how their concerns are considered and addressed by BGM.

The Project website will have "contact us" form where the public can anonymously submit their comments and questions. Prompts will ask people to voluntarily identify what community or if an individual wishes to self-identify as Indigenous by asking what Indigenous Nation the individual is a member of. Answering the prompts will not be mandatory for submitting a comment or

question and the option to leave self-identifying information blank will be provided. Comments and questions submitted through the website will be directed to feedback@osiskodev.com, which is managed by BGM's Community Relations Team. Responses to comments received through the website will be summarized, themed with other comments and questions received by BGM through other feedback mechanisms and posted to the website under FAQs. New comments and questions will be posted to the website FAQs quarterly.

3.1.3 E-mail and Phone

BGM uses emails to share newsletters to those on a contact list, or to share information or obtain feedback from a specific group or individual about a specific topic. BGM also has a dedicated email address so that the public can provide input, raise concerns, or ask questions. The phone number (778-414-8493) and email address (feedback@osiskodev.com) will be advertised with all communication materials.

3.2 Print Methods

3.2.1 Mail-outs, Newsletters, Local Newspaper

BGM will use mail-outs, newsletters, and put information in the local newspaper so that information related the Community Effect Plan reaches a wide and diverse audience. BGM will send the Participating nations a brief monthly update with photos that can be added to the Nations' monthly newsletter as not all community members read the local newspaper or BGM's newsletters.

3.2.2 Formal Document Review

BGM will produce formal documents to report back on the effectiveness of the Community Effect Plan and changes made through the adaptive management and monitoring process or in response to feedback and guidance from the local community or Participating Indigenous nations. Information will be shared through formal reports and engagement will be obtained through the review of formal documents.

3.3 Face-to Face Methods

3.3.1 Formal Meetings

Formal meetings, both virtual or face-to-face, allow BGM to share targeted information about the Community Effect Plan with key representatives of the local community or Participating Indigenous nations. Formal meetings also allow BGM to engage and obtain feedback and guidance on how to advance the Community Effect Plan.

3.3.2 Community Meetings

Community meetings, both virtual or face-to-face, with local communities or with Participating Indigenous nations provide BGM with an opportunity to share information through presentations and engage in discussions for gathering feedback and guidance on how to advance the

Community Effect Plan. BGM will establish and chair quarterly community meetings for the first year of Construction and Operations to discuss Project effects, mitigation measures that address social and economic effects, future project development plans, and the implementation of the Community Effect Plan.

3.3.3 One-on-One Meetings

When specific feedback from subject matter experts, or to improve accessibility for diverse populations, BGM will organize targeted one-on-one meetings.

3.3.4 Community Events

BGM will host community events, such as a Christmas Dinner, to build and strengthen positive relationships with local communities and Participating Indigenous nations. Strong positive relationships with local communities and Participating Indigenous nations facilitates trust which leads to deep engagement and participation so that meaningful feedback and guidance is provided to BGM.

3.3.5 Mine Site Visits

Similar to community events, mine site visits provide an opportunity for representatives and members of the local community and Participating Indigenous nations to experience and observe BGM's efforts to mitigate concerns raised during the EA process and provide meaningful feedback and guidance related to the Community Effect Plan based on their experience at the mine site.

3.3.6 Community Relations Office

BGM has a Community Relations Office in Wells located at 4270 Sanders Avenue. The community Relations Office provides a point of contact for the public and is staffed during regular business hours Monday to Friday.

3.3.7 Lhtako Dené Nation Community Liaison

BGM currently provides support for a Community Liaison position within the Lhtako Dené Nation. The Community Liaison is responsible for engaging with community members and providing updates related to the Community Effect Plan.

3.3.8 District of Wells Community Liaison

BGM has signed an agreement with the District to fund a Community Liaison position during the Construction and Operations phase. The District Community Liaison will review documentation, represent the community, and relay concerns back to BGM, and participate in community meetings. Table 3.3-1 outlines the general methods that BGM will use to achieve their engagement goals related to the Community Effect Plan during the Construction and Operation phases of the Project.

Table 3.3-1: Community Effect Plan Engagement Methods

Participating Indigenous Nation, Partner, or Stakeholder	Goal	Method	Frequency
Participating Indigenous nation: Lhtako Dené First Nation Xatśūll First Nation Williams Lake First Nation	Engagement	Formal Meetings: Depending on topic and action required, BGM will meet with leadership or the natural resources team.	Weekly
		Environmental Monitoring Board	Bi-annual
		Formal Document Review (i.e. annual reports)	Annually or as required
		E-mail and phone Community meetings Community events Mine-Site Visits Community Relations Office	As required
		Community Liaison (Lhtako Dené Nation)	As required
	Communication/ Information Sharing	Mail-outs, newsletters, newspaper	Bi-annually
		Social media e-mails website Community Liaison (Lhtako Dené Nation)	As required
	Reporting	Formal Meetings Formal document Review (i.e. annual reports)	Annually
		Community Meetings Website Community Liaison (Lhtako Dené Nation)	As required
District of Wells	Engagement	Formal meetings	Every two weeks
		Formal Document Review (i.e. annual reports)	Annually or as required
		Community Meetings	Quarterly
		E-mail Community events Mine-Site Visits Community Relations Office Community Liaison	As required

Participating Indigenous Nation, Partner, or Stakeholder	Goal	Method	Frequency
	Communication/Information Sharing	Mail-outs, newsletters, newspaper Social media e-mails website Community Liaison	As required
	Reporting	Formal meetings Formal Document Review (i.e. annual reports)	Annually or as required
		Community Meetings Website Community Liaison	As required
Interior Health	Engagement	Formal Meetings Formal Document Review (i.e. annual reports)	Annually or as required
	Communication/Information Sharing	E-mail	As required
	Reporting	Formal Meetings Formal Document Review (i.e. annual reports)	Annually or as required
Northern Health	Engagement	Formal Meetings Formal Document Review (i.e. annual reports)	Annually or as required
	Communication/Information Sharing	E-mail	As required
	Reporting	Formal Meetings Formal Document Review (i.e. annual reports)	Annually or as required
Social and Community Services	Engagement	Formal Meetings One-on-One Meetings	As required
	Communication/Information Sharing	E-mail	As required
	Reporting	Formal Meetings	As required

Participating Indigenous Nation, Partner, or Stakeholder	Goal	Method	Frequency
Public	Engagement	Community Meetings	Quarterly during the Construction and Operations phase
		Community Events Community Relations Office Email	As required
	Communication/Information Sharing	Mail-outs, newsletters, newspaper Social media e-mails website	As required
	Reporting	Community Events	Quarterly

3.1 Tailoring Engagement to Diverse Audiences

To ensure that BGM understands how the Project impacts diverse groups and can evaluate mitigation measures for diverse groups, BGM will tailor their engagement, communication, and reporting methods for diverse audiences. BGM will continue to make efforts to engage with seniors, youth, people experiencing unemployment, people with disabilities, low-income, women, immigrants, LGBTQ2, and families. BGM will follow the guidance and advice from social and community service providers on appropriate and best practices for engaging diverse populations in the region. Some strategies that BGM may use to obtain meaningful feedback and a comprehensive understanding of community impacts, are to host one-on-one meetings and allow individuals or groups to identify spaces for engagement that are comfortable and accessible.

BGM has a positive relationship with the Amata Transition House Society. The Amata Transition House Society provides information on potential project impacts related to domestic violence, sexual exploitation, and abuse issues. BGM will also seek guidance from the Amata Transition House Society on how to improve opportunities for diverse groups to participate in employment opportunities created by the Project.

4. REPORTING MECHANISMS

BGM is required to report back to the Participating Indigenous nations, the local community, and partners. The response to the Community Effect Plan reports will help assess whether the mitigation measures are working as intended and guide required adjustments to the mitigations.

BGM will report back to the Participating Indigenous nations, local community, and partners through the following mechanisms:

- Annual Reports
- Formal Meetings
- One-on-One Meetings
- Mail-outs (print and distributed electronically)

4.1 Real-time Reporting for Critical Events

Real-time critical event reporting involves a process of monitoring, identifying, and reporting critical events as they happen to prevent accidents and improve safety management. BGM has a 24/7 notification system that when triggered, engages an Incident Command Team and/or Emergency Management Team that is responsible for notifying the local communities and Participating Indigenous nations if there is a critical event. Reporting for critical events that would be of concern to the public, the local community, and Participating Indigenous nations is detailed in *Section 6* (Community Emergency Response Plan) of Appendix B Community Effect Plan Public Strategy.

5. FEEDBACK AND ITERATION

The Community Effect Plan ECR Strategy supports the implementation of the Community Effect Plan by outlining the mechanisms and tools that will solicit meaningful feedback from the public, Participating Indigenous nations, the local community, and partners, including NH and IH. Feedback obtained through engagement will guide the Community Effect Plan's evolution over the life of the Project to effectively mitigate community concerns.

5.1 Incorporating Feedback into the Community Effect Plan

BGM will obtain feedback to guide the adaptive management of the Community Effect Plan through an iterative Community Effect Plan reporting and feedback cycle. Feedback and guidance from Participating Indigenous nations, the local community and partners will be incorporated into the Community Effect Plan through the following five phases:

5.1.1 Community Effect Plan Monitoring

Once the Community Effect Plan is fully implemented, the mitigations will be monitored. Details about monitoring activities for the Community Effect Plan are detailed Community Effect Plan's Strategies (Section 6.3 of the Community Effect Plan).

5.1.2 Report Back to Participating Indigenous Nations, Local Community, and Partners

The results from monitoring efforts will be reported to the Participating Indigenous nations, the local community, partners, and the public through their preferred engagement, communication, and reporting methods.

5.1.3 Engagement, Assessment, and Evaluation

BGM will engage with the public, Participating Indigenous nations, the local community, and partners to understand their assessment of the Community Effect Plan related to the effectiveness of the mitigations. Methods for engaging and obtaining input into the assessment and evaluation of the Community Effect Plan's strategies will be done through the methods detailed in Section 3.

5.1.4 Adjust Mitigations

Based on feedback and guidance from the Participating Indigenous nations, the local community, and partners, BGM will make necessary adjustments to the mitigations to ensure that they are effectively and appropriately mitigating community concerns.

5.1.5 Community Effect Plan Implementation and Community Effect Plan Monitoring

BGM will implement adjusted mitigations and monitor their effectiveness, with plans to report back to the public, Participating Indigenous nations, local community, and partners annually.

The engagement, communication, and reporting cycle that supports adaptive management through this Community Effect Plan ECR Strategy is outlined in Figure 5.1-1.

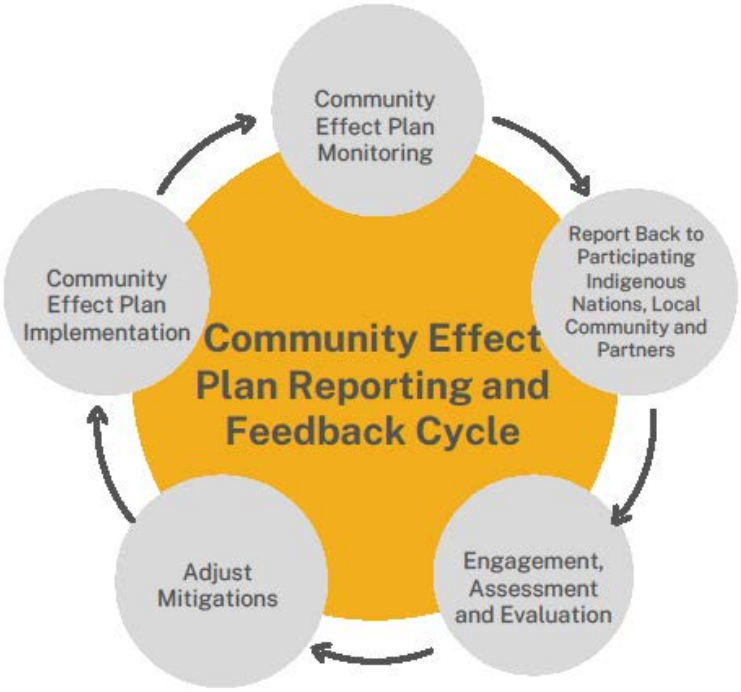


Figure 5.1-1: Feedback Cycle to support Adaptive Management of the Community Effect Plan

5.2 Grievance Mechanism

Grievances and issues that are raised through engagement and reporting activities will be tracked on an Issues Tracking Table that is managed by the Community Relations team for the Project during the Construction and Operations phases. Grievances and issues will be discussed and addressed through formal meetings and one-on-one meetings, and through adjustments to mitigations in BGM's efforts to find a resolution if possible. The Public can report grievances and issues about the Project through the Project feedback e-mail (feedback@osiskodev.com) or the phone line (778-414-8493). The Public can also visit the Community Relations Office in Wells and share their concerns during regular business hours. If there is an emergency, the Project has a toll-free number that the public can call that will connect them immediately to a manager during business hours. The toll-free number is managed by staff from the Community Relations Team after hours.

6. RISK MITIGATION STRATEGIES

BGM will need to thoughtfully consider effective engagement, communication, and reporting strategies to the overall process of implementing the Community Effect Plan. The execution and consistency of these strategies is critical as the following risks to the Community Effect Plan related to engagement, communication, and reporting may include:

- Loss of trust with Participating Indigenous nations, the local community, or other partners.
- Increased anxiety or confusion about the Project.
- Misinformation or rumours about the project.
- Reduced participation and collaboration leading to a lack of meaningful feedback and guidance.

Efforts to mitigate risks resulting from poor engagement, communication, and reporting include:

- Tailor engagement and communication methods to the needs and preferences of the audience. For example, provide presentations and visual materials for the general public, and more technical materials for a more technical audience. For individuals who belong to a population group that have difficulty attending larger community meetings, meet one-on-one or in locations and times chosen by the individual.
- Provide clear, concise, accurate, transparent, and timely information.
- Clearly explain how feedback and guidance from the public, Participating Indigenous nations, the local community, and partners was considered and guided the Community Effect Plan.
- Correct misinformation with reliable and trustworthy information.
- Take considerable effort to build and strengthen relationships with Participating Indigenous nations, the local community, and partners.
- Evaluate the effectiveness of the engagement, communication, and reporting strategies and adjust as needed.

7. TRAINING AND CAPACITY BUILDING

BGM will support employees involved in all aspects of the Project to participate in training and capacity building to learn effective methods and approaches for building and strengthening respectful relationships with Participating Indigenous nations and the local community. Strong respectful relationships are necessary for meaningful participation and collaboration.

7.1 Training Programs for Communication Teams

7.1.1 Indigenous Cultural Training

Cultural Awareness training programs that are designed by the Participating Indigenous nations will raise awareness and enhance BGM's worker's knowledge about cultural nuances, historical context, Indigenous Interests, and unique perspectives related to the Project.

7.1.2 Diversity, Equity, Inclusion, and Belonging Training

Equity, Diversity, and Inclusion training promotes awareness and a greater understanding of the experiences of people with different backgrounds, cultures, ages, races, genders, sexuality, religions, physical abilities, and beliefs for the purpose of learning how to collaborate and work together.

8. BUDGET AND RESOURCE ALLOCATION

8.1 Building Capacity for Effective Engagement

8.1.1 External Capacity

BGM will provide capacity funding to Participating Indigenous nations to support their participation and collaboration on the Community Effect Plan. BGM has signed an agreement with the District for a Community Liaison position that will represent the District to BGM.

8.1.2 Internal Capacity

BGM will dedicate staff to coordinate and implement the mitigations addressing community concerns, and manage relationships related to the Community Effect Plan. Internal capacity will be enhanced with Cultural Awareness Training and Diversity Equity and Inclusion Training to employees at all levels of the organization during their orientations to support respectful relationships with Participating Indigenous nations and the local community.

8.2 Resources for Communication and Reporting

BGM has a dedicated Community Relations team that will support the coordination and implementation of engagement, communication, and reporting activities. Resources will also be dedicated towards producing culturally appropriate and accessible documents, newsletters, and mailouts for the public. Dedicated resources will be allocated by BGM to update the website and manage the social media sites.

8.3 Budgeting for Technology and Software Needs

BGM will support the use of technology and software that facilitates effective engagement, communication, and reporting. For example, virtual meetings may be preferred and BGM will support subscriptions for tools that support their business operations. BGM will also purchase software to support the management of an engagement log.

9. MONITORING AND EVALUATION

Evaluating the effectiveness of BGM's engagement, communication, and reporting efforts will inform the continuous improvement of the Community Effect Plan's implementation as an adaptive monitoring and management plan. Possible methods BGM may use to evaluate their engagement, communication and reporting methods include:

- Review the issues tracking table and identify any themes or outstanding grievances related to engagement, communication, and reporting.
- Assess the quality and strength of the relationships BGM has with Participating Indigenous nations, the local community, and partners.
- Assess if feedback gathered from Participating Indigenous nations, the local community, and partners is meaningfully supporting the adaptive management of the Community Effect Plan to address community concerns.
- Assess if Participating Indigenous nations, the local community, and partners are actively engaged, participating, and collaborating with BGM on the implementation of the Community Effect Plan to address community concerns.
- Assess if Participating Indigenous nations, the local community, and partners are receiving information in a timely and accessible manner.
- Measure and track if the public is accessing information related to the Community Effect Plan on the website.
- Measure and track through the issue tracking table if concerns continue to be raised or if they are being adequately addressed.

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APPENDIX H WORKER ACCOMMODATION AND OFFICES



OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

May 29, 2023

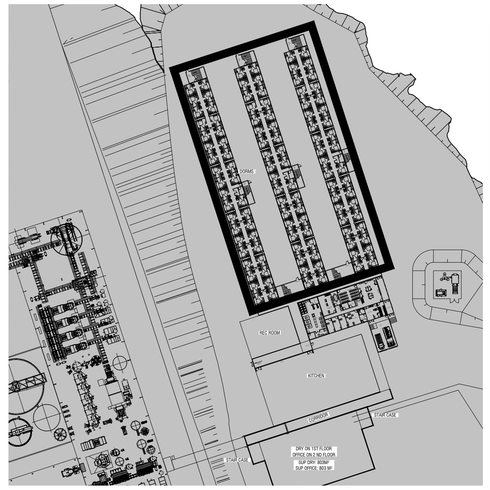
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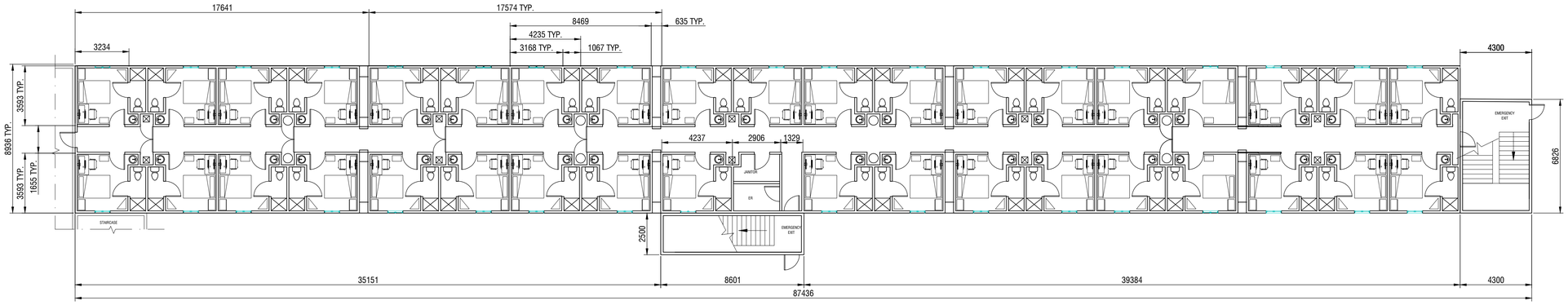
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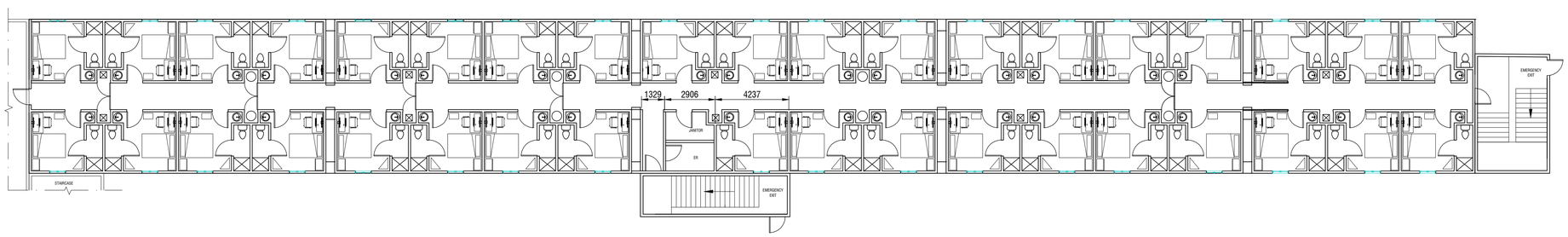
Table of Contents

1. Preliminary General Arrangements
    a. Dorm Facilities
    b. Kitchen and Dining Room
    c. Recreation Room
    d. Mine Offices
    e. Mine Dry





FIRST STORY
(37 ROOMS)



SECOND STORY
(37 ROOMS)

ENGINEER'S REFERENCE	
ENGINEER'S NAME	MEMBER'S #

FOR PERMITTING

REFERENCE DRAWINGS	
TITLE	DRAWING No.

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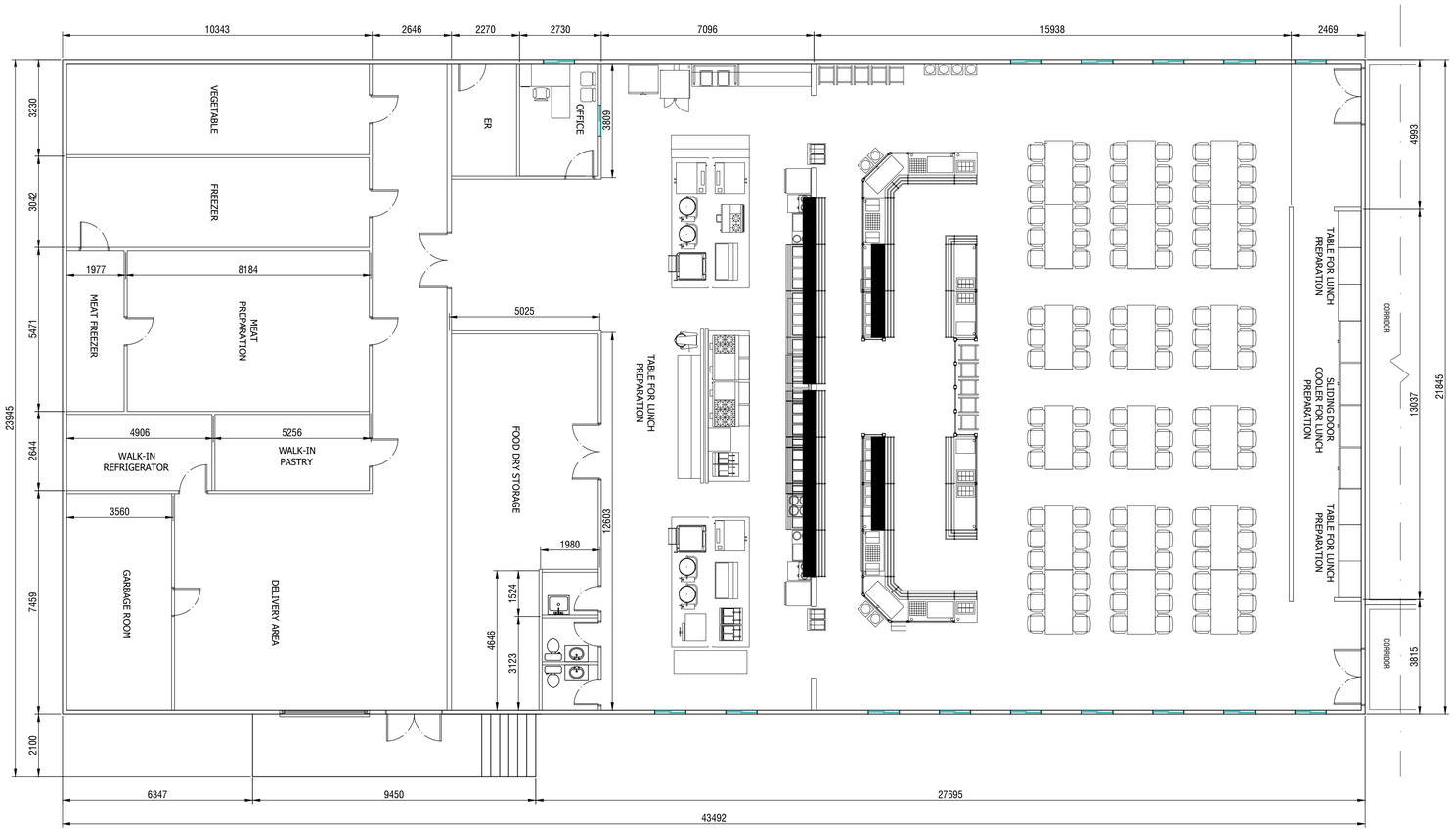
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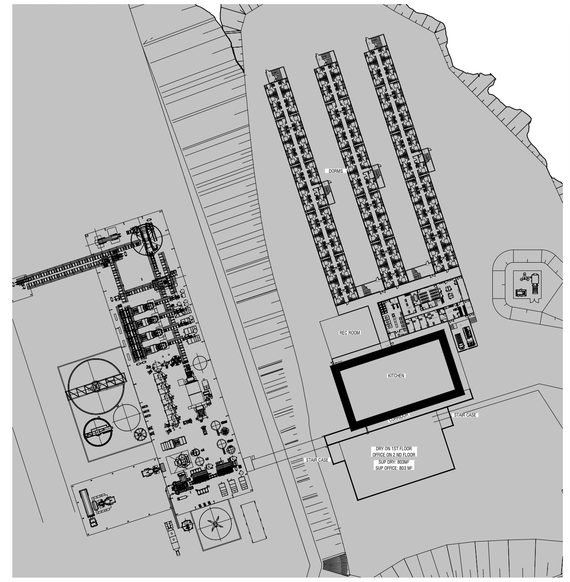
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ENGINEER'S NAME	MEMBER'S #

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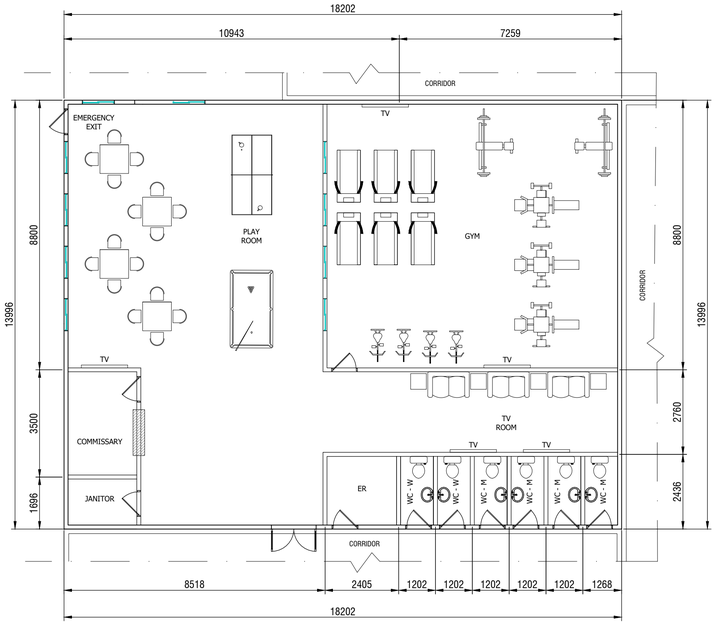
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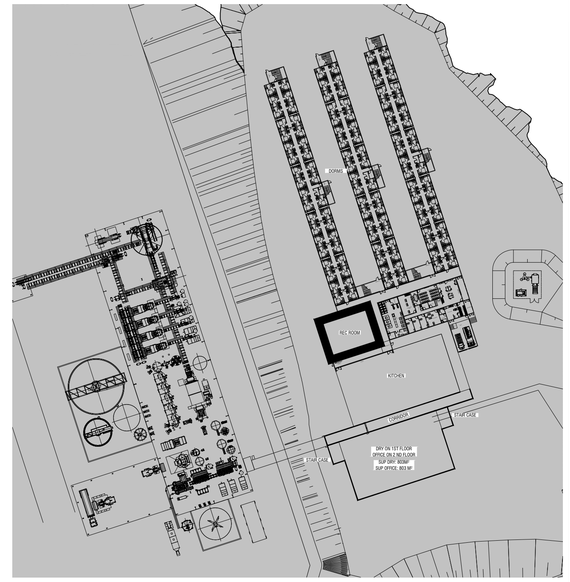
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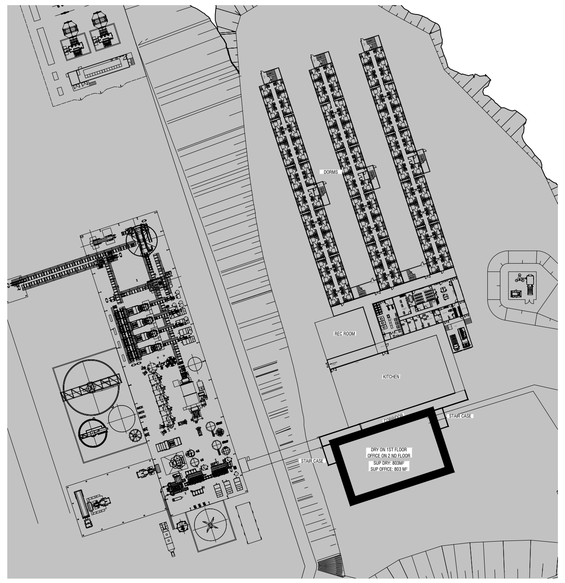
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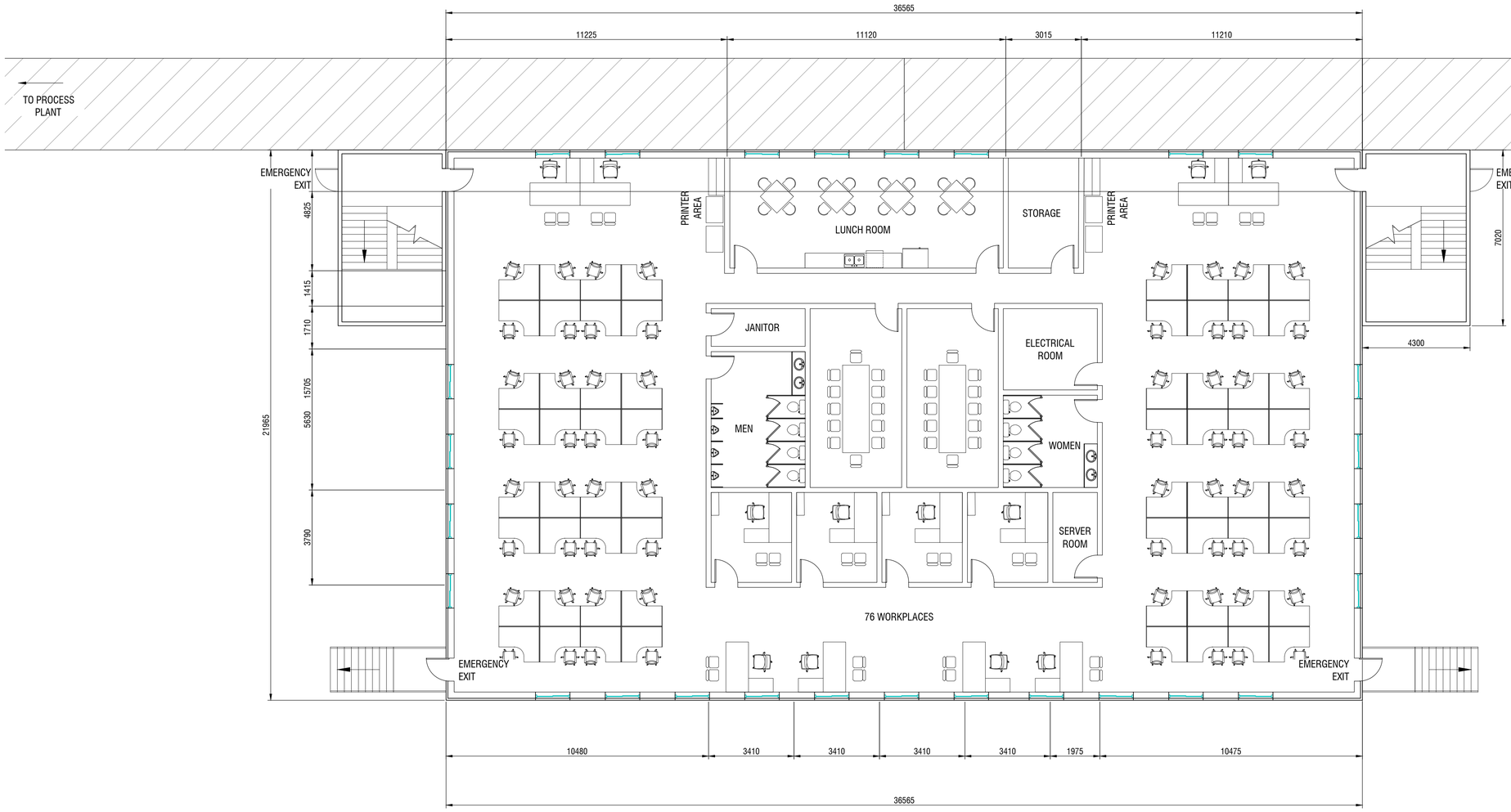
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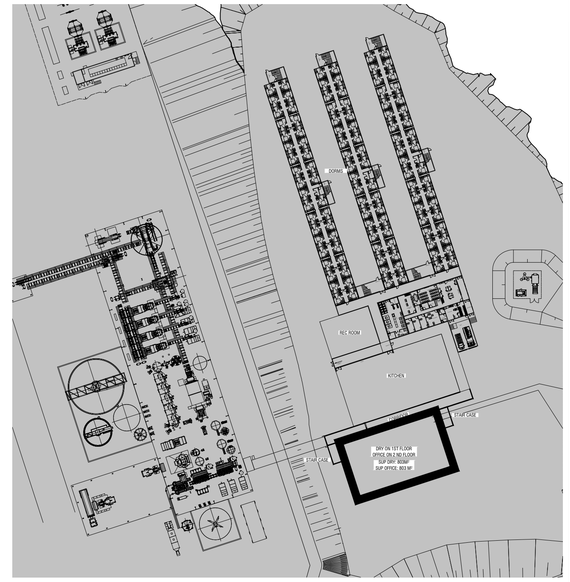
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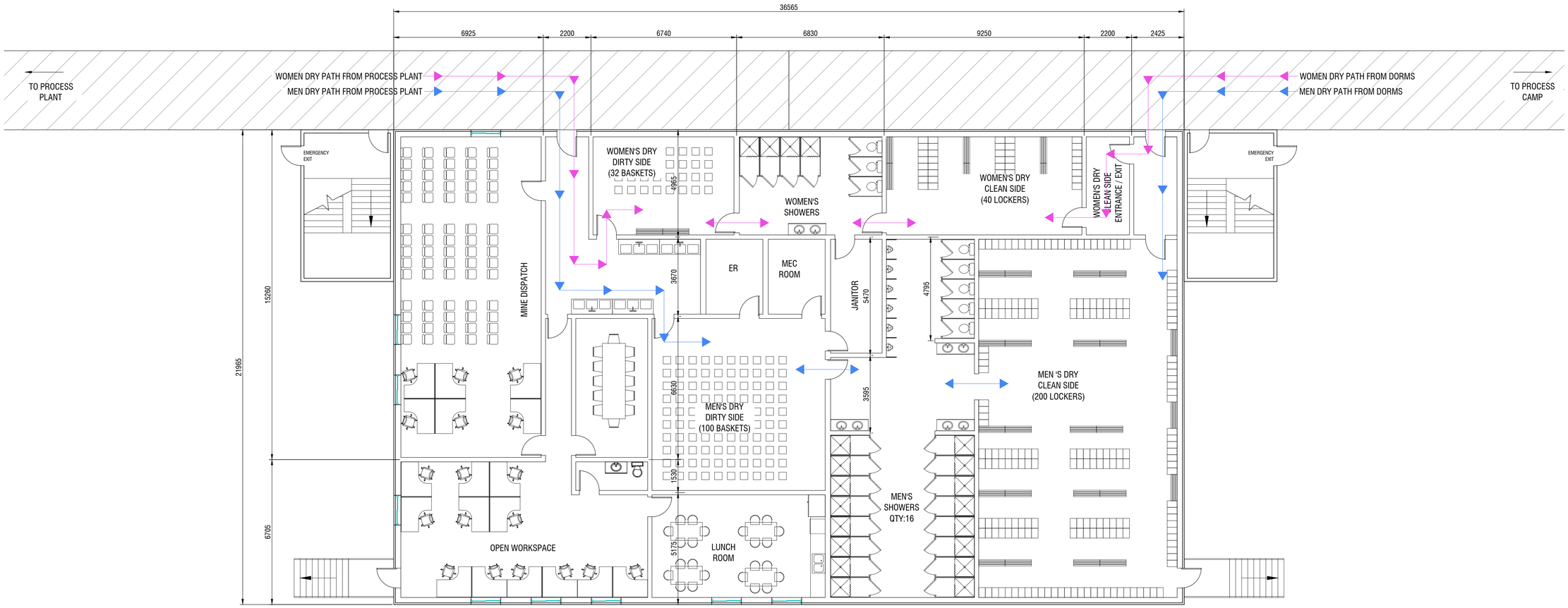
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OSISKO DEVELOPMENT
CARIBOO GOLD PROJECT

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APPENDIX I COMMUNITY EMERGENCY CONTACTS

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

Appendix I: Community Effects Management Plan: Community Emergency Contacts

November 2024



OSISKO DEVELOPMENT

Cariboo Gold Project

PO Box 250
3700 Ski Hill Road
Wells, BC V0K 2R0

1. COMMUNITY EMERGENCY RESPONSE CONTACTS

1.1 Local Medical and Emergency Services

Name	Position	Location	Contact Number
G.R. Baker Memorial Hospital	Quesnel	543 Front Street, Quesnel, BC V2J 2K7	Phone : (250) 985-5600 Fax : (250)992-5652
University Hospital of Northern B.C.	Prince George	1475 Edmonton Street, Prince George, BC V2M 1S2	Phone: (250) 565-2000 Fax: (250) 565-2343

EMERGENCY Ambulance, Police, Fire Department DIAL 9-1-1

Name	Location	Non-Emergency Contact Number
Wells Volunteer Fire Brigade	2314 Baker St Wells, BC V2N 1X4	Fire Chiefs: (250) 994-3330
Quesnel Volunteer Fire Department	310 Kinchant St. Quesnel, B.C. V2J 2R4	Phone: (250) 992-5121
Wells RCMP	12491 Barkerville HWY Wells, BC V0K 2R0	Phone: (250) 994-3314
Quesnel RCMP	584 Carson Avenue Quesnel, BC V2J 2B5	Phone : (250) 992-9211

1.2 Identification and Contact Information of Local Government and Partners

Identification of Local Government and Partners	Contact Information
District of Wells	Jerry Dombowsky, Chief Administrative Officer, email jerrydombowsky@well.ca, phone 250-991-1155 Tyler Doerksen, Facilities, Lands, and Infrastructure Manager: email tylerdoerksen@wells.ca, phone 250-994-3330 Angie Ward, District Clerk and Corporate Officer: email clerk@wells.ca, phone 250-994-3330 Brendan and Emily Bailey, Fire Chiefs: email brendanbailey@wells.ca; emilybailey@wells.ca, phone 250-994-3330 Ed Coleman, Mayor: email edcoleman@wells.ca, phone 250-991-9034 Dorothea Funk, Councillor: email dfunk@wells.ca Jennifer Lewis, Councillor: email jlewis@wells.ca Dirk Van Stralen, Councillor: email vanstralen@wells.ca Josh Trotter-Wanner, Councillor: email josh@wells.ca
Barkerville Historic Site	Operations & Infrastructure: (888) 994-3332 Ext. 45 General Inquiries: (888) 994-3332 Ext. 0

Identification of Local Government and Partners	Contact Information
City of Quesnel	Byron Johnson, City Manager: email bjohnson@quesnel.ca, phone 250-991-7477 Ron Richert, Fire Chief/Emergency Services Director: email rrichert@quesnel.ca, phone 250-992-5121 Teann Fung, Communications Clerk: email tfung@quesnel.ca, phone 250-991-7475 Ron Paull, Mayor: email rpaull@quesnel.ca, Executive Assistant 250-991-7477 Scott Elliott, Councillor: email selliott@quesnel.ca, Executive Assistant 250-991-7477 Tony Goulet, Councillor: email tgoulet@quesnel.ca, Executive Assistant 250-991-7477 Debra McKelvie, Councillor: email dmckelvie@quesnel.ca, Executive Assistant 250-991-7477 Laurey-Anne Roodenburg, Councillor: email lroodenburg@quesnel.ca, Executive Assistant 250-991-7477 Martin Runge, Councillor: email mrunge@quesnel.ca, Executive Assistant 250-991-7477 Mitch Vik, Councillor: email mvik@quesnel.ca, cell 250-983-6784, Executive Assistant 250-991-7477
Cariboo Regional District Emergency Program Services	Emergency Program Services Suite D, 180 North Third Avenue, Williams Lake, BC V2G 2A4 Phone: 250-392-3351 Toll-Free: 1-800-665-1636 Emergency & Recovery Line: 1-866-759-4977

1.3 Identification and Contact Information of Provincial Partners

Identification of Provincial Partners	Contact Information
BC Wildfire Service	• Report a wildfire: call 1-800-663-5555 toll-free, or *5555 to report wildfires, smoke columns, and violations of wildfire regulations • Wildfire information: call 1-888-336-7378 (3FOREST) for information on fire danger ratings, regional fire prohibitions, and wildfire activity • Burn registration line: Call 1-888-797-1717 to register your burn Cariboo Fire Centre at Williams Lake: 250-989-2600
First Nations' Emergency Service Society of BC	• Wayne Schnitzler, Executive Director: email wschnitzler@fness.bc.ca, phone 250-318-8278 • Cecile Brass, Director of Administration and Strategic Partnerships: email cbrass@fness.bc.ca, phone 250-713-0905 • Nathan Combs, Fire Services Team Leader: email ncombs@fness.bc.ca, phone 778-694-3900 • Quentin Nelson, Mitigation Team Leader: email qnelson@fness.bc.ca, phone 250-320-7682 • Brenden Mercer, Decision Support Team Leader: email bmercer@fness.bc.ca, phone 250-320-8611 • Jim Macdonald, Preparedness and Recovery Team Leader: email jmacdonald@fness.bc.ca, phone 778-694-1382 • Jamie Svendsen, Response Team Leader: email jsvendsen@fness.bc.ca, phone 778-694-9211

Identification of Provincial Partners	Contact Information
Interior Health	Williams Lake Health Protection Office 540 Borland Street, Williams Lake, BC V2G 1R8 Phone: 250-302-5000
Northern Health	For emergency events that require immediate connection with Northern Health, please call HEMBC on call number (24/7) 855-554-3622 (or 855-55-HEMBC) For non-urgent requests related to Emergency Response Plans, or emergency exercise planning/information, contact HEMBC North Director Mary Charters at 250-617-5288 or HEMBC@northernhealth.ca.
Ministry of Agriculture and Food	• Pam Alexis, Minister of Agriculture and Food: email AF.Minister@gov.bc.ca, phone 250-387-1023 • Jo-Anne Chadwick, Ministerial Advisor: email AF.Minister@gov.bc.ca, phone 250-387-1023 • Graham Knox, Emergency Management Director: email Graham.Knox@gov.bc.ca, phone 778-698-4949 • Jeremy Oaten, Emergency Management Deputy Director: email Jeremy.Oaten@gov.bc.ca, phone 250-356-7966 • Karl Martinson, Senior Emergency Planning Analyst: email Karl.Martinson@gov.bc.ca, phone 778-974-3349 • Saly Howard, Senior Emergency Planning Analyst: email Sally.Howard@gov.bc.ca, phone 236-766-7010 • Kristi Leon, Emergency Planning Analyst: email Kristi.Leon@gov.bc.ca, phone 236-478-2264 • Jenifer Kammerer, Emergency Planning Analyst: email Jenifer.Kammerer@gov.bc.ca, phone 778-362-4475
Ministry of Emergency Management and Climate Readiness	Report a provincial emergency: Contact the emergency coordination centre at 1-800-663-3456 Northeast Regional Office in Prince George: email EMBC.NEAAdmin@gov.bc.ca, phone 250-612-4172 Recovery and Funding Programs: email dfa@gov.bc.ca, phone 250-952-5505, toll free 1-888-257-4777 Emergency Support Services - Financial Inquiries: email ESSfinanceinquiries@gov.bc.ca
Ministry of Transportation and Infrastructure	• Rob Fleming, Minister of Transportation and Infrastructure: email Minister.Transportation@gov.bc.ca, phone 250-387-1978 • Veronica Harrison, Senior Ministerial Advisor: email Minister.Transportation@gov.bc.ca, phone 250-387-1978 • Ella Champion, Ministerial Advisor: email Ella.D.Champion@gov.bc.ca, phone 250-356-2178 • David Denhoff, Ministerial Advisor: email David.Denhoff@gov.bc.ca, phone 250-387-1978 • Lisa Grant, Division Operations Manager: email Minister.Transportation@gov.bc.ca, phone 778-974-6043

1.4 Identification and Contact Information for Federal Partners

Identification of Federal Partners	Contact Information
Canadian Armed Forces	19 Wing Comox PO Box 1000 Station Main, Lazo BC, V0R 2K0 Phone: 250-339-8201 Email: 19wingpublicaffairs@forces.gc.ca
Canadian Red Cross	Williams Lake Office 517 North 6th Avenue, Deni House, Williams Lake BC, V2G 2G8 Phone: 250-398-6803 Quesnel Office 543 Front Street, GR Baker Hospital, Quesnel BC, V2J 2K7 Phone: 250-991-7565
Public Safety Canada	Public Enquiries 269 Laurier Avenue West, Ottawa ON, K1A 0P8 Phone : 613-944-4875 or 1-800-830-3118 Instructions to contact various departments: https://www.publicsafety.gc.ca/cnt/bt/cntct-en.aspx
Royal Canadian Mounted Police	Williams Lake Detachment 575 Borland Street, Williams Lake BC, V2G 1R9 Phone: 250-392-6211 Quesnel Detachment 584 Carson Avenue, Quesnel BC, V2J 2B5 Phone: 250-992-9211
Transport Canada	820-800 Burrard Street, Vancouver BC, V6Z 2J8 Phone: 604-666-5586 Email: TC.PACInvestigation-EnquetePAC.TC@tc.gc.ca

1.5 Identification and Contact Information of Participating Indigenous Nations

Identification of Participating Indigenous Nations	Contact Information
Lhtako Dené Nation	• Garry Yablonski, Band Administrator: email garry@lhtako.com, phone 250-747-2900 ext. 301 • Clifford Lebrun, Chief: email cliff@lhtako.com, phone 250-747-2900 • Wanda Aldred, Councillor: email wanda@lhtako.com, phone 250-747-2900 • Raymond Alfred, Councillor: email ray@lhtako.com, phone 250-747-2900 • Tim Michell, Councillor: email tim@lhtako.com, phone 250-747-2900

Identification of Participating Indigenous Nations	Contact Information
Xatśūll First Nation	• Phone 250-989-2323, and Toll Free 1 844-989-2323 for Xatśūll First Nation's administrative staff • Chylane Diablo, Chief Band Administrator: email cao@xatsull.com, phone 989-2323 ext. 106 • Dina Stephenson Communications Coordinator: email commcoord@xatsull.com • Emily Sonntag, Natural Resource Manager: email nrmanager@xatsull.com • Rhonda Phillips, Chief: email chief@xatsull.com • Marjorie Sellers-Cady, Councillor: email m.sellars-cady@xatsull.com • Donna Dixon, Councillor: email d.dixon@hatsull.com • Pat Sellars, Councillor: email p.sellars@xatsull.com • Kelly Sellars, Councillor: email k.sellars@xatsull.com
Williams Lake First Nation	• Kourtney Cook, Chief Administrative Officer: email kourtney.cook@wlfn.ca • Quinton Boyce, Emergency Services Coordinator: email quinton.boyce@wlfn.ca, phone 250-267-5005 • Brandon Hoffman, Marketing & Communications Coordinator: email brandon.hoffman@wlfn.ca, phone 250-296-3507 ext.185 • Willie Sellars, Chief: email willie.sellars@wlfn.ca • Ann Louie, Councillor: email ann.louie@wlfn.ca • Dancing Water Sandy, Councillor: email dancing.water.sandy@wlfn.ca • Chris Wycotte, Councillor: email chris.wycotte@wlfn.ca • Shae Chelsea, Councillor: email shae.chelsea@wlfn.ca

APPENDIX J HUMAN HEALTH MONITORING AND MANAGEMENT PLAN

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

HUMAN HEALTH MONITORING AND MANAGEMENT PLAN REV0

May 2024



OSISKO DEVELOPMENT

Cariboo Gold Project

PO Box 250
3700 Ski Hill Road
Wells, BC V0K 2R0

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Appendix A Declaration of Competency
Appendix B Air Quality Monitoring Plan (AQMP)
Appendix C Groundwater Monitoring Plan (GWMP)
Appendix D Baseline Risk Estimates, Trigger Levels and Screening Criteria Selection

REVISION HISTORY

Rev. No.	Date	Author	Description
0	May 2, 2024	Audrey Wagenaar, Tessa Roselli, Janet Cheung	Initial version for environmental assessment condition review

EXECUTIVE SUMMARY

The Cariboo Gold Project (the Project) was granted Environmental Assessment Certificate #M23-01 (EAC) on October 10, 2023 by the British Columbia (BC) Environmental Assessment Office (EAO). The Project is an underground gold mine with a maximum production capacity of 1,793,400 tonnes per year of mineralized material (ore) and an operational mine life of 12 years. The Project is located in the District of Wells and the Cariboo Regional District.

Condition #19 of the EAC requires the development of a Human Health Monitoring and Management Plan (HHMMP) for the monitoring of environmental components related to human health (soil and vegetation, air quality, groundwater, surface water, sediment, and fish tissue) and the management of adverse Project effects to human health through the implementation of a trigger response plan. The main objective of the HHMMP is to serve as an overall plan for summarizing monitoring results for the relevant environmental components and detailing the trigger levels and associated responses (actions) required to protect human health, including mitigation measures, monitoring, and adaptive management related to the Project. The related environmental component plans for the HHMMP include:

- Soil and Vegetation Monitoring Plan (SVMP) developed as part of the HHMMP;
- Air Quality Monitoring Plan (AQMP);
- Groundwater Monitoring Plan (GWMP); and
- Aquatic Effects Monitoring Plan (AEMP) for Surface Water, Sediment and Fish.

This document also describes overarching components, such as monitoring, adaptive management measures, reporting, and consultation and feedback that are applicable across the environmental component plans. The mitigation measures applicable to human health effects are addressed through these environmental components; therefore, the mitigation measures provided as part of the environmental assessment for the respective components were applicable for the HHMMP.

ABBREVIATIONS

Terminology used in his document has been defined where it is first used, while the following list has been presented to assist readers that choose to review only portions of the document.

Abbreviation	Description
AEMP	Aquatic Effects Monitoring Plan
AQMP	Air Quality Monitoring Plan
BC	British Columbia
CAC	criteria air contaminant
COPC	constituent of potential concern
EAC	Environmental Assessment Certificate
EAO	Environmental Assessment Office (BC)
EMS	Environmental Management System
ENV	Ministry of Environment and Climate Change Strategy (BC)
GWMP	Groundwater Monitoring Plan
HHERA	Human Health and Ecological Risk Assessment
HHMMP	Human Health Monitoring and Management Plan
HHRA	Human Health Risk Assessment
km	kilometre
LSA	Local Study Area
m^2	square metre
Mine Site	Mine Site Complex and Bonanza Ledge Site
ODV	Osisko Development Corp.
PAH	polycyclic aromatic hydrocarbon
Participating Indigenous nations	Lhtako Dené Nation, Xatśūll First Nation, and Williams Lake First Nation
$PM_{2.5}$	Particulate matter (2.5 microns [µm])
PM_{10}	Particulate matter (10 microns [µm])

Abbreviation	Description
Project	Cariboo Gold Project
QP	Qualified Professional
QR Mill	Quesnel River Mill
RSA	Regional Study Area
SVMP	Soil and Vegetation Monitoring Plan
VC	Valued Component
WRSF	Waste Rock Storage Facility
WTP	Water Treatment Plant
WSP	WSP Canada Inc.

1. INTRODUCTION

This Human Health Monitoring and Management Plan (HHMMP or the Plan) was prepared by WSP Canada Inc. (WSP) to satisfy Environmental Assessment Certificate (EAC) Condition #19 for Osisko Development Corp.'s (ODV) Cariboo Gold Project (the Project). The HHMMP was developed based on mitigation measures outlined in the EAC Application, comments received on the EAC Application for the Project, and conditions set out in Schedule B of EAC #M23-01. The HHMMP was prepared as a consolidated report for the Project, which includes the Mine Site (Mine Site Complex and Bonanza Ledge Site) and Quesnel River Mill (QR Mill). These sites are described in Section 1.2.

The HHMMP was developed to address the requirements of Condition #19 of Schedule B of EAC #M23-01 and Table 20.1-12 in EAC Application Appendix 20.1. A Declaration of Competency form for Audrey Wagenaar, PChem, DABT, CSAP (BC), QPRA (Ontario), for preparation of the HHMMP is provided as Appendix A.

As part of the HHMMP, a Co-Located Soil and Vegetation Monitoring Plan (SVMP) was developed and is provided in Section 4.2.

Monitoring plans relevant for the HHMMP developed for other Valued Components (VCs) are as follows:

- Air Quality Monitoring Plan (AQMP) – Appendix B;
- Groundwater Monitoring Plans (GWMP) – Appendix C; and,
- Aquatic Effects Monitoring Plan (AEMP) - ODV 2024; prepared to meet Condition #22 of the EAC.

The Human Health management program is described in Section 5 of the HHMMP.

1.1 Objectives and Scope

The objective of the HHMMP is to document how environmental contaminants with the potential to impact human health (e.g., for work camp residents, residents of Wells, and local land users) will be monitored, and to establish triggers that would initiate alternative mitigation measures, notifications, and/or additional actions.

In addition to Condition #19, the HHMMP addresses EAC Conditions #3 (Document Development) and #4 (Trigger Response), which apply to the management plans and monitoring programs in the EAC conditions. Further, the HHMMP addresses EAC Condition #5 (Consultation), which applies to management and monitoring plans that require consultation of a party or parties to inform parts of the plan. The HHMMP functions as a comprehensive

document, incorporating components, such as adaptive management, monitoring, and reporting procedures, which are applicable to the appended monitoring plans.

The HHMMP is organized according to the following sections:

- Section 2 – Document Development;
- Section 3 – Evaluation of Baseline Health Conditions;
- Section 4 – Human Health Monitoring Program;
- Section 5 – Human Health Management Program;
- Section 6 – Reporting; and,
- Section 7 – Consultation and Feedback.

EAC Condition #19 is covered within the above sections and Condition #3 (Document Development) is discussed in Section 2. Condition #4 (Trigger Response) is discussed in Section 5.1 and Condition #5 (Consultation) is discussed in Section 7.

The HHMMP applies to Project activities during the Construction, Operations, and Closure Phases. The HHMMP will be provided to the BC Environmental Assessment Office (EAO) a minimum of 60 days prior to the planned commencement of Construction, unless otherwise authorized by the EAO. The HHMMP is not a fixed document and components of the HHMMP may be revised over the life of the Project.

1.2 Project Overview

This section summarizes the Project and information from the Conceptual Site Model for the Mine Site and QR Mill (KCB 2023).

1.2.1 Proposed Project

ODV is proposing to develop the Project, an underground gold mine with a maximum production capacity of 1,793,400 tonnes per year of mineralized material (ore) located in the District of Wells and Cariboo Regional District, BC. The Project includes the following sites and key components (Figure 1-1):

Mine Site:

- Mine Site Complex:
  - Waste management facilities;
  - Water supply and management structures and facilities;
  - Services Building;
  - Electrical Substation;
  - Camp (Worker Accommodation);
  - Valley Portal;

    - Water Treatment Plant (WTP); and
    - Other ancillary infrastructure.
- Bonanza Ledge Site:
    - A Waste Rock Storage Facility (WRSF) and associated water management structures;
    - Overburden Stockpiles;
    - Temporary Ore Stockpile;
    - Cow Portal;
    - Other ancillary infrastructure.
- Access roads and infrastructure:
- Quesnel River Mill (QR Mill):
    - ODV's existing and associated infrastructure within the Project Surface Footprint, including use of the Worker Accommodation and necessary upgrades to the existing infrastructure.
- Transmission Line

The mine will have an estimated operational mine life of 12 years and will operate 24 hours per day, 365 days per year. Closure will occur over a period of 2 years after mining is completed.

MINE SITE

QR MILL

093G
093H
093B
093A
093H/04
093A/12

Lodi Lake
Stephen Lake
Bowron River
Willow River
Ahbau Lake
Big Valley Creek
Summit Creek
Genevieve Lake
CINEMA BOG ECOLOGICAL RESERVE
Cinema
Ahbau Creek
COTTONWOOD RIVER PARK
Cottonwood River
Umiti Creek
WENDLE PARK
Wells
Slough Creek
Ten Mile Lake
TEN MILE LAKE PARK
Cottonwood
26
MINE SITE COMPLEX
Jack of Clubs Creek
Barlow Creek
Quesnel River
EXISTING BONANZA LEDGE SITE
Quesnel
Red Bluff
Dragon Lake
Rich Bar
Quesnel-Hydraulic Road
500 Nyland Lake Road
Swift River
Victoria Creek
Gravelle Ferry
DRAGON MOUNTAIN PARK
Kersley
Narcosli Creek
Fraser River
97
Maud Lake
Maud Creek
Rudy Creek
Cariboo River
Quesnel Forks
EXISTING QR MILL SITE
Beaver Creek
Hydraulic
Likely
BEAVER VALLEY PARK
CEDAR POINT PARK
Cuisson Creek
Morehead Lake
Beesley Creek
Joan Lake
Polley Lake
Chambers Lake
Bootjack Lake
Quesnel Lake
Opheim Lake
Tingley Creek
Cuisson Lake
Beaver Lake

Willow River
Main Access Road
Highway 26 Bypass
Wells
26
Willow River
Camp A and B
Lowhee Creek
Jack of Clubs Lake
Mine Site Complex
Camp Access Road
A Road
C Road (Emergency Access Road)
Ballarat Camp
Bonanza Ledge Site

0 500 1,000
1:47,000 METRES

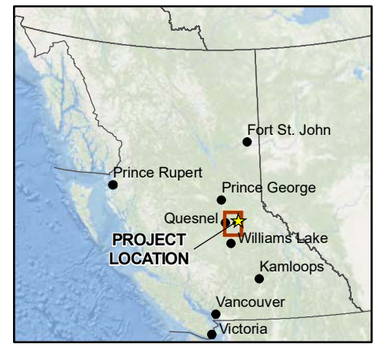
Rudy Creek
Existing QR Mill
500 Nyland Lake Road
Quesnel River

0 500 1,000
1:30,000 METRES

530000 540000 550000 560000 570000 580000 590000 600000
5910000 5900000 5890000 5880000 5870000 5860000 5850000 5840000 5830000 5820000

LEGEND

- POPULATED COMMUNITY
- PROJECT INFRASTRUCTURE LOCATION
- TEMPORARY EARLY CONSTRUCTION CAMP
- ROAD
- HIGHWAY
- WATERCOURSE
- WATERBODY
- PARKS/PROTECTED AREA
- BARKERVILLE HISTORIC TOWN AND PARK
- TRANSPORTATION ROUTE
- TRANSPORTATION ROUTE (MINE SITE ACCESS ROADS)
- TRANSMISSION LINE ROUTE
- SURFACE DISTURBANCE AREA



REFERENCE(S)

1.WATER FEATURES, TRANSPORTATION FEATURES OBTAINED FROM CANVEC © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
2. CITIES/TOWNS, INDIAN RESERVES, FEDERAL LANDS AND PARK/PROTECTED AREAS OBTAINED FROM BC MINISTRY OF FORESTS, LANDS NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
3. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

NAD83 CSRS
UTM Zone 10N

0 5 10 15
1:400,000 KILOMETRES

CARIBOO GOLD PROJECT

OVERVIEW OF MAJOR PROJECT COMPONENTS

REV.	DESCRIPTION	DATE	INITIALS
0		6/21/2023	MY

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	0	1-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm

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1.2.2 History of Mine Site Area

The Mine Site area contains several historical mines, and there has been substantial activity over the last 90 years on the overall claim holdings, with various companies that have undertaken work programs. Historical mines include Cariboo Gold Quartz, Aurum (also referred to as Island Mountain), and Mosquito Creek. The Cariboo Gold Quartz Mine in the District of Wells went into production in 1933. During Cariboo Gold Quartz Mine operation, approximately 2.65 million tonnes of flotation mill tailings were deposited into the northeastern end of Jack of Clubs Lake near its outlet into the Willow River, filling approximately 30 hectares of the original lake area (SNC 2011a). In addition to the mill tailings, hydraulic placer mining operations in Lowhee Creek also deposited an unknown quantity of placer outwash to the northeastern end of Jack of Clubs Lake. Historical waste rock associated with the 1,500 Level adit is also located on the northeast end of Jack of Clubs Lake, adjacent to the proposed Valley Portal. The Cariboo Gold Quartz Mine closed on August 31, 1959. Some remediation and reclamation has been undertaken on historical mine waste from the Cariboo Gold Quartz Mine.

Aurum Mine, located on the north side of Jack of Clubs Lake, across from the Cariboo Gold Quartz Mine, commenced milling in 1934 by Newmont Mining Corporation. The Aurum Mine closed in 1967. Various exploration, development, and mining occurred around the Aurum Mine and Mosquito Creek Mine sites throughout the 1970s and 1980s.

ODV now owns the Bonanza Ledge Mine (currently in care and maintenance) located 4 kilometres (km) southeast of the historic Cariboo Gold Quartz Mine. The mine is located on the ridge between Lowhee Creek to the north and Stouts Gulch to the south. Extensive hydraulic mining in both creek valleys from the early 1890s to the early 1920s displaced several vertical metres of streambed material to lower Lowhee Creek. Lode mining commenced in the 1930s and has continued intermittently until the present day.

1.2.3 History of QR Mill

The QR Mill is located on the Quesnel River Mine property, which has historically produced gold. The Quesnel River Mine began pre-production development and site construction under Kinross Gold in 1994, and production started from the Main Zone Pit in 1995. Barkerville Gold Mines Ltd. acquired the property in 2010 and focused on mining a small remaining deposit over a 12-month period, after which the mine was put into care and maintenance. ODV acquired the property in 2020 through its acquisition of Barkerville Gold Mines Ltd.

1.3 Roles and Responsibilities

ODV has the obligation to maintain compliance with Project commitments and to inform mine personnel and site contractors of relevant obligations during all phases of the mine's life. A clear understanding of the roles, responsibilities, and level of authority that employees and contractors have when working on the Project is essential to meet HHMMP and ODV Environmental Management System (EMS) objectives.

Table 1-1 provides an overview of general responsibilities for ODV personnel.

Table 1-1: Roles and Responsibilities Defined

Role	Responsibilities
Vice President Environment	Responsible for sign off on the Environmental Policy and has overall responsibility for verifying that Project activities are undertaken such that environmental legislation and regulatory requirements are considered and adhered to, and adverse impacts to the environment and communities in the vicinity of the Project are limited.
General Manager	Responsible for verifying that site personnel have access to and receive applicable training on the EMS and management plans and overseeing the day-to-day operations at the Project sites. Responsible for the health and safety of works and the public and verifying that Project activities comply with the Project's EMS, including integration of the EMS and management plans with other mine development plans and permit compliance.
Environmental Manager	Responsible for establishing, implementing, and maintaining the EMS, training of on-site personnel on the Project's EMS and applicable management plans, overseeing responses to non-compliance, evaluating the effectiveness of mitigation measures in each management plan, and reporting outcomes to the General Manager. The Environmental Manager or their agent (i.e., Environmental Personnel) is responsible for coordinating with the General Manager to communicate with other department heads, foremen, or field-level personnel to implement or modify mitigation measures, as necessary and where appropriate. The Environmental Manager has the authority to stop an activity or shut down the site if it is not meeting regulatory requirements. The Environmental Manager or designate is responsible for reporting non-compliances to the contractors or relevant consultants, ODV, Indigenous nations, and regulatory agencies, where required. Reports to the General Manager.
Qualified Professionals and Qualified Persons	Qualified professionals and qualified persons will be retained to review objectives and conduct various aspects of monitoring, management, and maintenance pertaining to Project facilities and other management and monitoring plans.

Notes: EMS = Environmental Management System; ODV= Osisko Development Corp.

2. DOCUMENT DEVELOPMENT

Document Development requirements per Condition #3 of EAC #M23-01 for the HHMMP are presented in Table 2-1 below. Please refer to the appended plans in Appendix B (AQMP) and C (GWMP) for their respective presentation of the Condition #3 requirements, where applicable.

Table 2-1: Document Development Requirements in Human Health Monitoring and Management Plan

Condition #3 Item	Condition #3 Requirement[1]	Section Number
3.2a	Purpose and objectives of the document	1.1
3.2b	Plain language summary of the document	Executive Summary
3.2c	Roles and responsibilities of the Holder, Project personnel and any contractors employed for the purposes of implementing the document	1.3
3.2d	Names and, if applicable, professional certifications and professional stamps, of those responsible for the preparation of the document	Appendix A
3.2e	Schedule for implementing the actions in the document throughout the relevant Project phases	4.2.1
3.2g	Schedules and methods for the submission of reporting required under the applicable condition, and the form and content of those reports	6
3.2h	Process and timing for updating the document, including any consultation with agencies and Participating Indigenous nations that would occur in connection with such updates	6, 7
3.3a	A description of baseline information that will be used to support monitoring of the effectiveness of mitigation	3
3.3b	Methods, objective, location, frequency, timing, and duration of monitoring	4
3.3c	Scope, content and frequency of reporting of the monitoring results	6

[1]Condition set out in Schedule B Table of Conditions of EAC M23-01 (EAO 2023)

3. EVALUATION OF BASELINE HEALTH CONDITIONS

As outlined in Condition #19.3a, an evaluation of baseline health risk conditions (hereafter referred to as baseline health conditions) for the environmental parameters outlined in Condition #19.3b is required for the HHMMP. Baseline conditions represent the environmental quality prior to the commencement of Project activities and are generally based on data collected before construction, or modelled data where measured data cannot be collected.

A Human Health and Ecological Risk Assessment (HHERA) was prepared in support of the EAC Application and was submitted in 2021 and 2022 (WSP 2021; WSP 2022) for the Project sites (i.e., Mine Site, Bonanza Ledge Site, and QR Mill). Baseline chemistry data were used in the evaluation of the Existing Conditions (baseline) scenario in the HHERA to characterize exposure conditions for informational purposes. For the human health risk assessment (HHRA), these baseline data included measured chemistry data for various media including soil, vegetation (berries, leaves), groundwater, surface water, sediment, fish tissue, and air (WSP 2021; WSP 2022). Baseline data were used to identify contaminants of potential concern (COPCs) for the HHRA and to provide context to changes to health risk estimates associated with the Project. A parameter was carried forward as a COPC if there was a predicted change[1] in concentration between baseline conditions (referred to as Existing Conditions in the 2021 and 2022 HHERAs) and the different Project scenarios, and concentrations also exceeded the applicable screening values. These COPCs were carried forward for further evaluation in the HHRA and Existing Conditions (baseline) risk estimates were provided.

To satisfy Condition #19.3a, the Existing Conditions (baseline) risk estimates from the 2021 and 2022 HHERAs have been included in Appendix D, Attachments D-1 and D-2. As risk estimates were not previously required for some of the parameters listed in Condition #19.3b, an update to the HHRA would be required to evaluate potential risks to human health for baseline conditions. At this time, the Bonanza Ledge and QR Mill sites are currently in care and maintenance, and construction at the Mine Site Complex has not yet started. This allows for baseline conditions to be evaluated prior to the start of Project activities. Environmental data used to evaluate the Existing Conditions scenario in the 2021 and 2022 HHERAs for the EAC Application will also be used to evaluate potential human health risks associated with baseline conditions at the Project sites. In addition, environmental data that have been collected since then as part of on-

[1] Defined by MOH (2022) as a predicted increase from baseline concentrations equal to or greater than the lowest analytical detection limit for that specific constituent and media type.

going/routine monitoring, or to satisfy specific Project objectives (e.g., data collection for reclamation planning), will be considered to supplement the dataset.

3.1.1 Recommended Human Health Risk Assessment Update

To satisfy Condition #19.3a, the Existing Conditions (baseline) risk estimates from the 2021 and 2022 HHERAs have been included in Appendix D, Attachments D-1 and D-2. These risk estimates represent hazard quotients and incremental lifetime cancer risks calculated for the Existing Conditions (baseline) scenario in the multimedia assessment (i.e., soil, groundwater, surface water, sediment, fish, wild game, vegetation) and air inhalation risk assessment. Contaminants of potential concern were carried forward to the risk characterization if they were found to be related to the Project. The Existing Conditions (baseline) risk estimates were calculated for the environmental parameters outlined in Condition #19.3b, except for chromium, copper, lead, cyanide and sulfur dioxide.

To consider additional environmental data that has been collected since the EAC Application, an HHRA update (referred to as the Baseline Health Conditions HHRA) is recommended to re-characterize potential human health risks associated with baseline conditions for the Mine Complex, Bonanza Ledge, and QR Mill. The Baseline Health Conditions HHRA will follow the risk assessment framework, which includes a problem formulation, exposure assessment, toxicity assessment, and risk characterization. It will include the environmental parameters listed in Condition #19.3b; however, the same methodologies and approaches used in the 2021 and 2022 HHERAs for the EAC Application will be applied (e.g., assume the same Local Study Areas [LSAs] and Regional Assessment Areas [RSAs], receptors, exposure frequencies/durations, screening approach, and risk modeling, etc.). Data representative of background conditions (i.e., reference areas), where feasible, will be incorporated into the Baseline Health Conditions HHRA, as natural levels of metals can exceed generic environmental guidelines without representing anthropogenic contamination.

3.1.2 Data Requirements

Baseline data considered in the 2021 and 2022 HHERAs for the Project sites will be used in the Baseline Health Conditions HHRA. In addition, environmental data collected since the completion of the HHERA relevant for human health will also be included in the dataset for evaluation in the HHRA.

Table 3-1 below describes the additional data collected since the submission of the EAC Application (i.e., soil and vegetation, air quality, groundwater, surface water, sediment and fish) that will be reviewed to determine if they are applicable to be included in the Baseline Health Conditions HHRA.

Table 3-1: Additional Data for Evaluation Baseline Health Conditions

Environmental Medium/ Component	Monitoring/Data Collection Since 2022 HHERA[1]	Monitoring Locations	Data Available for Parameters for HHMMP? (Y/N)	Reference Location(s) Available? (Y/N)	Next Steps/ Data to Review
Soil and Vegetation	Co-located soil and vegetation (i.e., berries and leaves) sampling conducted in 2023 for specific data collection needs associated with the Bonanza Ledge Mine reclamation plan	Bonanza Ledge Site (within Project footprint)	Y	Y– Southeast of Project footprint (Between Barkerville and Bonanza Ledge)	Data will be reviewed to determine if they are applicable to include in the Baseline Health Conditions HHRA
	Co-located soil and vegetation sampling for a metals uptake program undertaken in 2023.	QR Mill and Mine Site Complex (within Project footprint)	Y	Y	Data will be reviewed to determine if they are applicable to include in the Baseline Health Conditions HHRA.
	Co-located soil and vegetation sampling recommended in the LSA and RSA for Mine Site Complex, Bonanza Ledge, and QR Mill	See Section 4.2 of HHMMP	Not yet – Appropriate data will be collected as part of recommended monitoring program	Y	Implement sampling program discussed in Section 4.2 of HHMMP. Data will be incorporated into the dataset for the Baseline Health Conditions HHRA
Air Quality	Continuous air quality monitoring since February 2023 to satisfy conditions of EAC. Continuous monitoring includes $PM_{2.5}$, PM_{10}, sulphur dioxide, nitrogen dioxide, and carbon monoxide[2]	QR Mill near camp, AB Camp in Wells (Ski Hill Road and Hong Street) and Wells (Mooney Lane).	N – Missing metals and PAH air quality data	Y – Quesnel Johnston Avenue monitoring station can be used as a reference location[3]	Monitoring for metals and PAHs to be added to air quality monitoring program. Data will be reviewed to determine if they are applicable to include in the Baseline Health Conditions HHRA
	Meteorological parameters (e.g., wind speed, wind direction, relative humidity, temperature) continuously monitored	AB Camp in Wells (Ski Hill Road and Hong Street). QR Mill.	Y	N/**A**	N/A

Environmental Medium/ Component	Monitoring/Data Collection Since 2022 HHERA[1]	Monitoring Locations	Data Available for Parameters for HHMMP? (Y/N)	Reference Location(s) Available? (Y/N)	Next Steps/ Data to Review
Groundwater	Routine monitoring at monitoring site in mine area as per Permit PE-12601	QR Mill Camp	Y	Y	ODV to provide data from this compliance monitoring program. Data will be reviewed to determine if they are applicable to include in the Baseline Health Conditions HHRA
	Bonanza Ledge Mine Compliance Monitoring	Bonanza Ledge Project footprint.	TBD	TBD	ODV to provide data from this compliance monitoring program. Data will be reviewed to determine if they are applicable to include in the Baseline Health Conditions HHRA
	QR Mill Compliance Monitoring	QR Mill Project footprint. Monitoring locations may overlap with those considered in the Existing Conditions Report for the EAC Application	TBD	TBD	ODV to provide data from this compliance monitoring program. Data will be reviewed to determine if they are applicable to include in the Baseline Health Conditions HHRA
	QR Mill Drinking Water Monitoring for a small stream used as drinking water supply for the QR Mill and camp	Shallow well adjacent to stream (name?) serves as monitoring location	TBD	TBD	ODV to provide data from this drinking water monitoring program. Data will be reviewed to determine if they are applicable to include in the Baseline Health Conditions HHRA

Environmental Medium/ Component	Monitoring/Data Collection Since 2022 HHERA[1]	Monitoring Locations	Data Available for Parameters for HHMMP? (Y/N)	Reference Location(s) Available? (Y/N)	Next Steps/ Data to Review
	District of Wells Drinking Water Monitoring Program	District of Wells drinking water system	TBD	TBD	ODV to provide data from this drinking water monitoring program. Data will be reviewed to determine if they are applicable to include in the Baseline Health Conditions HHRA
	On-going groundwater monitoring program to characterize existing conditions at the Project sites. Program managed by ODV since 2019.	Monitoring locations considered in the EAC Application.	Y	N	ODV to provide data from this program. Data will be reviewed to determine if they are applicable to include in the Baseline Health Conditions HHRA
Surface Water	Operational/on-going surface water monitoring to satisfy Permit PE-17876 for Bonanza Ledge Mine	Willow River, Lowhee Creek, Stouts Gulch, Williams Creek	N – PAHs not measured in surface water	Y	Add PAHs to surface water monitoring program. Include data collected after 2022 into dataset for Baseline Health Conditions HHRA
	Operational/on-going surface water monitoring to satisfy Permit PE-12601 for QR Mill site	QR Mill (Rudy Creek and Creek #3)	N – PAHs not measured in surface water	Y	Add PAHs to surface water monitoring program. Include data collected after 2022 into dataset for Baseline Health Conditions HHRA
Sediment	Biological monitoring program to satisfy Permit PE-17876 for Bonanza Ledge Mine	Lowhee Creek, Stouts Gulch, Willow River	TBD	TBD	Data will be reviewed to determine if they are applicable to include in the Baseline Health Conditions HHRA
	Biological monitoring program to satisfy Permit PE-12601 for QR Mill site	Rudy Creek, Maud Creek	TBD	TBD	Data will be reviewed to determine if they are applicable to include in the Baseline Health Conditions HHRA

Environmental Medium/ Component	Monitoring/Data Collection Since 2022 HHERA[1]	Monitoring Locations	Data Available for Parameters for HHMMP? (Y/N)	Reference Location(s) Available? (Y/N)	Next Steps/ Data to Review
Freshwater Fish	Fish sampling as part of the Crown's Contaminated Sites Program in 2023	Willow River	N	N/A	ODV to provide data from this program if available

Notes: EAC= Environmental Assessment Certificate Application; HHMMP= Human Health Monitoring and Management Plan; LSA= Local Study Area; N/A= Not applicable; N= No; Y= Yes; ODV= Osisko Development Corp.; PAH= polycyclic aromatic hydrocarbon; RSA= Regional Study Area; QR Mill= Quesnel River Mill; TBD= to be determined
[1] ODV. 2022. Cariboo Gold Project Environmental Assessment Certificate (EAC) Application – Section 7.13 Human and Ecological Health. October 2022.
[2]Carbon monoxide is not a parameter included in Condition #19 of the EAC #M23-01, but it is included in routine air quality monitoring as a criteria air contaminant (CAC).
[3]Data from reference station should be evaluated to determine if they are appropriate for use, as several external factors can result in air quality spikes for certain periods (e.g., during forest fires or periods of drier summers and increased dust from unpaved roads).

3.1.3 Data Review

The data presented in Table 3-1 will be reviewed and determined if they are applicable to be included in the Baseline Health Conditions HHRA.

In addition, Appendix C provides the GWMPs for the Mine Site and QR Mill. Groundwater data collected based on these monitoring plans can be incorporated into the Baseline Health Conditions HHRA. The monitoring program will be reviewed by the Groundwater QP and Human Health QP so that reference wells are appropriately considered. Sampling frequencies set by mine permit requirements should be followed.

4. HUMAN HEALTH MONITORING PROGRAM

A program to monitor environmental contaminants in soil, vegetation, air, groundwater, surface water, sediment, and fish tissue has been developed to satisfy Condition #19 of Schedule B of the EAC Application. Except for soil and vegetation, the monitoring requirements are detailed in monitoring plans appended to the HHMMP (AQMP, GWMP) or under separate cover (ODV 2024).

As previously discussed, the SVMP will be developed as part of the HHMMP. The SVMP outlines the co-located soil and vegetation monitoring (sampling) plan that will be used to monitor soil quality and potential disturbance to vegetation and ecosystems associated with Project activities. The SVMP is detailed in Section 4.2.

The remaining component monitoring plans appended to the HHMMP are further described below:

- Air Quality Monitoring Plan (AQMP): The AQMP for the Mine Site and QR Mill outlines continuous air quality and meteorological monitoring requirements and reporting requirements to satisfy Condition #15 and the air quality related requirements of Condition #19.3(b) of the EAC. The AQMP is provided in Appendix B.
- Groundwater Monitoring Plans (GWMPs): The GWMPs for the Mine Site and QR Mill outline the groundwater monitoring program for assessing groundwater quality, groundwater flow pathways, and overall changes in water levels and hydraulic gradients with mine dewatering and reflooding to satisfy the groundwater-related requirements of Condition #19.3(b) of the EAC. The GWMPs are provided in Appendix C.
- Aquatics Effects Monitoring Plan (AEMP): The AEMP for the Mine Site and QR Mill outlines the study design for the monitoring program (surface water quality, sediment quality, periphyton biomass, benthic invertebrate community structure and tissue chemistry [including fish tissue, where relevant]), reporting requirements, and the adaptive management framework to meet the requirements of Condition #22 and relevant components of Condition #19.3(b) of the EAC. The AEMP is provided under separate cover (ODV 2024).

4.1 Monitoring Requirements

4.1.1 Environmental Parameters

As specified in Condition #19.3b, the environmental parameters considered for monitoring as part of the HHMMP are presented in Table 4-1.

Table 4-1: Environmental Parameters for Monitoring

Environmental Medium	Environmental Parameters	Sample/Monitoring Information	Applicable Plan
Soil and Vegetation	Metals[1]	Co-located soil and vegetation samples	HHMMP
	PAHs[3]		HHMMP
Air Quality	Metals[1]	Time-integrated sampling for metals bound to PM in air	AQMP
	PAHs[3]	Time-integrated sampling for PAHs bound to PM in air	AQMP
	$PM_{2.5}$ and PM_{10} Sulfur Dioxide Nitrogen Dioxide	-	AQMP
	Meteorological Parameters (wind speed, wind direction, relative humidity, temperature)	Continuous monitoring	AQMP
Groundwater	Metals[1]	-	GWMP
Surface Water	Metals[1]	Co-located surface water and fish tissue samples	AEMP
	PAHs[3]	-	AEMP
Sediment	Metals[1,2]	-	AEMP
Fish	Metals[1]	Co-located surface water and fish tissue samples	AEMP

Notes: AEMP = Aquatic Effects Monitoring Plan; AQMP= Air Quality Monitoring Plan; GWMP= Groundwater Monitoring Plan; HHMMP= Human Health Monitoring and Management Plan; PAH= polycyclic aromatic hydrocarbon; $PM_{2.5}$ and PM_{10}= Particulate matter (2.5 and 10 microns [µm]);- = not applicable;
[1]Metals parameters for monitoring include antimony, aluminum, arsenic, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, and cyanide.
[2]While metals analysis other than cyanide was not specified for sediment in Condition #19, for the purpose of considering potential effects from sediment for human health, the other metals parameters (i.e., antimony, aluminum, arsenic, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium) were recommended to be sampled in sediment for the HHMMP.
[3]PAH suite based on the EAC Application will be monitored.

4.2 Co-Located Soil and Vegetation Monitoring Plan

Co-located samples of soil and vegetation will be collected as part of the SVMP to support the HHMMP. The objective of the sample collection is to monitor soil and vegetation quality as it relates to human health impacts from the Project. This monitoring program is intended to be adaptive as monitoring results from each monitoring cycle will be used to inform subsequent monitoring (e.g., sampling frequency and timing, environmental parameters of interest, and sampling).

4.2.1 Methods

Monitoring Locations

Proposed co-located monitoring locations for soil and vegetation (leaves and berries, if available) are based on areas where human exposure is likely to occur (i.e., through direct contact with soil or consumption of vegetation). These locations were proposed based on available information from Indigenous Knowledge and community feedback gathered for the EAC Application. It is expected that monitoring locations (as well as the types of vegetation collected) may be further refined throughout the consultation process with Participating Indigenous nations (Lhtako Dené Nation, Xatśūll First Nation, and Williams Lake First Nation).

Monitoring locations were identified within the LSA and RSA, which were defined by the outermost areas of the LSAs and RSAs defined by air quality and aquatics components for the EAC Application. The selection of monitoring locations was based on consideration of those previously used for the EAC Application and additional soil and vegetation sampling programs carried out after the EAC Application submission. Locations were also reviewed to achieve sufficient spatial coverage of the respective study areas.

Co-located soil and vegetation will also be collected from locations representative of reference areas (e.g., representative undisturbed sites) to provide an indication of parameters that are naturally elevated in soils and do not represent anthropogenic influence. Reference locations are to be determined.

The proposed monitoring locations for the Mine Site and QR Mill are presented in

Figure 4-1and Figure 4-2 respectively and are listed in Table 4-2 below. Based on the results of operational activities of the Project and the results of monitoring, proposed monitoring locations may change depending on accessibility, health/safety considerations, and the presence of applicable vegetation.

Sample Collection

The field work will be undertaken in accordance with a Project-specific Sampling and Analysis Plan. Sampling will be dependent on accessibility, health/safety considerations, and the presence of applicable vegetation.

For the co-located soil samples, one soil sample will represent vegetation at that given monitoring location within a 10 square metre (m^2) area, if the soil type within that area is the same. Therefore, if both berries and leaves are found within this 10 m^2 area, no additional soil sampling is required at that given monitoring location. However, if only one of the vegetation types is identified (e.g., berries), another soil sample with co-located vegetation sample for the other type of vegetation (e.g., leaves) is required within a separate 10 m^2 area. With respect to the vegetation sampling, the edible portions of the vegetation will be targeted for sample collection. Sample collection will

depend on timing of the sampling program and availability (quantity of vegetation). One duplicate sample will be collected for approximately every 10 samples. Quality assurance measures and general procedures for sample collection, consistent with the British Columbia Field Sampling Manual (ENV 2023)[2] will be followed.

[2] BC ENV. 2023. British Columbia Field Sampling Manual. Environmental Monitoring and Analysis Branch, Laboratory Standards and Quality Assurance Unit, Ministry of Environment and Climate Change Strategy, Victoria, BC, Canada.
[3] Proposed monitoring locations may change depending on accessibility, health/safety considerations, and the presence of applicable vegetation.

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MS-L-20
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MS-L-22
WENDLE PARK
Mine Site Complex
Jack of Clubs Lake
Bonanza Ledge
Quesnel
Cooper Creek
Sugar Creek
Wiley Creek
Stewart Creek
Cafe Creek
Big Valley Creek
Two Sisters Creek
Antler
Nine Mile Creek
Summit Creek
Alex Allan Creek
Murray Creek
Shepherd Creek
Cornish Creek
Hardscrabble Creek
Tom Creek
Willow River
Martins Creek
Florrie Creek
Pinus Creek
Jubilee Creek
Greenberry Creek
Empire Creek
Yellowhawk Creek
Peep O'Day Creek
Red Gulch
Mosquito Creek
Courter Creek
Mailleue Creek
Montgomery Creek
New Creek
Steedy Creek
Slowuz Creek
Promise Creek
Wilsons Creek
Mckinnon Creek
Eureka Gulch
Frenchman Creek
Nelsons Creek
Devils Lake Creek
Burns Creek
Jawbone Creek
Olally Creek
Emory Gulch
Stouts Gulch
Williams Creek
Black Jack Gulch
Canadian Creek
Pleasant Valley Creek
Pinkerton Creek
Victoire Creek
Stoney Creek
Walker Gulch
Goyet Creek
Davis Creek
Chilcotin Creek
Anderson Creek
Queen of Clubs Creek
Grouse Creek
St. Lawrence Creek
Jack of Clubs Creek
Agnus Creek
Brough Creek
Last Chance Creek
Amador Creek
Houseman Creek
Peters Creek
Van Winkle Creek
Lightning Creek
Lorraine Creek

LEGEND
- PROPOSED PROJECT FOOTPRINT AREA
- HUMAN HEALTH AQUATICS REGIONAL STUDY AREA
- HUMAN HEALTH AQUATICS LOCAL STUDY AREA
- HUMAN HEALTH AIR QUALITY REGIONAL STUDY AREA
- HUMAN HEALTH AIR QUALITY LOCAL STUDY AREA
- LSA CO-LOCATED SOIL AND VEGETATION MONITORING LOCATION
- RSA CO-LOCATED SOIL AND VEGETATION MONITORING LOCATION
- TRANSPORTATION ROUTE
- TRANSMISSION LINE ROUTE
- ROAD
- WATERCOURSE
- WETLAND
- WATERBODY
- PARK/PROTECTED AREA

NOTE(S)
1. LOCAL STUDY AREA AND REGIONAL STUDY AREA ARE IN DRAFT AND TO BE DETERMINED EARLY IN THE EA PROCESS.

REFERENCE(S)
1. WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LAND AND NATURAL RESOURCE OPERATIONS.
2. HILLSHADE SOURCE AIRBUS, SGS, NGA, NASA, CGIAR, NCEAS, NLS, OS, NMA, GEODATASTYRELSEN, GSA,GSI AND THE GIS USER COMMUNITY.
3. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

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CARIBOO GOLD PROJECT

OSISKO DEVELOPMENT

CO-LOCATED SOIL AND VEGETATION MONITORING LOCATIONS FOR HUMAN HEALTH MONITORING PROGRAM AT MINE SITE (MINE SITE COMPLEX AND BONANZA LEDGE)

REV.	DESCRIPTION	DATE	INITIALS
3	FINAL- APPROVED	2024-04-25	S.W.
3	FINAL - REVIEWED	2024-04-25	S.W.
3	FINAL	2024-04-25	J.P.

PROJECT NO.	PHASE	REV.	FIGURE
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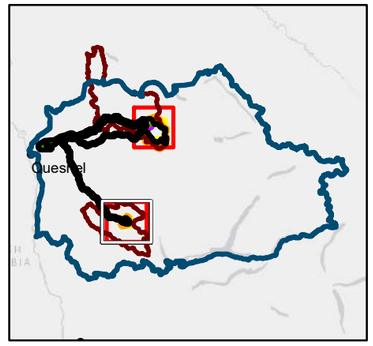
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QR-L-02

Maud Lake
Le Bourdais Lake
Kangaroo Creek
Ducks Creek
Maud Creek
Rudy Creek
Little Creek
Birrell Creek
Forks Creek
Slide Creek
Westenhiser Creek
Buxton Creek
Jackpine Creek
Jackpine Lake
Littlelake Creek
Dancing Bill Creek
Drop Creek
Little Lake
Prior Lake
Morehead Creek
Sam Creek
Morehead Lake
Warren Creek
Frypan Lake
Polley Lake
Jacobie Creek
Joan Lake
BEAVER VALLEY PARK

N

LEGEND

- PROPOSED PROJECT FOOTPRINT AREA
- HUMAN HEALTH AQUATICS REGIONAL STUDY AREA
- HUMAN HEALTH AQUATICS LOCAL STUDY AREA
- HUMAN HEALTH AIR QUALITY REGIONAL STUDY AREA
- HUMAN HEALTH AIR QUALITY LOCAL STUDY AREA
- LSA CO-LOCATED SOIL AND VEGETATION MONITORING LOCATION
- RSA CO-LOCATED SOIL AND VEGETATION MONITORING LOCATION
- TRANSPORTATION ROUTE
- ROAD
- WATERCOURSE
- WETLAND
- WATERBODY
- PARK/PROTECTED AREA



NOTE(S)
1. LOCAL STUDY AREA AND REGIONAL STUDY AREA ARE IN DRAFT AND TO BE DETERMINED EARLY IN THE EA PROCESS.

REFERENCE(S)
1. WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LAND AND NATURAL RESOURCE OPERATIONS.
2. HILLSHADE SOURCE AIRBUS, SGS, NGA, NASA, CGIAR, NCEAS, NLS, OS, NMA, GEODATASTYRELSEN, GSA,GSI AND THE GIS USER COMMUNITY.
3. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

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OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

CO-LOCATED SOIL AND VEGETATION LOCATIONS FOR HUMAN HEALTH MONITORING PROGRAM AT QR MILL

REV.	DESCRIPTION	DATE	INITIALS
3	FINAL- APPROVED	2024-04-16	S.W.
3	FINAL - REVIEWED	2024-04-16	S.W.
3	FINAL	2024-04-16	J.P.

PROJECT NO.	PHASE	REV.	FIGURE
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Table 4-2: Proposed Vegetation and Soil Monitoring Locations[3]

Study Area	ID	Easting	Northing
Mine Site (Mine Site Complex and Bonanza Ledge)			
RSA	MS-R-01	602144	5892572
RSA	MS-R-02	597255	5890549
RSA	MS-R-03	592166	5888303
RSA	MS-R-04	586712	5884437
RSA	MS-R-05	586584	5877332
RSA	MS-R-06	602955	5880023
RSA	MS-R-07	589858	5886207
RSA	MS-R-08	589482	5883898
RSA	MS-R-09	590726	5882500
LSA	MS-L-01	597126	5887444
LSA	MS-L-02	593444	5886764
LSA	MS-L-03	595306	5884848
LSA	MS-L-04	597187	5885014
LSA	MS-L-05	592549	5884060
LSA	MS-L-06	594416	5883702
LSA	MS-L-07	594643	5883096
LSA	MS-L-08	596074	5883211
LSA	MS-L-09	597906	5881946
LSA	MS-L-10	593225	5881012
LSA	MS-L-11	599748	5880873
LSA	MS-L-12	596768	5879822
LSA	MS-L-13	601032	5884365
LSA	MS-L-14	594745	5885723
LSA	MS-L-15	599841	5883106
LSA	MS-L-16	592210	5882282
LSA	MS-L-17	599877	5888030
LSA	MS-L-18	593700	5879629
LSA	MS-L-19	599196	5879044
LSA	MS-L-20	595368	5884524
LSA	MS-L-21	595898	5884439
LSA	MS-L-22	595482	5885073
RSA	MS-REF-1 (reference)	TBD	TBD
RSA	MS-REF-2 (reference)	TBD	TBD
QR Mill			
RSA	QR-R-01	581065	5840573
RSA	QR-R-02	583322	5841895
RSA	QR-R-03	579231	5842301

Study Area	ID	Easting	Northing
RSA	QR-R-04	577999	5841267
RSA	QR-R-05	576304	5839834
RSA	QR-R-06	574970	5840788
RSA	QR-R-07	574078	5836821
RSA	QR-R-08	577561	5837457
RSA	QR-R-09	571610	5841209
LSA	QR-L-01	579993	5836668
LSA	QR-L-02	580283	5836056
LSA	QR-L-03	579943	5836110
LSA	QR-L-04	580477	5836374
LSA	QR-L-05	580817	5836467
LSA	QR-L-06	581044	5837242
LSA	QR-L-07	581333	5837944
LSA	QR-L-08	581999	5837268
LSA	QR-L-09	581134	5838046
LSA	QR-L-10	582090	5838130
RSA	QR-REF-1 (reference)	TBD	TBD
RSA	QR-REF-2 (reference)	TBD	TBD

Note: ID= Identification; LSA= Local Study Area; QR Mill= Quesnel River Mill; RSA=Regional Study Area; TBD= To be determined; Universal Transverse Mercator coordinates, provided as Easting and Northing, are in 10U.

Monitoring Schedule - Frequency and Timing

The monitoring program will occur during the Project Construction, Operations, and Closure Phases with the first round of monitoring in the summer season prior to Project construction. The proposed frequency and timing of the SVMP is as follows:

- Frequency: The proposed frequency is annually for the first three years, and every three years thereafter, pending the findings of the initial monitoring.
- Timing: The collection of co-located soil and vegetation samples is recommended to occur in the summer season (generally late July through mid-September) to account for availability and quantity of vegetation for sample collection.

This monitoring program is intended to be adaptive based on the results of operational activities of the Project and the results of monitoring. The results of the monitoring program will be reviewed after each event and the frequency and timing of the subsequent program may be updated as required. The adaptive management proposed for this HHMMP is detailed in Section 5.2.

4.2.2 Data Compilation and Review

Soil chemistry data will be compared to trigger levels developed using relevant soil screening criteria (discussed in Section 5.1.1 below), as well as regional background and/or reference

concentrations. Screening criteria are not available for vegetation; therefore, soil screening criteria will be used as a surrogate for vegetation; any parameters in soil exceeding the established trigger levels were carried forward as a potential concern for vegetation as well. While the screening criteria are health-based values developed by regulatory agencies for the protection of people, the trigger levels are developed as indicators of potential health impacts as a result of Project-related changes allowing for adaptive management and mitigation planning to respond to these changes. Following each monitoring cycle, the results of the SVMP will be summarized in an interpretative report, which will be provided in the HHMMP report submission (See Section 5.2.1). The monitoring results will also inform the sampling frequency and timing, environmental parameters of interest, and sampling locations for the subsequent monitoring event.

The HHMMP is not a fixed document and components of the Plan may be revised over the life of the Project. It is expected that as screening criteria and regulatory guidance are periodically updated, and as the monitoring data are reviewed for effects to human health, the Plan may also require periodic updates. Recommendations will be included for changes in the monitoring program including, but not limited to:

- Changes to monitoring and sampling frequency,
- Updating list of parameters of interest,
- Adding or relocating monitoring locations, and
- Adopting mitigation strategies and risk communication plans.

4.2.3 Implementation

Qualified Professionals (QPs) will implement the Human Health Monitoring Program by conducting or overseeing the monitoring efforts.

4.3 Input from Other Component Management Plans

Monitoring of soil, vegetation, air, groundwater, surface water, sediment, and fish was required in the HHMMP to monitor potential effects associated with these environmental media to human health. Monitoring locations for the environmental parameters associated with the AQMP, GWMPs, and AEMP are specified in their respective plans (Appendix B and C, and ODV 2024). These include sampling locations for exposure sites (i.e., that could potentially be affected by the Project activities) and reference sites (i.e., representative of background/regional levels and are not affected by Project activities), where applicable. The frequency of monitoring is outlined in each of these plans.

5. HUMAN HEALTH MANAGEMENT PROGRAM

5.1 Trigger Response

Condition #4 of EAC #M23-01 (EAO 2023) requires that the HHMMP include trigger-response actions. The objective of trigger-response is to identify circumstances that require ODV to implement alternative or supplementary mitigation measures, monitoring, or adaptive management.

5.1.1 Trigger Levels

For each of the environmental parameters outlined in Condition #19.3, trigger levels were established based on health-based screening criteria and informed by assumptions, uncertainties, and conclusions of the 2022 HHERA.

Trigger levels were established for each of the relevant environmental parameters in soil, air, groundwater, surface water, sediment, and fish tissue. There are no screening criteria available for vegetation, therefore soil trigger levels will be used as a surrogate to assess the potential for effects to vegetation. For trigger levels for sediment, soil quality criteria will be used as a surrogate as human health-based guidelines for sediment were unavailable from provincial, federal, and other jurisdictions. The British Columbia Ministry of Environment and Climate Change Strategy ENV (ENV 2021) recommends the use of soil screening criteria to identify chemicals of potential concern if substances are considered to be non-bioaccumulative. For bioaccumulative substances, ENV recommends using ecological standards in BC Contaminated Site Regulation Schedule 3.4 to identify chemicals of potential concern in sediment for human health in a risk assessment (ENV 2021). None of the environmental parameters considered for the development of trigger levels were considered bioaccumulative; therefore, soil quality criteria were considered applicable for screening sediment. Similarly, there are no screening criteria available for vegetation, so soil trigger levels and associated actions are used as a surrogate to assess the potential for effects to vegetation.

It should be noted that while trigger levels are meant to be applied to concentrations measured at monitoring locations described in the respective VC plans, these locations will be reviewed by the appropriate QP prior to implementing the monitoring plans tied to the HHMMP. Trigger levels should be applied in consideration of areas of known contamination. For example, there is known contaminated sediment in Jack of Clubs Lake and surface water monitoring plans should be limited to the areas outside of the effluent mixing zone.

Health-based screening criteria were compiled based on those considered in the 2022 HHERA in Tables D-1 to D-5c (Appendix D). The selection of these health-based screening criteria is detailed

in the Screening Criteria Selection in Appendix D. A value of 80% of the selected health-based screening criteria for each environmental parameter was proposed as Trigger Level 1. A value of 90% of the selected health-based screening criteria was proposed as Trigger Level 2. The trigger levels are compiled in Table D-1 (Appendix D). It should be noted the HHMMP is not a fixed document and components of the Plan may be revised over the life of the Project. It is expected that as screening criteria and regulatory guidance are periodically updated, trigger levels may be updated accordingly.

5.1.2 Trigger Response Plan

A Trigger Response Plan was developed consisting of the established trigger levels (Levels 1 and 2) and proposed actions (Action Levels 1 and 2) to implement if the trigger levels are exceeded during monitoring. These trigger response actions will be implemented when monitoring identifies variations from the anticipated Project-related effects identified in the EAC Application and the Baseline Health Conditions HHRA. Exceedances of the trigger levels may indicate that mitigation is not sufficient, and subsequent actions, alternative mitigation measures, or adaptive management measures would be required.

The Trigger Response Plan for the HHMMP is presented in Table 5-1.

Table 5-1: Trigger Response Plan for the Human Health Monitoring and Management Plan

Environmental Medium	Environmental Parameter	Action Level 1 for Trigger Level 1 Exceedance[1,2]	Action Level 2 for Trigger Level 2 Exceedance[1,2]
Soil[3]	Metals, PAHs	If Trigger Level 1 is exceeded, then: • Human Health QP to compare monitoring results to regional soil background concentrations and reference concentrations to determine if parameter should be assessed further. • Human Health QP to determine if exceedance is linked to Project activities by comparing against baseline conditions. • Human Health QP to work with the Air Quality QP to review the air quality monitoring results to determine if there is a correlation between soil/vegetation concentrations and air quality concentrations (concentrations in soil and vegetation are related to air deposition from the Project). If exceedance is not related to the Project, continue monitoring at same frequency as SVMP. • If exceedance is considered related to the Project, confirm results through verification sampling during next reasonable sampling interval. In addition, implement mitigation measures prescribed by the Air Quality QP to prevent further increases in soil concentrations. • Depending on results of the verification sampling, assessment against baseline conditions, and implementation of mitigation measures, Human Health QP to assess whether a human health risk assessment is required to determine if potential risks associated with exposure to soil and vegetation exist.	• Implement the same steps as Action Level 1.

Environmental Medium	Environmental Parameter	Action Level 1 for Trigger Level 1 Exceedance[1,2]	Action Level 2 for Trigger Level 2 Exceedance[1,2]
Air Quality	Metals, PAHs, CACs	If Trigger Level 1 is exceeded, then: • Air quality QP to compare monitoring results to regional ambient air background, if available, to determine if parameter should be assessed further. • Air quality QP to identify the potential cause of the exceedance and determine if it is related to Project activities by comparing against baseline conditions. If deemed unrelated to the Project (e.g., related to external factors such as forest fires), continue monitoring at the same frequency as AQMP. • If exceedance is considered related to the Project, implement mitigation measures prescribed by the Air Quality QP and confirm results through verification sampling. • Depending on results of the verification sampling, assessment against baseline conditions, and implementation of mitigation measures, Human Health QP to assess whether a human health risk assessment is required to determine if potential risks associated with exposure to air exist.	• Implement the same steps as Action Level 1.

Environmental Medium	Environmental Parameter	Action Level 1 for Trigger Level 1 Exceedance[1,2]	Action Level 2 for Trigger Level 2 Exceedance[1,2]
Groundwater	Metals	If Trigger Level 1 is exceeded, then: • Groundwater QP to compare monitoring results to regional background concentrations and reference concentrations, if available, to determine if parameter should be assessed further. • Groundwater QP to identify the potential cause of the exceedance and determine if it is related to Project activities by comparing against baseline conditions. Determine if there is a consistent upward trend or increase in a number of downgradient monitoring locations. Update potential discrepancies in groundwater quality model if deemed necessary. If exceedance is not related to the Project, continue monitoring at the same frequency as GWMP. • If exceedance is considered related to the Project, Groundwater QP to confirm results through verification sampling. • Groundwater QP to assess results of increased monitoring. If concentrations remain above Trigger Level 1, implement mitigation measures prescribed by the Groundwater QP mitigation measures. • Depending on results of the verification sampling, assessment against baseline conditions, and implementation of mitigation measures, Human Health QP to assess whether a human health risk assessment is required to determine if potential risks associated with exposure to groundwater exist.	• Implement the same steps as Action Level 1.

Environmental Medium	Environmental Parameter	Action Level 1 for Trigger Level 1 Exceedance[1,2]	Action Level 2 for Trigger Level 2 Exceedance[1,2]
Surface Water	Metals, PAHs	If Trigger Level 1 is exceeded, then: • Aquatics QP to compare monitoring results to reference concentrations, if available, to determine if parameter should be assessed further. • Aquatics QP to review monitoring results to identify potential cause of increase, such as a review of construction activities or other potential disturbances in the area, similarity (or not) of the parameters indicative of mine-contact water, concentrations and flow rates, time series concentration trends to determine if levels are increasing with time or changing from baseline, and spatial extent/transport pathways of the elevated parameters. • Aquatics QP to determine if exceedance is linked to Project activities. If exceedance is not linked to the Project, continue monitoring at the same frequency as AEMP. • If exceedance is considered related to the Project, Aquatics QP to confirm results through verification sampling. If exceedance is related to construction/disturbance activities, implement mitigation measures prescribed by the appropriate QP. • Aquatics QP to assess results of increased monitoring. If concentrations remain above Trigger Level 1, implement mitigation measures prescribed by the Aquatics QP. • Depending on results of the verification sampling, assessment against baseline conditions, and implementation of mitigation measures, Human Health QP to assess whether a human health risk assessment is required to determine if potential risks associated with exposure to surface water.	• Implement the same steps as Action Level 1.

Environmental Medium	Environmental Parameter	Action Level 1 for Trigger Level 1 Exceedance[1,2]	Action Level 2 for Trigger Level 2 Exceedance[1,2]
Sediment[4]	Metals	If Trigger Level 1 is exceeded, then: • Aquatics QP to compare monitoring results to reference concentrations, if available, to determine if parameter should be assessed further. • Aquatics QP to review monitoring results to identify potential cause of increase. Aquatics QP to determine if exceedance is linked to Project activities. If exceedance is not linked to the Project, continue monitoring at the same frequency as AEMP. • If exceedance is considered related to the Project, Aquatics QP to confirm results through verification sampling. If exceedance is related to construction/disturbance activities, implement appropriate mitigation measures as prescribed by the appropriate QP. • Aquatics QP to assess results of verification monitoring. If concentrations remain above Trigger Level 1, implement mitigation measures prescribed by the Aquatics QP. • Depending on results of the verification sampling, assessment against baseline conditions, and implementation of mitigation measures, Human Health QP to assess whether a human health risk assessment is required to determine if potential risks associated with exposure to sediment.	• Implement the same steps as Action Level 1.

Environmental Medium	Environmental Parameter	Action Level 1 for Trigger Level 1 Exceedance[1,2]	Action Level 2 for Trigger Level 2 Exceedance[1,2]
Fish Tissue	Metals.	If Trigger Level 1 is exceeded, then: • Aquatics QP to compare monitoring results to reference tissue concentrations, if applicable, to determine if parameter should be assessed further. • Aquatics QP to review monitoring results to identify cause of increase, including a review of construction activities or other potential disturbances in the area, similarity (or not) of the elevated parameters in fish tissue concentrations compared to co-located surface water chemistry, and spatial extent of elevated fish tissue concentrations. • Aquatics QP to determine if exceedance is linked to Project. If exceedance is not linked to the Project, continue monitoring at the same frequency as the AEMP. • If exceedance is considered related to the Project, Aquatics QP to confirm results through verification monitoring of co-located fish tissue[5] and surface water samples at affected receptor locations and downgradient sites. If exceedance is related to construction/disturbance activities, implement mitigation measures prescribed by the appropriate QP. • Aquatics QP to assess results of increased monitoring. If concentrations remain above Trigger Level 1, implement mitigation measures prescribed by the Aquatics QP. • Depending on results of the verification sampling, assessment against baseline conditions, and implementation of mitigation measures, Human Health QP to assess whether a human health risk assessment is required to determine if potential risks associated with exposure from fish consumption	• Implement the same steps as Action Level 1.

Notes: AEMP = Aquatics Effects Monitoring Plan; AQMP= Air Quality Monitoring Plan; CAC = Criteria Air Contaminant; GWMP = Groundwater Monitoring Plan; PAH = polycyclic aromatic hydrocarbon; QP = Qualified Professional
[1] Refer to Trigger Levels 1 and 2 in Table D-1(Appendix D)
[2] Review and interpretation of data should be conducted by a Qualified Professional (QP)
[3] Trigger levels could not be developed for vegetation as no screening criteria are available. The soil trigger levels and associated actions will be used as a surrogate for vegetation.
[4]Soil quality criteria was used as a surrogate to develop sediment trigger levels as human health-based guidelines for sediment were unavailable under ENV guidance. ENV (2021) recommends the use of soil screening criteria to identify chemicals of potential concern if substances are considered to be non-bioaccumulative. For bioaccumulative substances, ENV recommends using ecological standards in BC Contaminated Site Regulation Schedule 3.4 to identify chemicals of potential concern in sediment for human health in a risk assessment (ENV 2021). None of the parameters were considered bioaccumulative; therefore, soil quality criteria were considered applicable for screening sediment.
[5]Appropriate permits are required prior to fish sampling.

5.1.3 Risk Communication

Exceedances of trigger levels will be communicated by ODV to relevant public health authorities (i.e., the Northern Health Authority and/or Interior Health) within 2 weeks of the observed exceedance. The notification will be prepared in accordance with the requirements of the respective authorities.

The risk communication strategies will be developed in consultation with the Northern Health Authority (NHA) and applicable health agencies. If a focused study (i.e., human health risk assessment) is required based on the results of the Trigger Response Plan, the results will be provided to the relevant stakeholders and may be used to inform risk communication. Public risk communication may include public advisories (e.g. signage with drinking water advisory at impacted waterway, fish consumption advice, air quality advisories), plain language summaries, and/or community presentations. Risk communication strategies and communication materials can generally be prepared within six weeks of observed trigger level exceedances. Should a human health risk assessment be needed prior to developing the risk communication materials, the timeline may be extended.

5.2 Adaptive Management

Adaptive management will be triggered if monitoring results exceed the established trigger levels specified in Section 5 of the HHMMP. The objective of adaptive management is to address circumstances where the implementation of alternative or additional mitigation measures would be required to address the effects of the Project. This HHMMP is intended to be adaptive given the number of environmental components that can be affected by Project activities and impact human health.

The adaptive framework is shown as a cyclical process (Figure 5-1) that recognizes that monitoring can lead to new information that should be used in future monitoring. This process allows feedback from this new information for development and modification of mitigation measures or management decisions. The progressive implementation of the adaptive management framework will also include an annual review of the monitoring program to determine the potential need for revisions to planned monitoring and analysis tasks.



Figure 5-1: Adaptive Management Framework

A decision framework for adaptively managing the human health monitoring program is provided in Table 5-2. The approach, methods, and schedule (frequency and timing) of the monitoring programs as described in the respective VC monitoring plans will be carried out according to the plan. If effects to human health receptors are detected, monitoring should be maintained or increased in frequency for a period of time, and focused studies (i.e., an updated HHRA) may need to be implemented to further support management decisions. Focused studies will be designed by a QP based on the findings of the monitoring program, relevant receptor locations, and Project conditions at the time.

Table 5-2: Key Elements of the Decision Framework for Changes to the Human Health Monitoring and Management Plan

Trigger	Time to Act	Action
Exceedance of trigger level for soil and vegetation, air quality, groundwater, surface water, sediment, and fish tissue	Within 1 month of observed trigger exceedance. Time to act will depend on environmental component.	Evaluate if effects are linked to Project activities
	Within next suitable field season	Conduct verification monitoring
	Within 1 month of verification monitoring	Implementation of mitigation measures prescribed by a QP
	Within 1 month of obtaining verification monitoring results	Implement focused study (i.e., conduct human health risk assessment) if concentrations remain above trigger levels after verification sampling and implementation of mitigation measures

Notes: QP = Qualified Professional

5.2.1 Implementation

The review and interpretation of monitoring results per the objectives of the Trigger Response Plan will be a collaborative effort conducted by the relevant QPs pertaining to the HHMMP (e.g., Human Health QP, Air Quality QP, Groundwater QP and Aquatics QP). These QPs may conduct various aspects of monitoring and management pertaining to this Plan.

6. REPORTING

HHMMP reporting will be provided annually, where possible, depending on data availability and seasonal constraints (e.g., fish migration patterns, fish population numbers affecting fish tissue monitoring, snow cover). The data will be provided in quarterly intervals where available. The HHMMP will be provided to the EAO a minimum of 60 days prior to commencement of Construction at the Mine Site and QR Mill. A revised HHMMP will be provided after the incorporation of feedback from relevant stakeholder groups (see Section 7).

Annual reporting will be provided to the EAO, the BC Ministry of Energy, Mines and Low Carbon Innovation, ENV, the Northern Health Authority, and Participating Indigenous nations (Condition #19.4). Reporting will summarize information gathered from the Human Health Monitoring Program (Section 4) and Human Health Management Plan (Section 5). It will provide a summary of monitoring results and screening against the established trigger levels associated with the soil and vegetation component, as well as summaries of relevant monitoring information from other VCs. Specifically, reporting will include the following:

- Summary and interpretation of collected data (including data quality and completeness), and a discussion of data as it relates to the trigger levels and effects to human health.
- A comparison of results between the baseline conditions estimates of the HHRA for the EAC Application and the results of the collected data to determine if Project activities are affecting human health.
- A summary of the SVMP monitoring results, including an assessment on whether Project activities are affecting human health based on comparing monitoring results to the relevant screening criteria (As described in Section 4.2.1).
- Additional mitigation measures or adaptive management implemented by ODV in response to Project-related changes as it relates to the HHMMP.
- A description of how the HHMMP relates to the Drinking Water and Water Treatment Plan (Condition #18),the Air Quality Monitoring Plan (Condition #15), and the Community Effects Management Plan (Condition #16), as available, required by Condition #19.3f.

Note that the recommended Baseline Health Conditions HHRA (Section 3.1.1) will be provided under separate cover from the HHMMP. Further, the HHMMP is not a fixed document and components of the HHMMP may be revised over the life of the Project.

7. CONSULTATION AND FEEDBACK

A consultation period will occur after submission of the HHMMP, after which updates based on feedback will be incorporated into a revised HHMMP submission.

The HHMMP will be presented (virtually) to provincial regulators, Participating Indigenous nations, and other stakeholders by the HHMMP Task Lead (QP). Information will be shared with these groups, including the BC Ministry of Forests' Crown Contaminated Sites Program and the District of Wells.

Specifically, consultation with the BC Ministry of Energy, Mines and Low Carbon Innovation, ENV, Northern Health Authority, and Participating Indigenous nations will be conducted so that feedback from these groups can be incorporated into the HHMMP. For example, feedback from the Participating Indigenous nations will help develop a HHMMP that is culturally appropriate and considers sampling locations and species of country foods that are representative of Participating Indigenous nations' use and consumption (Condition Item #19.3d).

Written notice of the HHMMP consultation and feedback period will be provided to the relevant parties, indicating the timeframe for providing feedback (i.e., within 3 weeks of obtaining the HHMMP). ODV will also provide a written explanation to the parties describing how their feedback has been considered and addressed in a revised version of the document. A copy of the consultation record will be provided to the EAO at the same time as the revised HHMMP is provided to EAO.

WSP will work with ODV to address the feedback. Under the direction of the HHMMP Task Lead (QP), updates based on the feedback will be made to the HHMMP for submission to the EAO. As the HHMMP and updates will be implemented throughout the Project phases, consultation and feedback will be required after each submission of the HHMMP.

8. REFERENCES

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APPENDIX A DECLARATION OF COMPETENCY FORM

Ministry of Environment and Climate Change Strategy

Declaration of Competency

The Ministry of Environment and Climate Change Strategy relies on the work, advice, recommendations and in some cases decision making of qualified professionals[1], under government's professional reliance regime. With this comes an assumption that professionals who undertake work in relation to ministry legislation, regulations and codes of practice have the knowledge, experience and objectivity necessary to fulfill this role.

1. Name of Qualified Professional: Audrey Wagenaar

   Title: Senior Principal, Environmental Scientist

2. Are you a registered member of a professional association in B.C.? ☑ Yes ☐ No

   Name of Association: Association of the Chemical Profession of BC Registration #: 2010214

3. Brief description of professional services:

   Human Health Monitoring and Management Plan preparation

This declaration of competency is collected under section 26(c) of the *Freedom of Information and Protection of Privacy Act* for the purposes of increasing government transparency and ensuring professional ethics and accountability. By signing and submitting this statement you consent to its publication and its disclosure outside of Canada. This consent is valid from the date submitted and cannot be revoked. If you have any questions about the collection, use or disclosure of your personal information please contact the Ministry of Environment and Climate Change Strategy Headquarters Office at 1-800-663-7867.

Declaration

I am a qualified professional with the knowledge, skills and experience to provide expert information, advice and/or recommendations in relation to the specific work described above.

Signature:

X Audrey K Wagenaar

Print Name: Audrey Wagenaar

Witnessed by:

X

Print Name: Sean Weston

Date signed: 2 May 2024

[1] *Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who*

a) is registered in British Columbia with a professional association, is acting under that organization's code of ethics, and is subject to disciplinary action by that association, and

b) *through suitable education, experience, accreditation and knowledge, may reasonably be relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.*

APPENDIX B AIR QUALITY MONITORING PLAN

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

AIR QUALITY MONITORING PLAN

REV0

APRIL 2024



OSISKO DEVELOPMENT

Cariboo Gold Project

PO Box 250
3700 Ski Hill Road
Wells, BC V0K 2R0

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Appendices

Appendix A Qualified Professional Declaration of Competency

REVISION HISTORY

Rev. No.	Date	Author	Description
0	April 18, 2024	Chris Koscher	Initial version for environmental assessment condition review

ABBREVIATIONS

Terminology used in his document has been defined where it is first used, while the following list has been presented to assist readers that choose to review only portions of the document.

Abbreviation	Description
AQMP	Air Quality Monitoring Plan
BC	British Columbia
BCFSM	British Columbia Field Sampling Manual
CRD	Cariboo Regional District
EAO	Environmental Assessment Office
EMS	Environmental Management System
ENV	Ministry of Environment and Climate Change Strategy (BC) – formerly Ministry of Environment
FDMS	Filter Dynamics Measurement System
km	kilometre
NAD 83	North American Datum of 1983
NAPS	National Air Pollution Surveillance Program
ODV	Osisko Development Corp.
PAH	Polycyclic aromatic hydrocarbons
PM	particulate matter (TSP, PM_{10}, $PM_{2.5}$)
$PM_{2.5}$	fine particulate matter (particulate matter < 2.5 microns)
PM_{10}	inhalable particulate matter (particulate matter < 10 microns)
Project	Cariboo Gold Project
QA	quality assurance
QA/QC	quality assurance / quality control
QR Mill	Quesnel River Mill
TSP	total suspended particulate
US EPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
WRSF	Waste Rock Storage Facility
WSP	WSP Canada Inc.
WTP	Water Treatment Plant

1. PURPOSE AND SCOPE

The Air Quality Monitoring Plan (AQMP) was prepared to satisfy relevant requirements of Environmental Assessment Certificate (EAC) conditions for Osisko Development Corp.'s (ODV's) Cariboo Gold Project (the Project). Specifically, requirements in Condition #15 (Air Quality) and Condition #19 (Human Health Monitoring and Management Plan) of Schedule B of EAC #M23-01. It is understood that the AQMP will also support requirements for waste discharge (air emission) authorizations for the Project from the British Columbia (BC) Ministry of Environment and Climate Change Strategy (ENV).

Below are select excerpts from EAC #M23-01 related to air quality monitoring:

15. Air Quality

15.3 The Holder must conduct continuous air quality and meteorological monitoring for particulate matter (both 2.5 and 10 µm), carbon monoxide, sulphur dioxide, and nitrogen dioxide in the District of Wells for one full, valid year prior to Operations and prior to Construction at the Mine Site Complex and during Construction, Operations, and Closure. The monitoring must use methods defined in the B.C. Field Sampling Manual (2020, or as updated or replaced from time to time) and use locations and types of equipment developed in consultation with ENV, Participating Indigenous Nations, and the District of Wells.

15.4 The Holder must report on the monitoring in 15.3 at least twice annually for the first two years of Operations at the Mine Site Complex and at least annually following, unless otherwise authorized by the EAO, including a plain language summary, and provide publicly through condition 12 (Public Information). These reports must also include the monitoring results interpreted and compared against the current B.C. Air Quality Objectives and/or Canadian Ambient Air Quality Standards, where applicable.

15.5 All mitigation measures, monitoring, rationale, and reporting in this condition must be implemented throughout Construction, Operations, and Closure under the direction of a Qualified Professional retained by the Holder and to the satisfaction of the EAO.

19. Human Health Monitoring and Management Plan

19.3 The plan must include at least the following:

b) Identification of a sampling and monitoring plan for the Project that must include at least:

i. The following substances, media, and additional sampling parameters, as well as any other Criteria Air Contaminant, Contaminant of Potential Concern, media, or parameter identified by the Qualified Person as necessary to determine the

human health effects of the Project, in consultation with EMLI, ENV, NHA, and Participating Indigenous Nations:

A) Continuous monitoring for particulate matter (both 2.5 and 10 µm), sulphur dioxide, and nitrogen dioxide in air;

B) Time-integrated sampling for polycyclic aromatic hydrocarbons in air and grab samples of soil and water;

C) Continuous monitoring for meteorological parameters (including wind speed, wind direction, relative humidity, and temperature);

D) Time-integrated sampling for metals (including but not limited to antimony, aluminum, arsenic, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, and selenium) in air (bound to particulate matter) and grab samples of soil, vegetation (including in natural environments and within the town of Wells), fish, surface water, and the community water supply or groundwater; and

iv. Sampling methods following the B.C Field Sampling Manual (2020, or as updated or replaced from time to time) including quality assurance and quality control measures and sampling frequency and the rationale for this chosen frequency.

The AQMP provides details regarding the air quality monitoring for the Project which has been organized in the following sections outlined below:

- Project Description and Setting (Section 2);
- Site Selection (Section 3);
- Roles and Responsibilities (Section 4);
- Methods and Instrumentation (Section 5);
- Quality Assurance and Quality Control (Section 6);
- Documentation and Record Keeping (Section 7);
- Reporting (Section 8); and
- References (Section 9).

This document was prepared with the support of WSP Canada Inc. The Declaration of Competency for the Qualified Professional involved is provided in Appendix A.

2. PROJECT DESCRIPTION AND SETTING

2.1 Project Overview

ODV is proposing to develop the Project, an underground gold mine with a maximum production capacity of 1,793,400 tonnes per year of mineralized material (ore) located in the District of Wells and Cariboo Regional District (CRD), BC. The Project includes the following sites and key components (Figure 2–1):

Mine Site:

- Mine Site Complex:
  - Waste management facilities;
  - Water supply and management structures and facilities;
  - Services Building;
  - Electrical Substation;
  - Camp (Worker Accommodation);
  - Valley Portal;
  - Water Treatment Plant (WTP); and
  - Other ancillary infrastructure.
- Bonanza Ledge Site:
  - A Waste Rock Storage Facility (WRSF) and associated water management structures;
  - Overburden Stockpiles;
  - Temporary Ore Stockpile;
  - Cow Portal;
  - Other ancillary infrastructure.
- Access roads and infrastructure.
- Quesnel River Mill (QR Mill):
  - ODV's existing and associated infrastructure within the Project Surface Footprint, including use of the Worker Accommodation and necessary upgrades to the existing infrastructure.
- Transmission Line

The mine will have an estimated operational mine life of 12 years and will operate 24 hours per day, 365 days per year. Closure will occur over a period of 2 years after mining is completed.

2.2 Physical Setting

2.2.1 Mine Site

The location of the Mine Site and Project surface footprint, and its relative location to the QR Mill, is shown in Figure 2–1. The Mine Site is located in the District of Wells and CRD in BC, approximately 123 kilometres (km) southeast of the city of Prince George, BC. The city of Quesnel, BC is located approximately 65 km west of the Mine Site, and the Rocky Mountains, which extend south to north for hundreds of kilometres, are located approximately 30 km east of the Mine Site.

The Project footprint does not overlap with provincial, national, or regional parks, ecological reserves, or legally protected wildlife habitat areas. The area encompassing the Mine Site is mountainous and forested, and mostly uninhabited, except for the District of Wells.

2.2.2 QR Mill

The location of QR Mill and the Project surface footprint is shown in Figure 2–1. The QR Mill is located on the Quesnel River Mine property in the CRD, BC, approximately 55 km southeast of the city of Quesnel and 50 km south-southwest of the District of Wells. QR Mill is centred at 52°40’21.0” N and 121°47’30.2” W; the UTM coordinates are 581,700.9 E, 5,836,526.4 N (NAD 83, Zone 10N). QR Mill is accessed via Highway 26, which connects to the 500 Nyland Lake Forest Service Road.

The Project footprint does not overlap with provincial, national, or regional parks, ecological reserves, or legally protected wildlife habitat areas. The area encompassing QR Mill is mountainous and forested, and mostly uninhabited.

MINE SITE

QR MILL

093G
093H
093H/04
093B
093A
093A/12

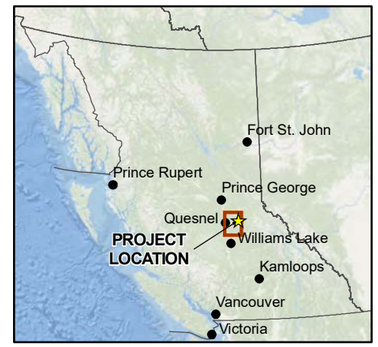
Lodi Lake
Stephen Lake
Bowron River
Willow River
Ahbau Lake
Big Valley Creek
Summit Creek
Genevieve Lake
CINEMA BOG ECOLOGICAL RESERVE
Cinema
Ahbau Creek
COTTONWOOD RIVER PARK
Cottonwood River
Umiti Creek
WENDLE PARK
Wells
Slough Creek
Ten Mile Lake
TEN MILE LAKE PARK
Cottonwood
26
MINE SITE COMPLEX
Jack of Clubs Creek
Barlow Creek
Quesnel River
EXISTING BONANZA LEDGE SITE
Quesnel
Red Bluff
Dragon Lake
Rich Bar
Quesnel-Hydraulic Road
500 Nyland Lake Road
Swift River
Victoria Creek
DRAGON MOUNTAIN PARK
Gravelle Ferry
Kersley
Narcosli Creek
Fraser River
97
Maud Lake
Maud Creek
Rudy Creek
Cariboo River
Quesnel Forks
EXISTING QR MILL SITE
Beaver Creek
Hydraulic
Likely
BEAVER VALLEY PARK
CEDAR POINT PARK
Cuisson Creek
Morehead Lake
Beesley Creek
Joan Lake
Polley Lake
Chambers Lake
Bootjack Lake
Quesnel Lake
Opheim Lake
Tingley Creek
Cuisson Lake
Beaver Lake

Willow River
Main Access Road
Highway 26 Bypass
Wells
26
Willow River
Camp A and B
Lowhee Creek
Jack of Clubs Lake
Mine Site Complex
Camp Access Road
A Road
C Road (Emergency Access Road)
Ballarat Camp
Bonanza Ledge Site
0 500 1,000
1:47,000 METRES

Rudy Creek
Existing QR Mill
500 Nyland Lake Road
Quesnel River
0 500 1,000
1:30,000 METRES

LEGEND

- POPULATED COMMUNITY
- PROJECT INFRASTRUCTURE LOCATION
- TEMPORARY EARLY CONSTRUCTION CAMP
- ROAD
- HIGHWAY
- WATERCOURSE
- WATERBODY
- PARKS/PROTECTED AREA
- BARKERVILLE HISTORIC TOWN AND PARK
- TRANSPORTATION ROUTE
- TRANSPORTATION ROUTE (MINE SITE ACCESS ROADS)
- TRANSMISSION LINE ROUTE
- SURFACE DISTURBANCE AREA



REFERENCE(S)

1.WATER FEATURES, TRANSPORTATION FEATURES OBTAINED FROM CANVEC © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
2. CITIES/TOWNS, INDIAN RESERVES, FEDERAL LANDS AND PARK/PROTECTED AREAS OBTAINED FROM BC MINISTRY OF FORESTS, LANDS NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
3. INSET BASE SOURCE: ESRI, DELORME, GEBCO, NOAA NGDC, AND OTHER CONTRIBUTORS.

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CARIBOO GOLD PROJECT

OVERVIEW OF MAJOR PROJECT COMPONENTS

REV.	DESCRIPTION	DATE	INITIALS
0		6/21/2023	MY

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	0	**2-1**

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3. SITE SELECTION

The British Columbia Field Sampling Manual (BCFSM) Part B1 Ambient Air Monitoring (ENV 2020) was used as a key reference to guide the siting of the air quality monitoring stations for the Project. The BCFSM was developed in part with information published by the National Air Pollution Surveillance Program (NAPS), the United States Environmental Protection Agency (US EPA) 2013 QA handbook for Air Pollution Measurement Systems Volume II Ambient Air Quality Monitoring Program, and industry best practices (ENV 2020).

3.1 General Siting Considerations

A summary of general siting considerations from the BCFSM is presented below. For further details see Monitoring Station Siting and Design (Section 2) in the BCFSM.

Site location and access:

- Sites should be accessible and secure from unauthorized access;
- Access to sites should not be impeded by snow or seasonal closures;
- Sites should be accessible 24 hours a day and 7 days a week; and
- Sites and external equipment should be located to minimize the potential for vandalism.

The shelter must protect the station's instrumentation from:

- Precipitation and rodent impacts;
- Fluctuations in internal temperature, pressure, or humidity that may be caused by improperly sized air conditioning units, or intrusion of ambient air;
- Excessive dust and dirt; and
- Environmental stress, including temperature extremes, vibration, corrosive chemicals, intense light, or radiation pertinent to a manufacturer's specification.

Other general siting considerations:

- Access / availability of communications (e.g., cellular connectivity) and electrical power; and
- Long term viability of the site.

3.2 Project Siting Considerations

The monitoring location sites for the Project considered the siting considerations presented in the BCFSM as well as:

- Predicted results from the *Air Quality Effects Assessment* (WSP 2022) conducted for the EAC Application for the Project;

- Comments received on the EAC Application for the Project from stakeholders;
- Locations of nearby residential and/or sensitive receptors;
- Proximity to local emission sources (e.g. home heating, vehicular traffic, unpaved roads, etc.); and
- Specific siting criteria for the monitoring equipment.

There are two air quality monitoring stations located in Wells. One is located on Mooney Lane (see Section 3.2.1), and the other is located at AB Camp (see Section 3.2.2). There is a third air quality monitoring station located at the QR Mill (see Section 3.2.3). Meteorological parameters at the Mine Site are gathered by the air quality monitoring stations. Meteorological parameters at QR Mill are gathered by a separate meteorological monitoring station and temperature at the air quality monitoring station.

3.2.1 Wells Air Quality Monitoring Station (Mooney Lane)

A photo of the Wells Air Quality Monitoring Station (Mooney Lane) is provided in Figure 3–1, and the location of the Wells Air Quality Monitoring Station (Mooney Lane) is shown in Figure 3–5. This location was chosen based on the general siting and Project-specific siting considerations outlined in Sections 3.1 and 3.2. It is located on Mooney Lane in a residential neighbourhood at a property owned by ODV situated near the edge of the Wells community adjacent to the Project. This location serves to monitor ambient air concentrations within the community of Wells.

3.2.2 Wells Air Quality Monitoring Station (AB Camp)

A photo of the Wells Air Quality Monitoring Station (AB Camp) is provided in Figure 3–2, and the location of the Wells Air Quality Monitoring Station (AB Camp) is shown in Figure 3–5. This location was chosen based on the general siting and Project-specific siting considerations outlined in Sections 3.1 and 3.2. It is located on ODV's AB Camp which is situated near the edge of the Wells community adjacent to the Project. This location serves to monitor ambient air concentrations within the community of Wells / AB Camp.

3.2.3 QR Mill Air Quality and Meteorological Monitoring Stations

A photo of the QR Mill Air Quality Monitoring Station is provided in Figure 3–3, and a photo of the QR Mill Meteorological Station is provided as Figure 3–4. The locations of the QR Mill monitoring stations are shown in Figure 3–6. This location of the Air Quality Monitoring Station was chosen based on the general siting and Project-specific siting considerations outlined in Sections 3.1 and 3.2. It is located at the QR Mill Camp and serves to monitor ambient air concentrations for workers at the camp.



Figure 3–1: Photo of Wells Air Quality Monitoring Station (Mooney Lane)



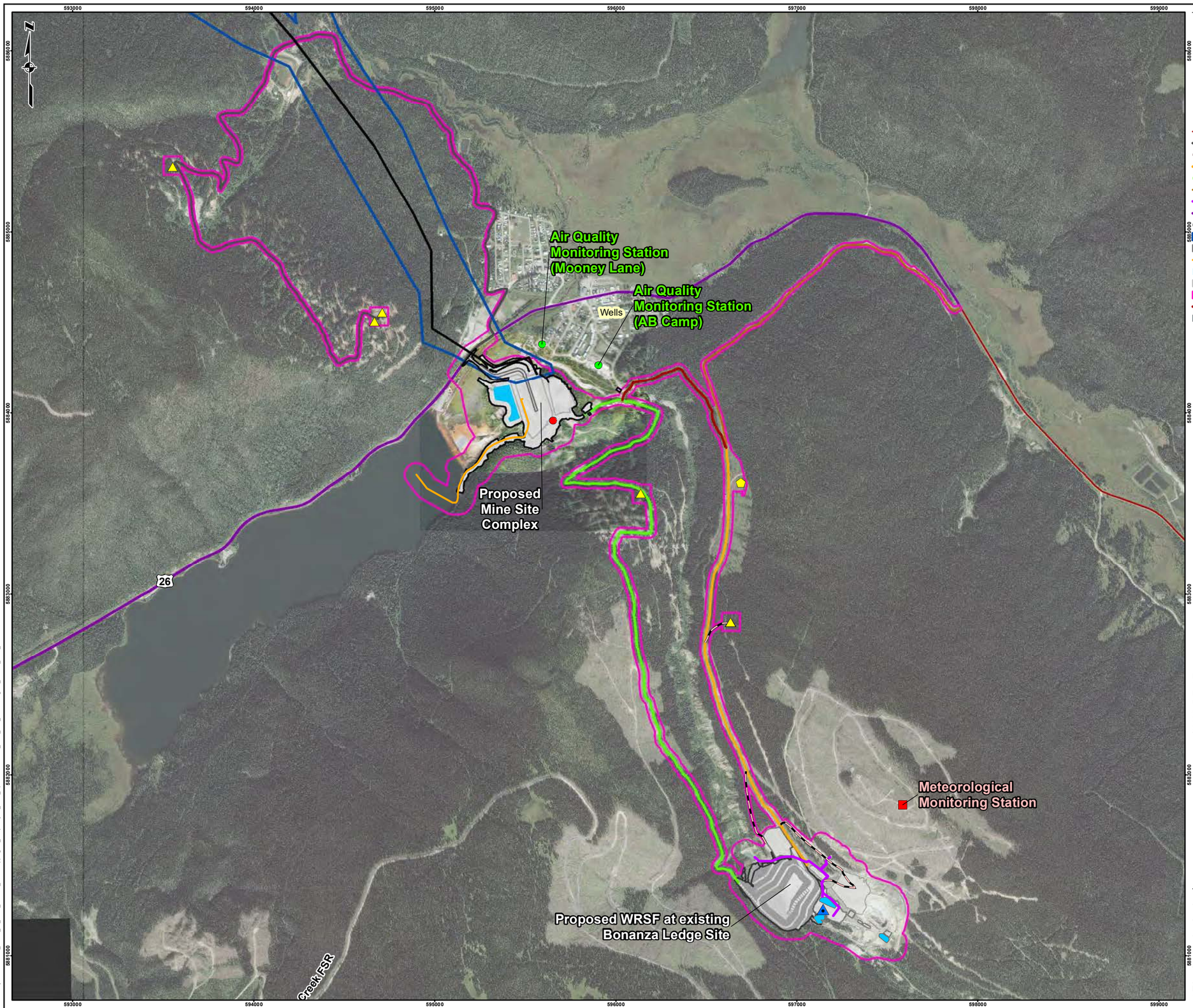
Figure 3–2: Photo of Wells Air Quality Monitoring Station (AB Camp)



Figure 3–3: Photo of QR Mill Air Quality Monitoring Station



Figure 3–4: Photo of QR Mill Meteorological Monitoring Station



LEGEND

- AIR QUALITY MONITORING STATION
- METEOROLOGICAL MONITORING STATION
- PROPOSED MINE PORTAL LOCATION
- EXISTING COW PORTAL
- PROPOSED VENTILATION RAISE
- UPGRADED WATER TREATMENT PLANT
- WRSF DISCHARGE LOCATION TO LOWHEE CREEK
- HIGHWAY
- VENTILATION RAISE ACCESS ROAD
- ACCESS ROAD
- BONANZA LEDGE SITE WRSF ACCESS ROAD (EXISTING A ROAD, NO UPGRADE)
- EMERGENCY WRSF ACCESS ROAD (EXISTING C ROAD, NO UPGRADE)
- ACCESS ROAD (EXISTING A-ROAD, NO UPGRADE)
- BONANZA FLOOD MANAGMENT SYSTEM PIPELINE
- TRANSPORTATION ROUTE
- PROPOSED TRANSMISSION LINE ROUTE
- PROPOSED TRANSMISSION LINE CORRIDOR
- PROPOSED CAMP ACCESS ROAD
- PROPOSED TREATED DISCHARGE / DIFFUSER PIPELINE
- PROPOSED MINE SITE SURFACE SEDIMENT POND
- PROPOSED SURFACE DISTURBANCE AREA
- PROPOSED SURFACE FOOTPRINT
- FIBRE OPTIC LINE ACCESS ROAD (EXISTING B ROAD, NO UPGRADE)
- BONANZA SUMP LOCATION

REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
2. HILLSHADE DERIVED FROM LIDAR DATA FLOWN BY MCELHANNAY CONSULTANTS LTD. JUNE 27, 2016.

NAD83 CSRS
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OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

METEOROLOGICAL AND AIR QUALITY MONITORING LOCATIONS

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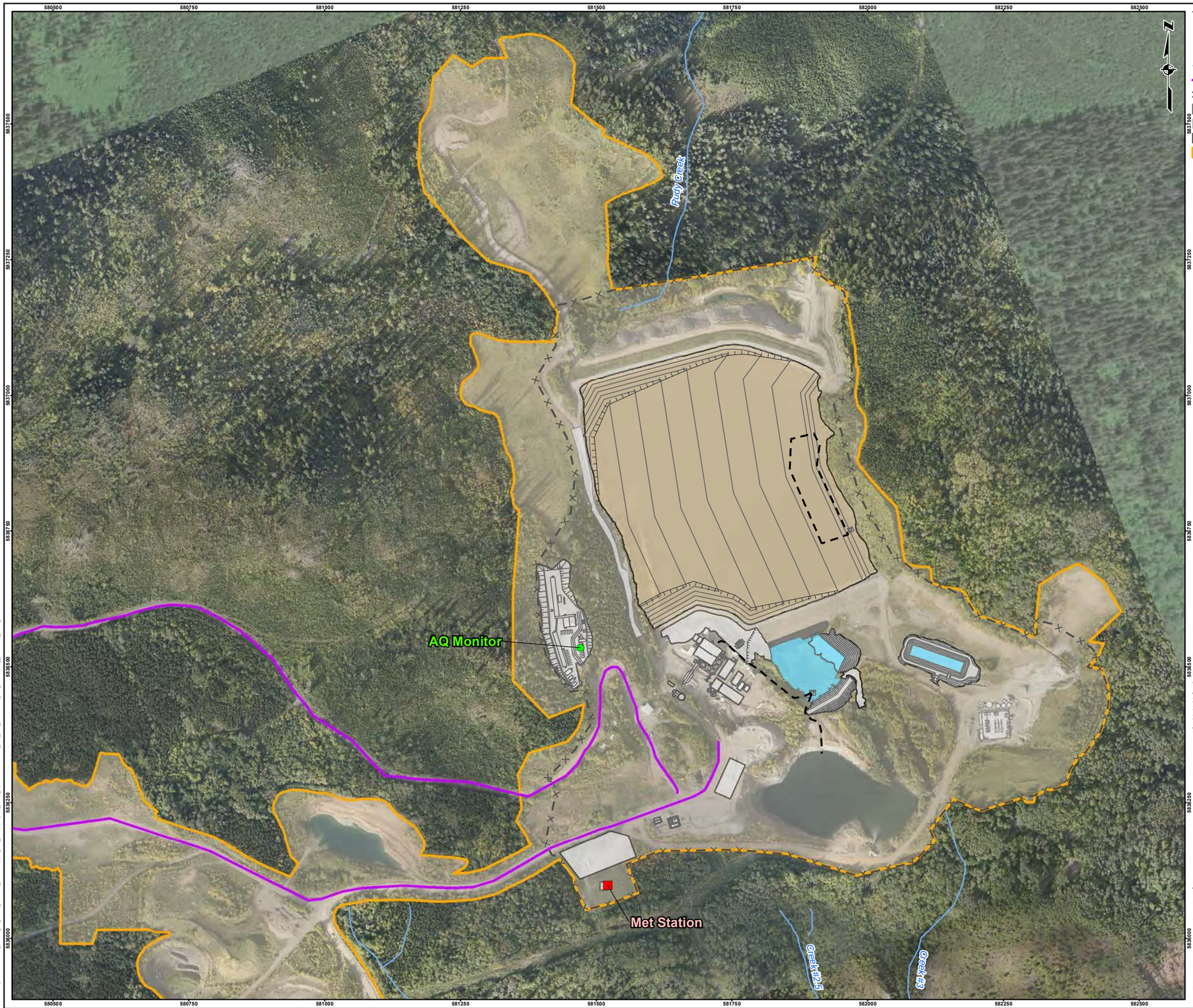
PROJECT NO.	PHASE	REV.	FIGURE
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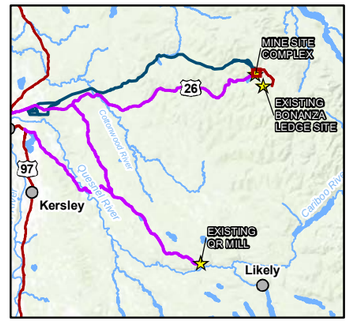
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LEGEND

- AIR PARTICULATE MATTER MONITORING STATION
- METEOROLOGICAL STATION
- WATERCOURSE
- PROPOSED TRANSPORTATION ROUTE
- FENCE LINE
- INFRASTRUCTURE
- SOUTH SEEPAGE COLLECTION POND
- FILTERED STACK TAILINGS STORAGE FACILITY
- PROPOSED SURFACE FOOTPRINT



NOTES:

THE PROPOSED FILTERED STACK TAILINGS STORAGE FACILITY WILL UTILIZE THE SAME FOOTPRINT OF THE DEWATERED EXISTING TAILINGS STORAGE FACILITY

REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, MUNICIPAL BOUNDARY, PARK/PROTECTED AREAS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS AND RURAL DEVELOPMENT.
2. BASE DATA SOURCE: ESRI, GEOBASE, NRCAN, AND THE GIS USER COMMUNITY.
3. STOCKPILE SOURCE: BARKERVILLE GOLD MINES LTD. (BGM). 2020. QUESNEL RIVER MINE 2020 RECLAMATION AND CLOSURE PLAN. PREPARED FOR BGM. PREPARED BY GOLDER ASSOCIATES INC. NOVEMBER 5, 2020.

NAD83 CSRS
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0 100 200 300 400
1:7,000 METRES

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

QR MILL MONITORING LOCATIONS

REV.	DESCRIPTION	DATE	INITIALS
B		3/29/2024	M.Y

PROJECT NO.	PHASE	REV.	FIGURE
151-11330-70	00	B	3-6

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4. ROLES AND RESPONSIBILITIES

ODV has the obligation of maintaining compliance with Project commitments and informing mine personnel and site contractors of relevant obligations during all phases of the mine life. A clear understanding of the roles, responsibilities, and level of authority that employees and contractors have when working on the Project is essential to meet AQMP and ODV Environmental Management System (EMS) objectives.

Table 4–1 provides an overview of general responsibilities for ODV personnel.

Table 4–1: Roles and Responsibilities Defined

Role	Responsibilities
Vice President Environment	Responsible for sign off on the Environmental Policy and has overall responsibility for verifying that Project activities are undertaken such that environmental legislation and regulatory requirements are considered and adhered to, and adverse impacts to the environment and communities in the vicinity of the Project are limited.
General Manager	Responsible for verifying that site personnel have access to and receive applicable training on the EMS and management plans and overseeing the day-to-day operations at the Project sites. Responsible for the health and safety of works and the public and verifying that Project activities comply with the Project's EMS, including integration of the EMS and management plans with other mine development plans and permit compliance.
Environmental Manager	Responsible for establishing, implementing, and maintaining the EMS, training of on-site personnel on the Project's EMS and applicable management plans, overseeing responses to non-compliance, evaluating the effectiveness of mitigation measures in each management plan, and reporting outcomes to the General Manager. The Environmental Manager or their agent (i.e., Environmental Personnel) is responsible for coordinating with the General Manager to communicate with other department heads, foremen, or field-level personnel to implement or modify mitigation measures, as necessary and where appropriate. The Environmental Manager has the authority to stop an activity or shut down the site if it is not meeting regulatory requirements. The Environmental Manager or designate is responsible for reporting non-compliances to the contractors or relevant consultants, ODV, Indigenous nations, and regulatory agencies, where required. Reports to the General Manager.
Qualified Professionals and Qualified Persons	Qualified professionals and qualified persons will be retained to review objectives and conduct various aspects of monitoring, management, and maintenance pertaining to Project facilities and other management and monitoring plans.

5. METHODS AND INSTRUMENTATION

5.1 Air Contaminants and Meteorological Parameters to be Monitored

The air contaminants to be monitored include:

- Particulate matter ($PM_{2.5}$);
- Particulate matter (PM_{10});
- Total suspended particulate (TSP);
- Carbon monoxide;
- Sulphur dioxide;
- Nitrogen dioxide;
- Polycyclic aromatic hydrocarbons (PAH);
- Metals (including but not limited to antimony, aluminum, arsenic, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, and selenium) in air (bound to particulate matter).
- Precipitation;
- Relative humidity; and
- Wind speed and direction.

Further details regarding the speciated polycyclic aromatic hydrocarbons and metals can be found in the Human Health Monitoring and Management Plan (ODV 2024).

5.2 Sampling Frequency and Duration

The sampling frequency for the air quality and meteorological parameters is presented in Table 5–1 and follows the sampling frequency in the BCFSM, NAPS, and Metro Vancouver for passive PAH sampling.

Table 5–1: Sampling Frequency

Parameter	Sampling Frequency
Particulate matter ($PM_{2.5}$)	Continuous
Particulate matter (PM_{10})	Continuous
Total suspended particulate (TSP)	Continuous
Carbon monoxide	Continuous
Sulphur dioxide	Continuous
Nitrogen dioxide	Continuous
Polycyclic aromatic hydrocarbons	Passive Polyurethane foam (PUF) (PAH). Change PUF disk every 3 months (see notes)
Metals	One in six-day sampling (NAPS schedule)
Wind speed and direction	Continuous
Relative humidity	Continuous
Temperature	Continuous

Notes: This follows Metro Vancouver's sampling frequency for passive PAH sampling (Metro Vancouver 2022).

Continuous meteorological monitoring and air quality monitoring for particulate matter (both $PM_{2.5}$ and PM_{10}), carbon monoxide, sulphur dioxide, and nitrogen dioxide will occur in the District of Wells for one full, valid year prior to operations and prior to construction at the Mine Site Complex and during construction, operations, and closure per Condition #15 of EAC #M23-01.

Polycyclic aromatic hydrocarbons and metals monitoring will occur during operations.

5.3 Continuous Monitoring Instrumentation

A description of the continuous air quality and meteorological monitoring equipment is provided in Table 5–2, Table 5–3, Table 5–4, and Table 5–5.

Table 5–2: Wells Air Quality Monitoring Station (Mooney Lane) Continuous Monitoring Instrumentation

Parameter	Continuous Monitoring Instrumentation
Particulate matter ($PM_{2.5}$)	Thermo Fisher Scientific 1405D Continuous Air Monitor (equipped with relative humidity and temperature sensor)
Particulate matter (PM_{10})	
Relative humidity	
Temperature	
Total suspended particulate (TSP)	Thermo Fisher Scientific TEOM 1405 Continuous Air Monitor
Carbon monoxide	Thermo Fisher Scientific Model 48iQ Gas Filter Correlation CO Analyzer
Sulphur dioxide	Thermo Fisher Scientific Model 43iQ Pulsed Fluorescent SO_2 Analyzer
Nitrogen dioxide	Thermo Fisher Scientific Model 42iQ Chemiluminescent NO-NO_2-NO_x

Table 5–3: Wells Air Quality Monitoring Station (AB) – Continuous Instrumentation

Parameter	Continuous Monitoring Instrumentation
Particulate matter ($PM_{2.5}$)	Thermo Fisher Scientific 1405D Continuous Air Monitor with Filter Dynamics Measurement System (FDMS) (equipped with temperature sensor)
Particulate matter (PM_{10})	
Temperature	
Total suspended particulate (TSP)	Thermo Fisher Scientific TEOM 1405 Continuous Air Monitor
Carbon monoxide	Thermo Fisher Scientific Model 48iQ Gas Filter Correlation CO Analyzer
Sulphur dioxide	Thermo Fisher Scientific Model 43iQ Pulsed Fluorescent SO_2 Analyzer
Nitrogen dioxide	Thermo Fisher Scientific Model 42iQ Chemiluminescent NO-NO_2-NO_x
Wind speed and direction	RM Young 05103

Table 5–4: QR Mill Air Quality Monitoring Station – Continuous Instrumentation

Parameter	Continuous Monitoring Instrumentation
Particulate matter ($PM_{2.5}$)	Thermo Fisher Scientific 1405D Continuous Air Monitor (equipped with temperature sensor)
Particulate matter (PM_{10})	
Temperature	
Total suspended particulate (TSP)	Thermo Fisher Scientific TEOM 1405 Continuous Air Monitor
Carbon monoxide	Thermo Fisher Scientific Model 48iQ Gas Filter Correlation CO Analyzer
Sulphur dioxide	Thermo Fisher Scientific Model 43iQ Pulsed Fluorescent SO_2 Analyzer
Nitrogen dioxide	Thermo Fisher Scientific Model 42iQ Chemiluminescent NO-NO_2-NO_x

Table 5–5: QR Mill Meteorological Monitoring Station – Continuous Instrumentation

Parameter	Continuous Monitoring Instrumentation
Wind speed and direction	RM Young 05103
Relative humidity	Rotronic HC2-S
Temperature	
Total precipitation	OTT Pluvio2
Rainfall	TE525M
Solar radiation	SPLITE2

5.4 Time-Integrated Sampling

A description of the time-integrated sampling is provided in Table 5–6. No time-integrated sampling occurs at QR Mill.

Table 5–6: Wells Air Quality Monitoring Station (Mooney Lane) – Time-Integrated Sampling

Parameter	Time-Integrated Instrumentation
Polycyclic aromatic hydrocarbons	Passive PUF (PAH)
Metals	Tisch Environmental High Volume Air Sampler

6. QUALITY ASSURANCE AND QUALITY CONTROL

6.1 Routine Operations and Maintenance of the Monitoring System

Routine operations and maintenance will follow the BCFSM and manufacturer recommendations. Key sections of the BCFSM pertaining to routine operations and maintenance of the monitoring system include:

- Routine Operations (Section 5);
- Forms and Checklists (Appendix 1); and
- Standard Operating Procedures (Appendix 2).

Routine operations and maintenance include:

- Scheduled and non-scheduled inspection;
- Preventative and planned maintenance;
- Scheduled calibrations; and
- Repairs and calibration.

Routine inspection/maintenance activities are grouped into short term (e.g., weekly, bi-weekly, monthly) and long term (e.g., quarterly/semi-annual). An example summary of routine inspection/maintenance activities from the BCFSM is shown in Table 6–1.

Table 6–1: Routine Inspection/Maintenance Summary

Short term – Weekly, Bi-Weekly, Monthly	Long Term – Quarterly/Semi-Annual
1. Check shelter integrity and security. 2. Check/test communications array. 3. Check/test communications array. 4. Check/test Battery Backup system; clean filters as necessary. 5. Inspect manifold apparatus and sample lines to the analyzers, clean if needed. 6. Check all equipment fans and filters. 7. Inspect and replace drying. 8. Check for adequate supply of consumables (e.g., desiccant, filters, gloves, etc.). 9. As applicable, check station temperature is within designed operating range. 10. Review instrument alarms, instrument issues, and/or data issues identified since the last visit. 11. Verify that maintenance undertaken on the last visit is still effective. 12. Check the fire extinguisher. 13. Verify instrument standard operating procedures, manufacturer information, and routine operation plan/checklist is up-to-date. 14. Conduct routine operation checklist.	1. Review operational requirements as per Quality Assurance Plan/Agency Quality Assurance Plan. 2. Inventory of all equipment on-site, compare against previous visit, and update accordingly; this includes manufacturer's information and standard operating procedures. 3. Carry out short term checks. 4. If applicable, check zero air supply system for each analyzer and change/correct, if necessary. 5. Perform multi-point verification, if applicable. 6. Perform flow verification, if applicable. 7. Check time stamps in the local database and in equipment data loggers. 8. Conduct routine operation checklist. 9. Conduct function checks for abnormal performance (e.g., excessive signal noise, unstable baseline, positive and/or negative drift, spiking, long response time, incorrect flow/pressure readings, warning light indicators, power or pump failure, etc.).

6.2 Verification and Calibration

Verification and calibration will follow the BCFSM and manufacturer recommendations. Key sections of the BCFSM pertaining to verification and calibration of monitoring equipment include:

- Gas Analyzer Calibrations and Verifications (Section 6);
- Forms and Checklists (Appendix 1); and
- Standard Operating Procedures (Appendix 2).

6.3 Data Collection and Validation

Data collection and validation will follow the BCFSM and manufacturer recommendations. Key sections of the BCFSM pertaining to data collection and validation include:

- Collection and Validation of Continuous Monitoring Data (Section 7);
- Collection and Validation of Non-Continuous Monitoring Data (Section 8);
- Forms and Checklists (Appendix 1); and
- Standard Operating Procedures (Appendix 2).

7. DOCUMENTATION AND RECORD KEEPING

Documentation and record keeping will follow the BCFSM (Section 10). Records must be kept that are relevant to the station's operation. This includes the deployment of instrumentation, maintenance records, logging of issues and incidents, and anything else that is deemed relevant and could impact the validity of the data. Record keeping that is accurate and organized will assist in detecting potential issues early on and potential trends, and demonstrates best practice of the station's operation.

The list below is an example of the documentation and records to be maintained:

- Station Start-Up Record;
- Inspection and Maintenance Records;
- Verification and Calibration Records;
- Non-Conformance and Corrective Action Records;
- Level 0 Data Verification Log; and
- Audit Evaluations.

8. REPORTING

As required in Condition 15.4 of EAC #M23-01 (see Section 1) a report on monitoring outlined in Condition 15.3 of EAC #M23-01 (see Section 1) must be prepared at least twice annually for the first two years of operations at the Mine Site Complex and at least annually following, unless otherwise authorized by the BC Environmental Assessment Office (EAO). Reporting is to include a plain language summary and be provided publicly through Condition #12 (Public Information) of EAC #23-01. The monitoring data will be interpreted and compared to the current BC Air Quality Objectives and/or Canadian Ambient Air Quality Standards, where applicable.

Air quality data collected to satisfy the requirements of Condition #19 of EAC #M23-01 (see Section 1) will be included in the reporting requirements for the Human Health Monitoring and Management Plan (ODV 2024).

9. REFERENCES

ENV (BC Ministry of Environment and Climate Change Strategy). 2020. The British Columbia Field Sampling Manual. Part B Air and Emissions Testing. Part B1 Ambient Air Quality Monitoring. https://www2.gov.bc.ca/assets/gov/environment/research-monitoring-and-reporting/monitoring/emre/bc_field_sampling_manual_part_b.pdf. Accessed March 2024.

Metro Vancouver. 2022. Metro Vancouver. Air Quality & Climate Change Parks & Environment Department Network Quality Assurance Plan 2022.

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APPENDIX A QUALIFIED PROFESSIONAL DECLARATION OF COMPETENCY

Ministry of Environment and Climate Change Strategy

Declaration of Competency

The Ministry of Environment and Climate Change Strategy relies on the work, advice, recommendations and in some cases decision making of qualified professionals[1], under government's professional reliance regime. With this comes an assumption that professionals who undertake work in relation to ministry legislation, regulations and codes of practice have the knowledge, experience and objectivity necessary to fulfill this role.

1. Name of Qualified Professional Chris Koscher

   Title Senior Principal Air Quality Scientist

2. Are you a registered member of a professional association in B.C.? ☐ Yes ☑ No

   Name of Association: Eco Canada Registration # N/A

3. Brief description of professional services:

   Air Quality Monitoring Plan

This declaration of competency is collected under section 26(c) of the *Freedom of Information and Protection of Privacy Act* for the purposes of increasing government transparency and ensuring professional ethics and accountability. By signing and submitting this statement you consent to its publication and its disclosure outside of Canada. This consent is valid from the date submitted and cannot be revoked. If you have any questions about the collection, use or disclosure of your personal information please contact the Ministry of Environment and Climate Change Strategy Headquarters Office at 1-800-663-7867.

Declaration

I am a qualified professional with the knowledge, skills and experience to provide expert information, advice and/or recommendations in relation to the specific work described above.

Signature: 

X _____

Print Name: Chris Koshcer

Witnessed by: 

X _____

Print Name: Sean Weston

Date signed: April 18, 2024

[1] *Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who*

a) is registered in British Columbia with a professional association, is acting under that organization's code of ethics, and is subject to disciplinary action by that association, and

b) *through suitable education, experience, accreditation and knowledge, may reasonably be relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.*

APPENDIX C GROUNDWATER MONITORING PLANS

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

MINE SITE GROUNDWATER MONITORING PLAN REV0

APRIL 2024



OSISKO DEVELOPMENT

Cariboo Gold Project

PO Box 250
3700 Ski Hill Road
Wells, BC V0K 2R0

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Appendices

Appendix A Declaration of Competency Form

REVISION HISTORY

Rev. No.	Date	Author	Description
0	April 19, 2024	Jennifer Levenick	Initial version for environmental assessment condition review

ABBREVIATIONS

Terminology used in his document has been defined where it is first used, while the following list has been presented to assist readers that choose to review only portions of the document.

Abbreviation	Description
CALA	Canadian Association of Laboratory Accreditation
ENV	BC Ministry of Environment and Climate Change Strategy (BC)
mbgs	metres below ground surface
ODV	Osisko Development Corp.
Plan	Groundwater Monitoring Plan
Project	Cariboo Gold Project
PVC	polyvinyl chloride
QA/QC	quality assurance / quality control
SCP	Seepage Control Pond
SOP	standard operating procedure
VWP	vibrating wire piezometer
WRSF	Waste Rock Storage Facility

1. INTRODUCTION

This Groundwater Monitoring Plan (the Plan) provides the groundwater monitoring program (the Program) for the Mine Site (the Bonanza Ledge Site and the Mine Site Complex) portion of Osisko Development Corp.'s (ODV's) Cariboo Gold Project (the Project).

This document was prepared with the support of WSP Canada Inc. The Declaration of Competency for the Qualified Professional involved is provided in Appendix A.

The Program includes:

- Groundwater quality sampling program to assess seepage water quality pathways; and
- Groundwater water level program to assess groundwater flow pathways and overall changes in water levels and hydraulic gradients with mine dewatering and reflooding.

2. GROUNDWATER MONITORING PROGRAM

2.1 Objectives

The objectives of the groundwater monitoring program for the Mine Site are to:

- Assess the potential effects of Project-related mining activities on the groundwater flow system and receiving environment.
- Collect appropriate data to verify groundwater modelling predictions and support future updates of the groundwater model, if required.
- Characterize potential seepage water quality and groundwater flow pathways.

2.2 Monitoring Locations

Figure 2.2–1, Figure 2.2–2 and Figure 2.2–3 present the groundwater monitoring network that will be used to monitor groundwater quality and groundwater levels in the Mine Site area, including the Bonanza Ledge Site. The monitoring locations are also summarized in Table 2.2–1 and Table 2.2–2, along with the rationale for the monitoring location, target hydrostratigraphic unit, and depth, where relevant.

2.2.1 Bonanza Ledge Site

Table 2.2–1 summarizes the locations to be monitored at the Bonanza Ledge Site for groundwater quality and/or groundwater wells. The monitoring network includes existing wells that are monitored at the Bonanza Ledge Site. The Bonanza Ledge Mine is permitted under *Mines Act* permit M-238 and *Environmental Management Act* effluent discharge authorization PE-17876.

Of the wells listed in Table 2.2–1, wells MW16-10S, MW16-10D, and MW21-09 will need to be decommissioned as part of construction of the Bonanza Ledge Waste Rock Storage Facility (WRSF). The WRSF was designed to be constructed with potentially acid generating and non-potentially acid generating materials; therefore, the WRSF foundation was designed to be lined to manage seepage and runoff. The Bonanza Ledge Sediment Control Pond will also be lined. Water within the Bonanza Ledge Sediment Control Pond will be pumped for treatment, if required. The wells will be replaced with a new well at the toe of the Project WRSF. The well is arbitrarily named New Well 1 but will be formally named after the well is installed. The new well will be installed at least 90 days prior to the decommissioning of wells MW16-10S, MW16-10D, and MW21-09.

590000
595000
600000
5885000
5880000

Willow River
Tom Creek
Peggy Ogpay Creek
Martins Creek
Florrie Creek
Jubilee Creek
Pinus Creek
Coulter Creek
Yellowjack Creek
Mailleux Creek
Sleepy Creek
Slough Creek
Nelsons Creek
Slough Creek 2100 Rd
Promise Creek
Wilsons Creek
Jack of Clubs Lake
Lowhee Creek
Williams Creek
Devils Lake Creek
Burns Creek
Watsons Gulch
Stouts Gulch
Black Jack Gulch
French Creek
O'Daly Creek
Victoire Creek
Pinkerton Creek
Stoney Creek
Queen of Clubs Creek
Walker Gulch
Jack of Clubs Creek
Amador Creek
Lightning Creek
Van Winkle Creek
Houseman Creek
Bluejay Creek
Agnus Creek
Hwy 26

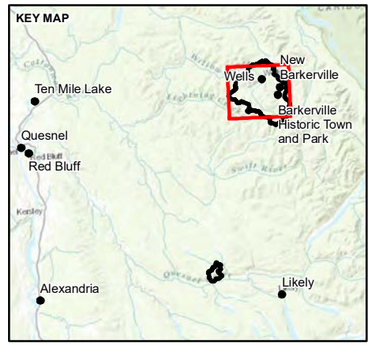
Island Mountain
Barkerville Mountain
Cow Mountain

New Well 13
MW-LL-16-02A
MW-LL-16-02B
MINE SEEPAGE 1
New Well 12
New VWP 2
REFER TO FIGURE 2.2-3
MW18-01a
MW18-01b
MW18-04b
New Well 2
New VWP 1
MW-LL-16-01A
MW-LL-16-01B
MW-HL-16-02
REFER TO FIGURE 2.2-2
MW-HL-16-03
MW-LL-16-03A
MW-LL-16-03B
MW-LL-16-04A
MW-LL-16-04B
Hard Scrabble Rd
Lowhee Rd
Barkerville Hwy
Reduction Rd
campground
Bowron Lake Rd
Cunningham Pass FSR

LEGEND

- GROUNDWATER MONITORING LOCATIONS – WATER QUALITY/WATER LEVELS
- GROUNDWATER MONITORING LOCATIONS – WATER LEVELS
- LOCAL STUDY AREA
- BARKERVILLE HISTORIC TOWN AND PARK
- HIGHWAY/ROAD
- CONTOUR (100 m)
- WATERCOURSE
- WETLAND
- WATERBODY
- PROPOSED UNDERGROUND FOOTPRINT
- PROPOSED SURFACE DISTURBANCE AREA
- PROPOSED INFRASTRUCTURE
- PROPOSED SURFACE SEDIMENT POND / SUMPS
- VENTILATION RAISE
- PROPOSED MINE PORTAL LOCATION
- EXISTING COW PORTAL
- UPGRADED WATER TREATMENT PLANT
- WRSF DISCHARGE LOCATION TO LOWHEE CREEK
- PROPOSED TREATED DISCHARGE / DIFFUSER PIPELINE
- PROPOSED BURIED POTABLE WATER LINE
- BONANZA FLOOD MANAGMENT SYSTEM PIPELINE
- ACCESS ROAD
- UNDERGROUND WASTE HAULING ROUTE - PROJECTED TO SURFACE

KEY MAP



REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, BARKERVILLE HISTORIC TOWN/PARK, CITIES (INSET), PROVINCIAL BORDERS (INSET) OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LAND AND NATURAL RESOURCE OPERATIONS.
2. HILLSHADE DERIVED FROM LIDAR DATA FLOWN BY MCELHANNEY CONSULTANTS LTD. JUNE 27, 2016.
3. BASE DATA SOURCE: ESRI, GEOBASE, NRCAN, AND THE GIS USER COMMUNITY.
4. INSET TOPOGRAPHIC MAP © ESRI AND ITS LICENSORS. USED UNDER LICENSE, ALL RIGHTS RESERVED.
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SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, IGN, AND THE GIS USER COMMUNITY.

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CARIBOO GOLD PROJECT

GROUNDWATER MONITORING PLAN

MINE SITE MONITORING LOCATIONS

REV.	DESCRIPTION	DATE	INITIALS
0	FINAL - APPROVED	2023-05-30	J.L.
0	FINAL - REVIEWED	2023-05-30	S.R.
0	FINAL	2023-05-30	J.P.

PROJECT NO.	PHASE	REV.	FIGURE
1774160	40000	0	**2.2-1**

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596500 597000 597500 598000

5881500 5881000

N

Lowhee Creek
Watsons Gulch
Stouts Gulch
Emory Gulch

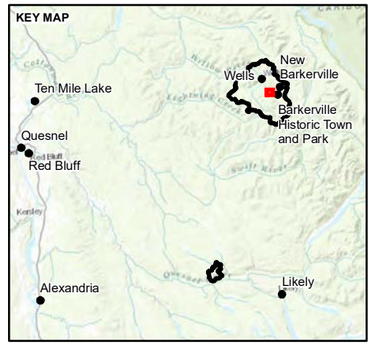
BCVN-17-023 VWP 1
BCVN-17-023 VWP 2
BCVN-17-023 VWP 3
BCVN-17-023 VWP 4
BCVN-17-022
WRSF-BH21-VWP13
WRSF-BH21-MW13A
WRSF-BH21-MW13B
MW21-10
New Well 1
BCVN-17-025
MW16-10D
MW16-10S
MW21-09
MW6-BL
MW16-09 VWP1
MW16-09 VWP2
MW16-09 VWP3
MW3
MW16-08 VWP
MW16-08
MW4
BLMW2D
BLMW2S
MW5

1550 1600 1650 1450 1500 1550 1600 1650 1500 1500 1550 1600 1650 1450 1500 1550 1600 1650

LEGEND

- GROUNDWATER MONITORING LOCATIONS – WATER QUALITY/WATER LEVELS
- GROUNDWATER MONITORING LOCATIONS – WATER LEVELS
- RESOURCE ROAD
- WATERCOURSE
- CONTOUR (10 m)
- PROPOSED SURFACE FOOTPRINT
- BONANZA LEDGE INFRASTRUCTURE (NEW)
- BONANZA SUMP LOCATION
- UPGRADED WATER TREATMENT PLANT
- WRSF DISCHARGE LOCATION TO LOWHEE CREEK
- BONANZA FLOOD MANAGMENT SYSTEM PIPELINE
- BONANZA LEDGE SITE WRSF ACCESS ROAD (EXISTING A ROAD, NO UPGRADE)
- EMERGENCY WRSF ACCESS ROAD (EXISTING C ROAD, NO UPGRADE)
- ACCESS ROAD

KEY MAP



REFERENCE(S)

1. TRAILS, WATER FEATURES, ROADS, OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LAND AND NATURAL RESOURCE OPERATIONS.
2. IMAGERY (2017 AND 2019) PROVIDED BY ODV.
3. BASE DATA SOURCE: ESRI, GEOBASE, NRCAN, AND THE GIS USER COMMUNITY.
4. INSET TOPOGRAPHIC MAP © ESRI AND ITS LICENSORS. USED UNDER LICENSE, ALL RIGHTS RESERVED.

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CARIBOO GOLD PROJECT

GROUNDWATER MONITORING PLAN

BONANZA LEDGE MONITORING LOCATIONS

REV.	DESCRIPTION	DATE	INITIALS
0	FINAL - APPROVED	2023-05-30	J.L.
0	FINAL - REVIEWED	2023-05-30	S.R.
0	FINAL	2023-05-30	J.P.

PROJECT NO.	PHASE	REV.	FIGURE
1774160	40000	0	**2.2-2**

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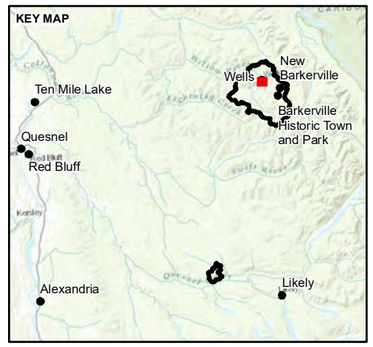
595000
595500
596000
5884500
5884000

Baker St
Jones Ave
Sanders Ave
Blair Ave
Blanchette St
Richardson Lane
Pooley St
Davies Rd
Mildred Ave
Margaret Ave
Burnett Ave
Bowman Cres
Willow River
Camel Dr
Hoy St
Covey St
Barkerville Hwy
Cold Quartz Dr
District of Wells MW
Gardner St
Mooney Lane
Legion Dr
Schlenkel Dr
Lowhee Rd
Hong St
Ski Hill Rd
access road
rest area

MW-19-07
New Well 3
New Well 4
New Well 6
New Well 5
MINE SEEPAGE 2
MW-09-091A
MW-09-091B
MW-09-091C
MW-19-08S
MW-19-08D
MW18-02a
MW18-02b
New Well 8
New Well 7
MW-09-063A
MW-09-063B
MINE SEEPAGE 3
MW-09-052
New Well 9
New Well 10
BFA-BH21-08 - VWP8
BFA-BH21-04 - VWP4
BFA-BH21-03 - VWP3b
BFA-BH21-03 - VWP3a
MW-09-029A
MW-09-029B
BFA-BH21-09 - VWP9a
BFA-BH21-09 - VWP9b
MW-09-026
New Well 11
MINE SEEPAGE 5
MW-09-007A
MW-09-007B
MW-09-007C
MW18-03b

LEGEND

- GROUNDWATER MONITORING LOCATIONS – WATER QUALITY/WATER LEVELS
- GROUNDWATER MONITORING LOCATIONS – WATER LEVELS
- HIGHWAY/ROAD
- GROUNDWATER SEEPAGE AREA
- PROPOSED INFRASTRUCTURE
- PROPOSED MINE SITE SURFACE SEDIMENT POND
- PROPOSED SURFACE DISTURBANCE AREA
- PROPOSED SURFACE FOOTPRINT
- PROPOSED UNDERGROUND FOOTPRINT
- PROPOSED VENTILATION RAISE
- PROPOSED TREATED DISCHARGE / DIFFUSER PIPELINE
- PROPOSED BURIED POTABLE WATER LINE
- FIBRE OPTIC LINE ACCESS ROAD (EXISTING B ROAD, NO UPGRADE)
- EMERGENCY WRSF ACCESS ROAD (EXISTING C ROAD, NO UPGRADE)
- VENTILATION RAISE ACCESS ROAD
- UNDERGROUND WASTE HAULING ROUTE - PROJECTED TO SURFACE



REFERENCE(S)
1. TRAILS, WATER FEATURES, ROADS, OBTAINED FROM THE B.C. MINISTRY OF FORESTS, LAND AND NATURAL RESOURCE OPERATIONS.
2. IMAGERY (2017 AND 2019) PROVIDED BY ODV.
3. BASE DATA SOURCE: ESRI, GEOBASE, NRCAN, AND THE GIS USER COMMUNITY.
4. INSET TOPOGRAPHIC MAP © ESRI AND ITS LICENSORS. USED UNDER LICENSE, ALL RIGHTS RESERVED.

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100 0 100
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CARIBOO GOLD PROJECT

GROUNDWATER MONITORING PLAN

MINE SITE COMPLEX MONITORING LOCATIONS

REV.	DESCRIPTION	DATE	INITIALS
0	FINAL - APPROVED	2023-05-30	J.L.
0	FINAL - REVIEWED	2023-05-30	S.R.
0	FINAL	2023-05-30	J.P.

PROJECT NO.	PHASE	REV.	FIGURE
1774160	40000	0	**2.2-3**

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Table 2.2–1: Bonanza Ledge Site Groundwater Monitoring Program

Location	Rationale	Hydrostratigraphic Unit	Monitoring Depth (mbgs)	Water Sampling Frequency	Water Level Frequency
BLMW2D	Monitor groundwater associated with Lower Stouts Gulch Catchment Area and to the east of the Bonanza Ledge Site Infrastructure.	Bedrock	34.5-39.3	Quarterly*	Quarterly Download and Manual Measurements
BLMW2S	Monitor groundwater associated with Lower Stouts Gulch Catchment Area and to the east of the Bonanza Ledge Site Infrastructure.	Overburden	15.2-16.7	Quarterly*	Quarterly Download and Manual Measurements
MW3	Monitor groundwater down-gradient of the Bonanza Ledge Site Open Pit.	Bedrock	47.2-53.3	Quarterly*	Quarterly Download and Manual Measurements
MW4	Monitor groundwater down-gradient of Pond S2.	Bedrock	37.9-44	Quarterly*	Quarterly Download and Manual Measurements
MW5	Monitor groundwater associated with Lower Stouts Gulch Catchment Area and to the east of the Bonanza Ledge Site Infrastructure.	Bedrock	32.3-38.4	Quarterly*	Quarterly Download and Manual Measurements
MW6-BL	Monitor groundwater up-gradient of the Bonanza Ledge Site Infrastructure.	Bedrock	64.0-71.6	Quarterly*	Quarterly Download and Manual Measurements
MW16-10D[2]	Monitor groundwater northwest of the existing WRSF.	Bedrock	16.2-22.2	Quarterly*	Quarterly Download and Manual Measurements
MW16-10S[2]	Monitor groundwater northwest of the existing WRSF.	Overburden	4.5-7.5	Quarterly*	Quarterly Download and Manual Measurements
MW21-09[2]	Monitor groundwater immediately down-gradient of the existing WRSF.	To be confirmed	To be confirmed	Quarterly*	Quarterly Download and Manual Measurements
MW21-10	Monitor groundwater immediately down-gradient of the existing WRSF.	To be confirmed	To be confirmed	Quarterly*	Quarterly Download and Manual Measurements
New Well 1	Monitor groundwater down-gradient of the Project WRSF	Overburden or Shallow Bedrock (to be confirmed by field drilling observations and location of water table)	To be determined[1]	Quarterly*	Quarterly Download and Manual Measurements
WRSF-BH21-13-VWP	Monitor water levels near the Bonanza Ledge Site to support groundwater flow interpretation and groundwater model verification.	Bedrock	6.96	Not applicable	Quarterly Download and Manual Measurements
WRSF-BH21-13A	Monitor water levels near the Bonanza Ledge Site to support groundwater flow interpretation and groundwater model verification.	Bedrock	16.5-18.0	Not applicable	Quarterly Download and Manual Measurements
WRSF-BH21-13B	Monitor water levels near the Bonanza Ledge Site to support groundwater flow interpretation and groundwater model verification.	Overburden	7.3-8.8	Not applicable	Quarterly Download and Manual Measurements
MW16-08	Monitor water levels near the Bonanza Ledge Site to support groundwater flow interpretation and groundwater model verification.	Bedrock	67.7-73.7	Not applicable	Quarterly Download and Manual Measurements
MW16-08 VWP	Monitor water levels near the Bonanza Ledge Site to support groundwater flow interpretation and groundwater model verification.	Bedrock	28.2	Not applicable	Quarterly Download
MW16-09 VWP	Monitor water levels near the Bonanza Ledge Site to support groundwater flow interpretation and groundwater model verification.	Bedrock	16.0, 23.5 and 37.6	Not applicable	Quarterly Download
BCVN-17-022	Monitor water levels near the Bonanza Ledge Site to support groundwater flow interpretation and groundwater model verification.	Bedrock	174.6-191.8	Not applicable	Quarterly Download and Manual Measurements
BCVN-17-023 VWP	Monitor water levels near the Bonanza Ledge Site to support groundwater flow interpretation and groundwater model verification.	Bedrock	68.3, 93.3, 103.3 and 116.7	Not applicable	Quarterly Download
BCVN-17-025	Monitor water levels near the Bonanza Ledge Site to support groundwater flow interpretation and groundwater model verification.	Bedrock	143-152	Not applicable	Quarterly Download and Manual Measurements

Notes: mbgs = metres below ground surface; VWP = vibrating wire piezometer; * = Samples will be analyzed for dissolved and total metals, sulphate, chloride, nutrients, pH, and total suspended solids; 1- Screened interval to be determined based on subsurface conditions encountered during drilling; 2- Water level monitoring to continue until well is destroyed during construction

Table 2.2–2: Mine Site Complex Groundwater Monitoring Program

Location	Rationale	Hydrostratigraphic Unit	Monitoring Depth (mbgs)	Water Sampling Frequency	Water Level Frequency
Mine Seepage 1	Monitor seepage from existing underground development.	Not Applicable	Not Applicable	Quarterly when flowing*	Not Applicable
Mine Seepage 2	Monitor seepage from existing underground development.	Not Applicable	Not Applicable	Quarterly when flowing*	Not Applicable
Mine Seepage 3	Monitor seepage from existing underground development.	Not Applicable	Not Applicable	Quarterly when flowing*	Not Applicable
Mine Seepage 5	Monitor seepage from existing underground development.	Not Applicable	Not Applicable	Quarterly when flowing*	Not Applicable
New VWP 1	Monitor groundwater near the Lowhee underground development to support model verification.	Bedrock	To be determined[1]	Not applicable	Quarterly Download
New Well 2	Monitor groundwater near the Lowhee underground development.	Bedrock	To be determined[1]	Quarterly*	Quarterly Download and Manual Measurements
MW18-02A	Monitor seepage between Mine Seepage 2 and Willow River	Glaciolacustrine	18.3-22.9	Quarterly*	Quarterly Download and Manual Measurements
MW18-02B	Monitor seepage between Mine Seepage 2, underground development, and Willow River.	Bedrock	121.3-127.4	Quarterly*	Quarterly Download and Manual Measurements
District of Wells Monitoring Well	Monitor groundwater in the Wells Aquifer.	Wells Aquifer	Unknown	Quarterly*	Quarterly Download and Manual Measurements
MW19-07	Monitor groundwater in the Wells Aquifer.	Wells Aquifer	26.2-29.2	Quarterly*	Quarterly Download and Manual Measurements
MW19-08D	Monitor groundwater in the Wells Aquifer.	Wells Aquifer	43.0-44.5	Quarterly*	Quarterly Download and Manual Measurements
MW19-08S	Monitor groundwater in Placer Outwash / Alluvial Fan.	Place Outwash / Alluvial Fan	4.6-6.1	Quarterly*	Quarterly Download and Manual Measurements
New Well 3	Monitor groundwater in Bedrock.	Bedrock	To be determined[1]	Quarterly*	Quarterly Download and Manual Measurements
New Well 4	Monitor groundwater in the Wells Aquifer.	Wells Aquifer	To be determined[1]	Quarterly*	Quarterly Download and Manual Measurements
New Well 5	Monitor groundwater in the Wells Aquifer.	Wells Aquifer	To be determined[1]	Quarterly*	Quarterly Download and Manual Measurements
New Well 6	Monitor groundwater in Placer Outwash.	Placer Outwash	To be determined[1]	Quarterly*	Quarterly Download and Manual Measurements
New Well 7	Monitor groundwater in the Wells Aquifer.	Wells Aquifer	To be determined[1]	Quarterly*	Quarterly Download and Manual Measurements
New Well 8	Monitor groundwater downgradient of the Mine Site Complex Sediment Control Pond near the Willow River.	Till / Lowlands	To be determined[1]	Quarterly*	Quarterly Download and Manual Measurements
New Well 9	Monitor groundwater in the Wells Aquifer.	Wells Aquifer	To be determined[1]	Quarterly*	Quarterly Download and Manual Measurements
New Well 10	Monitor groundwater downgradient of the Mine Site Complex Sediment Control Pond.	Mill Tailings	To be determined[1]	Quarterly*	Quarterly Download and Manual Measurements
MW09-026	Monitor groundwater downstream of the Mine Site Complex Sediment Control Pond and Groundwater Seepage Area.	Mill Tailings	2.5-4	Quarterly*	Quarterly Download and Manual Measurements
New Well 11	Monitor groundwater in the Wells Aquifer (if present).	Wells Aquifer (if present)	To be determined[1]	Quarterly*	Quarterly Download and Manual Measurements
MW-LL-16-02A	Monitor groundwater downgradient of Mosquito Creek Operations.	Bedrock	50.4 - 53.5	Quarterly*	Quarterly Download and Manual Measurements
MW-LL-16-02B	Monitor groundwater downgradient of Mosquito Creek Operations.	Overburden	15.2 – 16.8	Quarterly*	Quarterly Download and Manual Measurements
New VWP 2	Monitor groundwater near Mosquito Creek Operations to support model verification.	Bedrock	To be determined[1]	Not applicable	Quarterly Download
New Well 12	Monitor groundwater near Mosquito Creek Operations.	Bedrock	To be determined[1]	Quarterly*	Quarterly Download and Manual Measurements
New Well 13	Monitor shallow groundwater downgradient of Mine Seepage 1 and Mosquito Creek Operations.	Overburden	To be determined[1]	Quarterly*	Quarterly Download and Manual Measurements
MW18-01A	Monitor groundwater to support groundwater flow interpretation and groundwater model verification.	Overburden	4.9-6.4	Not applicable	Quarterly Download and Manual Measurements
MW18-01B	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Bedrock	224.2-230.3	Not applicable	Quarterly Download and Manual Measurements

Location	Rationale	Hydrostratigraphic Unit	Monitoring Depth (mbgs)	Water Sampling Frequency	Water Level Frequency
MW18-03B	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Bedrock	143.6-149.6	Not applicable	Quarterly Download and Manual Measurements
MW18-04B	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Bedrock	308.2-314.3	Not applicable	Semi-annual Download and Manual Measurements
MW09-007A	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Mill Tailings	1.3-2.8	Not applicable	Quarterly Download and Manual Measurements
MW09-007B	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Glaciolacustrine	14.4-15.8	Not applicable	Quarterly Download and Manual Measurements
MW09-007C	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Glaciolacustrine	25.1-26.8	Not applicable	Quarterly Download and Manual Measurements
MW09-029A	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Mill Tailings	1.1-2.6	Not applicable	Quarterly Download and Manual Measurements
MW09-029B	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Glaciolacustrine	8.0-9.5	Not applicable	Quarterly Download and Manual Measurements
MW09-052	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Mill Tailings	1.2-2.6	Not applicable	Quarterly Download and Manual Measurements
MW09-063A[2]	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Placer Outwash / Alluvial Fan	2.2-3.6	Not applicable	Quarterly Download and Manual Measurements
MW09-063B[2]	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Glaciolacustrine	9.2-10.7	Not applicable	Quarterly Download and Manual Measurements
MW09-091A	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Placer Outwash / Alluvial Fan	2.2-3.6	Not applicable	Quarterly Download and Manual Measurements
MW09-091B	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Glaciolacustrine	6.8-8.3	Not applicable	Quarterly Download and Manual Measurements
MW09-091C	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Glaciolacustrine	13.7-15.2	Not applicable	Quarterly Download and Manual Measurements
BFA-BH21-03 - VWP3a	Monitor water levels downstream of the Mine Site Complex Sediment Control Pond near the Groundwater Seepage Area.	Glaciolacustrine	19.81	Not applicable	Quarterly Download
BFA-BH21-03 - VWP3b	Monitor water levels downstream of Mine Site Complex Sediment Control Pond near the Groundwater Seepage Area.	Mill Tailings	6.71	Not applicable	Quarterly Download
BFA-BH21-04 - VWP4[2]	Monitor water levels near the Groundwater Seepage Area.	Placer Outwash / Alluvial Fan	4.88	Not applicable	Quarterly Download
BFA-BH21-08 - VWP8	Monitor water levels downstream of the Mine Site Complex Sediment Control Pond.	Glaciolacustrine	12.19	Not applicable	Quarterly Download
BFA-BH21-09 - VWP9a	Monitor water levels downstream of the Mine Site Complex Sediment Control Pond.	Mill Tailings	6.10	Not applicable	Quarterly Download
BFA-BH21-09 - VWP9b	Monitor water levels downstream of the Mine Site Complex Sediment Control Pond.	Placer Outwash / Alluvial Fan	2.13	Not applicable	Quarterly Download
MW-HL-16-02	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Bedrock	93.7-121.1	Not applicable	Quarterly Download and Manual Measurements
MW-HL-16-03	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Bedrock	63.1-110	Not applicable	Quarterly Download and Manual Measurements
MW-LL-16-01A	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Bedrock	39.3-42.4	Not applicable	Quarterly Download and Manual Measurements

Location	Rationale	Hydrostratigraphic Unit	Monitoring Depth (mbgs)	Water Sampling Frequency	Water Level Frequency
MW-LL-16-01B	Monitor water levels to support groundwater flow interpretation and groundwater model verification.	Overburden	4.6-6.1	Not applicable	Quarterly Download and Manual Measurements
MW-LL-16-03A	Monitor groundwater near the Ballarat Camp / Regional Water.	Overburden	47.1–50.2	Semi-annually*	Semi-annual Download and Manual Measurements
MW-LL-16-03B	Monitor groundwater near the Ballarat Camp / Regional Water.	Overburden	7.32–8.8	Semi-annually*	Semi-annual Download and Manual Measurements
MW-LL-16-04A	Monitor groundwater down-gradient of the Bonanza Ledge Site at Black Jack Gulch upstream of Williams Creek.	Bedrock	13.41–16.5	Semi-annually*	Semi-annual Download and Manual Measurements
MW-LL-16-04B	Monitor groundwater down-gradient of the Bonanza Ledge Site at Black Jack Gulch upstream of Williams Creek.	Overburden	4.6-6.1	Semi-annually*	Semi-annual Download and Manual Measurements

Notes: mbgs = metres below ground surface; VWP = vibrating wire piezometer; * = Samples will be analyzed for dissolved and total metals, sulphate, chloride, nutrients, pH, and total suspended solids; 1- Screened interval to be determined based on subsurface conditions encountered during drilling; 2- Water level monitoring to continue until wells is destroyed during construction

2.2.2 Mine Site Complex

Table 2.2–2 summarizes the locations to be monitored at the Mine Site Complex for groundwater quality and/or groundwater levels. The monitoring network includes existing wells or vibrating wire piezometers (VWPs) that have been installed either as part of previous baseline characterization or as part of supplemental investigations, as well as new wells and VWPs proposed to augment the existing monitoring network.

Twelve new wells and two new vibrating wire piezometers are identified for the Mine Site Complex to complement the existing monitoring network, based on where predicted changes in groundwater levels are expected and where groundwater seepage from the underground may occur at closure. The screened depth and/or sensor elevations will be optimized based on observed drilling conditions, and the monitoring location may be adjusted somewhat based on access restrictions, while still maintaining the objective of the monitoring location. Five of the new wells are targeting the Wells Aquifer to provide supplemental characterization of the aquifer extents and vertical and hydraulic gradients within the valley. The new monitoring locations in the Wells Aquifer are paired with new and/or existing wells in the underlying and/or overlying hydrostratigraphic units to be able to monitor changes in vertical gradients/flow directions.

In addition to groundwater monitoring at monitoring wells and vibrating wire piezometers, underground seepage surveys will be conducted to monitor enhanced permeability zones that contribute to increased groundwater inflows. Enhanced permeability zones will be noted as encountered during mining and in annual underground seepage surveys.

The new wells in the Mine Site Complex (New Well 3 to New Well 11) and the new well and VWP in the Lowhee Creek underground development area (New Well 2 and VWP 1) will be installed in Year -1 during the Construction Phase, prior to the start of mining at the Lowhee underground development. The new wells and VWP near Mosquito Creek Operations (New Well 12, New Well 13, and VWP 2) will be installed at least 90 days prior to dewatering the historical underground workings in the Island Mountain area.

2.3 Monitoring Methods

2.3.1 Water Level Monitoring

Manual groundwater level readings will be collected in monitoring locations at the same frequency as the groundwater quality monitoring program. Using a water level meter, the depth to water will be recorded, and the stickup height of the monitoring well measured. The water levels will be recorded at each location prior to initiating purging or sampling of the well. If pressure is released when the cap is removed, this information will be recorded in field notes. The meter will be cleaned thoroughly before and after monitoring each well.

Each monitoring location will also be monitored with continuous data loggers, where possible. Continuous monitoring (at a minimum frequency of daily) will provide information on seasonal and temporal groundwater fluctuations.

2.3.2 Groundwater Sampling

Groundwater sampling will be conducted in alignment with methods described in the British Columbia Field Sampling Manual (MOE 2013) by trained mine personnel or contractors retained by ODV. Groundwater sampling methods will remain consistent with the methods used for baseline data collection from monitoring wells, which consisted of purging and sampling using a Waterra inertial pump. If sampling challenges are encountered due to depth of the well screen interval or static water level using a Waterra intertial pump, alternate sampling methods will be employed. For samples collected from areas of groundwater seepage, grab samples will be collected from the flowing water using a syringe. When required for the selected analysis, samples will be field filtered using Waterra in-line 25-micron filters.

In-situ measurements will be made with a field meter that has been appropriately calibrated. Field meters will be used to measure turbidity, water temperature, conductivity, pH, and dissolved oxygen.

2.3.3 Laboratory Analysis

Sample collection will be documented on Chain of Custody sheets and in field notes, as applicable. Samples will be stored and transported in coolers packed with ice packs and will be submitted to applicable laboratories in a timely manner so that the sample storage times are not exceeded. If, for any reason, samples do not reach the laboratory within the maximum sample hold time for individual parameters, the results of the specific parameters will be qualified, or the samples will not be analyzed for the specific parameters.

The samples will be submitted to Canadian Association of Laboratory Accreditation (CALA) accredited laboratories for analysis of parameters. Analytical methods for physico-chemical parameters will be consistent with the British Columbia Environmental Laboratory Manual (MOE 2020).

Consistent with surface water quality monitoring for the Project, groundwater samples will be monitored for contaminants of concern, including dissolved and total metals, sulphate, chloride, nutrients, pH, and total suspended solids.

2.3.4 Data Management and Quality Assurance / Quality Control

When laboratory data are received, the data will be reviewed prior to entry into a database to verify the correct analyses were conducted, that method blank results were below reported detection limits, and that matrix spikes and laboratory duplicates meet the laboratory specified data quality

objectives. The data will also be reviewed for outliers or unusual results, and the analytical laboratory will be contacted to resolve identified data quality issues.

The quality assurance / quality control (QA/QC) program will further include:

- Following standard operating procedures (SOPs) for groundwater sampling and use of properly calibrated sampling equipment;
- Collection of field duplicate samples at a rate of approximately 10%;
- Collection of field blanks to assess for potential contamination of field sampling equipment and methods; and
- Collection of trip blanks to assess for potential contamination from laboratory equipment and analysis, storage, and transport.
- Use of chain-of-custody forms in the transportation of samples

Field blanks will be prepared in the field using deionized water to fill a set of sample containers, which will then be submitted to the laboratory for the same analysis as field water samples. Field blanks will be used to detect potential sampling contamination during collection, shipping, and analysis.

Travel blanks will be prepared and preserved at the analytical laboratory prior to the sampling trip using laboratory-provided deionized water. The sample will remain unopened throughout the duration of the sampling trip. Travel blanks will be used to detect potential sample contamination during transport, storage, and lab analysis.

Duplicate samples will be collected during sampling from the same well. They will be labelled, preserved individually, and submitted for identical analysis. Duplicate samples will be used to assess variability in water quality at the sampling site and lab analysis.

2.4 Reporting

Groundwater quality results from the groundwater stations outlined in this plan will be compared to the BC Contaminated Sites Regulations and Standards, Schedule 3.2 for groundwater quality. The sample analysis data and field measurement data will be submitted in an electronic format suitable for entry into the Environmental Monitoring System, the provincial repository for environmental monitoring data.

The information gathered during groundwater monitoring will be summarized annually. The annual report will provide a summary of monitoring results and identify existing or developing water quality trends or issues. Groundwater reporting will be done in alignment with BC Ministry of Environment and Climate Change Strategy (ENV) Technical Guidance 4, Annual Reporting Under the *Environmental Management Act* – A Guide for Mines in British Columbia (MOE 2016).

Monitoring data will be evaluated in comparison to expected Project-related changes in groundwater conditions in the study area. If negative groundwater quantity or quality is identified through interpretation of collected data, a review of the sampling frequency, parameters of interest, and sampling locations will be conducted. Recommendations will be included for changes in the monitoring network based on this comparison, including, but not limited to:

- Changes to monitoring and sampling frequency;
- Adding or relocating monitoring locations;
- Developing new contingency plans;
- Updating conceptual and numerical models developed for the site; and
- Adopting mitigation strategies.

The Groundwater Monitoring Plan is not a fixed document and components of the Plan may be revised over the life of the Project. It is expected that the Plan may be updated annually, if required, based on the review of collected groundwater monitoring data.

3. REFERENCES

MOE (BC Ministry of Environment). 2013. British Columbia Field Sampling Manual for Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples, 2013 Edition (Permittee).

MOE. 2016. Technical Guidance 4, *Environmental Management Act* Authorizations, Annual Reporting Under the *Environmental Management Act* – A Guide for Mines in British Columbia. Version 1.1, January 2016.

MOE. 2020. British Columbia Environmental Laboratory Manual.

APPENDIX A DECLARATION OF COMPETENCY FORM

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Declaration of Competency

The Ministry of Environment and Climate Change Strategy relies on the work, advice, recommendations and in some cases decision making of qualified professionals[1], under government's professional reliance regime. With this comes an assumption that professionals who undertake work in relation to ministry legislation, regulations and codes of practice have the knowledge, experience and objectivity necessary to fulfill this role.

1. Name of Qualified Professional: Jennifer Levenick

   Title: Senior Hydrogeologist

2. Are you a registered member of a professional association in B.C.? ☑ Yes ☐ No

   Name of Association: EGBC (PEng) Registration #: 35959

3. Brief description of professional services:

   Mine Site Groundwater Monitoring Plan preparation

This declaration of competency is collected under section 26(c) of the *Freedom of Information and Protection of Privacy Act* for the purposes of increasing government transparency and ensuring professional ethics and accountability. By signing and submitting this statement you consent to its publication and its disclosure outside of Canada. This consent is valid from the date submitted and cannot be revoked. If you have any questions about the collection, use or disclosure of your personal information please contact the Ministry of Environment and Climate Change Strategy Headquarters Office at 1-800-663-7867.

Declaration

I am a qualified professional with the knowledge, skills and experience to provide expert information, advice and/or recommendations in relation to the specific work described above.

Signature: 

X

Print Name: Jennifer Levenick

Witnessed by: 

X

Print Name: Sean Weston

Date signed: April 19, 2024

[1] *Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who*

a) is registered in British Columbia with a professional association, is acting under that organization's code of ethics, and is subject to disciplinary action by that association, and

b) through suitable education, experience, accreditation and knowledge, may reasonably be relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

QR MILL SURFACE AND GROUNDWATER MONITORING PLAN

April 2024



OSISKO DEVELOPMENT

Cariboo Gold Project

PO Box 250
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Wells, BC V0K 2R0

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REVISION HISTORY

Rev. No.	Date	Author	Description
0	October 2023	KCB	Issued for the Revised Permit Application
1	February 2024	KCB	Removed E8 and Weir 9 from Table C-2
2	April 2024	KCB	Issued as stand-alone report for inclusion in WSP's Human Health Monitoring and Management Plan

ABBREVIATIONS

Terminology used in this document has been defined where it is first used, while the following list has been presented to assist readers that choose to review only portions of the document.

Abbreviation	Description
BCCSR	British Columbia Contaminated Sites Regulation
BCFSM	British Columbia Field Sampling Manual
BCWOG-FAL	British Columbia Water Quality Guidelines for Freshwater Aquatic Life
CGP	Cariboo Gold Project
DL	Detection Limit
FSTSF	Filtered Stack Tailings Storage Facility
JAIR	Joint Application Information Requirements
MDMER	Metal and Diamond Mining Effluent Regulations
MZP	Main Zone Pit
NLP	North Lobe Pit
ODV	Osisko Development Corp.
QA	Quality Assurance
QC	Quality Control
QR	Quesnel River
SSCP	South Seepage Collection Pond
TDS	Total Dissolved Solids
TSF	Tailings Storage Facility
TSS	Total Suspended Solids
WAD	Weak Acid Dissociable
WBWQM	Water Balance and Water Quality Model
WMP	Water Management Plan

Prepared by:

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Water Resources Engineer
Klohn Crippen Berger Ltd.

CLARIFICATION REGARDING THIS REPORT

This report is an instrument of service of Klohn Crippen Berger Ltd. (KCB). The QR Mill Surface and Groundwater Monitoring Plan has been prepared for the use of Osisko Development Corp. (ODV) for the specific application to the Quesnel River Mill component of the Cariboo Gold Project and may be published or disclosed by ODV as part of the Joint Permit Application for *Mines Act* and *Environmental Management Act* Permits.

KCB has prepared this report in a manner consistent with the level of care, skill and diligence ordinarily provided by members of the same profession for projects of a similar nature at the time and place the services were rendered; however, the use of this report will be at the user's sole risk absolutely and in all respects, and KCB makes no warranty, express or implied. This report may not be relied upon by any person other than ODV or the British Columbia Ministry of Environment and Climate Changes Strategy and Ministry of Energy, Mines and Low Carbon Innovation, without KCB's written consent.

Use of or reliance upon this instrument of service by ODV is subject to the following conditions:

1. The report is to be read in full, with sections or parts of the report relied upon in the context of the whole report.
2. The observations, findings and conclusions in this report are based on observed factual data and conditions that existed at the time of the work and should not be relied upon to precisely represent conditions at any other time.
3. The report is based on information provided to KCB by ODV or by other parties on behalf of ODV (ODV-supplied information). KCB has not verified the correctness or accuracy of such information and makes no representations regarding its correctness or accuracy. KCB shall not be responsible to ODV for the consequences of any error or omission contained in ODV-supplied information.
4. KCB should be consulted regarding the interpretation or application of the findings and recommendations in the report.

1. INTRODUCTION

This report presents the proposed surface and groundwater monitoring program for the Cariboo Gold Project (CGP) at the Quesnel River (QR) Mill Site. The program includes:

- discharge and surface water quantity monitoring;
- surface water quality sampling;
- discharge water quality monitoring to evaluate compliance with permit criteria;
- receiving environment water quality monitoring to assess the surface water pathway and potential for effects to aquatic receptors;
- effluent water quality sampling;
- groundwater quality sampling to assess water quality trends and potential impacts due to seepage; and
- groundwater level monitoring to understand groundwater flow.

1.1 JAIR Requirements

This plan is intended to meet the requirements of Section 9.6 of the 2019 Joint Application Information Requirements (JAIR) for *Mines Act* and *Environmental Management Act* permits (EMPR and ECCS 2019). According to the JAIR, the plan should include a detailed summary of all surface water and groundwater monitoring that will occur within the mine site boundary and in the receiving environment for each phase of mine life. The plan should include the following information for both surface water and groundwater monitoring:

- objectives;
- monitoring methods;
- monitoring locations, including a detailed map showing each location;
- rationale for the distribution of monitoring locations (including depths, where relevant), and how they relate to the maintenance and improvement of the site-wide water balance model (Section 5.3), surface water quality model (Section 5.4), and groundwater model (Section 5.5);
- for groundwater, information must be provided on the range of monitoring depths that will be included for each individual monitoring location;
- parameters of concern to be measured at each location;
- sampling frequency and period, including high, medium, and low-flow periods;

- analytical testing standard operating procedures to be used;
- Quality Assurance/Quality Control (QA/QC) protocols;
- name of the certified laboratories used to analyze samples;
- comparisons to relevant guidelines and objectives;
- methods for data analyses;
- reporting schedule; and
- any other relevant information.

1.2 Regulatory Context

There are two site-specific permits that currently govern effluent discharge, tailings deposition, and water management at the QR Mill Site:

- *Mines Act* Permit M-198, issued July 18, 1994 and last amended on October 18, 2021 (BC EMLI 2021).
- *Environmental Management Act* Permit PE-12601, issued March 3, 1994 and last amended on March 18, 2022 (BC ECCS 2022).

2. SURFACE WATER QUALITY AND QUANTITY

2.1 Objective

The objectives of the QR Mill surface water monitoring program are to:

- monitor water treatment plant performance;
- monitor impacts to the receiving environment as a result of authorized effluent discharge or accidental and emergency releases;
- determine the volume of effluent discharge;
- verify the effectiveness of the environmental protection activities and implement improvements to the WMP if targets are not achieved;
- provide information for site maintenance, such as measures to improve Total Suspended Solids (TSS);
- establish hydrologic conditions of the QR Mill Site; and
- provide information for updates to the site-wide Water Balance and Water Quality Model (WBWQM).

2.2 Regulatory Requirements

The parameters currently required by Permit PE-12601 (referred to as “Analytics” in the permit and in Table 2.2 and Table 4.1 to be monitored at all monitoring locations includes:

- Dissolved and Total Metals: Table 4.1 presents requirements to meet water quality guidelines for the protection of aquatic life;
- Nutrients: ammonia (NH_4), nitrite (NO_2), nitrate (NO_3), total nitrogen, total and dissolved phosphorus, orthophosphate;
- Organics: dissolved organic carbon (total organic carbon not specified, assume accidental omission);
- Physical parameters: laboratory measurements of pH, hardness, specific conductance, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), turbidity;
- Major anions: alkalinity, acidity, chloride, fluoride, bromide, sulphate;
- Cyanide: total and Weak Acid Dissociable (WAD); and
- Field measurements: pH, temperature, dissolved oxygen, turbidity, specific conductance.

Thiosalts can cause delayed acidity in the downstream environment. Therefore, to inform the water treatment design, it is recommended to include total thiosalts (sum of thiosulfate,

trithionate, and tetrathionate) as part of the monitoring program at process water and tailings contact water monitoring stations (see Table 2.2).

For permitted effluent being discharged to the environment, Permit PE-12601 also requires:

- 96-hour LC50 rainbow trout toxicity test; and
- *48-hour LT50 Daphnia magna* bioassays (acute toxicity testing).

Monitoring requirements also address those of the Metal and Diamond Mining Effluent Regulations (MDMER) of the *Fisheries Act* (DFO 2022) (Table 2.1), and consist of the following components at the Final Discharge Point(s) for:

- effluent flow measurements (as per MDMER Division 2, Section 19);
- effluent sampling for chemical analyses (as per MDMER Division 2, Sections 12 and 13);
- effluent acute lethality testing (as per MDMER Division 2, Sections 14, 15, 16, and 17);
- effluent sublethal toxicity testing (as per MDMER Schedule 5, Part 1, Sections 5 and 6); and
- surface water quality sampling at the effluent point of entry (as per MDMER Schedule 5, Part 1, Section 7).

Table 2.1 Effluent Monitoring Required by MDMER

Sampling Location	Frequency	Required Monitoring under MDMER
At effluent final discharge point.	Weekly[1]	Effluent flow measurements for calculation of monthly loadings. Effluent grab or composite samples for pH, TSS, and MDMER Schedule 4 deleterious substances.
	Monthly[2]	Acute toxicity testing – 96-hour rainbow trout LC50, and 48-hour *Daphnia magna* LC50.
	Bi-annual[3]	Sublethal toxicity testing (i.e., developmental, reproductive, or survival effects) – fish, invertebrate, plant, and algal species.
Point of entry in receiving environment.	Quarterly[4]	Surface water quality sampling during periods of active discharge at the effluent point of entry.

Notes:

1. Weekly monitoring frequency may be reduced to quarterly sample collections if monthly mean concentrations are less than 10% of MDMER Schedule 4 limits (for the 12 months immediately preceding the most recent test). Sampling may not occur less than 24 hours apart (see MDMER Division 2, Section 12 and Section 13).
2. The required frequency of acute toxicity testing may change (i.e., increase or decrease) depending on the results of acute toxicity tests. The frequency of sampling may be increased if acute lethality is observed. The frequency of sampling may be decreased to once in a calendar quarter if the effluent is determined to be not acutely lethal for 12 consecutive months. Grab sampling may not occur less than 15 days apart (see MDMER Division 2, Sections 15 and 16).
3. After three years, the tests shall be conducted once per calendar quarter on the species referred to in subsection 5(1) or (2), as the case may be, whose results for all the tests conducted in accordance with subsections (1) and (2) — including such tests conducted in addition to the number required by those subsections — produce the lowest geometric mean, taking into account the inhibition concentration that produces a 25% effect or an effective concentration of 25% (see MDMER Schedule 5, Part 6, Section 3).
4. Sampling may not occur less than one month apart (see MDMER Schedule 5, Part 1, Section 7). Given that the site streams ice over during winter months, samples will be collected approximately monthly during ice free periods rather than quarterly. In accordance with Section 25(1) of the MDMER, if it is not possible to collect the samples at these times due to safety concerns or access problems, Osisko Development Corp. (ODV) will notify the Director and indicate an alternative sampling date.

2.3 Monitoring Program

Most surface water monitoring locations currently required under Permit PE-12601 will continue to be monitored during the CGP construction and operations phase.

The CGP construction phase includes drawdown of the existing Tailings Storage Facility (TSF) pond, enlargement of the South Seepage Collection Pond (SSCP) and construction of the Sediment Pond. The CGP operations phase includes placement of the filtered tailings in the Filtered Stack Tailings Storage Facility (FSTSF) and maintenance of the FSTSF ephemeral pond which will capture FSTSF runoff. Temporary covers will be used during FSTSF construction and are intended to reduce contact between the tailings and the runoff as well as reduce infiltration into these tailings. Discharge to the receiving environment will come from the Water Treatment Plant (WTP) and the Sediment Pond (pending approval) provided it meets criteria for discharge.

The current monitoring locations, as well as additional proposed locations, are summarized in Table 2.2 and shown on Figure 2.1.

Table 2.2 CGP Effluent Discharge and Surface Water Monitoring Program

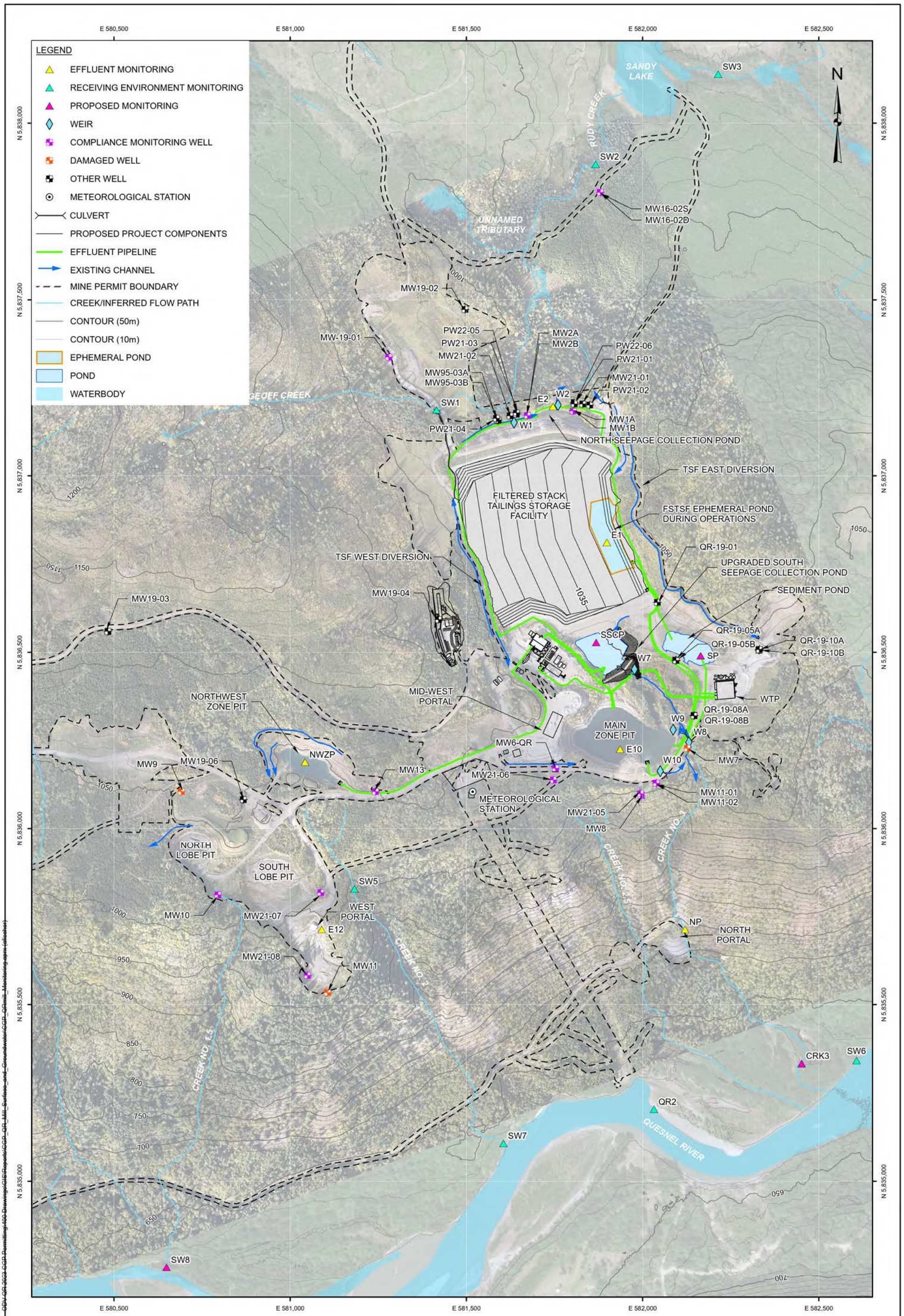
Monitoring Site ID	Stream/Site	EMS[1] Reference	Site Rationale	Frequency	Parameters
Effluent Monitoring					
E1	FSTSF Ephemeral Pond (formally TSF supernatant)	E220177	Mine contact water storage. Monitor to understand effectiveness of temporary covers and for model validation.	Monthly Quarterly Weekly	Analytics[2] Total thiosalts Water Level
E2	NSCP	E221632	Mine contact water (TSF/FSTSF seepage).	Monthly Weekly	Analytics[2] Water Level
WTP[6]	WTP effluent	E326313	Post-treatment to determine WTP is meeting discharge criteria.	Weekly Daily Continuous	Analytics[2] pH, Conductivity, Temperature Flow
WTP-R[6]	WTP retentate	E327923	Deposited in MZP. Monitor to assess treatment efficiency.	Weekly Daily Continuous	Analytics[2] pH, Conductivity Flow
E8 **(REMOVE)**	West Zone North Lobe	E221637	**ODV proposes to remove this monitoring site.** The NLP does not retain water or discharge to the environment due to breakthrough to the pit floor in 2012.	**REMOVE**	**REMOVE**
E10	MZP supernatant	E221639	Mine contact water storage. Monitor for model validation.	Monthly Quarterly Weekly	Analytics[2] Total thiosalts Water Level
E12	West Zone Portal discharge	E235980	Authorized discharge location for legacy mine contact water. Underground workings discharge from portal discharge.	Monthly Monthly Weekly	Analytics[2] Rainbow Trout 96 hr, Daphnia Magna 48 hr LC 50, Single Concentration, Total and Dissolved Metals, hardness, pH, SO4, Conductivity and TSS Flow
NP	North Zone Portal discharge	E268144	Monitoring will continue and will inform mitigation strategies (such as a pump-back system) for the North Portal discharge.	Monthly (during non-winter months) Monthly (during non-winter months) Monthly (during non-winter months)	Analytics[2] Rainbow Trout 96 hr, Daphnia Magna 48 hr LC 50, Single Concentration Total and Dissolved Metals, hardness, pH, SO4, Conductivity and TSS Flow
W2 (Weir 2)	Weir 2: Treated effluent from WTP Outlet	E327925	Authorized discharge location for WTP treated effluent. Monitor to ensure compliance with permit criteria.	Weekly Monthly Daily	Analytics[2] Rainbow Trout 96 hr, Daphnia Magna 48 hr acute lethality in full strength effluent[5] Flow
Mid-west Portal (proposed)	Mid-west Portal	-	Portal drainage is captured in the MZP. Proposed monitoring to obtain baseline information.	Monthly	Analytics[2] Flow
SSCP (proposed)	SSCP	-	Mine contact water storage. Monitor for model validation.	Monthly Weekly	Analytics[2] +Total thiosalts Water Level
Weir 7	SSCP Discharge to the MZP Diversion	E324291	SSCP Seepage Outflow. Monitor for model validation.	Monthly Weekly	Analytics[2] +Total thiosalts Flow
SP (proposed)	Sediment Pond	-	Monitor sediment pond water to ensure it meets criteria for discharge to the receiving environment via Weir 8.	Monthly Weekly	Analytics[2] Water Level
W8	Weir 8: Sediment Pond discharge	E324292	Proposed discharge location for Sediment Pond provided it meets discharge criteria.	Weekly Daily	Analytics[2] Flow
W9 **(REMOVE)**	Weir 9 : Main Zone Pit Diversion	E327926	**ODV proposes to remove this monitoring site as this is immediately downstream of Weir 7.**	**REMOVE**	**REMOVE**
NWZP	North-west Zone Pit	E327927	Legacy pit. Monitor for closure planning.	Quarterly	Analytics[2] Water Level

Monitoring Site ID	Stream/Site	EMS[1] Reference	Site Rationale	Frequency	Parameters
Receiving Environment Monitoring					
SW1	Geoff Creek	E221659	Located upstream of TSF/FSTSF and mine-impacted seepage and discharge. Reference location for monitoring background water quality (i.e., non-mine contact water).	Monthly Monthly	Analytics[2] Water Level + Flow
SW2	Rudy Creek upstream of Sandy Lake	E221660	Monitor potential impacts in the receiving environment due to E2 discharge and non-point discharge (i.e., TSF/FSTSF seepage).	Monthly Twice annually – 5 samples collected in 30 days[3] Continuous Quarterly	Analytics[2] +Total thiosalts[4] Analytics[2] Water Level + Flow Sub-lethal toxicity tests[7]
SW3	Rudy Creek downstream of Sandy Lake	E221661	Monitor potential impacts in the receiving environment due to E2 discharge and non-point discharge (i.e., TSF/FSTSF seepage).	Monthly Twice annually – 5 samples collected in 30 days[3] Continuous	Analytics[2] +Total thiosalts[4] Analytics[2] Water Level + Flow
SW5	Creek No. 2 downstream of West Zone Road	E221663	Monitor potential impacts in the receiving environment due to legacy mining activities.	Twice annually (late spring and fall)	Analytics[2]
SW6	Quesnel River u/s of QR Mine	E240061	Quesnel River upstream of mine-impacted streams and discharges. Reference location for monitoring background water quality (i.e., non-mine contact water).	Twice annually (late spring and fall)	Analytics[2]
SW7	Quesnel River d/s of QR Mine	E240063	Quesnel River downstream of mine-impacted streams and discharges (downstream of Creeks No. 3, No. 2.5, and No. 2).	Twice annually (late spring and fall)	Analytics[2]
QR2	Quesnel River downstream of Creeks No. 2.5 and 3	E240062	Quesnel River downstream of TSF/FSTSF and MZP impacted streams and discharges (downstream of Creeks No. 3 and No. 2.5).	Twice annually (late spring and fall)	Analytics[2]
SW8[8] (proposed)	Quesnel River d/s of QR Mine	-	Proposed Quesnel River monitoring to capture all potential impacted streams and discharges (downstream of Creeks No. 3, No. 2.5, No. 2, and No. 1.5).	Twice annually (late spring and fall)	Analytics[2]
CRK3 (proposed)	Creek No. 3 Wetland north of Quesnel River	-	Proposed Creek No. 3 location before it joins the Quesnel River. Monitor potential impacts in the receiving environment due to upstream CGP activities and a legacy waste rock pile located within the watershed.	Same frequency as North Portal during first year to establish baseline; twice annually (late spring and fall) thereafter.	Analytics[2]

FSTSF = Filtered Stack Tailings Storage Facility; TSF = Tailings Storage Facility; NSCP= North Seepage Collection Pond; WTP = water treatment plant; MZP = Main Zone Pit; NLP = North Lobe Pit; SSCP = South Seepage Collection Pond.

Notes:

1. The provincial reporting database system is known as EMS.
2. Analytics include all parameters listed in Table 4.1. The minimum analytical detection limits for each parameter must be suitable for comparison with the applicable standards listed in the most recent approved and working British Columbia Water Quality Guidelines for Freshwater Aquatic Life (BCWQG-FAL) (BC ECCS 2021a).
3. Five samples in 30 days will be collected during spring freshet (May-June) and late fall (Oct to Dec) periods for the purpose of comparison to the average BCWQG-FAL. Samples to be as evenly spaced as possible over the 30 days.
4. If thiosalts are detected at SSCP, E1 or E10, then add total thiosalts to SW2 and SW3 monthly testing program.
5. Acute toxicity results exceeding 50% mortality compared to control, will result in a follow-up multi-concentration acute toxicity sample and initiation of a 5 in 30 sampling program at discharge location and downstream exposure sites SW2 and SW3.
6. WTP samples/measurements are only collected during active treatment. The WTP performance monitoring plan is provided in the operating and maintenance manual. The current Permit PE-12601 uses water treatment system, instead of WTP.
7. ODV must conduct quarterly sub-lethal toxicity tests with full strength creek water from site SW2 including but not limited to a test for early life stage rainbow trout, invertebrates, and algae. Reporting requirement is presented in Section 5.
8. Add SW8 to the monitoring program if monitoring wells MW10 and MW21-08 show increasing arsenic trends and if safe access to SW8 is possible.



NOT FOR CONSTRUCTION

SCALE 0 500m

NOTES:
1. DATUM/PROJECTION: NAD83, UTM ZONE 10N
2. 2019 ORTHOPHOTO PROVIDED BY BGM, SUPPLEMENTED WITH IMAGERY FROM ESRI
3. CONTOURS(10m) DERIVED FROM 2019 LIDAR PROVIDED BY BGM

FOR THE MUTUAL PROTECTION OF OUR CLIENT, THE PUBLIC, AND KLOHN CRIPPEN BERGER, ALL DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT, AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, CONCLUSIONS, OR ABSTRACTS FROM OR REGARDING OUR DRAWINGS IS RESERVED PENDING OUR WRITTEN APPROVAL.

CLIENT: OSISKO DEVELOPMENT

Klohn Crippen Berger

PROJECT: CARIBOO GOLD PROJECT QR MILL
SURFACE AND GROUNDWATER MONITORING PLAN

TITLE: MONITORING LOCATIONS

SCALE	PROJECT No.	FIG No.
1:10,000	M09672A24	2.1

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3. GROUNDWATER QUALITY AND QUANTITY

3.1 Objective

The objectives of the QR Mill groundwater monitoring program are to:

- characterize seepage water quality and identify potential flow pathways;
- provide information for use in the site hydrogeologic model and WBWQM; and
- assess the potential effects of CGP activities on the receiving environment.

3.2 Regulatory Requirements

The sample parameters required by Permit PE-12601 (referred to as “Analytics” in the permit) includes the following:

- Dissolved and Total Metals: Table 4.1 presents requirements to meet water quality guidelines for the protection of aquatic life.
- Nutrients: NH_4, NO_2, NO_3, total nitrogen, total and dissolved phosphorus, orthophosphate.
- Physical parameters: pH, hardness, specific conductance, TSS, TDS, turbidity.
- Major anions: alkalinity, acidity, chloride, fluoride, bromide, sulphate, cyanide.
- Organics: Total and dissolved organic carbon.
- Field measurements: pH, temperature, dissolved oxygen, turbidity, specific conductance.

3.3 Monitoring Programs

Most groundwater monitoring locations required under Permit PE-12601 will continue to be monitored during CGP; as well proposed new sites (summarized in Table 3.1 and shown on Figure 2.1).

Table 3.1 Groundwater Sampling Programs

Monitoring Well ID	Screened Depth (m) and Hydrostratigraphic Unit	EMS	Site Rationale	Frequency	Parameters
MW1A	6.2 - 9.2 Shallow bedrock	E221460	Monitors impacts due to seepage downgradient (to the north) of the TSF/FSTSF, just north of the Tailings Dam.	Three times annually (spring, summer, and fall/winter)	Analytics Groundwater elevation
MW1B	3.1 - 6.1 Till above bedrock contact	E221641		Three times annually	Analytics Groundwater elevation
MW2A	10.7 - 13.7 Shallow bedrock	E221642		Three times annually (spring, summer, and fall/winter)	Analytics Groundwater elevation
MW2B	4.6 - 7.6 Till above bedrock contact	E221643		Three times annually (spring, summer, and fall/winter)	Analytics Groundwater elevation
MW16-02S	3.27 - 4.27 Till above bedrock contact	E327915	Monitors impacts due to seepage downgradient (to the north) of the TSF/FSTSF, near SW2.	Semi-annual (late spring[1] and fall[2])	Analytics Groundwater elevation
MW16-02D	24 - 30 Shallow bedrock	E327914		Semi-annual (late spring[1] and fall[2])	Analytics Groundwater elevation
MW21-05 (replaces MW8)	Unknown	E327917	Monitors impacts due to seepage downgradient of MZP.	Semi-annual (late spring[1] and fall[2])	Analytics Groundwater elevation
MW21-06 (replaces MW6-QR)	Unknown	E327918		Semi-annual (late spring[1] and fall[2])	Analytics Groundwater elevation
MW11-01	39.6 - 48.8 Deep bedrock[5]	E327911		Semi-annual (late spring[1] and fall[2])	Analytics Groundwater elevation
MW10[3]	Depth not available Deep bedrock5	E221654	Monitors impacts due to seepage downgradient of North Lobe Pit.	Semi-annual (late spring[1] and fall[2])	Analytics Groundwater elevation
MW21-07	Unknown	E327919	Monitors impacts due to seepage downgradient of South Lobe Pit.	Semi-annual (late spring[1] and fall[2])	Analytics Groundwater elevation

Monitoring Well ID	Screened Depth (m) and Hydrostratigraphic Unit	EMS	Site Rationale	Frequency	Parameters
MW21-08	Unknown	E327920	Monitors impacts due to seepage downgradient of West Zone Portal.	Semi-annual (late spring[1] and fall[2])	Analytics Groundwater elevation
MW13	Depth not available Deep bedrock5	E221657	Monitors impacts due to seepage downgradient of Northwest Pit.	Semi-annual (late spring[1] and fall[2])	Analytics Groundwater elevation
MW16-01S	3.15 - 4.15 Gravelly Till	E327913	Monitors impacts due to seepage downgradient (to the south) of TSF/FSTSF. These two wells will continue to be monitored until inundated by expansion of the SSCP. No new wells proposed as replacement as seepage reports to MZP. Seepage downgradient of MZP is monitored.	Semi-annual (late spring[1] and fall[2])	Analytics Groundwater elevation
MW16-01D	18.85 - 25.05 Shallow bedrock	E327912		Semi-annual (late spring[1] and fall[2])	Analytics Groundwater elevation
MW19-01	8.4 – 10.2 Shallow bedrock	E327916	Monitors water quality upgradient of TSF/FSTSF at New Sand Borrow Area. Reference location for monitoring background water quality (i.e., non- mine contact water).	Semi-annual (late spring[1] and fall[2])	Analytics Groundwater elevation
MW19-03 (Proposed)	7.2 – 8.7 Shallow bedrock	Proposed	Proposed to be added to monitoring program as reference location to monitor background water quality upgradient of mine impact. Located next to main road north of North lobe pit and borrow areas.	Semi-annual (late spring[1] and fall[2])	Analytics Groundwater elevation
QR-19-08A	7.6 – 12.8 Shallow bedrock	E327921	Monitors impacts due to seepage downgradient of the FSTSF, East Waste Rock Pile.	Semi-annual (late spring[1] and fall[2])	Analytics Groundwater elevation
QR-19-08B	2.4 – 4.4 Gravelly Till	E327922		Semi-annual (late spring[1] and fall[2])	Analytics Groundwater elevation

Notes:

1. Late spring means the period of the years where groundwater levels are expected at their highest, following freshet.
2. Fall means the period of the year where groundwater levels are expected to be at their lowest.
3. Historical debris and blockage in well, creates sampling challenges, MW21-08 added downslope.
4. Groundwater elevation is either recorded continuously via pressure transducers with dataloggers (if installed in the well) or collected manually in the field (if pressure transducer is not installed or is not functioning).
5. From Table 13 of Hydrogeology Existing Conditions Report (Golder 2021).

4. FIELD DATA AND WATER SAMPLE COLLECTION

Surface and groundwater sampling will be conducted by trained personnel according to the procedures, protocols, and safety considerations described in the British Columbia Field Sampling Manual (BC FSM) (BC MOE 2013).

4.1 Field Observation and Measurements

Sampling event observations will be recorded and include at a minimum: water level and/or flow, water colour, any odours, and presence of sediment at the time of sampling. Additional observations may include anything unusual, such as pressure being released upon removal of a monitoring well cap, observations of damage to monitoring well casings, or obstructions upstream of downstream of surface water monitoring locations.

In-situ field measurements will be made with a handheld multiparameter water quality meter that has been calibrated according to the manufacturer's instructions. The calibration results will be logged and maintained for future reference. Water quality meters will be used to measure at a minimum: pH, specific conductance, temperature, turbidity, and dissolved oxygen. Additional parameters that can be measured in situ include TSS, Oxidation Reduction Potential.

Surface water level and flow measurements will be obtained using staff gauges, conventional flow meters, or the volumetric flow (bucket and stopwatch) method. Manual flow measurements will be used to check and calibrate the continuous flow measuring devices at least once per year. Analysis of the flow measurements will be conducted by a qualified hydrologist according to the Manual of British Columbia Hydrometric Standards Version 2.0 (BC ECCS 2018) and the Hydrological Guidelines for Waterpower Projects (LWBC 2005)

Some groundwater wells have pressure transducers installed to record continuous water levels to a datalogger. Manual groundwater level readings will be collected using a water level meter to measure the depth to water. The stickup height of the PVC casing above ground surface will also be recorded. In order to obtain representative groundwater elevations, the water level measurements will be collected before purging or sampling. The water level meter will be cleaned thoroughly before and after use in each well.

4.2 Collecting Samples

Sample collection bottles, filter syringes and filters, and sample preservatives (i.e., sulphuric acid or nitric acid) will be ordered ahead of time from the laboratory. Sample collection, filtering, and preservation of water quality samples will be conducted according to laboratory instructions.

Note that sample preservatives may already be included in the sample bottles provided by the laboratory, so the bottles should not be emptied prior to sample collection or overfilled during sampling collection.

It is important to prevent contamination of the laboratory bottles prior to sample collection. If it is not possible to fill the bottles directly, a clean receptacle triple rinsed with deionized water can be used to collect water to distribute between bottles. Note that prior to groundwater sample collection, the standing water from the well from must be purged.

Sample collection will be documented on Chain of Custody forms (one copy remains for the site and one copy travels with the samples) and in field notes as applicable. Samples will be stored and transported in coolers packed with ice packs and will be submitted to the selected laboratory or laboratories within the sample storage time.

In addition, trip blanks, field blanks, and duplicate samples will be prepared, recorded, and included with the shipment (see Section 4.4).

4.3 Laboratory Analysis

Samples will be submitted to Canadian Association of Laboratory Accreditation accredited laboratories for analysis of water quality parameters specified in Permit PE-12601. Analytical methods will be consistent with the British Columbia Environmental Laboratory Manual (BC ECCS 2020).

Table 4.1 provides a comprehensive list of the water quality parameters recommended to included in the sampling program along with the rationale for inclusion.

Toxicity testing will be conducted following applicable protocols:

- Acute lethality testing: Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout EPS1/RM/13 (Environment Canada 2016a).
- *Daphnia magna* testing: Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to '*Daphnia magna*' EPS1/RM/14 (Environment Canada 2016b).

Table 4.1 Water Quality Parameters Recommended for Sampling Programs

Parameter	Surface Water Sampling	Groundwater Sampling	Reason for Inclusion
Total Ammonia (NH3 and NH4+) as nitrogen	Y	Y	BCWQG-FAL/BCCSR
Nitrate as nitrogen	Y	Y	BCWQG-FAL/BCCSR
Nitrite as nitrogen	Y	Y	BCWQG-FAL/BCCSR
Total nitrogen	Y	Y	Modelling water chemistry
Total phosphorous	Y	Y	BCWQG-FAL

Parameter	Surface Water Sampling	Groundwater Sampling	Reason for Inclusion
Dissolved phosphorous	Y	Y	Modelling water chemistry
Orthophosphate	Y	Y	Modelling water chemistry
Dissolved organic carbon	Y	Y	BCWQG-FAL
Total organic carbon	Y	Y	BCWQG-FAL
pH	Y	Y	BCWQG-FAL
Hardness	Y	Y	Needed to calculate certain guidelines
Specific conductance	Y	Y	Modelling water chemistry
TSS	Y	Y	BCWQG-FAL/BCCSR
TDS	Y	Y	Modelling water chemistry
Turbidity	Y	Y	BCWQG-FAL
Alkalinity	Y	Y	BCWQG-FAL
Acidity	Y	Y	Modelling water chemistry
Chloride	Y	Y	BCWQG-FAL/BCCSR
Fluoride	Y	Y	BCWQG-FAL
Bromide	Y	Y	Modelling water chemistry
Sulphate	Y	Y	BCWQG-FAL/BCCSR
Total Cyanide	Y	Y	BCWQG-FAL
Free Cyanide	Y	Y	No applicable guideline, but part of cyanide speciation
WAD Cyanide	Y	Y	BCWQG-FAL
Cyanate[1]	Y	Y	Cyanide destruction product. Required for modelling water chemistry.
Thiocyanate[1]	Y	Y	
Total thiosalts[1] (thiosulfate, trithionate, and tetrathionate)	Y	Y	Included for tracking mill reagents (currently no data)
Aluminum	Y	Y	BCWQG-FAL
Antimony	Y	Y	BCWQG-FAL/BCCSR
Arsenic	Y	Y	BCWQG-FAL/BCCSR
Barium	Y	Y	BCWQG-FAL/BCCSR
Beryllium	Y	Y	BCWQG-FAL/BCCSR
Boron	Y	Y	BCWQG-FAL/BCCSR
Cadmium	Y	Y	BCWQG-FAL/BCCSR
Calcium	Y	Y	Modelling water chemistry
Chromium	Y	Y	BCWQG-FAL/BCCSR
Cobalt	Y	Y	BCWQG-FAL/BCCSR

Parameter	Surface Water Sampling	Groundwater Sampling	Reason for Inclusion
Copper	Y	Y	BCWQG-FAL/BCCSR
Iron	Y	Y	BCWQG-FAL
Lead	Y	Y	BCWQG-FAL/BCCSR
Magnesium	Y	Y	Modelling water chemistry
Manganese	Y	Y	BCWQG-FAL
Total Mercury	Y	Y	BCWQG-FAL/BCCSR
Molybdenum	Y	Y	BCWQG-FAL/BCCSR
Nickel	Y	Y	BCWQG-FAL/BCCSR
Potassium	Y	Y	Modelling water chemistry
Selenium	Y	Y	BCWQG-FAL/BCCSR
Silver	Y	Y	BCWQG-FAL/BCCSR
Sodium	Y	Y	Modelling water chemistry
Thallium	Y	Y	BCWQG-FAL/BCCSR
Uranium	Y	Y	BCWQG-FAL/BCCSR
Zinc	Y	Y	BCWQG-FAL/BCCSR

Note:

1. Parameters recommended to be added to the current monitoring program. BCWQG-FAL includes both working and approved guidelines.

4.4 Quality Assurance and Quality Control

The purpose of a QA/QC program is to verify the reliability of monitoring data through the implementation of procedures for controlling and monitoring the measurement process. The QA/QC program provides information for the evaluation of the analytical procedures, and for identifying contamination in the field or laboratory. The QA/QC program is conducted at all stages of the sampling program; sample collection, transport, filtration, and analysis. Certified laboratories will conduct analytical QA/QC which is reported in the Certificate of Analysis. Additional information is found in the BC FSM (BC MOE 2013).

Batches of samples submitted for external laboratory analysis will contain a minimum of one duplicate, one trip blank (ordered ahead of time from the laboratory) and one field blank sample (de-ionized water) per parameter analyzed. Blank and duplicate samples will be prepared, preserved, and transported in the same fashion as the other samples.

Trip Blanks and Field Blanks

Field blanks, consisting of distilled de-ionized water, will be exposed to the same conditions and treatments as the water samples collected, and are intended to monitor contamination that may

occur during the sampling event. The standard method for field blanks is as follows: blanks are carried into the field by the sampling staff, bottles are filled with de-ionized distilled water and shipped to the analytical laboratory with the remainder of the samples for analysis.

Field Duplicates

Sample duplicates are intended to evaluate the QA/QC surrounding the sampling methods. Duplicates are prepared by collecting two full sample suites from one location at the same time. When the results are reported back from the analytical laboratory all parameters from the two sample suites are reviewed to confirm likeness or potential of sampling error/ contamination. The review process also considers small-scale natural variations in water quality which may occur over the time scale of collection (~10 minutes). In particular, there is considerable potential for variations in water quality over short-time scales during periods of high sediment loads.

For concentrations less than five times the Detection Limit (DL), the difference between the two duplicate values should not exceed twice the DL value. For concentrations at or greater than five times the DL, the relative percent difference[1] should not exceed 20%.

[1] For duplicate values where A is greater than B, the relative percent difference = 2*(A-B)/(A+B)*100.

5. REPORTING REQUIREMENTS

Effluent that is discharged to the receiving environment is compared to the Permit PE-12601 discharge limits for effluent quality. Receiving surface water quality results are compared to the BCWQG-FAL. Groundwater quality results are compared to the BC Contaminated Sites Regulation (BCCSR), Schedule 3.2 (BC ECCS 2021b).

5.1 Quarterly Water Quality Reporting

Quarterly water quality reporting will be prepared in accordance with Permit PE-12601, and will report on the following:

- Collect and maintain water sample analysis, flow and water level measurements, climate data and water balance, quality assurance data and field measurement data for inspection and submit the data, suitably tabulated, to the Director, Lhtako Dene Nation, Williams Lake First Nation and Xatśūll First Nation each quarter.
- Submit results of the quarterly sub-lethal toxicity testing from site SW2 to the Director, Lhtako Dene Nation, Williams Lake First Nation and Xatśūll First Nation, with a summary of the results, within 30 days of receiving the results from the laboratory.
- Submit all reports within 30 days of the end of the quarter during which the data were collected. Submit sample analysis data and field measurement data in an electronic format suitable for entry into the provincial database system known as EMS.
- Submit all data required to be submitted in this permit by email to the Ministry's Routine Environmental Reporting Submission Mailbox at envauthorizationsreporting@gov.bc.ca or as otherwise instructed by the director.

5.2 Annual Water Quality Reporting

Quarterly water quality reporting will be prepared in accordance with Permit PE-12601, and will report on the following:

- Before March 31st submit a comprehensive Annual Report for the preceding calendar year, to the Director by email at envauthorizationsreporting@gov.bc.ca or as otherwise instructed by the Director, in a form that is suitably tabulated, graphically represented and interpreted and signed off by a Qualified Professional, to the satisfaction of the Director.
- Provide a copy of the annual report to the Lhtako Dene Nation, Williams Lake First Nation and Xatśūll First Nation, at the time the report is submitted to the Director.
- Provide a copy of the annual report to the Quesnel Public Library within 30 days of the report being submitted to the Director.

- The Annual Report must include at minimum, the following:
  a. An evaluation of the impacts of the mining and milling operation on the receiving environment from the previous year.
  b. An update on the construction and performance of the tailings impoundment and dam, including a review of the results and analysis of hydrogeological data from the previous year.
  c. A review and update of the assessment of acid rock drainage potential and water quality impacts.
  d. An update on the progress on reclamation and any updating of the reclamation plan.
  e. The results of any Aquatic Effects Monitoring that may have been done.
  f. An updated Water Balance and Site Water Management Plan.
  g. A review of the Sulphate Adaptive Management Plan implementation.
  h. A review of the groundwater and surface water monitoring program results including:
     i. a review and interpretation of the monitoring data for the preceding calendar year;
     ii. a graphical analysis of any trends in monitoring results with interpretation by a qualified professional;
     iii. an evaluation of the required quality assurance program;
     iv. an evaluation of the performance of the treatment works, identifying any changes recommended;
     v. an update on the water treatment system and associated wastes management with an implementation schedule for any alterations to the treatment and disposal works which may impact the discharge under this Authorization;
     vi. a review of the WQ modeling update in the year it was conducted; and
     vii. a review and recommendations of the surface water Trigger Response Plans, the Sulphate Adaptive Management Plan and SW and GW monitoring programs.
- Include an annual summary of the sub-lethal toxicity testing from site SW2 in the Annual Report, suitably interpreted by a Qualified Professional.
- Submit a summary of annual effluent treatment and discharge rates, treatment system wastes production and disposal rates, and evaluation of the water treatment system efficiencies, with recommendations made by a Qualified Professional for any changes to the treatment process.
- Include results of the final mill tailings slurry sampling and the analytical laboratory results.

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APPENDIX D BASELINE RISK ESTIMATES, TRIGGER LEVELS AND SCREENING CRITERIA SELECTION

1. INTRODUCTION

This appendix provides the details of the health-based screening criteria selection (e.g., guidelines, standards) used in the development of trigger levels for relevant environmental parameters (soil, air, groundwater, surface water, sediment, and fish tissue) for the Human Health Monitoring and Management Plan (HHMMP). The development of trigger levels was required for the HHMMP as part of Condition #19 of Environmental Assessment Certificate (EAC) #M23-01 granted to the Cariboo Gold Project (the Project) and will be applicable for monitoring at the Mine Site (Mine Site Complex and Bonanza Ledge) and Quesnel River Mill (QR Mill) Project sites. The trigger levels will be used in the Trigger Response Plan that can identify circumstances that require Osisko Development Corp. (ODV) to implement alternative or supplementary mitigation measures, monitoring, or adaptive management. The Trigger Response Plan for the HHMMP is detailed in Section 5.0 of the main report.

As part of the Trigger Response Plan, trigger levels were established for each of the relevant environmental parameters required per Condition #19.3 including soil, groundwater, sediment, surface water, fish tissue, and air. Trigger levels were identified based on available screening criteria from various regulatory jurisdictions. Environmental quality criteria for sediment for the protection of human health are not available from regulatory jurisdictions, so soil quality screening criteria were used to identify triggers for sediments. Similarly, there are no screening criteria available for vegetation, so soil trigger levels and associated actions are used as a surrogate to assess the potential for effects to vegetation. In addition to the trigger levels, regional background or reference concentrations (from site-specific reference locations), if available, will be considered in the Trigger Response Plan. Applicable background concentrations are also discussed in this appendix.

A description of the screening criteria considered and the selection approach to identify trigger levels for the relevant environmental media is described in the following sections. In general, the selection approach and screening criteria considered in the 2022 Human Health and Ecological Risk Assessment (HHERA) prepared for the EAC Application were utilized for the development of trigger levels. It should also be noted that it is expected that trigger levels may require periodic updates as screening criteria and regulatory guidance are updated.

1.1 Regulatory Considerations

The Project is located in British Columbia (BC) and the HHMMP is being prepared under the *BC Environmental Assessment Act* (ENV 2021a). Therefore, preference was given to provincial legislation and guidance on selecting screening criteria. Federal guidance was used to supplement where provincial guidance was not available, or if federal guidance is more current. In BC, the applicable regulation under the Environmental Management Act is the Contaminated

Sites Regulation (CSR; BC Reg. 375/96, O.C. 1480/96, last amended 7 July 2021 by BC Reg 179/2021).

1.2 Environmental Parameters

For the development of trigger levels, health-based environmental quality criteria from federal, provincial, or international regulatory agencies, were considered for the relevant environmental parameters specified in Condition #19.3b of EAC #M23-01 for the Project. These environmental parameters are summarized in Table 1-1.

Table 1-1. Environmental Parameters Considered in the Development of Trigger Levels

Environmental Medium	Environmental Parameters	Sample/Monitoring Information	Applicable Plan
Soil and Vegetation	Metals[1]	Co-located soil and vegetation samples	HHMMP
	PAHs[3]		HHMMP
Air Quality	Metals[1]	Time-integrated sampling for metals bound to PM in air	AQMP
	PAHs[3]	Time-integrated sampling for PAHs bound to PM in air	AQMP
	$PM_{2.5}$ and PM_{10} Sulfur Dioxide Nitrogen Dioxide	-	AQMP
	Meteorological Parameters (wind speed, wind direction, relative humidity, temperature)	Continuous monitoring	AQMP
Groundwater	Metals[1]	-	GWMP
Surface Water	Metals[1]	Co-located surface water and fish tissue samples	AEMP
	PAHs[3]	-	AEMP
Sediment	Metals[1,2]	-	AEMP
Fish	Metals[1]	Co-located surface water and fish tissue samples	AEMP

Notes: AEMP – Aquatic Effects Monitoring Plan; AQMP – Air Quality Monitoring Plan; GWMP – Groundwater Monitoring Plan; HHMMP – Human Health Monitoring and Management Plan; PAH – polycyclic aromatic hydrocarbon; $PM_{2.5}$ and PM_{10} – Particulate matter (2.5 and 10 microns [µm]);- = not applicable;
[1]Metals parameters for monitoring include antimony, aluminum, arsenic, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, and cyanide.
[2]While metals analysis other than cyanide was not specified for sediment in Condition #19, for the purpose of considering potential effects from sediment for human health, the other metals parameters (i.e., antimony, aluminum, arsenic, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium) were recommended to be sampled in sediment for the HHMMP.
[3]PAH suite based on the EAC Application will be monitored.

2. SOIL

Soil screening criteria considered for the development of trigger levels are provided by land use type. Although some areas within the Project site footprints may be disturbed by existing mining operations (e.g., QR Mill) and future Project operations, which is reflective of industrial land use, residential land use was conservatively selected for the development of trigger response levels, where applicable. The following sources were considered for selecting soil screening criteria:

- British Columbia Contaminated Sites Regulation (BC CSR) Schedule 3.1 – Numerical Soil Standards (BC CSR 2023a) — The Numerical Soil Standards are typically based on an allocation of 20% of the provisional tolerable daily intake of soil (i.e., assuming 20% of a person's tolerable daily intake of a chemical comes from soil, and the remaining 80% comes from other sources such as food and water). The CSR soil standards are divided into six categories and two sub-categories based on land use: wildlands (subdivided into natural and reverted), agricultural, urban park, residential (subdivided into low density and high density), commercial, and industrial. The residential low density land use was considered applicable. The intake of contaminated soil site-specific factor from Schedule 3.1 – Part 1 Matrix Numerical Soil Standards was considered applicable for developing trigger response levels in soil. In the absence of this site-specific factor, generic human health standards from Schedule 3.1 – Part 2 Generic Numerical Soil Standards to Protect Human Health were presented.
- CCME (Canadian Council of Ministers of the Environment; current to 2024a) Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health—The CCME soil quality guidelines for protection of human health are typically based on an allocation of 20% of the provisional tolerable daily intake of soil (i.e., assuming 20% of a person's tolerable daily intake of a chemical comes from soil, and the remaining 80% comes from other sources such as food and water). The CCME soil quality guidelines are divided into categories based on land use (agricultural, residential/parkland, commercial, and industrial). The residential/parkland guidelines were considered applicable. The human health guidelines/check values for soil ingestion or direct contact were used. In the absence of these guidelines/check values, the generic guideline was presented.
- US EPA (United States Environmental Protection Agency; 2023a) Regional Screening Level (RSL) for Resident Soil—The US EPA RSLs are risk-based screening criteria that are based on an acceptable hazard quotient of 1 for non-carcinogens, and an acceptable incremental lifetime cancer risk of 1 in 1,000,000 for carcinogens. The British Columbia Ministry of the Environment and Climate Change (ENV) (2021a) and CCME (1999) apply a soil allocation factor of 20% in the derivation of soil criteria and Health Canada (2010, 2021a) considers a hazard quotient of 0.2 in order to account for background exposure. Therefore, for non-carcinogens, RSLs were adjusted by a factor of 0.2 to reflect an allocation of 20% of a person's tolerable daily intake from soil. ENV (2022) and Health Canada (2010, 2021a) consider an incremental lifetime cancer risk of 1 in 100, 000 to be acceptable. Therefore, for carcinogens, RSLs were adjusted to an incremental lifetime cancer risk of 1 in 100,000 to be consistent with provincial and federal guidance.

The following hierarchy was used to select the soil screening criteria for the development of trigger levels:

1) The more conservative value (i.e., lower) between:
    a. BC CSR residential low density pathway-specific standard;
    b. CCME residential/parkland pathway-specific standard;
2) US EPA RSL;
3) BC CSR generic human health standard; and
4) CCME generic guideline.

The soil quality criteria from the above agencies and the selected soil screening criteria are presented in Appendix D, Table D-2. The applicable regional background soil concentrations are available for the Cariboo region (Region 5) in Protocol 4 for Contaminated Sites: Establishing Local Background Concentrations in Soil (ENV 2021b). Regional background soil concentrations were also included in Table D-2.

3. GROUNDWATER

Health-based drinking water criteria were selected over aesthetic or operational criteria (i.e., criteria that were not derived specifically for human health). The following sources were considered for selecting groundwater screening criteria:

- ENV (2020a) Source Drinking Water Guidelines—The guidelines were developed to protect water quality used for drinking water purposes and apply to ambient water (e.g., rivers, lakes, and streams) prior to treatment and distribution. The guidelines are generally based on Health Canada's Guidelines for Canadian Drinking Water Quality (see below), but some were adopted from other jurisdictions or developed by ENV. The ENV (2020a) provides guidelines based on health and aesthetic effects:
  - MAC: Guideline established to be protective of health effects.
  - AO: Guideline is based on taste, smell, or colour and is not associated with health effects. An aesthetic objective was only selected in the absence of a MAC.
- BC CSR (2023b) Schedule 3.2 Generic Numerical Water Standards—The CSR water standards are divided into aquatic life (freshwater and marine), irrigation water, livestock water, and drinking water. The drinking water standards were considered applicable for human health and selected as the BC CSR drinking water standard.
- Health Canada (2022) Guidelines for Canadian Drinking Water Quality—The guidelines apply when groundwater or surface water may be used for drinking water purposes. Health Canada provides drinking water quality guidelines based on health effects and aesthetic effects as listed below:
  - Maximum Acceptable Concentration (MAC): Health-based guidelines, which are established based on the health effects associated with each parameter and exposure levels. Where available, MAC was selected preferentially over the aesthetic objective.
  - Aesthetic Objectives (AO): Based on aesthetic effects (e.g., taste, odour, and colour). An aesthetic objective was only selected in the absence of a MAC.

  Health Canada's health-based guidelines (or MACs) were established from comprehensive review of current, published scientific research (Health Canada 2022). The guidelines (or MACs) were generally derived using an average daily intake of 1.5 L of drinking water by a 70 kg adult. However, for some constituents, regulatory agencies have developed guidelines based on intake of the most sensitive sub-population (e.g., children). For non-carcinogenic constituents, a 20% allocation of the total daily intake to drinking water was generally applied (i.e., assuming 20% of a person's tolerable daily intake form a chemical comes from water, and the remaining 80% comes from other sources such as food), unless data on the proportion of total intake normally ingested in drinking water were available (Health Canada 1995).

- US EPA (2023a) RSL for Resident Tap Water—The tap water RSLs are risk-based criteria applicable to water at the point of exposure (e.g., from the tap, post-treatment). As discussed in Section 2 for soils, non-carcinogenic RSLs were adjusted to a hazard quotient of 0.2 and carcinogenic RSLs were adjusted to an incremental lifetime cancer risk of 1 in 100,000 to be consistent with provincial and federal guidance.

The following hierarchy was used to select the groundwater screening criteria for the development of trigger levels:

1) ENV Source Drinking Water Guideline (health-based);

2) ENV CSR drinking water standard;

3) Health Canada health-based guideline; and

4) US EPA RSL.

The groundwater screening criteria from the above agencies and the selected groundwater screening criteria are presented in Appendix D, Table D-3. The selected groundwater screening criteria are considered protective of both potable use and dermal contact.

4. SEDIMENT

Changes to sediment quality are not anticipated as a result of the Project as settled particles are not expected to be present in a large enough volume to be detectable. Potential changes to sediment quality will be monitored and addressed as part of the receiving environment monitoring programs.

Human health-based guidelines for sediment were unavailable from provincial, federal, and other jurisdictions; therefore, soil quality screening criteria for the protection of human health (described in Section 2) were used for sediment (BC CSR 2023a). ENV (2021c) recommends the use of soil screening criteria for identify chemicals of potential concern if substances are considered to be non-bioaccumulative. For bioaccumulative substances, ENV (2021c) recommends using ecological standards in CSR Schedule 3.4 to identify chemicals of potential concern in sediment for human health in a risk assessment. None of the environmental parameters in sediment were considered to be bioaccumulative; therefore, soil quality criteria were considered applicable for screening sediment and are presented in Appendix D, Table D-2.

5. SURFACE WATER

People who access the Site may use surface water as a drinking water source or come in contact with surface water during recreational activities (e.g., fishing, canoeing). Health-based drinking water criteria were selected over aesthetic or operational criteria (i.e., criteria that were not derived specifically for human health). The following sources were considered for selecting surface water screening criteria:

- ENV (2020) Source Drinking Water Guidelines—The guidelines were developed to protect water quality used for drinking water purposes and apply to ambient water (e.g., rivers, lakes, and streams) prior to treatment and distribution. The guidelines are generally based on Health Canada's Guidelines for Canadian Drinking Water Quality (see below), but some were adopted from other jurisdictions or developed by ENV. ENV (2020) provides guidelines based on health and aesthetic effects:
  - MAC: Guideline established to be protective of health effects. Where available, MAC was selected preferentially over the aesthetic objective.
  - AO: Guideline is based on taste, smell, or colour and is not associated with health effects. An aesthetic objective was only selected in the absence of a MAC.
- BC CSR (2023b) Schedule 3.2 Generic Numerical Water Standards—The CSR water standards are divided into aquatic life (freshwater and marine), irrigation water, livestock water, and drinking water. The drinking water standards were considered applicable for human health and selected as the BC CSR drinking water standard.
- Health Canada (2022) Guidelines for Canadian Drinking Water Quality—The guidelines apply when groundwater or surface water may be used for drinking water purposes. The drinking water quality guidelines are intended to be applied at the point of exposure (e.g., from the tap, post-treatment), but are used conservatively for the purpose of trigger level development for surface water. The Health Canada guidelines are described in more detail in Section 3.
- US EPA (2023a) RSL for Resident Tap Water—The tap water RSLs are risk-based criteria applicable to water at the point of exposure (e.g., from the tap, post-treatment), but are used conservatively for the purpose of trigger level development for surface water. As discussed in Section 2 for soil, non-carcinogenic RSLs were adjusted to a hazard quotient of 0.2 and carcinogenic RSLs were adjusted to an incremental lifetime cancer risk of 1 in 100,000.

The following hierarchy was used to select the surface water screening criteria for the development of trigger levels:

1) ENV Source Drinking Water Guideline (health-based);
2) ENV CSR drinking water standard;
3) Health Canada health-based guideline; and
4) US EPA RSL.

The surface water quality criteria from the above sources and the selected human health criteria are presented in Appendix D Table D-3. The selected surface water screening criteria are considered protective of both potable and recreational (e.g., dermal contact) use.

6. FISH TISSUE

Site-specific fish tissue screening criteria were derived using acceptable risk levels and fish ingestion rates appropriate for local Indigenous populations. Fish tissue criteria were calculated based on the Health Canada (2021a) equation for ingestion of foods as follows, which is similar to the approach used by ENV (2014) to calculate a fish ingestion guideline for selenium:

Equation 1

$$\text{Dose (mg/kg bw/day)} = \frac{C_{fish} \times IR_{fish} \times RAF_O \times D_2 \times D_3 \times D_4}{BW \times LE}$$

Where:

C_{fish} = concentration of constituent in fish muscle (mg/kg ww)

IR_{fish} = fish ingestion rate (kg/day)

RAF_O = oral relative absorption factor (unitless)

D_2 = days per week fish is consumed / 7 days

D_3 = weeks per year fish is consumed / 52 weeks

D_4 = total years consuming fish (for assessment of carcinogens only)

BW = body weight (kg)

LE = life expectancy (years) (for assessment of carcinogens only)

A hazard quotient is used to estimate non-carcinogenic risk as follows:

Equation 2

$$HQ = \frac{Dose}{RfD}$$

Where:

Dose = exposure dose for ingestion of fish muscle (mg/kg bw/day)

RfD = reference dose (mg/kg bw/day)

To calculate the non-cancer fish tissue screening criteria, the dose in Equation 1 is substituted for the reference dose multiplied by the hazard quotient (i.e., Equation 2 solved for the dose term). The resulting equation was then rearranged to solve for the fish tissue concentration (C_{fish}):

Equation 3

$$\mathrm{RfD} \times \mathrm{THQ} = \frac{\mathrm{C}_{fish} \times \mathrm{IR}_{fish} \times \mathrm{RAF_O} \times \mathrm{D_2} \times \mathrm{D_3}}{\mathrm{BW}}$$

Adjustments to Equation 3 include:

- The D_4 and LE terms were excluded as these are only applicable for carcinogens.
- The HQ term was changed to target hazard quotient (THQ)

The equation for calculating the non-cancer fish tissue criteria is presented below.

Equation 4

$$\mathrm{Non-cancer\ Screening\ Criteria\ (mg/kg\ ww)} = \frac{\mathrm{THQ} \times \mathrm{RfD} \times \mathrm{BW}}{\mathrm{IR_{fish}} \times \mathrm{RAF_O} \times D_2 \times D_3}$$

Where:

THQ = target hazard quotient (unitless)

RfD = reference dose (mg/kg/day)

BW = body weight (kg)

IR_{fish} = fish ingestion rate (kg/day)

RAF_O = oral relative absorption factor (unitless)

D_2 = days per week fish is consumed

D_3 = weeks per year fish is consumed

An incremental lifetime cancer risk is used to estimate carcinogenic risk as follows:

Equation 5

$$\mathrm{ILCR} = Dose \times SF$$

Where:

Dose = exposure dose for ingestion of fish muscle (mg/kg bw/day)

SF = slope factor $(mg/kg\ bw/day)^{-1}$

To calculate the cancer fish tissue screening criteria, the dose in Equation 1 is substituted for the incremental lifetime cancer risk divided by the slope factor (i.e., Equation 5 solved for the dose term). The resulting equation was then rearranged to solve for the fish tissue concentration (C_{fish}):

Equation 6

$$\frac{ILCR}{SF} = \frac{\mathrm{C}_{fish} \times \mathrm{IR}_{fish} \times \mathrm{RAF}_{\mathrm{O}} \times \mathrm{D}_2 \times \mathrm{D}_3 \times D_4}{\mathrm{BW} \times LE}$$

The ILCR term in Equation 6 was changed to target incremental lifetime cancer risk (TILCR).

The equation for calculating the cancer fish tissue criteria is presented below.

Equation 7

$$\text{Cancer Screening Criteria (mg/kg ww)} = \frac{\mathrm{TILCR} \times \mathrm{BW} \times \mathrm{LE}}{\mathrm{IR}_{\mathrm{fish}} \times \mathrm{SF} \times \mathrm{RAF}_{\mathrm{O}} \times D_2 \times \mathrm{D}_3 \times D_4}$$

Where:

TILCR = target incremental lifetime cancer risk (unitless)

BW = body weight (kg)

LE = life expectancy (years)

IR_{fish} = fish ingestion rate (kg/day)

SF = slope factor $(mg/kg/day)^{-1}$

RAF_O = oral relative absorption factor (unitless)

D_2 = days per week fish is consumed / 7 days

D_3 = weeks per year fish is consumed / 52 weeks

D_4 = total years consuming fish (years)

Non-cancer criteria were calculated for both a toddler and an adult. For mercury (assumed to be methylmercury), the criterion is protective of women of child-bearing age and children under 12 years of age. Cancer criteria were calculated for an adult only, as this is the life stage with the longest exposure duration (60 years) that would result in the most conservative criterion. The lowest calculated criterion (of the non-carcinogenic and carcinogenic criteria) was used to develop trigger levels for fish tissue. The inputs used to derive the fish tissue criteria are presented in D-4 in Appendix D.

Table 6-1: Inputs for Calculating Fish Tissue Criteria

Input	Units	Toddler	Adult	Source
Body weight (BW)	kg	16.5	70.7	Health Canada (2021a)
Fish ingestion rate (IR_{fish})	kg/day	0.050[a]	0.099	Adult ingestion rate from Chan et al. (2011)
Relative absorption factor for oral exposure (RAF_O)	-	1	1	Health Canada (2021a)
Target hazard quotient (THQ)	-	0.2	0.2	Health Canada (2021a)
Target incremental lifetime cancer risk (TILCR)	-	-	0.00001	BC ENV (2022); Health Canada (2021a)
Life expectancy (LE)	years	-	80	Health Canada (2021a)
Days per week fish is consumed (D_2)	days	7	7	Assumed
Weeks per year fish is consumed (D_3)	weeks	52	52	Assumed
Total years exposed to site (life stage duration) (D_4)	years	-	60	Health Canada (2021a)
Reference dose (RfD)	mg/kg/day	Chemical-specific (Appendix D, Table D-4)		
Slope factor (SF)	$(mg/kg/day)^{-1}$			

- = not applicable; kg = kilogram; kg/day = kilogram per day; mg/kg/day = milligrams per kilogram per day.

a. Toddler ingestion rate estimated assuming 50% of adult ingestion rate (Health Canada 2007).

Additional information on the inputs used to derive the fish tissue criteria are provided below:

- Fish consumption data from Chan et al. (2011) were used to calculate fish ingestion rates representative of local Indigenous populations. The highest heavy consumer (95th percentile) salmon (any type) ingestion rate was conservatively selected (0.099 kg/day, for men aged 19-50). The selected fish ingestion rate is more conservative than the Health Canada (2007) finfish consumption rate of 0.040 kg/day for the subsistence fisher. To adjust this adult consumption rate to a toddler consumption rate, the relative ingestion rates for fish consumption by toddlers (0.020 kg/day) and adults (0.040 kg/day) was used to derive a toddler consumption rate of 0.050 kg/day (Health Canada 2007).
- Toxicity reference values were selected preferentially from the US EPA IRIS (2024a) over Health Canada (2021b). If a TRV was not available from US EPA or Health Canada, then other sources were consulted (e.g., Agency for Toxic Substances and Disease Registry, Netherlands National Institute of Public Health and the Environment, World Health Organization) to identify a TRV based on the most current information. The TRVs used to calculate the fish tissue criteria are presented in Appendix D, Table D-5.

- Default body weights, life expectancy, and total years exposed to site were obtained from (Health Canada 2021a).
- The relative absorption factor for oral exposure was assumed to be 100% (Health Canada 2021a).
- The fish tissue criteria are based on a target hazard quotient of 0.2 and a target incremental lifetime cancer risk of 1 in 100,000 consistent with ENV (2022) and Health Canada (2021a) guidance.

ENV (2001) have derived a mercury fish tissue criterion for the protection of people consuming a diet based primarily on fish. Criteria were derived based on weekly consumption rates ranging from 210 to 1,050 g wet weight (ww), which corresponds to screening criteria ranging from 0.1 to 0.5 mg/kg ww for total mercury. However, the mercury (assumed to be methylmercury) fish tissue screening value was derived using the approach and equations presented above because it results in a more conservative screening value (0.013 mg/kg ww). The derived criterion is protective of women of child-bearing age and children under 12 years of age and the TRV was obtained from Health Canada (2021b).

ENV (2014) derived human consumption screening values for selenium based on high (220 g/day), moderate (111 g/day), and low (21.5 g/day) consumers of fish. The resulting fish tissue screening values for selenium are 1.83, 3.63 and 18.7 mg/kg ww, respectively. ENV (2014) calculated selenium screening values for an adult only and based on a target hazard quotient of 1. To account for toddler fish consumption, a target HQ of 0.2, and the site-specific fish ingestion rates, the selenium fish tissue screening value for both a toddler and adult was derived using the approach and equations presented above.

The fish tissue screening criteria used to develop trigger response levels are presented in Appendix D, Tables D-4.

7. AIR

Air quality criteria were selected from the agencies described below.

British Columbia Ministry of the Environment and Climate Change

In BC, air quality objectives are developed ENV (2021e) under the authority of the *Environmental Management Act*. Air quality criteria are available for criteria air contaminants and are presented for time weighted averages of 1-hour, 24-hour, and annual (yearly) (ENV 2021e). A pollution control objective is available for reference purposes for carbon monoxide (1-hour and 8-hour) for food-processing, agriculturally oriented, and other industries. The air quality objectives were developed using air quality criteria from provincial and federal governing bodies and are non-legally binding limits to help inform decisions with respect to the management of air quality, including guiding decisions on environmental impact assessments and informing regulatory development.

Canadian Council of Ministers of the Environment

Air quality in Canada is regulated by standards set by the Canadian Council of Ministers of the Environment (CCME), an inter-governmental body of federal, provincial, and territorial ministers responsible for the environment. In 2012, a Canada-wide Air Quality Management System was implemented as one approach to try to reduce air pollution in Canada. The Canadian Ambient Air Quality Standards (CAAQS), which are established as objectives under the *Canadian Environmental Protection Act* (1999), have been developed for particulate matter with a mean aerodynamic diameter of 2.5 microns (µm) or smaller ($PM_{2.5}$), ozone, sulphur dioxide, and nitrogen dioxide. Targets for these constituents are set for 2015 ($PM_{2.5}$ and ozone only), 2020, and 2025 (ozone, sulphur dioxide, and nitrogen dioxide only) (CCME 2024b).

Agency for Toxic Substances and Disease Registry

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal public health agency of the United States Department of Health and Human Services. The ATSDR derives Minimal Risk Levels (MRLs) for non-carcinogenic health effects (ATSDR 2024). The MRLs are based on data that identify the target organ(s) of effect or the most sensitive health effect(s) for a specific duration for a given route of exposure to the substance. The ATSDR generally uses the No Observed Adverse Effect Level / Uncertainty Factor approach to derive MRLs. Physiologically-based pharmacokinetic modelling and benchmark dose modelling have also been used in deriving MRLs. Acute MRLs are derived for exposure durations of 1 to 14 days. Intermediate MRLs are derived for exposure durations of 15 to 364 days. Chronic MRLs are derived for exposure durations greater than or equal to 365 days.

The ATSDR MRLs are generally based on the most sensitive endpoint considered to be of relevance to humans. The ATSDR applies a protective approach (i.e., application of margins of safety) to address uncertainty, for those people who might be most sensitive (e.g., infants, elderly and nutritionally or immunologically compromised people). Supporting documentation is available for the MRLs used in this assessment.

United States Environmental Protection Agency National Ambient Air Quality Standards

The United States Environmental Protection Agency (US EPA) has developed National Ambient Air Quality Standards (NAAQS) for widespread pollutants that are considered harmful to human health as part of the *Clean Air Act*. These six criteria pollutants include carbon monoxide, lead, nitrogen dioxide, ozone, PM_{10}, $PM_{2.5}$, and sulphur dioxide (US EPA 2024b). A primary and/or secondary standard is set for each of the criteria pollutants. Primary standards are intended to protect sensitive populations, including children, the elderly, and those with pre-disposed respiratory illnesses (e.g., asthma). Secondary standards are intended to be protective of public welfare (e.g., damage to animals, crops, vegetation, and buildings).

United States Environmental Protection Agency Regional Screening Levels

The US EPA (2023a) has developed residential air Regional Screening Levels (RSL) for the protection of human health. The RSL are risk-based concentrations derived from standardized equations combining exposure information assumptions with US EPA toxicity data. The RSL were adjusted for residential phase exposure factors based on default assumptions for an adult. The RSL are considered by the US EPA to be protective of human exposure (including sensitive groups) over a lifetime. Chemical concentrations above the RSL do not automatically constitute a health risk; however, exceeding an RSL suggests that further evaluation of the potential risks is appropriate. The US EPA RSL for non-carcinogens are based on a hazard quotient (HQ) of 1.0, and for carcinogens are based on a risk level of 1 in 1,000,000. The carcinogenic RSL were multiplied by a factor of 10 to adjust to a risk level of 1 in 100,000 to be consistent with the acceptable risk level in BC (ENV 2022).

World Health Organization

The World Health Organization (WHO) has developed air quality guidelines to provide a basis for protecting public health from adverse effects of air pollution (WHO 2010, 2021). The guidelines are intended to provide background information and guidance to governments in making risk management decisions, particularly in setting standards. These guidelines may also be used in planning processes and various management decisions at a community or regional level. Supporting documentation is available for the WHO guidelines. The air quality guidelines for non-carcinogens are based on a HQ of 1.0 and for carcinogens are provided for a cancer risk level of 1 in 100,000.

Ontario Ministry of the Environment, Conservation and Parks

The Ontario Ministry of the Environment, Conservation and Parks (MECP) has developed Ambient Air Quality Criteria (AAQC) to assess air quality (MECP 2020). The AAQC is a concentration in air that is protective against adverse effects on human health and/or the environment. The MECP have adopted the CCME CAAQS.

The AAQCs are provided for 1-hour, 24-hour, and annual averaging periods. Criteria for 1-hour averaging times are developed to be protective against acute health effects, whereas criteria for 24-hour and annual averaging times set to protect against chronic health effects. In general, the MECP AAQCs for carcinogens are based on a risk level of 1 in 1,000,000. The MECP standards were multiplied by a factor of 10 to adjust to a risk level of 1 in 100,000 to be consistent with the acceptable risk level in BC (ENV 2022). Air standards for non-carcinogens are generally derived from reference concentrations (chosen based on available peer-reviewed toxicological information and key studies with associated limiting or critical effect[s]). The air standards for non-carcinogens are generally set at a target HQ of 1.0.

The MECP has also developed Air Contaminant Benchmarks (ACB), which are standards, guidelines and screening levels for assessing point of impingement concentrations (MECP 2023). ACBs are available for 24-hour averaging periods. ACBs were selected as the air screening criteria (for 24-hour averaging time) if MECP AAQC were unavailable.

California Office of Environmental Health Hazard Assessment

The California Office of Environmental Health Hazard Assessment (Cal OEHHA 2020) Reference Exposure Levels (REL) are concentrations of a chemical at or below which adverse non-carcinogenic health effects are not anticipated to occur in a human population, including in sensitive subgroups (e.g., infants and children), for a specific exposure duration (Cal OEHHA 2008). The REL are used in risk assessments to evaluate the potential for adverse non-carcinogenic public health effects from facility emissions or similar localized sources in the Air Toxics Hot Spots Program, and from widespread exposures in the Toxic Air Contaminants program. Supporting documentation is available for most of the REL. The chronic REL for non-carcinogens are based on a HQ of 1.0.

The Cal OEHHA does not develop REL or air quality guidelines or objectives for carcinogens. Rather, the Cal OEHHA has developed inhalation unit risks (IURs) for use in cancer risk assessments (Cal OEHHA 2009, 2023). Cal OEHHA was contacted regarding the use of their IUR factors for screening purposes. Mr. Chris Halm of the California Environmental Protection Agency Air Resources Board indicated that IURs can be adjusted based on an applicable cancer risk level and used as air criteria (Halm 2010, pers. comm.). The Cal OEHHA IURs are based on a cancer risk level of 1 in 1,000,000; this level was divided by the IUR and multiplied by a factor of 10 to derive an air criterion for a risk level of 1 in 100,000 to be consistent with the acceptable risk level in BC (ENV 2022).

Texas Commission on Environmental Quality

The Texas Commission on Environmental Quality (TCEQ) has developed acute (1-hour) and chronic Effects Screening Levels (ESL) that are used in the air permitting process to evaluate emissions predicted by air dispersion modelling. The TCEQ (2015) outlines the approach and methods used to derive the ESL, and their application. The final ESL are calculated from reference values and adjusted to a HQ of 0.3. The ESLs for carcinogens are based on a risk level of 1 in 100,000. The short-term ESL are based on health effects, the potential for odours to be a nuisance, and effects on vegetation. The long-term ESL are based on data concerning chronic health and vegetation effects.

The TCEQ has also developed Air Monitoring Comparison Values (AMCVs), which are based on reference values derived from toxicological data (i.e., lowest observed adverse effect level [LOAEL] and no observed adverse effect level [NOAEL]) (TCEQ 2015). The AMCVs are based on a HQ of 1.0.

Where a final ESL is available for an environmental parameter (which is based on a HQ of 0.3), the AMCV (which is based on a HQ of 1.0), was selected as the TCEQ air criteria. For parameters where an interim ESL is available, the ESL and AMCV are the same and are selected as the TCEQ air criteria.

The TCEQ ESL and AMCVs were obtained by querying the Texas Air Monitoring Information System database (TCEQ 2023). The ESL are not ambient air standards. The ESL are used in the air permit review process, for review of air permit applications, where emissions of one constituent from one site are evaluated at a time (emissions from multiple sites or multiple chemicals are not evaluated). If predicted airborne levels of a constituent do not exceed the screening level, adverse health effects are not expected. If predicted ambient levels of constituents in air exceed the screening levels, it does not necessarily indicate a problem, but rather triggers a more detailed review.

Acute Air Criteria

The 1-hour and 24-hour health-based air criteria were obtained from the following agencies and selected based on the following hierarchy:

- Primary Sources:
  - ENV, and
  - CCME.
- Secondary Sources:
  - ATSDR,
  - US EPA NAAQS, and
  - WHO.

- Tertiary Sources:
  - MECP, and
  - Cal OEHHA (available for 1-hour air criteria only).

TCEQ.Air criteria were generally preferentially selected from the primary sources, followed by the secondary sources, and then the tertiary sources. The lowest health-based air criterion with supporting information was generally selected for use in the screening process. Consideration was also given to relevant test species (i.e., human data versus animal data), study endpoint, study quality, relevance of results to human health, and date of the study. If an air criterion was deemed more appropriate based on those considerations (e.g., criteria is based on more current studies or human data), then this air criterion was preferentially selected over more conservative criteria.

-The selected acute inhalation air criteria are provided in Appendix D, Table D-5a and D-5b. The air criteria shown in these tables are based on a HQ of 1.0. When background exposure is considered, the acceptable risk level is an HQ of 1.0 (Health Canada 2017).

Chronic Air Criteria

The annual health-based air criteria were obtained from the following agencies:

- Primary:
  - ENV, and
  - CCME.
- Secondary:
  - ATSDR,
  - US EPA NAAQS and Resident Air RSLs, and
  - WHO.
- Tertiary
  - MECP,
  - Cal OEHHA, and
  - TCEQ.

Air criteria were generally selected preferentially from the primary sources, followed by the secondary sources, and then the tertiary sources. The lowest health-based air criterion with supporting information was generally selected for use in the screening process. Consideration was also given to relevant species (i.e., human data versus animal data), study endpoint, study quality, and date of the study. If an air criterion was deemed more appropriate based on those considerations (e.g., criteria is based on more current studies or human data), then the air criterion was preferentially selected over more conservative criteria.

Carcinogenic risk levels for which the air criteria were derived were standardized to risk levels considered acceptable by Health Canada (2021a) and ENV (2022). For carcinogenic chemical parameters, this involved adjusting air criteria to a risk level of 1 in 100,000 (i.e., 1×10^{-5}). For parameters with both non-carcinogenic and carcinogenic criteria, the lowest of the two criteria was selected.

The selected annual air screening criteria are provided in Appendix D, Table D-5c. When background exposure is considered, the acceptable risk level is an HQ of 1.0 (Health Canada 2017).

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Appendix D
Table D-1: Trigger Response Levels
Osisko Development Corp. Cariboo Gold Project

Parameter	Soil (mg/kg) [a]					Groundwater (mg/L)				
	Regional Soil Background [c]	Selected criteria	Source	Trigger Level 1 (80% of Selected Criteria)	Trigger Level 2 (90% of Selected Criteria)	Average Concentration at Reference Wells	Selected criteria	Source	Trigger Level 1 (80% of Selected Criteria)	Trigger Level 2 (90% of Selected Criteria)
Metals										
Aluminum	25000	15500	US EPA	12400	13950	-	9500	ENV SDWG	7600	8550
Antimony	4	6.3	US EPA	5.0	5.6	-	6.0	ENV SDWG	4.8	5.4
Arsenic	10	20	ENV CSR	16	18	-	10	ENV SDWG	8.0	9.0
Cadmium	0.4	14	CCME	11.2	12.6	-	5.0	ENV SDWG	4.0	4.5
Chromium	100	100	ENV CSR	80	90	-	50	ENV SDWG	40	45
Cobalt	20	25	ENV CSR	20	22.5	-	1.0	ENV SDWG	0.8	0.9
Copper	60	1100	CCME	880	990	-	2000	ENV SDWG	1600	1800
Iron	30000	10960	US EPA	8768	9864	-	6500	ENV CSR	5200	5850
Lead	15	120	ENV CSR	96	108	-	5.0	ENV SDWG	4.0	4.5
Manganese	850	6000	ENV CSR	4800	5400	-	120	ENV SDWG	96	108
Mercury	0.09	6.6	CCME	5.3	5.9	-	1.0	ENV SDWG	0.8	0.9
Nickel	200	200	CCME	160	180	-	80	ENV SDWG	64	72
Selenium	4	80	CCME	64	72	-	10	ENV SDWG	8.0	9
Cyanide	-	25	ENV CSR	20	23	NA	200	ENV SDWG	NA	NA
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	-	717	US EPA	574	645	NA	NA	NA	NA	NA
Acenaphthylene	-	-	-	-	-	NA	NA	NA	NA	NA
Acridine	-	-	-	-	-	NA	NA	NA	NA	NA
Anthracene	-	10000	ENV CSR	8000	9000	NA	NA	NA	NA	NA
Benz(a)anthracene	-	NR(d)	CCME	NR[d]	NR[d]	NA	NA	NA	NA	NA
Benzo(a)pyrene	-	NR(d)	CCME	NR[d]	NR[d]	NA	NA	NA	NA	NA
Benzo(b,j)fluoranthene	-	NR(d)	CCME	NR[d]	NR[d]	NA	NA	NA	NA	NA
Benzo(b,j,k)fluoranthene	-	NR(d)	CCME	NR[d]	NR[d]	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	-	NR(d)	CCME	NR[d]	NR[d]	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	-	NR(d)	CCME	NR[d]	NR[d]	NA	NA	NA	NA	NA
Chrysene	-	NR(d)	CCME	NR[d]	NR[d]	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	-	NR(d)	CCME	NR[d]	NR[d]	NA	NA	NA	NA	NA
Fluoranthene	-	1500	ENV CSR	1200	1350	NA	NA	NA	NA	NA
Fluorene	-	478	US EPA	382	430	NA	NA	NA	NA	NA
Indeno(1,2,3-c,d)pyrene	-	NR(d)	CCME	NR[d]	NR[d]	NA	NA	NA	NA	NA
1-Methylnaphthalene	-	176	US EPA	141	158	NA	NA	NA	NA	NA
2-Methylnaphthalene	-	47.8	US EPA	38	43	NA	NA	NA	NA	NA
Naphthalene	-	850	ENV CSR	680	765	NA	NA	NA	NA	NA
Phenanthrene	-	1500	ENV CSR	1200	1350	NA	NA	NA	NA	NA
Pyrene	-	359	US EPA	287	323	NA	NA	NA	NA	NA
Quinoline	-	1.81	US EPA	1.4	1.6	NA	NA	NA	NA	NA
B(a)P TPE	-	5.3	-	4.2	4.8	NA	NA	NA	NA	NA
IACR (CCME)	-	1	CCME	0.8	0.9	NA	NA	NA	NA	NA
Criteria Air Contaminants										
PM2.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PM10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulphur Dioxide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Monoxide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen Dioxide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
- =No value available; ATSDR= Agency for Toxic Substances and Disease Registry; B(a)P TPE - Benzo(a)pyrene total potency equivalence; BC ENV= British Columbia Ministry of Environment and Climate Change Strategy; Cal OEHHA = California Office of Environmental Health Hazard Assessment; CCME = Canadian Council of Ministers of the Environments; CSR= Contaminated Sites Regulations; IACR= Index of Additive Cancer Risk; MECP = Ontario Ministry of the Environment, Conservation and Parks; mg/kg= milligram per kilogram; mg/L= milligram per litres; µg/m^3= microgram per cubic metre; NR= Not required; PM= Particulate Matter, RIVM= Rijksinstituut Voor Volksgezondheid en Milieu; SDWG= Source Drinking Water Quality Guideline; TBD = To be determined; TCEQ = Texas Commission on Environmental Quality; US EPA= United States Environmental Protection Agency

The selection approach for selected criteria is provided in each respective screening criteria table (Tables D-2 to D-6c) and described in Appendix D.
The screening criteria considered for each medium, the approach for identifying the selected screening criteria, as well as the selected screening criteria, are presented in Tables D-2 to -6c based on a hazard quotient (HQ) of 0.2 (except for air, where an HQ=1 was considered) and incremental lifetime cancer risk (ILCR) of 1x10-5.

(a) Trigger levels developed for soil are used as surrogates for vegetation.
(b) Trigger levels for sediment are based on selected criteria for soil.
(c) Regional soil background concentrations based on BC ENV (2021) Protocol 4 for Contaminated Sites, Establishing Local Background Concentrations in Soil. Table 1 Regional estimates for background concentrations iin soil for inorganic substances for Region 5 Cariboo. February 1, 2021. Accessed online: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/protocols/p4__jan2021_revisions_final_signed.pdf
(d) The screening of B(a)PTPE is protective of direct contact exposure for carcinogenic PAHs.
(e) Screening value for total chromium used.
(f) Carbon monoxide 8-hour value used from primary source instead of 1-hour value from secondary source.

Appendix D
Table D-1: Trigger Response Levels
Osisko Development Corp. Cariboo Gold Project

Parameter	Sediment (mg/kg) [b]					Surface water (mg/L)					Fish Tissue (mg/kg)				
	Average Concentration at Reference Locations	Selected criteria	Source	Trigger Level 1 (80% of Selected Criteria)	Trigger Level 2 (90% of Selected Criteria)	Average Concentration at Reference Locations	Selected criteria	Source	Trigger Level 1 (80% of Selected Criteria)	Trigger Level 2 (90% of Selected Criteria)	Average Concentration at Reference Locations	Selected criteria	Source	Trigger Level 1 (80% of Selected Criteria)	Trigger Level 2 (90% of Selected Criteria)
Metals															
Aluminum	TBD	15500	US EPA	12400	13950	TBD	9500	ENV SDWG	7600	8550	TBD	-	US EPA	-	-
Antimony	TBD	6.3	US EPA	5.0	5.6	TBD	6.0	ENV SDWG	4.8	5.4	TBD	-	US EPA	-	-
Arsenic	TBD	20	ENV CSR	16	18	TBD	10	ENV SDWG	8.0	9.0	TBD	-	ATSDR	-	-
Cadmium	TBD	14	CCME	11.2	12.6	TBD	5.0	ENV SDWG	4.0	4.5	TBD	-	Health Canada	-	-
Chromium	TBD	100	ENV CSR	80	90	TBD	50	ENV SDWG	40	45	TBD	-	Health Canada	-	-
Cobalt	TBD	25	ENV CSR	20	23	TBD	1.0	ENV SDWG	0.8	0.9	TBD	-	RIVM	-	-
Copper	TBD	1100	CCME	880	990	TBD	2000	ENV SDWG	1600	1800	TBD	-	Health Canada	-	-
Iron	TBD	10960	US EPA	8768	9864	TBD	6500	ENV CSR	5200	5850	TBD	-	US EPA	-	-
Lead	TBD	120	ENV CSR	96	108	TBD	5.0	ENV SDWG	4.0	4.5	TBD	-	Health Canada	-	-
Manganese	TBD	6000	ENV CSR	4800	5400	TBD	120	ENV SDWG	96	108	TBD	-	Health Canada	-	-
Mercury	TBD	6.6	CCME	5.3	5.9	TBD	1.0	ENV SDWG	0.8	0.9	TBD	-	Health Canada	-	-
Nickel	TBD	200	CCME	160	180	TBD	80	ENV SDWG	64	72	TBD	-	Health Canada	-	-
Selenium	TBD	80	CCME	64	72	TBD	10	ENV SDWG	8.0	9.0	TBD	-	Health Canada	-	-
Cyanide	TBD	25	ENV CSR	20	22.5	TBD	200	ENV SDWG	160	180	NA	NA	NA	NA	NA
Polycyclic Aromatic Hydrocarbons															
Acenaphthene	NA	NA	NA	NA	NA	TBD	250	ENV CSR	200	225	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	TBD	-	-	-	-	NA	NA	NA	NA	NA
Acridine	NA	NA	NA	NA	NA	TBD	-	-	-	-	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	TBD	1000	ENV CSR	800	900	NA	NA	NA	NA	NA
Benz(a)anthracene	NA	NA	NA	NA	NA	TBD	NR(d)	ENV SDWG	NR(d)	NR(d)	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	TBD	NR(d)	ENV SDWG	NR(d)	NR(d)	NA	NA	NA	NA	NA
Benzo(b,j)fluoranthene	NA	NA	NA	NA	NA	TBD	NR(d)	ENV SDWG	NR(d)	NR(d)	NA	NA	NA	NA	NA
Benzo(b,j,k)fluoranthene	NA	NA	NA	NA	NA	TBD	NR(d)	ENV SDWG	NR(d)	NR(d)	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	TBD	NR(d)	ENV SDWG	NR(d)	NR(d)	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	TBD	NR(d)	ENV SDWG	NR(d)	NR(d)	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	TBD	NR(d)	ENV SDWG	NR(d)	NR(d)	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	TBD	NR(d)	ENV SDWG	NR(d)	NR(d)	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	TBD	150	ENV CSR	120	135	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	TBD	150	ENV CSR	120	135	NA	NA	NA	NA	NA
Indeno(1,2,3-c,d)pyrene	NA	NA	NA	NA	NA	TBD	NR(d)	ENV SDWG	NR(d)	NR(d)	NA	NA	NA	NA	NA
1-Methylnaphthalene	NA	NA	NA	NA	NA	TBD	5.5	ENV CSR	4.4	5.0	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	TBD	15.0	ENV CSR	12.0	13.5	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	TBD	80.0	ENV CSR	64.00	72.0	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	TBD	-	-	-	-	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	TBD	100	ENV CSR	80	90	NA	NA	NA	NA	NA
Quinoline	NA	NA	NA	NA	NA	TBD	0.05	ENV CSR	0.04	0.045	NA	NA	NA	NA	NA
B(a)P TPE	NA	NA	NA	NA	NA	TBD	0.04	BC ENV SDWG	0.03	0.036	NA	NA	NA	NA	NA
IACR (CCME)	NA	NA	NA	NA	NA	NR	NR	NR	NR	NR	NA	NA	NA	NA	NA
Criteria Air Contaminants															
PM2.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PM10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulphur Dioxide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Monoxide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen Dioxide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
- =No value available; ATSDR= Agency for Toxic Substances and Disease Registry; B(a)P TPE - Benzo(a)pyrene total potency equivalence; BC ENV= British Columbia Ministry of Environment and Climate Change Strategy; Cal OEHHA = California Office of Environmental Health Hazard Assessment; CCME = Canadian Council of Ministers of the Environments; CSR= Contaminated Sites Regulations; IACR= Index of Additive Cancer Risk; MECP = Ontario Ministry of the Environment, Conservation and Parks; mg/kg= milligram per kilogram; mg/L= milligram per litres; $\mu g/m^3$= microgram per cubic metre; NR= Not required; PM= Particulate Matter, RIVM= Rijksinstituut Voor Volksgezondheid en Milieu; SDWG= Source Drinking Water Quality Guideline; TBD = To be determined; TCEQ = Texas Commission on Environmental Quality; US EPA= United States Environmental Protection Agency

The selection approach for selected criteria is provided in each respective screening criteria table (Tables D-2 to D-6c) and described in Appendix D.
The screening criteria considered for each medium, the approach for identifying the selected screening criteria, as well as the selected screening criteria, are presented in Tables D-2 to -6c based on a hazard quotient (HQ) of 0.2 (except for air, where an HQ=1 was considered) and incremental lifetime cancer risk (ILCR) of 1x10-5.

(a) Trigger levels developed for soil are used as surrogates for vegetation.
(b) Trigger levels for sediment are based on selected criteria for soil.
(c) Regional soil background concentrations based on BC ENV (2021) Protocol 4 for Contaminated Sites, Establishing Local Background Concentrations in Soil. Table 1 Regional estimates for background concentrations iin soil for inorganic substances for Region 5 Cariboo. February 1, 2021. Accessed online: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/protocols/p4__jan2021_revisions_final_signed.pdf
(d) The screening of B(a)PTPE is protective of direct contact exposure for carcinogenic PAHs.
(e) Screening value for total chromium used.
(f) Carbon monoxide 8-hour value used from primary source instead of 1-hour value from secondary source.

Appendix D
Table D-1: Trigger Response Levels
Osisko Development Corp. Cariboo Gold Project

Parameter	Air- 1-hour (µg/m^3)					Air- 24-hour (µg/m^3)					Air-Annual (µg/m^3)				
	Average Concentration at Reference Locations	Selected criteria	Source	Trigger Level 1 (80% of Selected Criteria)	Trigger Level 2 (90% of Selected Criteria)	Average Concentration at Reference Locations	Selected criteria	Source	Trigger Level 1 (80% of Selected Criteria)	Trigger Level 2 (90% of Selected Criteria)	Average Concentration at Reference Locations	Selected criteria	Source	Trigger Level 1 (80% of Selected Criteria)	Trigger Level 2 (90% of Selected Criteria)
Metals															
Aluminum	TBD	50	TCEQ	40.0	45.0	TBD	8.9	TCEQ	7.12	8.0	TBD	5.2	US EPA	4.16	4.7
Antimony	TBD	5	TCEQ	4.0	4.5	TBD	1	ATSDR	0.80	0.900	TBD	0.3	ATSDR	0.24	0.270
Arsenic	TBD	9.9	TCEQ	7.9	8.9	TBD	5.4	TCEQ	4.32	4.860	TBD	0.006	US EPA	0.00	0.005
Cadmium	TBD	18	TCEQ	14	16	TBD	0.03	ATSDR	0.024	0.027	TBD	0.005	WHO, MECP	0.00	0.005
Chromium	TBD	12	TCEQ[e]	9.6	11	TBD	0.5	MECP[e]	0.40	0.45	TBD	0.14	TCEQ[e]	0.11	0.13
Cobalt	TBD	0.69	TCEQ	0.55	0.6	TBD	0.095	TCEQ	0.08	0.086	TBD	0.0031	US EPA	0.00	0.003
Copper	TBD	100	Cal OEHHA	80	90	TBD	50	MECP	40	45.0	TBD	1	TCEQ	0.8	0.9
Iron	TBD	-	-	-	-	TBD	4	MECP	3.20	3.6	TBD	-		-	-
Lead	TBD	-	-	-	-	TBD	0.5	MECP	0.40	0.45	TBD	0.15	US EPA	0.12	0.14
Manganese	TBD	9.1	TCEQ	7.3	8.2	TBD	5	TCEQ	4.0	4.50	TBD	0.3	ATSDR	0.24	0.27
Mercury	TBD	0.6	Cal OEHHA	0.48	0.54	TBD	2	MECP	1.6	1.800	TBD	0.2	ATSDR	0.16	0.180
Nickel	TBD	1.1	TCEQ	0.88	0.99	TBD	1.1	TCEQ	0.88	0.990	TBD	0.015	US EPA	0.01	0.014
Selenium	TBD	2	TCEQ	1.6	1.8	TBD	10	MECP	8.0	9.00	TBD	21	US EPA	16.80	18.90
Cyanide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Polycyclic Aromatic Hydrocarbons															
Acenaphthene	TBD	100	TCEQ	80	90	TBD	-	-	-	-	TBD	10	TCEQ	8.00	9.00
Acenaphthylene	TBD	100	TCEQ	80	90	TBD	-	-	-	-	TBD	10	TCEQ	8.00	9.00
Acridine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	TBD	1	TCEQ	0.80	0.90	TBD	-	-	-	-	TBD	0.1	TCEQ	0.08	0.09
Benz(a)anthracene	TBD	0.5	TCEQ	0.40	0.45	TBD	-	-	-	-	TBD	0.17	US EPA	0.14	0.15
Benzo(a)pyrene	TBD	-	-	-	-	TBD	0.0005	MECP	0.0004	0.0005	TBD	0.017	US EPA	0.01	0.02
Benzo(b,j)fluoranthene	TBD	0.5	TCEQ	0.40	0.45	TBD	-	-	-	-	TBD	0.17	US EPA	0.14	0.15
Benzo(b,j,k)fluoranthene	TBD	0.5	TCEQ	0.40	0.45	TBD	-	-	-	-	TBD	0.17	US EPA	0.14	0.15
Benzo(g,h,i)perylene	TBD	0.5	TCEQ	0.40	0.45	TBD	-	-	-	-	TBD	0.05	TCEQ	0.04	0.05
Benzo(k)fluoranthene	TBD	0.5	TCEQ	0.40	0.45	TBD	-	-	-	-	TBD	1.7	US EPA	1.36	1.53
Chrysene	TBD	0.5	TCEQ	0.40	0.45	TBD	-	-	-	-	TBD	17	US EPA	13.6	15.3
Dibenz(a,h)anthracene	TBD	0.5	TCEQ	0.40	0.45	TBD	-	-	-	-	TBD	0.017	US EPA	0.01	0.02
Fluoranthene	TBD	0.5	TCEQ	0.40	0.45	TBD	-	-	-	-	TBD	0.05	TCEQ	0.04	0.05
Fluorene	TBD	10	TCEQ	8.00	9.00	TBD	-	-	-	-	TBD	1	TCEQ	0.80	0.90
Indeno(1,2,3-c,d)pyrene	TBD	0.5	TCEQ	0.40	0.45	TBD	-	-	-	-	TBD	0.17	US EPA	0.14	0.15
1-Methylnaphthalene	TBD	200	TCEQ	160	180	TBD	36	MECP	28	32	TBD	20	TCEQ	16.0	18.0
2-Methylnaphthalene	TBD	200	TCEQ	160	180	TBD	36	MECP	28	32	TBD	20	TCEQ	16.0	18.0
Naphthalene	TBD	500	TCEQ	400	450	TBD	23	MECP	18	20	TBD	3.1	US EPA	2.48	2.79
Phenanthrene	TBD	8	TCEQ	6.40	7.20	TBD	-	-	-	-	TBD	0.8	TCEQ	0.64	0.72
Pyrene	TBD	0.5	TCEQ	0.40	0.45	TBD	-	-	-	-	TBD	0.05	TCEQ	0.04	0.05
Quinoline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B(a)P TPE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IACR (CCME)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Criteria Air Contaminants															
PM2.5	TBD	-	-	-	-	TBD	25	BC ENV	20	23	TBD	8	BC ENV	6.4	7.2
PM10	TBD	-	-	-	-	TBD	50	BC ENV	40	45	TBD	15	WHO	12.0	13.5
Sulphur Dioxide	TBD	170	ENV, CCME	136	153	TBD	40	WHO	32	36	TBD	10	ENV, CCME	8.0	9.0
Carbon Monoxide	TBD	14300	ENV	11440	12870	TBD	5500	ENV[f]	4400	4950	TBD	-	-	-	-
Nitrogen Dioxide	TBD	79	ENV, CCME	63.2	71	TBD	25	WHO	20	23	TBD	23	ENV, CCME	18.4	20.7

Notes:
- =No value available; ATSDR= Agency for Toxic Substances and Disease Registry; B(a)P TPE - Benzo(a)pyrene total potency equivalence; BC ENV= British Columbia Ministry of Environment and Climate Change Strategy; Cal OEHHA = California Office of Environmental Health Hazard Assessment; CCME = Canadian Council of Ministers of the Environments; CSR= Contaminated Sites Regulations; IACR= Index of Additive Cancer Risk; MECP = Ontario Ministry of the Environment, Conservation and Parks; mg/kg= milligram per kilogram; mg/L= milligram per litres; µg/m^3= microgram per cubic metre; NR= Not required; PM= Particulate Matter, RIVM= Rijksinstituut Voor Volksgezondheid en Milieu; SDWG= Source Drinking Water Quality Guideline; TBD = To be determined; TCEQ = Texas Commission on Environmental Quality; US EPA= United States Environmental Protection Agency

The selection approach for selected criteria is provided in each respective screening criteria table (Tables D-2 to D-6c) and described in Appendix D.
The screening criteria considered for each medium, the approach for identifying the selected screening criteria, as well as the selected screening criteria, are presented in Tables D-2 to -6c based on a hazard quotient (HQ) of 0.2 (except for air, where an HQ=1 was considered) and incremental lifetime cancer risk (ILCR) of 1x10-5.

(a) Trigger levels developed for soil are used as surrogates for vegetation.
(b) Trigger levels for sediment are based on selected criteria for soil.
(c) Regional soil background concentrations based on BC ENV (2021) Protocol 4 for Contaminated Sites, Establishing Local Background Concentrations in Soil. Table 1 Regional estimates for background concentrations iin soil for inorganic substances for Region 5 Cariboo. February 1, 2021. Accessed online: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/protocols/p4__jan2021_revisions_final_signed.pdf
(d) The screening of B(a)PTPE is protective of direct contact exposure for carcinogenic PAHs.
(e) Screening value for total chromium used.
(f) Carbon monoxide 8-hour value used from primary source instead of 1-hour value from secondary source.

Appendix D
Table D-2: Selected Soil Criteria
Osisko Development Corp. Cariboo Gold Project

Parameter	Primary				Secondary		Tertiary						
	ENV CSR RLLD (Pathway specific)	Notes	CCME RL/PL (Pathway specific)	Notes	Selected US EPA RSL[a,b]	Notes	ENV CSR RLLD (Generic human health)	Notes	CCME RL/PL (Generic)	Notes	Selected Human Health Screening Value[h]	Notes	Source
Metals													
Aluminum	NV	-	NV	-	15,500	NC	40000	G_{HH}	NV	-	15,500	NC	US EPA
Antimony	NV	-	NV	-	6.26	NC	250	G_{HH}	20	G	6.26	NC	US EPA
Arsenic	20	I	31	SI	6.77	NC, inorganic	NV	-	12	G	20	I	ENV CSR
Cadmium	20	I	14	SI	1.43	NC, for Cd in diet	NV	-	10	G	14	SI	CCME
Chromium	100	I, CrTot	220	SI, CrTot	3.01[c]	C, Cr(III) insoluble salts	NV	-	64	G	100	I, CrTot	ENV CSR
Cobalt	25	I	NV	-	4.68	NC	NV	-	50	G	25	I	ENV CSR
Copper	3,500	I	1,100	SI	626	NC	NV	-	63	G	1,100	SI	CCME
Cyanide	25	I	29	SI	4.57	NC	NV	-	0.9	G	25	I	ENV CSR
Iron	NV	-	NV	-	11,000	NC	35,000	G_{HH}	NV	-	10,960	NC	US EPA
Lead	120	I	140	SI	-	-	NV	-	140	G	120	I	ENV CSR
Manganese	6,000	I	NV	-	366	NC, non-dietary	NV	-	NV	-	6,000	I	ENV CSR
Mercury	10	I	6.6	SI	2.17	NC, elemental	NV	-	6.6	G	6.6	SI	CCME
Nickel	450	I	200	DC	290	NC, soluble salts	NV	-	45	G	200	DC	CCME
Selenium	200	I	80	DC	78.2	NC	NV	-	1	G	80	DC	CCME
Polycyclic Aromatic Hydrocarbons (PAHs)													
Acenaphthene	NV	-	NV	-	717	NC	950	G_{HH}	NV	-	717	NC	US EPA
Acenaphthylene	NV	-	NV	-	-	-	NV	-	NV	-	-	-	-
Acridine	NV	-	NV	-	-	-	NV	-	NV	-	-	-	-
Anthracene	10,000	I	NV	-	3,590	NC	NV	-	NV	-	10,000	I	ENV CSR
Benz(a)anthracene	NV	-	see B(a)P TPE	PEF=0.1	11.3	C	50	G_{HH}	NV	-	NR[g]	See B(a)P TPE	CCME
Benzo(a)pyrene	5	I	see B(a)P TPE	PEF=1.0	1.15	C	NV	-	NV	-	NR[g]	See B(a)P TPE	CCME
Benzo(b,j)fluoranthene	NV	-	see B(a)P TPE	-	4.24 [d]	C	50	G_{HH}	NV	-	NR[g]	See B(a)P TPE	CCME
Benzo(b,j,k)fluoranthene	NV	-	see B(a)P TPE	PEF=0.1	4.24 [e]	C	50[c]	G_{HH}	NV	-	NR[g]	See B(a)P TPE	CCME
Benzo(g,h,i)perylene	NV	-	see B(a)P TPE	PEF=0.01	-		NV	-	NV	-	NR[g]	See B(a)P TPE	CCME
Benzo(k)fluoranthene	NV	-	see B(a)P TPE	-	115	C	50	G_{HH}	NV	-	NR[g]	See B(a)P TPE	CCME
Chrysene	NV	-	see B(a)P TPE	PEF=0.01	1150	C	200	G_{HH}	NV	-	NR[g]	See B(a)P TPE	CCME
Dibenz(a,h)anthracene	NV	-	see B(a)P TPE	PEF=1.0	1.15	C	5	G_{HH}	NV	-	NR[g]	See B(a)P TPE	CCME
Fluoranthene	1,500	I	NV	-	478	NC	NV	-	NV	-	1,500	I	ENV CSR
Fluorene	NV	-	NV	-	478	NC	600	G_{HH}	NV	-	478	NC	US EPA
Indeno(1,2,3-c,d)pyrene	NV	-	see B(a)P TPE	PEF=0.1	11.5	C	50	G_{HH}	NV	-	NR[g]	See B(a)P TPE	CCME
1-Methylnaphthalene	NV	-	NV	-	176	C	250	G_{HH}	NV	-	176	C	US EPA
2-Methylnaphthalene	NV	-	NV	-	47.8	NC	60	G_{HH}	NV	-	47.8	NC	US EPA
Naphthalene	850	I	NV	-	20.1	C	NV	-	NV	-	850	I	ENV CSR
Phenanthrene	NV	-	NV	-	-		1,500	G_{HH}	NV	-	1,500	GHH	ENV CSR
Pyrene	NV	-	NV	-	359	NC	1,000	G_{HH}	NV	-	359	NC	US EPA
Quinoline	NV	-	NV	-	1.81	C	NV	-	NV	-	1.81	C	US EPA
B(a)P TPE [f]	NV	-	5.3	DC	-		NV	-	NV	-	5.3	DC	CCME
IACR (CCME)	NV	-	1	PW	-		NV	-	NV	-	1	PW	CCME

Notes:

B(a)P = benzo(a)pyrene; C = carinogenic; CCME = Canadian Council of Ministers of the Environments; CrTot = total chromium; ENV CSR = British Columbia Ministry of Environment and Climate Change Strategy Contaminated Sites Regulations; DC = direct contact; G = generic; GHH = generic human health; I = ingestion of contaminated soil; IACR = Index of Additive Cancer Risks; NC = non-carcinogenic; NV= No Value; P = provisional; PAHs = polycyclic aromatic hydrocarbons; PEF = probably effects level; PW = protection of potable water; RLLD = residential low density; RL/PL = residential/parkland; RSL = regional screening level; SI = soil ingestion; TPE = total potency equivalents; US EPA = United States Environmental Protection Agency

Screening values are in units of miligrams per kilogram (mg/kg) . It is noted that while this table provides soil screening values, they were also adopted as sediment screening values.

[a] The lower of the carcinogenic (if applicable) and non-carcinogenic value was selected.

[b] US EPA RSLs were adjusted to reflect an acceptable incremental lifetime cancer risk of $1x10^{-5}$ (1 in 100,000) by applying a factor of 10 for carcinogenic values and adjusted to reflect a hazard quotient of 0.2 for non-carcinogenic values by applying a factor of 0.2.

[c] The lower of the chromium (III) and chromium (VI) screening value was used.

[d] The RSL for benzo(j)fluoranthene, which is the lower value between benzo(b)fluoranthene and benzo(j)fluoranthene, was used as a surrogate.

[e] The RSL for benzo(j)fluoranthene, which is the lower value between benzo(b)fluoranthene, benzo(j)fluoranthene and benzo(k)fluoranthene, was used as a surrogate.

[f] Benzo(a)Pyrene Total Potency Equivalents (B(a)PTPE) is the sum of the estimated cancer potency relative to benzo(a)pyrene for all potentially carcinogenic PAHs. The B(a)PTPE value of 5.3 mg/kg is protective of direct contact exposure for carcinogenic PAHs and is based on an incremental lifetime cancer risk of 1x10-5.

[g] The screening of B(a)PTPE is protective of direct contact exposure for carcinogenic PAHs.

[h] The selected human health screening value is based on the following hierarchy: 1) Lower of the primary sources (i.e., pathway-specific screening values from ENV CSR and CCME), 2) secondary source (i.e., US EPA RSL), 3) ENV CSR followed by generic CCME screening values.

References:

Canadian Council of Ministers of the Environment (CCME), 2024. Soil quality guidelines for the protection of Environmental and Human Health. Accessed February 2024, online: https://ccme.ca/en/resources#

ENV (British Columbia Ministry of Environment and Climate Change Strategy). 2023. Contaminated Sites Regulation, Schedule 3.1 accessed February 2024 from: https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/375_96_07

United States Environmental Protection Agency (US EPA), 2024. Regional Screening Levels (RSLs), Resident Soil Scenario (chronic). Accessed February 2024 online: https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables

Appendix D
Table D-3: Selected Surface Water and Grounwater Criteria
Osisko Development Corp. Cariboo Gold Project

Parameter	Unit	ENV (2020) Source Drinking Water Quality Guideline (SDWG)	Notes	ENV CSR (2023) Generic Drinking Water Quality Standards	Notes	Health Canada (2022) Canadian Drinking Water Quality Guideline	Notes	US EPA (2023) RSLs for Residential Tapwater[a]	Notes	Selected Human Health Screening Value[b]	Notes	Source
Total Metals												
Aluminum	µg/L	9,500	MAC	9,500	MAC	2,900	MAC	3990	NC	9,500	MAC	ENV SDWG
Antimony	µg/L	6	MAC	6	MAC	6	MAC	1.56	NC	6	MAC	ENV SDWG
Arsenic	µg/L	10	MAC	10	MAC	10	ALARA	0.517	C	10	MAC	ENV SDWG
Cadmium	µg/L	5	MAC	5	MAC	7	MAC	0.369	NC, water	5	MAC	ENV SDWG
Chromium	µg/L	50	MAC	50[c]	MAC	50	MAC	0.35[c]	C	50	MAC	ENV SDWG
Cobalt	µg/L	1	MAC	1	MAC	-	-	1.2	NC	1	MAC	ENV SDWG
Copper	µg/L	2000 [i]	MAC, AO: 1,000	1,500	MAC	2,000	MAC, AO: 1,000	160	NC	2,000	MAC	ENV SDWG
Cyanide	µg/L	200	MAC	200	MAC	200	MAC	0.293	NC	200	MAC	ENV SDWG
Iron	µg/L	300	AO	6,500	MAC	≤300	AO	2800	NC	6,500	MAC	ENV CSR
Lead	µg/L	5	MAC	10	MAC	5	ALARA	-	-	5	MAC	ENV SDWG
Manganese	µg/L	120 [i]	MAC, AO: ≤20	1,500	MAC	120	MAC, AO: ≤20	86.7	NC	120	MAC	ENV SDWG
Mercury	µg/L	1	MAC	1	MAC	1	MAC	0.125	NC	1	MAC	ENV SDWG
Nickel	µg/L	80	MAC	80	MAC	-	-	78.5	NC, soluble salts	80	MAC	ENV SDWG
Selenium	µg/L	10	MAC	10	MAC	50	MAC	20	NC	10	MAC	ENV SDWG
Polycyclic Aromatic Hydrocarbons (PAHs)- Surface Water Only												
Acenaphthene	µg/L	-	-	250	MAC	-	-	107	NC	250	MAC	ENV CSR
Acenaphthylene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Acridine	µg/L	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L	-	-	1,000	MAC	-	-	353	NC	1000	MAC	ENV CSR
Benz(a)anthracene	µg/L	NR[d]	MAC	0.07	MAC	-	-	0.298	C	NR[d]	MAC	ENV SDWG
Benzo(a)pyrene	µg/L	NR[d]	MAC	0.01	MAC	0.04	MAC	0.251	C	NR[d]	MAC	ENV SDWG
Benzo(b,j) fluoranthene	µg/L	NR[d]	MAC	0.07	MAC	-	-	0.649[e]	C	NR[d]	MAC	ENV SDWG
Benzo(b,j,k)fluoranthene	µg/L	NR[d]	MAC	0.07[g]	MAC	-	-	0.649[f]	C	NR[d]	MAC	ENV SDWG
Benzo(g,h,i)perylene	µg/L	NR[d]	MAC	0.07[g]	MAC	-	-	-	-	NR[d]	MAC	ENV SDWG
Benzo(k)fluoranthene	µg/L	NR[d]	MAC	0.07[g]	MAC	-	-	25.1	C	NR[d]	MAC	ENV SDWG
Chrysene	µg/L	NR[d]	MAC	7	MAC	-	-	251	C	NR[d]	MAC	ENV SDWG
Dibenz(a,h)anthracene	µg/L	NR[d]	MAC	0.01	MAC	-	-	0.251	C	NR[d]	MAC	ENV SDWG
Fluoranthene	µg/L	-	-	150	MAC	-	-	160	NC	150	MAC	ENV CSR
Fluorene	µg/L	-	-	150	MAC	-	-	58.8	NC	150	MAC	ENV CSR
Indeno(1,2,3-c,d)pyrene	µg/L	NR[d]	MAC	-	-	-	-	2.51	C	NR[d]	MAC	ENV SDWG
1-Methylnaphthalene	µg/L	-	-	5.5	MAC	-	-	11.4	C	5.5	MAC	ENV CSR
2-Methylnaphthalene	µg/L	-	-	15	MAC	-	-	7.19	NC	15	MAC	ENV CSR
Naphthalene	µg/L	-	-	80	MAC	-	-	1.17	C	80	MAC	ENV CSR
Phenanthrene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Pyrene	µg/L	-	-	100	MAC	-	-	24.2	NC	100	-	ENV CSR
Quinoline	µg/L	-	-	0.05	MAC	-	-	0.239	C	0.05	-	ENV CSR
B(a)P TPE[h]	µg/L	0.04	MAC	-	-	-	-	-	-	0.04	MAC	ENV SDWG

Notes

- = no guideline available or not applicable; ALARA = as low as reasonably achievable; AO = aesthetic objective; B(a)P = benzo(a)pyrene; C=Carciogenic; CSR= Contaminated Sites Regulations; ENV= British Columbia Ministry of Environment and Climate Change Strategy; µg/L= micrograms/L; MAC = maximum acceptable concentration; NR = none required; NC = non-carcinogenic; RSL= Regional Secreening Level; SDWG= Source Drinking Water Quality Guideline; TPE = total potency equivalents; US EPA = United States Environmental Protection Agency

Screening values are in units of µg/L (micrograms per litre).

[a] US EPA RSLs were adjusted to reflect an acceptable incremental lifetime cancer risk of 1x10-5 (1 in 100,000) by applying a factor of 10 for carcinogenic values and adjusted to reflect a hazard quotient of 0.2 for non-carcinogenic values by applying a factor of 0.2.

[b] The selected human health screening value is based on the following hierarchy: 1) ENV Source Drinking Water Quality Guideline; 2) ENV CSR Pathway-specific Drinking Water Quality Standards; 3) Health Canada Canadian Drinking Water Quality Guideline; and 4)US EPA RSL

[c] Screening value for total chromium was unavailable, therefore the lower value between chromium (III) and chromium (VI) used.

[d] The screening of B(a)PTPE is protective of direct contact exposure for carcinogenic PAHs.

[e] The RSL for benzo(j)fluoranthene, which is the lower value between benzo(b)fluoranthene and benzo(j)fluoranthene, was used as a surrogate.

[f] The RSL for benzo(j)fluoranthene, which is the lower value between benzo(b)fluoranthene, benzo(j)fluoranthene and benzo(k)fluoranthene, was used as a surrogate.

[g] Value for benzo(b,j)fluoranthene used as a surrogate (i.e., lowest value between similar PAHs including benz(a)anthracene and benzo(b,j)fluoranthene)

[h] Benzo(a)Pyrene Total Potency Equivalents (B(a)PTPE) is the sum of the estimated cancer potency relative to benzo(a)pyrene for all potentially carcinogenic PAHs. The B(a)PTPE value of 0.04 µg/L is protective of direct contact exposure for carcinogenic PAHs and is based on an incremental lifetime cancer risk of 1x10-5.

[i] Health-based water quality guideline was preferentially selected over available aesthetic objective.

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Appendix D
Table D-4: Fish Tissue Screening Criteria
Osisko Development Corp. Cariboo Gold Project

Parameter	Carcinogenic Classification for Oral Exposure			Carcinogenic Classification for Oral Pathway	TRV - Oral Reference Dose (mg/kg BW/day)[c]					TRV - Oral Slope Factor (mg/kg BW/day)$^{-1}$[c]				Fish Tissue Screening Value (mg/kg)[i]				Selected Fish Tissue Screening Value[j]
	US EPA IRIS (2024)[a]	US EPA PPRTV (2023)	IARC (2024)[b]		US EPA (2023, 2024)	Source	Health Canada or Other Agency			US EPA	Source	Health Canada or Other Agency	Source	Selected Non-Cancer TRV		Selected Cancer TRV		
							Toddler	Adult	Source					Toddler	Adult	Toddler	Adult	
Metals																		
Aluminum (Al)	-	IN	-	NC	1	US EPA 2006 (cited in US EPA PPRTV, 2023)	1	1	ATSDR 2008[h]	-	-	-	-	66	142	-	-	66.5
Antimony (Sb)	-	IN	2A[k]	NC	0.0004	US EPA 1987 (cited in US EPA IRIS, 2004)	0.006	0.006	RIVM 2009	-	-	-	-	0.027	0.057	-	-	0.027
Arsenic (As)	A	-	1	C	0.0003	US EPA 1991 (cited in US EPA IRIS, 2024)	0.0003	0.0003	ATSDR 2007[h]	1.5	US EPA 1995 (US EPA IRIS, 2024)	1.8	Health Canada 2021a	0.0199	0.043	0.0053	0.0053	0.0053
Cadmium (Cd)	B1	-	1	NC	0.001	US EPA 1989 (cited in US EPA IRIS, 2024)[e]	0.0008	0.0008	WHO, 2011 (cited in Health Canada 2021a, provisional)	-	-	-	-	0.053	0.11	-	-	0.053
Chromium (Cr) III	D	-	3	NC	1.5	US EPA 1998 (cited inUS EPA IRIS, 2024)[f]	1.5	1.5	US EPA, 1998 (cited in Health Canada 2021a)	-	-	-	-	100	214	-	-	100
Chromium (Cr) VI	D	-	1	NC	0.003	US EPA 1998 (cited in US EPA IRIS, 2024)	0.0022	0.0022	Health Canada, 2016 (cited in Health Canada 2021a)	-	-	-	-	0.2	0.43	-	-	0.20
Chromium Total	-	-	3	NC	-	-	-	-	-					-	-			NV[n]
Cobalt (Co)	-	-	2A	NC	0.0003	US EPA 2008 (cited in US EPA PPRTV, 2023)	0.0014	0.0014	RIVM 2001	-	-	-	-	0.093	0.199	-	-	0.09
Copper (Cu)	D	-	-	NC	-	-	0.426	0.426	Health Canada, 2019 (cited in Health Canada 2021a)	-	-	-	-	28	61	-	-	28
Cyanide	D	-	-	NC	0.00063	US EPA 2010 (cited in US EPA IRIS, 2024)	0.05	0.05	ATSDR (2006)[h]					0.042	0.090			0.042
Iron (Fe)	-	IN	-	NC	0.7	US EPA 2006 (cited in US EPA PPRTV, 2023)	-	-	-	-	-	-	-	47	100	-	-	47
Lead (Pb)	B2	-	2B	NC	-	-	0.0005	0.0005	EFSA, 2013 (cited in Health Canada 2021a, provisional)	-	-	-	-	0.033	3.6	-	-	0.033
Manganese (Mn)	D	-	-	NC	0.14	US EPA 1995 (cited in US EPA IRIS, 2024)	0.025	0.025	Health Canada, 2019 (cited in Health Canada 2021a)					9.3	19.9	-	-	9.3
Mercury (Hg) (assumed to be methylmercury)	C	-	2B	NC	0.0001	US EPA 2001 (cited in US EPA IRIS, 2024)	0.0002	0.00047	Health Canada, 2007 and WHO, 2007 (cited in Health Canada 2021a)	-	-	-	-	0.013	0.067	-	-	0.013
Nickel (Ni)	-	-	2B[l]	NC	0.02	US EPA 1991 (cited in US EPA IRIS, 2024)[g]	0.0013	0.0013	Health Canada, 1996 (cited in Health Canada 2021[m])	-	-	-	-	1.33	2.8	-	-	1.3
Selenium (Se)	D	-	3	NC	0.005	US EPA 1991 (cited in US EPA IRIS, 2024)	0.006	0.0057	IOM, 2000 (cited in Health Canada 2021a[d])	-	-	-	-	0.4	0.81	-	-	0.4

Notes:

"-" = value or classification is not available; ATSDR= Agency for Toxic Substances and Disease Registry; C = carcinogen; IARC = International Agency for Research on Cancer; EFSA= European Food Safety Authority; IOM= Institute of Medicine of the National Academies (renamed the National Academy of Medicine in 2015); IRIS= Integrates Risk Information System; mg/kg/bw = miligrams per kilogram body weight; mg/kg bw/day = milligram per kilogram body weight per day; NC = non-carcinogen; NV = no value; PPRTV= Provisional Peer-Reviewed Toxicity Values; RIVM= Rijksinstituut Voor Volksgezondheid en Milieu; TRV= Toxicological Reference Value; US EPA = United States Environmental Protection Agency.

[a] US EPA IRIS carcinogenic classification is as follows: A- Human carcinogen; B1 - Probable carcinogenic to humans, based on limited evidence of carcinogenicity in humans; B2- Probable human carcinogen, based on sufficient evidence of carcinongenicity in animals; C- Possible human carcinogen; D- Not classifiable as to its carcinogenicity to humans

[b] IARC carcinogenic classification is as follows: 1- Carcinogenic to humans; 2A - Probably carcinogenic to humans; 2B - Possibly carcinogenic to humans; 3- Not classifiable as to its carcinogenicity to humans

[c] US EPA IRIS (2024) was selected preferentially over Health Canada (2021a), followed by the most recent TRV from other sources including US EPA PPRTV, ATSDR and RIVM. This approach was different for cobalt, where the principal study from US EPA PPRTV was much older than that considered by RIVM, and as such, the RIVM TRV was selected.

[d] Tolerable upper intake level

[e] Based on food/diet

[f] Value for insoluble salt

[g] Value for soluble salts

[h] Minimal risk level

[i] Non-cancer and cancer fish tissue screening value calculated based on Health Canada (2021b) equation for ingestion of food, using the selected TRV, hazard quotient of 0.2 (non-cancer), incremental lifetime cancer risk of 1x10-5 (cancer) and the receptor characteristics presented in Appendix D.

[j] Selected Fish Tissue Screening Value is the lowest of the toddler and adult fish tissue screening values.

[k] Value for trivalent antimony

[l] Value for nickel (metallic)

[m] Value for nickel chloride

[n] Value for total chromium could not be calculated, therefore more conservative screening value between chromium (III) and chromium (VI) will be considered.

Shaded = selected toxicity reference value or fish tissue screening value

References:

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Appendix D
Table D-5a: Air Screening Criteria (1-Hour)
Osisko Development Corp. Cariboo Gold Project

	Table A: 1-Hour (Acute) Air Thresholds									
		Primary		Secondary			Tertiary			
Parameter	**CAS**	**ENV (2021) AAQO**	**CCME (1999, 2023) CAAQS and NAAQO**	**ATSDR (2024) MRL**	**US EPA (2024) NAAQS**	**WHO (2010, 2021) AQG**	**MECP (2020) AAQC**	**Cal OEHHA (2020) REL**	**TCEQ (2023) AMCV/ReV [(a)]**	**Toxicological Endpoints and Derivations**
Criteria Air Contaminants										
Carbon monoxide (CO)	630-08-0	Pollution Control Objective (reference only) - **14,300**	Desirable NAAQO = 15,000 Acceptable NAAQO = 35,000	-	40,100 (35 ppm)	35,000	36,200	23,000	-	ENV [Reference only]: Pollution control objective for food-processing, agriculturally orientated, and other industries. The pollution control objective was developed in the 1975. This pollution control objective was rescinded in 2006 but is used by ENV for reference purposes (supporting documentation not available). CCME (NAAQO): Screening value is based on cardiorespiratory effects in people with exercise-induced myocardial ischemia, which was evaluated and derived by the CCME (CCME 1994). The CCME derived a 1-hour average maximum acceptable level (35,000 µg/m3) which is based on the maintenance of blood carboxyhemoglobin concentrations below the lowest-observed effect level (LOEL) of 2% (Allred et al. 1989; as cited in CCME 1994). A physiologically based pharmacokinetic (PBPK) model developed by Coburn, Foster, and Kane was used to extrapolate a 2% blood carboxyhemoglobin concentration to an ambient carbon monoxide concentration in the air. The maximum desirable level (15,000 µg/m^3) was derived based on 1% blood carboxyhemoglobin concentration. The maximum acceptable level is an air quality concentration that is protective of the general population against effects on the environment, visibility, personal comfort and well-being, while the maximum desirable level is the long term objective for air quality. US NAAQS: Screening value based on clinical evidence relating carboxyhemoglobin (carbon monoxide bound to blood hemoglobin) levels to various adverse health endpoints. The NAAQS of 35 ppm was converted to µg/m3 using a molecular weight of 28.01 g/mol. WHO: Screening value based on a maximum concentration of 2.5% carboxyhemoglobin in blood which is intended to be protective of non-smoking, middle-aged and elderly population groups with coronary artery disease, and fetuses of non-smoking pregnant women. The guideline is calculated using an equation that takes into account the known physiological variables that have an impact on the uptake of carbon monoxide and determines the guideline that will keep carboxyhemoglobin levels below 2.5%. MECP: Health-based 1-hr screening value based on the CCME NAAQO of 30 ppm. The MECP used a conversion factor of 1 ppm = 1.2055 mg CO/m3 to convert from the NAAQO of 30 ppm to a value of 36,200 µg CO/m3, while the CCME NAAQO applied a conversion factor of 1 ppm = 1.146 mg CO/m3 in their conversion of the NAAQO. Cal OEHHA: Screening value based on an inhalation study in humans examining the aggravation of existing angina and other cardiovascular diseases when subjects are exercising heavily (Allred et al. 1989 and Kleinman et al., 1989; as cited in Cal OEHHA 2008b). The screening values is based on a NOAEL of 1.1 to 1.3 % carboxyhemoglobin level in blood which corresponds to 23,000 µg/m3.
Nitrogen dioxide (NO2)	10102-44-0	CAAQS (Current) = 113 **CAAQS (Effective 2025) = 79**	CAAQS (Current) = 113 **CAAQS (Effective 2025) = 79**	-	188 (100 ppb)	200	400	470	-	ENV: Supporting documentation not available for screening value. The interim AQO is 188 µg/m3 and the CAAQS of 113 µg/m3 took effect on 1 January 2020. A value of 42 ppb (79 µg/m3) is proposed for the year 2025 and it was selected as the screening value as it is more conservative than the 2020 CAAQS of 113 µg/m3. The CAAQS is a three-year average of the annual 98th percentile of the daily maximum 1-hour average concentrations. The CAAQS of 42 ppb was converted to µg/m3 using a molecular weight of 46.01. CCME CAAQS: Proposed screening value for the year 2025 (supporting documentation not available) was selected as it is more conservative than the 2020 CAAQS of 113 µg/m3.. The metric is the 3-year average of the 98th percentile of the nitrogen dioxide daily maximum 1-hour average concentration. The CAAQS of 60 and 42 ppb were converted to µg/m3 using a molecular weight of 46.01. US NAAQS: Screening value based on the 98th percentile of maximum 1-hour daily concentrations, averaged over a three-year period. The NAAQS is protective of a broad range of respiratory effects in sensitive populations, such as those with asthma and those who spend time near major roadways. The NAAQS of 100 ppb was converted to µg/m3 using a molecular weight of 46.01 g/mol. WHO: Screening value based on studies of bronchial responsiveness among asthmatics. MECP: Screening value based on a health endpoint (supporting documentation not available). Cal OEHHA: Screening value is based on a study where sensitive humans (asthmatics) were exposed to 0.25 ppm of NO2 for 1 hour (Mohsenin 1987; as cited in Cal OEHHA 2008b). The critical effect was an increase in airway reactivity. No uncertainty factors were applied to the NOAEL of 0.25 ppm (470 µg/m3), which was adopted as the reference exposure level (REL) and California ambient air quality standard to protect against mild adverse effects.

Appendix D
Table D-5a: Air Screening Criteria (1-Hour)
Osisko Development Corp. Cariboo Gold Project

Parameter	CAS	ENV (2021) AAQO	CCME (1999, 2023) CAAQS and NAAQO	ATSDR (2024) MRL	US EPA (2024) NAAQS	WHO (2010, 2021) AQG	MECP (2020) AAQC	Cal OEHHA (2020) REL	TCEQ (2023) AMCV/ReV [a]	Toxicological Endpoints and Derivations
Sulphur dioxide (SO2)	7446-09-5	Interim AQO = 196 CAAQS = 183 **CAAQS = 170** **(effective in 2025)**	183 (70 ppb) (effective in 2020) **170** (65 ppb) **(effective in 2025)**	-	200 (75 ppb)	-	100 (40 ppb)	660	-	ENV: The CAAQS of 183 µg/m3 took effect on 1 January 2020 and a value of 170 µg/m3 is proposed for the year 2025. The 2025 value was selected as the screening criterion as it is more conservative than the 2020 CAAQS. The CAAQS is a based on the annual 99th percentile of D1HM, averaged over three consecutive years and is described below. The CAAQS of 65 ppb was converted to µg/m3 using a molecular weight of 64.07. CCME CAAQS: Screening value was developed based on respiratory health problems, focused on susceptible populations (e.g. asthmatic children and adults), and environmental impacts such as acid rain and smog (CCME 2017). A value of 170 µg/m3 is proposed for the year 2025. It was selected as the screening value as it is more conservative than the 2020 CAAQS of 183 µg/m3. The metric is the 3-year average of the 99th percentile of the sulphur dioxide daily maximum 1-hour average concentration. The CAAQS of 70 and 65 ppb were converted to µg/m3 using a molecular weight of 64.07. US NAAQS: Screening value based on epidemiological evidence of increased emergency department visits and hospitalizations associated with sulphur dioxide concentrations in the range of 75 to 150 ppb. The NAAQS of 75 ppb was converted to µg/m3 using a molecular weight of 64.07 g/mol. MECP: MECP derived the 1-hour screening value from the 10-minute MECP averaging time, using conversion factors that are derived from an exponential equation based on empirical monitoring data, ratios of concentrations measured for different averaging periods, and meteorological considerations (MECP 2017). The MECP derived the 1-hour averaging time from the more toxicologically relevant 10-minute averaging time, because exposure to short-intermittent spikes in sulphur dioxide concentrations (within the 5-10 minute range) are associated with respiratory morbidity. The AAQC of 40 ppb were converted to µg/m3 using a molecular weight of 64.07. Cal OEHHA: Screening value based on impairment of airway function (bronchoconstriction) especially in asthmatics (Linn et al. 1987; as cited in Cal OEHHA 2008b). After reviewing human several studies on acute exposures of normal, asthmatic, and atopic (susceptible to hypersensitive allergic reactions) individuals to low concentrations of SO2 (0.25 to 2.0 ppm), Cal OEHHA staff concluded that exposure to 0.25 ppm, the California Ambient Air Quality Standard (Cal AAQS) for SO2, would not result in respiratory effects causing discomfort in sensitive individuals exposed for one hour. The Cal AAQS for SO2 is intended to protect sensitive individuals (i.e., exercising asthmatics) from lower respiratory effects of acute exposure. Cal OEHHA concluded that an exposure concentration of 0.25 ppm SO2 for 1-hour is comparable to a NOAEL in sensitive individuals. It was determined by Cal OEHHA that the NOAEL would be protective of asthmatic individuals because adverse effects are consistently observed only at higher concentrations with participants undertaking moderate exercise and there is also an inconsistency in response to SO2 exposure at lower concentrations.
PM10	N/A	-	-	-	-	-	-	-	-	A 1-hour screening value is not available. Acute inhalation exposure to particulate matter is assessed utilizing the 24-hour exposure scenario.
PM2.5	N/A	-	-	-	-	-	-	-	-	A 1-hour screening value is not available. Acute inhalation exposure to particulate matter is assessed utilizing the 24-hour exposure scenario.
Metals										
Aluminum	7429-90-5	-	-	-	-	-	-	-	**50**	TCEQ: Screening value based on a health endpoint (Interim ESL and AMCV, supporting documentation not available) in PM..
Antimony	7440-36-0	-	-	-	-	-	-	-	**5**	TCEQ: Screening value based on a health endpoint (Interim ESL and AMCV, supporting documentation not available) in PM..
Arsenic	7440-38-2	-	-	-	-	-	-	0.2	**9.9 [c]**	Cal OEHHA: Screening value based on a study by Nagymajtenyi et. al. (1985; as cited in Cal OEHHA 2014) which found decreased fetal weight in mice following maternal inhalation of As2O3 for 4 hours/day during gestation days 9 to 12. A statistically significant decrease in the weight of fetuses was observed in all concentrations used in the study; therefore, a NOAEL was not available. A LOAEL of 0.26 mg/m^3 and an uncertainty factor of 1,000 (10 for a lack of a NOAEL value, 10 for interspecies differences between mice and humans, and 10 for human interindividual differences) were used to derive the screening value. TCEQ: Screening value (AMCV) based on a study where female rats were exposed to 0, 0.3, 3, and 10 mg/m3 arsenic trioxide for 6 hours/day for multiple days (Holson et al. 1999; as cited in TCEQ 2012). The NOAEL and LOAEL for maternal effects (i.e., rales) were 3000 and 10,000 µg/m3, respectively. The TCEQ chose the NOAEL of 3000 µg/m^3 as the point of departure. The NOAEL was adjusted for exposure duration (5451 µg/m3) and a human equivalent concentration of 0.714 (3891.3 µg/m3). Uncertainty factors were applied for interspecies variability (3), intraspecies variability (10) and database uncertainties (10), resulting in a threshold of 13 ug/m3 for arsenic trioxide. The threshold for arsenic trioxide was adjusted for arsenic (arsenic trioxide is 76% arsenic by weight), resulting in an acute Air Monitoring Comparison Value (AMCV) of 9.9 µg/m3 based on a target HQ=1. The TCEQ value is chosen preferentially over Cal OEHHA values because it is based on a more recent study .
Cadmium	7440-43-9	-	-	-	-	-	-	-	**18**	TCEQ: Screening value (AMCV) based on immunotoxicity in Swiss albino mice exposed to cadmium chloride as an aerosol for 2 hours (TCEQ 2016). A NOAEL of 110 µg/m3 was identified from the study. The NOAEL was adjusted to a 1-hour exposure (138.6 µg/m3). A point of departure human equivalency concentration (PODHEC) of 554 µg cadmium/m3 was derived from the study and an uncertainty factor of 30 was applied (3 for extrapolation from animals to humans and 10 to account for intraspecies variability) to derive an acute Air Monitoring Comparison Value (AMCV) of 18 µg/m^3, based on HQ=1.
Chromium (total or trivalent)	7440-47-3	-	-	-	-	-	-	-	**12[b]**	TCEQ: Screening value for lung effects in hamsters exposed to chromium chloride (via inhalation) for 30 minutes (TCEQ 2009). The NOAEL was 77 mg/m3 and extrapolated to a 1-hour exposure (38.5 mg/m3). The human equivalent concentration (HEC) was 10.82 mg/m3 and an uncertainty factor of 300 (3 for interspecies variability, 10 for intraspecies variability and 10 for database limitations) was applied to an derive an acute (ReV) of 12 µg/m^3, based on HQ=1.

Appendix D
Table D-5a: Air Screening Criteria (1-Hour)
Osisko Development Corp. Cariboo Gold Project

Parameter	CAS	ENV (2021) AAQO	CCME (1999, 2023) CAAQS and NAAQO	ATSDR (2024) MRL	US EPA (2024) NAAQS	WHO (2010, 2021) AQG	MECP (2020) AAQC	Cal OEHHA (2020) REL	TCEQ (2023) AMCV/ReV [a]	Toxicological Endpoints and Derivations
Chromium (hexavalent)	18540-29-9	-	-	-	-	-	-	-	1.3	TCEQ: Screening value (AMCV) for hexavalent chromium based on a benchmark concentration lower confidence limit corresponding to the lower 10% incidence of effect (BMCL10) of 16.06 µg Cr(VI)/m3 for increased relative lung weight in rats exposed to 0, 50, 100, 200, or 400 µg Cr(VI)/m3, as sodium dichromate, for 22 hours/day for 7 days/week for 30 days (TCEQ 2014). The BMCL10 was not adjusted for continuous exposure by TCEQ because the study exposure duration of 22 hours/day, 7 days/week for 30 days is much longer than the acute duration of interest (24-hour). The BMCL10 was adjusted for a human equivalent concentration (HEC) using the regional deposited dose ratio for animal to human adjustment of 2.41. Uncertainty factors for interspecies variation (3) and intraspecies variation (10) were applied. The resulting AMCV value of 1.3 µg Cr(VI)/m3 was based on an HQ = 1.0.
Cobalt	7440-48-4	-	-	-	-	-	-	-	**0.69**	TCEQ: Screening value (AMCV) based on the critical effect of respiratory irritation (coughing, sore throat and changes to forced expiratory volume) after exposure of 15 healthy male workers to hard metal dust containing 38 µg cobalt/m^3 for 6 hours (TCEQ 2017). The LOAEL of 38 µg cobalt/m3 is used as the point of departure (POD) for derivation of the 1-hour reference concentration and is adjusted to a 1-hour value of 69.05 µg cobalt/m^3. A total uncertainty factor of 100 was applied (10 for intrahuman variability and 10 to extrapolate from a LOAEL to NOAEL) to derive the Air Monitoring Comparison Value (AMCV), based on an HQ=1.
Copper	7440-50-8	-	-	-	-	-	-	**100** [c]	10	Cal OEHHA: Screening value based on a NOAEL of 1 mg copper/m3 from a study where workers were exposed to 1 to 3 mg/m3 copper for an unspecified amount of time (Whitman 1957; as cited in Cal OEHHA 2008b). No extrapolation for continuous exposure was applied because the exposure duration was not clearly specified in the reports. An uncertainty factor for intraspecies variability (10) was applied. The Cal OEHHA value was selected preferentially over the MECP and TCEQ values because there is supporting documentation.
										TCEQ: Screening value based on a health endpoint (interim ESL and AMCV), supporting documentation not available), as copper in PM.
Iron	7439-89-6	-	-	-	-	-	-	-	Must meet NAAQS	TCEQ: No value specific value available for iron. "Must Meet NAAQS" indicates that, for species of limited concern, the determination of the individual species impacts are not requried if a National Ambient Air Quality Standards (NAAQS) analysis is completed for particulate matter of 2.5 and 10 microns or less (PM2.5 and PM10)
Lead	7439-92-1	-	-	-	-	-	-	-	-	A 1-hour screening value is not available. Acute inhalation exposure to iron is assessed utilizing the 24-hour exposure scenario.
Manganese	7439-96-5	-	-	-	-	-	-	-	**9.1**	TCEQ: Screening value (AMCV) based on an inhalation study where rhesus monkeys were exposed to manganese sulphate for 6 hours per day, 5 days per week for 3 weeks (total of 90 hours of exposure) (TCEQ 2017). The critical effect was mild inflammatory changes to the airway with a point of departure (POD) LOAEL for 6 hours of exposure of 1.5 mg manganese/m^3. The LOAEL was extrapolated from a 6-hour exposure over a single day to a 1-hour value of 2.72 mg manganese/m3. An uncertainty factor of 360 was calculated (2 for extrapolation from a LOAEL to a NOAEL, 10 for intrahuman variability, 3 for potential toxicodynamic differences between rhesus monkeys and humans and 6 to account for limitations and uncertainty in the database); however, a maximum uncertainty factor of 300 was applied. Based on AMCV value where target HQ=1.
Mercury	7439-97-6	-	-	-	-	-	-	**0.6** [c]	0.25	Cal OEHHA: Screening value based on central nervous system disturbances in rat offspring (Danielsonn et al. 1993; as cited in Cal OEHHA 2014). Maternal rats were exposed to metallic mercury vapour (1.8 mg/m3) for 1 or 3 hours/day during gestation. The offspring displayed significant dose-dependent deficits in behaviour 3 to 7 months after birth compared to controls. The behaviors measured included spontaneous motor activity, performance of a spatial learning task, and habituation to an automated test chamber. An uncertainty factor of 3000 (10 for using LOAEL for moderate to severe effects in the absence of a NOAEL, 3 for interspecies toxicokinetic differences, 10 for interspecies toxicodynamic differences, 3 for individual variability, and 3 for intraspecies differences in age differences) was used. The Cal OEHHA value was selected preferentially over the MECP and TCEQ values because there is supporting documentation.
										TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available) as mercury metal and inorganic mercury forms in PM. AMCV value was not available therefore interim ESL was selected.
Nickel	7440-02-0	-	-	-	-	-	-	0.2	**1.1** [c]	Cal OEHHA: Screening value based on a mild reduction in antibody response in mice, exposed for 2 hours to nickel and nickel compounds (Graham et al. 1978; as cited by Cal OEHHA 2012). The 2-hour benchmark dose level (BMDL) was 165 µg/m3 and was extrapolated to a 1-hour concentration of 233 µg/m^3. An uncertainty factor of 1000 (3 for benchmark response uncertainty, 10 for interspecies differences, and 30 for intraspecies differences) was applied.
										TCEQ: Screening value (AMCV) is based on an exposure study in which significant bronchial constriction was observed in 12 metal plating factory workers with recurring occupationally-related respiratory problems (Cirla et al. 1985, as cited by TCEQ 2017). The subjects of the study were exposed to an aerosol of 0.3 mg/m3 of nickel sulphate (67 µg nickel/m3) in an exposure chamber for 30 minutes in which respiratory effects were significant at this level of exposure (LOAEL of 67 µg/m3) and therefore a NOAEL was not available. The exposure concentration was extrapolated to 1 hour (33.5 µg nickel/m3) and an uncertainty factor of 30 (10 for using a LOAEL and 3 for an incomplete database) was applied by TCEQ to derive an acute screening value of 1.1 µg Ni/m^3 . The TCEQ value was selected preferentially over the Cal OEHHA value because the screening value is based on a controlled human study that is more recent. Based on AMCV value where target HQ=1.
Selenium	7782-49-2	-	-	-	-	-	-	-	**2**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available), as selenium and compounds in PM.

Appendix D
Table D-5a: Air Screening Criteria (1-Hour)
Osisko Development Corp. Cariboo Gold Project

Parameter	CAS	ENV (2021) AAQO	CCME (1999, 2023) CAAQS and NAAQO	ATSDR (2024) MRL	US EPA (2024) NAAQS	WHO (2010, 2021) AQG	MECP (2020) AAQC	Cal OEHHA (2020) REL	TCEQ (2023) AMCV/ReV [a]	Toxicological Endpoints and Derivations
Polycyclic Aromatic Hydrocarbons										
1-Methylnaphthalene	90-12-0	-	-	-	-	-	-	-	**200**	TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available) in PM.
2-Methylnaphthalene	91-57-6	-	-	-	-	-	-	-	**200**	TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available) in PM.
Acenaphthene	83-32-9	-	-	-	-	-	-	-	**100**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available) in PM.
Acenaphthylene	208-96-8	-	-	-	-	-	-	-	**100**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available) in PM.
Anthracene	120-12-7	-	-	-	-	-	-	-	**1**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available) in PM.
Benzo(a)anthracene	56-55-3	-	-	-	-	-	-	-	**0.5**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available) in PM.
Benzo(a)pyrene	50-32-8	-	-	-	-	-	-	-	-	A 1-hour screening value is not available. Acute inhalation exposure is assessed utilizing the 24-hour exposure scenario.
Benzo(b)fluoranthene	205-99-2	-	-	-	-	-	-	-	**0.5**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available) in PM.
Benzo(g,h,i)perylene		-	-	-	-	-	-	-	**0.5**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV), supporting documentation not available) in PM.
Benzo(k)fluoranthene	207-08-9	-	-	-	-	-	-	-	**0.5**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV), supporting documentation not available) in PM.
Chrysene	218-01-9	-	-	-	-	-	-	-	**0.5**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV), supporting documentation not available) in PM.
Dibenz(a,h)anthracene	53-70-3	-	-	-	-	-	-	-	**0.5**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available) in PM.
Fluoranthene	206-44-0	-	-	-	-	-	-	-	**0.5**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available) in PM.
Fluorene	86-73-7	-	-	-	-	-	-	-	**10**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available) in PM.
Indeno(1,2,3-c,d)pyrene	193-39-5	-	-	-	-	-	-	-	**0.5**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available) in PM.
Naphthalene	91-20-3	-	-	-	-	-	-	-	**500**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available) in PM.
Phenanthrene	85-01-8	-	-	-	-	-	-	-	**8**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available) in PM.
Pyrene	129-00-0	-	-	-	-	-	-	-	**0.5**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available) in PM.

Notes
- = no guideline available or not applicable; AMCV= Air Monitoring Comparison Value; AQG = Air Quality Guideline; ATSDR = Agency for Toxic Substances and Disease Registry; Cal OEHHA = California Office of Environmental Health Hazard Assessment; CCME = Canadian Council of Ministers of the Environment; ENV = British Columbia Ministry of Environment and Climate Change Strategy; ESL = Effects Screening Level; LOAEL= Lowest observed adverse effect level; MECP = Ontario Ministry of the Environment, Conservation and Parks; MRL = Minimal Risk Level; NAAQO = National Ambient Air Quality Objectives; NAAQS = National Ambient Air Quality Standard; NOAEL= No observed adverse effect leve; PM= Particulate Matter; REL = Reference Exposure Level; ReV= Reference Value; TCEQ = Texas Commission on Environmental Quality; US EPA = United States Environmental Protection Agency; WHO = World Health Organization

Concentrations are in micrograms per cubic metre ($\mu g/m^3$), unless otherwise noted.

Concentrations in parts per million (ppm) were converted to mg/m^3 by applying the formula: molecular weight (grams per mol) x ppm / 24.45.

Bold and Shaded = selected screening value

(a) Air Monitoring Comparison Value (AMCV), which are based on the Reference Value (ReV) adjusted to HQ=1, are preferentially selected over the Effect Screening Level (ESL), are based on the Reference Value adjusted to HQ=0.3, where available. Where values are the same (i.e., interim values), then both AMCV and ESL are selected. ReV are toxicological studies derived from relevant studies and are presented in available supporting documentation associated with the parameter.

(b) Acute ReV, based on an HQ=1, was preferentially selected over acute ESL, based on HQ=0.3 as AMCV were not available. See footnote (a) for TCEQ selection approach.

(c) Selected values are preferentially selected over more conservative criteria of the tertiary sources if supporting documentation is available for the selected criteria only, criteria is based on more current studies, or criteria is based on studies which are more relevant to human health (i.e., human studies).

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Appendix D

Table D-5b: Air Screening Criteria (24-Hour)

Osisko Development Corp. Cariboo Gold Project

	Table B: 24-Hour (Acute) Air Thresholds								
		Primary		Secondary			Tertiary		
Parameter	**CAS**	**ENV (2021) AAQO**	**CCME (1999, 2023) CAAQS and NAAQO**	**ATSDR (2024) MRL**	**US EPA (2024) NAAQS**	**WHO (2021) AQG**	**MECP (2020, 2023) AAQC/ACB**	**TCEQ (2023) AMCV**	**Toxicological Endpoints and Derivations**
Criteria Air Contaminants									
Carbon monoxide (CO)	630-08-0	-	-	-	-	**4,000**	-	-	WHO: Based on a systemic review on CO exposure and hospital admissions for myocardial infarction. The 99th percentile daily mean concentrations in a year was calculated with the assumption that the 99th percentile is three times greater than the annual mean observed in the MCC Collaborative Research Network database. Although the risk of myocardial infarction hospital admissions and emergency room visits is expected to be elevated by about 5% on days where CO is equal to the air quality guideline, the overall health burden related to a few days with higher concentrations corresponds to a very small fraction of the total air pollution related burden (WHO, 2021).
Carbon monoxide (CO) (8-hour) [(a)]	630-08-0	**5,500**	Desirable NAAQO = 6,000 Acceptable NAAQO = 15,000 Tolerable NAAQO = 20,000	-	10,300 (9 ppm)	10,000	15,700	-	ENV: Pollution control objectives for food-processing, agriculturally orientated, and other industries; additional supporting documentation not available. CCME NAAQO: Screening value is based on cardiorespiratory effects in people with exercise-induced myocardial ischemia, which was evaluated and derived by the NAAQO in 1994 (NAAQO 1994). The NAAQO derived an 8-hour rolling average maximum acceptable level (15,000 µg/m3) which is based on the maintenance of blood carboxyhemoglobin concentrations below the LOEL of 2% (Allred et al. 1989; as cited in NAAQO 1994). The maximum acceptable level is an air quality concentration that is protective against effects on the environment, visibility, personal comfort, and well-being. The PBPK model developed by Coburn, Foster, and Kane was used to extrapolate a 2% blood carboxyhemoglobin concentration to an ambient carbon monoxide concentration in the air. The maximum desirable level was based on 1% blood carboxyhemoglobin concentration and the maximum tolerable level was based on a LOAEL of 2.9% carboxyhemoglobin. The maximum desirable level is the long term goal for air quality. US NAAQS: Screening value based on clinical evidence relating carboxyhemoglobin (carbon monoxide bound to blood hemoglobin) levels to various adverse health endpoints including hypoxia, cardiovascular effects, reproductive effects, central nervous system effects, respiratory effects and impairment of prenatal development. The NAAQS of 9 ppm was converted to µg/m3 using a molecular weight of 28.01 g/mol. WHO: Screening value is a time-weighted average 8-hour exposure derived so that the carboxyhemoglobin (carbon monoxide bound to blood hemoglobin) level of 2.5% is not exceeded (screening value for human health effect). MECP: Screening value based on a health endpoint (supporting documentation not available).
Nitrogen dioxide (NO2)	10102-44-0	-	-	-	-	**25**	200	-	WHO: Screening value based on studies of bronchial responsiveness among asthmatics as reviewed by the WHO. Based on their review, the WHO (2021) derived a 24-hr screening value based on the 99th percentile of common distributions of daily air pollution concentrations corresponding to an average long-term concentration equivalent to the annual air quality guideline. The effect estimates obtained from a systemic review on NO2 and daily hospital admissions for asthma supported the calculation of the short-term air quality guideline. MECP: Screening value based on a health endpoint (supporting documentation not available).
Sulphur dioxide (SO2)	7446-09-5	-	-	-	-	**40**	-	-	WHO: 24 hr screening value is based on the 99th percentile (equivalent to three to four exceedance days per year) of the annual distribution of 24-hour average concentrations. The epidemiological evidence underpinning the AQG level is discussed in a systematic review commissioned by WHO on asthma hospital admissions and emergency room visits (Zheng et al., 2021) and another on daily sulfur dioxide mortality (Orellano, Reynoso & Quaranta, 2021) (WHO 2021).
PM10	N/A	**50**	-	-	150	45	**50**	-	ENV: Supporting documentation not available. US NAAQS: Air screening level to protect against adverse health effects of inhalable airborne particles that can be deposited in the lower (thoracic) regions of the human respiratory tract. The standard is met when a 24-hr average PM10 concentration of 150 mg/m3 is not exceeded more than one day per year, on average over a three-year period. WHO: Based on non-accidental and cause-specific mortality (e.g., cardiovascular, non-malignant respiratory and cerebrovascular mortality). The guideline is derived from the 99th percentile of common distributions of daily air pollution concentrations corresponding to an average long-term concentration equivalent to the annual AQG level. MECP: Screening value based on a health endpoint (supporting documentation not available). Interim AAQC for decision making; no conversion to other averaging times.

Appendix D
Table D-5b: Air Screening Criteria (24-Hour)
Osisko Development Corp. Cariboo Gold Project

Parameter	CAS	ENV (2021) AAQO	CCME (1999, 2023) CAAQS and NAAQO	ATSDR (2024) MRL	US EPA (2024) NAAQS	WHO (2021) AQG	MECP (2020, 2023) AAQC/ACB	TCEQ (2023) AMCV	Toxicological Endpoints and Derivations
PM2.5	N/A	**AQO = 25** CAAQS = 27	27	-	35	15	27	-	ENV: Supporting documentation not available. The provincial air quality objective is based on the annual 98th percentile of daily average, over one year and was selected as it is more conservative than the CAAQS. The objective is the primary air management tool that is used to guide decisions on environmental impact assessments and authorizations, airshed planning efforts, and regulatory development. The objective is also used to guide decisions on whether or not to issue an air quality advisory. CCME CAAQS: Air screening levels based on Canada Wide Standards, intended for the protection of respiratory effects. CCME has proposed a Canadian ambient air quality standard (CAAQS) for PM2.5 of 27 µg/m3 for the year 2020, which is intended to be protective of human health and the environment. The metric is the 3-year average of the annual 98th percentile of the daily 24-hour average concentrations. US NAAQS: Standard based on the 98th percentile of daily 24-hour concentrations averaged over 3 years and is protective of increased health effects associated with short-term PM2.5 exposure, including premature mortality and increased hospital admissions and emergency department visits. WHO: The guideline is based on the same toxicological endpoint as PM10 where exposure is associated with a 0.46 to 0.62% increase in mortality per 10 µg/m3 increase in PM10. The PM10 guideline is converted using a PM2.5:PM10 ratio of 0.5. This PM2.5:PM10 ratio is typical of that found in urban areas of developing countries and is at the bottom of the range found in urban areas in developed countries (0.5 to 0.8). The AQG is the 99th percentile of the annual distribution of 24-hour average concentrations, based on short-term exposure of PM2.5 and non-accidental mortality. MECP: Based on CCME CAAQS
Metals									
Aluminum	7429-90-5	-	-	-	-	-	12[(b)]	**8.9**	MECP: 24 hr ACB screening level based on the lower annual screening value from the New York State Department of Environmental Conservation (2.4 µg/m3) and TCEQ (5 µg/m3). The MECP converted the annual New York guideline to a 24-hour averaging period using a conversion factor of 5. Screening value based on a health endpoint (supporting documentation for the annual screening value from New York not available). TCEQ: Screening value (AMCV) based on 4 h/d for 3 d (total exposure of 12 h) acute study that identified a NOAEL and a LOAEL of 3.2 and 7 mg Al/m3, respectively, for the changes in lung weight in male Hamsters Drew 1974 as cited in TCEQ, 2021). The NOAEL was adjusted for a 24 hr exposure duration. Uncertainty factors were applied for interspecies variability (3), intraspecies variability (10) and database uncertainties (6), resulting in a threshold of 8.9 ug/m3 for aluminum.
Antimony	7440-36-0	-	-	**1**	-	-	25	-	ATSDR: Screening value based on squamous metaplasia of the epiglottis respiratory endpoints. Mice were exposed to 0, 3.71, 7.43, 14.7, 30.2 and 59.4 mg/m3 antimony trioxide gas for 17 days (ATSDR 2019). A BMCL10 of 940 µg/m3 was identified as the point of departure. The BMCL10 was adjusted for a human equivalency concentration (HEC) (35 µg/m3). Uncertainty factors for extrapolation from animals to humans using dosimetric adjustments (3), and human variability (10) were applied, for a total uncertainty factor of 30. The acute-duration inhalation MRL was adopted as the 24-hour air threshold. MECP: Screening value based on a health endpoint (supporting documentation not available).
Arsenic	7440-38-2	-	-	-	-	-	0.3	**5.4** [(c)]	MECP: Screening value based on an occupational exposure study conducted on retired copper smelter employees, who had worked in copper smelters for 28 years (Pinto et al. 1978 as cited in MECP 1981). The study examined urinary arsenic biomarkers and found an increased risk of mortality due to lung cancer associated with duration and degree of exposure to arsenic trioxide. TCEQ: Screening value (AMCV) based on a study where female rats were exposed to 0, 0.3, 3, and 10 mg/m3 arsenic trioxide for 6 hours/day for multiple days (Holson et al. 1999; as cited in TCEQ 2021). The NOAEL and LOAEL for maternal effects (i.e., rales) were 3000 and 10,000 µg/m3, respectively. The TCEQ chose the NOAEL of 3000 µg/m3 as the point of departure. The NOAEL was adjusted for a human equivalent concentration of 0.714 (2142 µg/m3). Uncertainty factors were applied for interspecies variability (3), intraspecies variability (10) and database uncertainties (10), resulting in a threshold of 7.14 ug/m3 for arsenic trioxide. The threshold for arsenic trioxide was adjusted for arsenic (arsenic trioxide is 76% arsenic by weight), resulting in a threshold of 5.4 µg/m3. The TCEQ value was selected preferentially over the MECP value because the MECP value is based on a carcinogenic endpoint, which is better suited for the evaluation of chronic effects.

Appendix D
Table D-5b: Air Screening Criteria (24-Hour)
Osisko Development Corp. Cariboo Gold Project

Parameter	CAS	ENV (2021) AAQO	CCME (1999, 2023) CAAQS and NAAQO	ATSDR (2024) MRL	US EPA (2024) NAAQS	WHO (2021) AQG	MECP (2020, 2023) AAQC/ACB	TCEQ (2023) AMCV	Toxicological Endpoints and Derivations
Cadmium	7440-43-9	-	-	**0.03**	-	-	0.025	0.55	ATSDR: Screening value based on a LOAEL of 88 µg/m3 for respiratory effects in rats exposed to cadmium oxide for 6.2 hours/day, 5 days/week for 2 weeks (ATSDR 2012). A NOAEL was not available from this study because effects were observed in all concentrations tested. The LOAEL was adjusted for continuous exposure (88 µg cadmium/m3 x 6.2 hours/24 hours x 5 days/7 days) and for a regional deposited dose ratio in the pulmonary region of 0.617 to determine a human equivalent concentration (HEC; 10 µg/m3). An uncertainty factor of 300 (3 for extrapolating from animals to humans, 10 for a use of a LOAEL and 10 for human variability) was applied to the HEC (10 mg/m3). MECP: The MECP used a conversion factor of 5 to convert from the annual-averaging value (0.005 µg/m3) to the 24-hour averaging-value. Screening value is based on the annual MECP screening value, which is based on kidney effects associated with exposure to cadmium compounds (MECP 2006). TCEQ: Screening value based on the same study used to derive the ATSDR MRL. The LOAEL was 0.088 mg/m3 (total of 62 hours of exposure) (TCEQ 2016). The LOAEL was not extrapolated to a 24-hour exposure. The LOAEL was adjusted for a regional deposited dose ration (1.87), resulting in a human equivalent concentration point of departure (PODHEC) of 165 µg/m3. An uncertainty factor of 300 was applied (3 for interspecies variability, 10 for intraspecies variability and 10 for use of a LOAEL).
Chromium (total or trivalent)	7440-47-3	-	-	-	-	-	**0.5**	-	MECP: metallic, divalent and trivalent forms: Screening value for chromium (metallic, divalent and trivalent forms) based on a subchronic inhalation study where rats were exposed to various forms of trivalent chromium at 3, 10, and 30 mg/m3 for 6 hours/day, 5 days/week for 13 weeks. The authors derived the BMCL10 value of 3.45 mg/m3 chromium sulphate for increases in total lung and trachea weights (relative to body weight) in rats. The BMCL10 was adjusted for continuous exposure (3.45 mg/m3 x 6/24 hours x 5/7 days = 0.616 mg/m3) and converted to a human equivalent concentration using a Regional Deposited Dose Ratio value of 1.31. The fraction of trivalent chromium in chromium sulfate was accounted for (17%) yielding, resulting in an adjusted concentration of 0.138 mg/m3. Uncertainty factors of 10 (intraspecies variability), 3 (interspecies extrapolation), and 10 (use of a subchronic (13-weeks) study) were applied.
Chromium (hexavalent)	18540-29-9	-	-	-	-	-	0.007	**1.3** [(c)]	MECP: The MECP used a conversion factor of 5 to convert from the annual-averaging value (0.00014 µg/m3) to the 24-hour averaging-value. Screening value is based on the annual MECP value, which is based on carcinogenic effects of chromium IV (MECP 2011). The 24-hour MECP value is based on hexavalent chromium in the TSP size fraction, which incorporates the MECP assumption that approximately 50% of TSP is in the PM10 fraction. The annual MECP screening value is based on a cancer risk of 1 in 1,000,000 and was adjusted to a cancer risk of 1 in 100,000; therefore, the 24-hour value was also adjusted by 10. TCEQ: Screening value for hexavalent chromium based on a benchmark concentration lower confidence limit corresponding to the lower 10% incidence of effect (BMCL10) of 16.06 µg Cr(VI)/m3 for increased relative lung weight in rats exposed to 0, 50, 100, 200, or 400 µg Cr(VI)/m3, as sodium dichromate, for 22 hours/day for 7 days/week for 30 days (TCEQ 2014). The BMCL10 was not adjusted for continuous exposure by TCEQ because the study exposure duration of 22 hours/day, 7 days/week for 30 days is much longer than the acute duration of interest (24-hour). The BMCL10 was adjusted for a human equivalent concentration (HEC) using the regional deposited dose ratio for animal to human adjustment of 2.41. Uncertainty factors for interspecies variation (3) and intraspecies variation (10) were applied. The resulting screening value of 1.3 µg Cr(VI)/m3 was based on an HQ = 1.0. The TCEQ value was selected preferentially over the MECP value because the MECP value is based on a carcinogenic endpoint, which is better suited for the evaluation of chronic effects.

Appendix D
Table D-5b: Air Screening Criteria (24-Hour)
Osisko Development Corp. Cariboo Gold Project

Parameter	CAS	ENV (2021) AAQO	CCME (1999, 2023) CAAQS and NAAQO	ATSDR (2024) MRL	US EPA (2024) NAAQS	WHO (2021) AQG	MECP (2020, 2023) AAQC/ACB	TCEQ (2023) AMCV	Toxicological Endpoints and Derivations
Cobalt	7440-48-4	-	-	-	-	-	0.1	**0.095**	MECP: Screening value based on a health endpoint (supporting documentation not available). TCEQ: Screening value based on respiratory effects in occupationally-exposed people (TCEQ 2017). The 6-hour LOAEL of 38 µg/m3 was adjusted to 24 hours using the following equation: C2 = C1 * (T1/T2) , where C1 = 38 µg/m3, T1 = 6 hours and T2 = 24 hours . An uncertainty factor of 100 was applied (10 for interspecies variability, 10 for use of a LOAEL).
Copper	7440-50-8	-	-	-	-	-	**50**	-	MECP: Screening value based on a health endpoint (supporting documentation not available).
Iron	7439-89-6	-	-	-	-	-	**4**	-	MECP: The MECP derived the 24-hour screening value from the half-hour value using a conversion factor of 2.5. The conversion factor of 2.5 accounts for differences in sampling time and the potential for multiple iron sources (MECP 2005). The screening value is based on pulmonary siderosis, a form of pneumoconiosis (MECP 2005).
Lead	7439-92-1	-	-	-	-	-	**0.5**	-	MECP: Screening value based on neurological effects in children. The screening value is based on Cal EPA (2001; as cited in (MECP 2007) approach where the airborne lead concentration is based on a 5% probability of children in a reference population exceeding the LOAEL. The study that formed the basis of the Cal EPA derivation (Lanpear et al. 2005 as cited in CalEPA 2001) evaluated the epidemiologic incidence of increased blood lead levels and decreased intelligence quotients (IQ), in several cohorts of children. The LOAEL blood level lead was determined to be 10 µg/dL. An uncertainty factor of 2 to account for other study results that showed blood levels below the LOAEL associated lower IQ and other adverse neurobehavioural effects.
Manganese	7439-96-5	-	-	-	-	-	0.1 (PM2.5) 0.2 (PM10) 0.4 (SPM)	**5** [(c)]	MECP: Screening value based on the occupational exposure to manganese. A $BMCL_{05}$ of 84 µg/m3 for neurological effects (eye-hand coordination impairment) was identified (Roels et al. 1992 as cited in MECP 2011). The BMCL05 was adjusted for continuous exposure (84 µg/m3 x 5/7 days x 10m3/20m3 = 30 µg/m3). Uncertainty factors of 10 (intraspecies variability), 3 (database limitations), 3 (subchronic to chronic extrapolation) were applied, resulting in a screening value of 0.1 µg/m3 for manganese in PM2.5. This was converted to a manganese concentration in PM10 and then TSP (0.4 µg/m3) on the basis that approximately 50% of ambient PM10 is made up of PM2.5 and approximately 50% of ambient TSP is made up of PM10. TCEQ: Screening value based on an inhalation study where rhesus monkeys were exposed to manganese sulphate for 6 hours per day, 5 days per week for 3 weeks (total of 90 hours of exposure) (TCEQ 2017). The critical effect was mild inflammatory changes to the airway with a point of departure LOAEL (6 hours of exposure) of 1.5 mg Mn/m3. The LOAEL did not require adjustment to a human equivalent concentration (HEC) because the particulate deposition efficiency is the same in rhesus monkeys and humans. Uncertainty factors for extrapolation from a LOAEL to a NOAEL (2), intrahuman variability (10), 3 to account for potential toxicodynamic differences between rhesus monkeys and humans and 6 for a limited database were applied; however, a maximum uncertainty factor of 300 is used to derive an acute reference value of 5 µg/m3.
Mercury	7439-97-6	-	-	-	-	-	**2**	-	MECP: Screening value based on the NIOSH occupational limit of 50 $\mu g/m^3$ for mercury compounds (MECP 2020). The MECP divided the NIOSH occupational limit (50 $\mu g/m^3$) by a factor of 25 to obtain the 24-hour screening value (MECP 2020).

Appendix D
Table D-5b: Air Screening Criteria (24-Hour)
Osisko Development Corp. Cariboo Gold Project

Parameter	CAS	ENV (2021) AAQO	CCME (1999, 2023) CAAQS and NAAQO	ATSDR (2024) MRL	US EPA (2024) NAAQS	WHO (2021) AQG	MECP (2020, 2023) AAQC/ACB	TCEQ (2023) AMCV	Toxicological Endpoints and Derivations
Nickel	7440-02-0	-	-	0.2	-	-	0.1 (PM10) 0.2 (SPM)	**1.1** [(c)]	ATSDR: Screening value based on chronic active inflammation respiratory endpoints in rats (ATSDR 2005). Rats were exposed to 0.12, 0.25,0.5,1.0, or 2.0 mg/m3 nickel sulfate hexahydrate for 6 hours per day, 5 days per week for 13 weeks. A NOAEL of 0.06 mg/m3 was observed. The NOAEL was adjusted for intermittent exposure, yielding 11 µg-Ni/m3. The NOAEL human equivalency concentration (HEC) was calculated using the adjusted NOAEL and a regional deposited dose ratio of 0.474 for the pulmonary region. The NOAEL HEC was 5.2 µg-Ni/m3. Uncertainty factors for extrapolation from animals to humans with dosimetric adjustment (3), and human variability (10) were applied for an uncertainty factor of 30. MECP: MECP used a conversion factor of 5 to convert from the annual-averaging value (0.02 µg/m3). Screening value is for nickel as a metal in PM10. Screening value based on the annual MECP screening value which is based on carcinogenic and non-carcinogenic effects (MECP 2011). The MECP screening value of 0.2 µg/m3 is based on nickel in TSP assuming that approximately 50% of ambient TSP is made up of PM10. TCEQ: Screening value (AMCV) as PM10 based on an inhalation study where rats were exposed to Ni for 72 hours over 12 exposure days (TCEQ 2021). The critical effect was lung inflammation and increased relative lung weight with a point of departure LOAEL of 0.7 mg Ni/m3. The LOAEL was adjusted to a human equivalent concentration (HEC) for a POD of 0.9191 mg Ni/m3. Uncertainty factors for extrapolation of LOAEL to NOAEL (10), intrahuman variability (10), and potential toxicodynamic differences between rats and humans (3) were applied to derive a final acute reference value of 3.1 µg Ni/m3. The candidate interim 24-ReV of 3.1 µg Ni/m3 is higher than the 1-hour ReV of 1.1 µg Ni/m3 (based on bronchial constriction in human volunteers with occupational asthma). While associated with uncertainty that is an order of magnitude higher, the candidate interim 24-ReV supports use of the 1-hour ReV (1.1 µg Ni/m3) as the interim 24-hour ReV. TCEQ AMCV was selected as it is derived from an acute exposure study, while MECP and ATSDR are based on longer intermediate or chronic exposure durations.
Selenium	7782-49-2	-	-	-	-	-	**10**	-	MECP: Screening value based on a health endpoint (supporting documentation not available).
Polycyclic Aromatic Hydrocarbons									
1-Methylnaphthalene	90-12-0	-	-	-	-	-	**35.5** [(b)]	-	MECP: 24 hr ACB screening level based on a health endpoint (supporting documentation not available).
2-Methylnaphthalene	91-57-6	-	-	-	-	-	**35.5** [(b)]	-	MECP: 24 hr ACB screening level based on a health endpoint (supporting documentation not available).
Acenaphthene	83-32-9	-	-	-	-	-	-	-	A 24-hour screening value was not available; acute exposure evaluated for 1-hour averaging time only.
Acenaphthylene	208-96-8	-	-	-	-	-	-	-	A 24-hour screening value was not available; acute exposure evaluated for 1-hour averaging time only.
Anthracene	120-12-7	-	-	-	-	-	-	-	A 24-hour screening value was not available; acute exposure evaluated for 1-hour averaging time only.
Benzo(a)anthracene	56-55-3	-	-	-	-	-	-	-	A 24-hour screening value was not available; acute exposure evaluated for 1-hour averaging time only.
Benzo(a)pyrene	50-32-8	-	-	-	-	-	**0.0005** (0.00005)	-	MECP: MECP used a conversion factor of 5 to convert from the annual-averaging value (0.00001 µg/m3) to the 24-hour averaging value. Screening value based on the annual MECP screening value, which is based on carcinogenic effects (MECP 2011). The annual MECP screening value is based on a cancer risk of 1 in 1,000,000 and was adjusted to a cancer risk of 1 in 100,000; therefore, the 24-hour value was also adjusted by 10 for this assessment.
Benzo(b)fluoranthene	205-99-2	-	-	-	-	-	-	-	A 24-hour screening value was not available; acute exposure evaluated for 1-hour averaging time only.

Appendix D
Table D-5b: Air Screening Criteria (24-Hour)
Osisko Development Corp. Cariboo Gold Project

Parameter	CAS	ENV (2021) AAQO	CCME (1999, 2023) CAAQS and NAAQO	ATSDR (2024) MRL	US EPA (2024) NAAQS	WHO (2021) AQG	MECP (2020, 2023) AAQC/ACB	TCEQ (2023) AMCV	Toxicological Endpoints and Derivations
Benzo(g,h,i)perylene		-	-	-	-	-	-	-	A 24-hour screening value was not available; acute exposure evaluated for 1-hour averaging time only.
Benzo(k)fluoranthene		-	-	-	-	-	-	-	A 24-hour screening value was not available; acute exposure evaluated for 1-hour averaging time only.
Chrysene	218-01-9	-	-	-	-	-	-	-	A 24-hour screening value was not available; acute exposure evaluated for 1-hour averaging time only.
Dibenz(a,h)anthracene	53-70-3	-	-	-	-	-	-	-	A 24-hour screening value was not available; acute exposure evaluated for 1-hour averaging time only.
Fluoranthene	206-44-0	-	-	-	-	-	-	-	A 24-hour screening value was not available; acute exposure evaluated for 1-hour averaging time only.
Fluorene	86-73-7	-	-	-	-	-	-	-	A 24-hour screening value was not available; acute exposure evaluated for 1-hour averaging time only.
Indeno(1,2,3-c,d)pyrene	193-39-5	-	-	-	-	-	-	-	A 24-hour screening value was not available; acute exposure evaluated for 1-hour averaging time only.
Naphthalene	91-20-3	-	-	-	-	-	**22.5**	-	MECP: Screening value based on adverse respiratory effects in mice following single intraperitoneal injections of naphthalene (0.05- 2.0 mmol/kg) dissolved in corn oil. The endpoint measured in mice included ultrastructural or histopathological changes in the nonciliated bronchiolar epithelial cells. The study found a NOAEL of 6.4 mg/kg, which was converted to the human equivalent concentration (6.4 mg/kg x 70 kg ÷ 20 m3/d = 22.5 mg/m3), and an uncertainty factor of 1000 was applied for the extrapolation from acute to chronic, intraspecies extrapolation, and interspecies extrapolation (MECP 1987).
Phenanthrene	85-01-8	-	-	-	-	-	-	-	A 24-hour screening value was not available; acute exposure evaluated for 1-hour averaging time only.
Pyrene	129-00-0	-	-	-	-	-	-	-	A 24-hour screening value was not available; acute exposure evaluated for 1-hour averaging time only.

Notes

- = no guideline available or not applicable; ACB = Air Contaminant Benchmarks; AMCV= Air Monitoring Comparison Values; AQG = Air Quality Guideline; ATSDR = Agency for Toxic Substances and Disease Registry; CCME = Canadian Council of Ministers of the Environment; ENV = British Columbia Ministry of Environment and Climate Change Strategy; LOAEL= Lowest observed adverse effect level; MECP = Ontario Ministry of the Environment, Conservation and Parks; MRL = Minimal Risk Level; NAAQO = National Ambient Air Quality Objectives; NAAQS = National Ambient Air Quality Standard; NOAEL= No observed adverse effect level; ReV= Reference value; TCEQ = Texas Commission on Environmental Quality; US EPA = United States Environmental Protection Agency; WHO = World Health Organization.

Concentrations are in microgram per cubic metre (µg/m3), unless otherwise noted.
Concentrations in parts per million (ppm) were converted to mg/m3 by applying the formula: molecular weight (grams per mol) x ppm / 24.45.
(a) Carbon monoxide was evaluated using an 8-hr averaging time rather than a 24-hr averaging time as no 24-hr screening value was available.
(b) MECP (2021) Air Contaminant Benchmark (ACB) was selected given MECP (2020) Ambient Air Quality Criteria (AAQC) were unavailable. The ACBs are standards, guidelines and screening levels for assessing point of impingement concentrations.
(c) Selected values are preferentially selected over more conservative criteria of the secondary or tertiary sources if criteria is based on more current studies, non-carcinogenic endpoint and/or acute exposure instead of chronic exposure.
Bold and Shaded = selected screening value

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Appendix D
Table D-5b: Air Screening Criteria (Annual)
Osisko Development Corp. Cariboo Gold Project

		Table C: Annual (Chronic) Air Thresholds									
			Primary		Secondary			Tertiary			
Parameter	**CAS**	**Carcinogen Classification**	**ENV (2021) AAQO**	**CCME (2023) CAAQS**	**ATSDR (2020) MRL**	**US EPA (2023, 2024) RSL/NAAQS[a), b)]**	**WHO (2021) AQG**	**MECP (2020) AAQC [c)]**	**Cal OEHHA (2020) REL [d)]**	**TCEQ (2023) AMCV/ReV [e)]**	**Toxicological Endpoints and Derivations**
Criteria Air Contaminants											
Carbon monoxide (CO)	630-08-0	NC	-	-	-	-	-	-	-	-	Chronic screening values not available because health effects linked to CO are associated with shorter term exposures (i.e., 1- or 8 hours).
Nitrogen dioxide (NO2)	10102-44-0	NC	Interim AQO = 60 CAAQS = 32 **CAAQS = 23** **(effective in 2025)**	32 (17 ppb) (effective in 2020) **23** **(12 ppb)** **(effective in 2025)**	-	100 (53 ppb)	40	-	-	-	ENV: Supporting documentation not available for screening value. The interim AQO is 60 µg/m3 and the CAAQS of 32 µg/m3 took effect on 1 January 2020. A value of 23 µg/m3 is proposed for the year 2025 and it was selected as the screening value as it is more conservative than the 2020 CAAQS of 32 µg/m3. The CAAQS is the annual average of 1-hour average concentrations over one year. The CAAQS of 12 ppb was converted to µg/m3 using a molecular weight of 46.01. CCME CAAQS: Proposed screening value for the year 2025 was selected as it is more conservative than the 2020 CAAQS of 32 µg/m3 (supporting documentation not available). The metric is the average over a single calendar year of all 1-hour average concentrations. The CAAQS of 17 and 12 ppb were converted to µg/m3 using a molecular weight of 46.01. US NAAQS: Screening value based on a large body of evidence for respiratory effects from exposure to nitrogen oxides. The key clinical studies on human health effects are based on shorter exposure durations (0.5 to 3 hours). The health effects reported include increased airway responsiveness in asthmatics, small decreases in forced vital capacity and forced expiratory volume in one second (FEV1) with mild exercise in patients with chronic obstructive pulmonary disease, increased airway responsiveness to bronchoconstrictors in healthy adults, and changes in lung function in healthy adults (US EPA 1993). The key epidemiological studies on human health effects indicated increased risk of lower respiratory symptoms/disease in children (aged 5 to 12 years). Exposure to NO2 in occupational settings was associated with bronchial pneumonia and bronchitis (25 to 100 ppm). In high occupational exposure cases (>200 ppm), effects ranged from hypoxemia/transient airway obstruction to death (US EPA 1993). The NAAQS is a primary and secondary value, which is protective of "sensitive" populations such as asthmatics, children, and the elderly. The NAAQS of 53 ppb was converted to µg/m3 using a molecular weight of 46.01 g/mol. WHO: Screening value based on a health endpoint. Epidemiological studies show that reduced lung function in children is linked to elevated NO2 concentrations within communities already at current North American and European urban ambient air levels. Studies indicated that a 28.2 µg/m3 increase in nitrogen dioxide is associated with a 20% increase in the odds of lower respiratory symptoms. WHO (2000) states that there is still no robust basis for setting a guideline value based on any direct toxic effect. The screening value was set based on a meta-analysis of indoor air studies; however, there is evidence to suggest that there are health effects at the current screening value. The extent to which observed health effects in studies are attributable to NO2 itself is still unknown (WHO 2000).
Sulphur dioxide (SO2)	7446-09-5	NC	CAAQS = 13 **CAAQS = 10** (4 ppb) (effective in 2025)	13 (5 ppb) (effective in 2020) **10** (4 pbb) (effective in 2025)	-	-	-	-	-	-	ENV: Supporting documentation not available. A value of 10 µg/m3 is proposed for the year 2025. It was selected as the screening value as it is more conservative than the 2020 CAAQS of 13 µg/m3. The CAAQS is the average over a single calendar year of all the 1-hour average concentrations. The CAAQS of 4 ppb was converted to µg/m3 using a molecular weight of 64.07. CCME CAAQS: The annual screening value of 4.0 ppb is intended to be applied to the average over a single calendar year of all the 1-hour average SO2 concentrations. It was selected as the screening value as it is more conservative than the 2020 CAAQS of 13 µg/m3. Based upon protection of human health and the environment. The CAAQS of 5 and 4 ppb were converted to µg/m3 using a molecular weight of 64.07.
PM10	N/A	NC	-	-	-	-	**15**	-	-	-	WHO: The PM10 annual AQG level was reduced from 20 µg/m^3 to 15 µg/m^3 (WHO 2021). This reflects the new evidence of effects on mortality occurring at concentrations below 20 µg/m3. In this update of the air quality guidelines, an analysis was introduced to identify the most appropriate level of the long-term air quality guidelines that is more formalized than what was used in 2005. However, the change from 20 µg/m3 to 15 µg/m3 primarily reflects the new evidence about effects occurring at low levels. It is important to note that the assessment of PM10 was based on studies that had actually measured PM10, without taking into consideration the ratios between PM10 and PM2.5. In 2005 based on empirical data, a PM10 : PM2.5 ratio of 2 was used to establish the PM10 AQG levels. The GDG notes that the empirical PM10 : PM2.5 ratios have not changed, but the method used to derive the AQG levels has changed. The resulting PM10 annual AQG level is less protective than the PM2.5 annual AQG level in most practical circumstances.
PM2.5	N/A	NC	**Provincial AAQO= 8** CAAQS = 8.8	8.8	-	9	5	8.8	-	-	ENV: Supporting documentation not available. The CAAQS of 8.8 µg/m3 comes into effect on 1 January 2020 and is based on the annual average, averaged over three consecutive years. The planning goal of 6 µg/m3 is a voluntary target used to guide airshed planning efforts and encourage communities to maintain good air quality during economic growth and development. The air quality objective of 8 µg/m3 is an air management tool used to guide decisions on environmental impact assessments and authorizations, airshed planning efforts and regulatory development (ENV 2008; BC MHLS 2009). The air quality objective is based on the annual average, over one year, and was selected as the screening value because it is more conservative than the CAAQS. CCME CAAQS: Canadian ambient air quality standard protective of human health and the environment. The standard represents a balance between achieving the best health and environmental protection possible and the feasibility and costs of reducing pollutant emissions; a value of 8.8 µg/m3 is proposed for the year 2020. The metric is the 3-year average of the annual average concentrations. US EPA: The NAAQS is protective of adverse health effects associated with long-term PM2.5 exposure, including premature mortality, asthmatic symptoms, heart attacks, emergency room visists, and lost work/school days. Achievement is based on the annual mean, averaged over 3 years. In February 2024, US EPA announced its decision to lower the primary health-based annual standard from its current level of 12 ug/m3 to 9.0 ug/m3 to be more stringent and protective of public health in order to meet the Clean Air Act, which requires that primary standards are ""requisite to protect public health with an adequate margin of safety,"". This decision is based on review of the mose recent scientific evidence which suggest adverse health effects may occur from exposure at levels permitted by the previous standard of 12 ug/m3 . WHO: A long-term air quality guideline of 5 ug/m3 was established to protect against non-accidental and cause-specific mortality (e.g., circulatory, lung cancer, and non-malignant respiratory mortality). This guideline is derived from the average of the five lowest 5th percentile levels measured in five studies (WHO 2021). MECP: Based on CCME CAAQS

Appendix D
Table D-5b: Air Screening Criteria (Annual)
Osisko Development Corp. Cariboo Gold Project

Parameter	CAS	Carcinogen Classification	ENV (2021) AAQO	CCME (2023) CAAQS	ATSDR (2020) MRL	US EPA (2023, 2024) RSL/NAAQS[a], [b]	WHO (2021) AQG	MECP (2020) AAQC [c]	Cal OEHHA (2020) REL [d]	TCEQ (2023) AMCV/ReV [e]	Toxicological Endpoints and Derivations
Inorganics											
Aluminum	7429-90-5	NC	-	-	-	**5.2**	-	-	-	1.5	US EPA: Screening value based on a provisional reference concentration (RfC) of 0.005 mg/m3 for neurotoxic effects (psychomotor and cognitive impairment) in occupationally exposed workers (US EPA 2006). Workers were exposed to a time-weighted average concentration of 4.6 to 11.5 mg/m3 for an average of 12 years. The LOAEL of 4.6 mg/m3 based on an 8-hour exposure was adjusted for continuous exposure and corrected for a human equivalent concentration (HEC). The LOAELHEC is 1.64 mg/m3. An uncertainty factor of 300 (10 for intrahuman variability, 10 for using a LOAEL and 3 for database limitations) was applied. A residential scenario exposure factor was applied to the RfC to derive the screening level.
											TCEQ: Screening value based on a health endpoint (Interim ESL and AMCV, supporting documentation not available) in PM.
Antimony	7440-36-0	NC	-	-	**0.3**	0.31	-	-	-	0.5	ATSDR: Screening value based on lung inflammation in Fischer rats exposed to 0, 0.06, 0.51 or 4.5 mg/m3 antimony trioxide dust for 6 hours/day, 5 days/week for 12 months followed by a 12-month observation period (Newton et al. 1994; as cited in ATSDR 2019). The minimum risk level was derived from a BMCL10 of 0.10 mg/m3. The BMCL10 was adjusted for intermittent exposure (PODADJ) followed by an adjustment to a human-equivalent concentration by multiplying the PODADJ by a regional deposited dose ratio (RDDR). A total uncertainty factor of 30 was then applied (3 for intraspecies variability and 10 for human variability) in the calculation of the minimum risk level.
											US EPA: Screening value based on the same study used to derive the ATSDR MRL. The benchmark concentration of 0.87 mg/m3 was adjusted for exposure duration (6/24 hours, 5/7 days) and a human equivalent concentration of 0.46, resulting in a concentration of 0.074 mg/m3. An uncertainty factor of 300 (3 for extrapolation from animals to humans with dosimetric adjustments, 10 for human variability and 3 for database deficiencies). The US EPA applies a residential scenario exposure factor to the reference concentration to derive the screening level (Target HQ=1).
											TCEQ: Screening value based on a health endpoint (Interim ESL and AMCV, supporting documentation not available) in PM..
Arsenic	7440-38-2	NC	-	-	-	**0.016**	-	-	0.015	-	US EPA (RSL): Screening value based on a Cal OEHHA chronic REL, and a residential scenario exposure factor was applied to the REL to derive the screening level.
											Cal OEHHA: Screening value based on decrease in intellectual function and adverse effects on neurobehavioural development in humans (Wasserman et al. 2004; as cited in Cal OEHHA 2014). An inhalation dose was estimated from an oral dose (drinking water) to give a value of 0.46 µg/m3. An uncertainty factor of 30 (3 for estimating a LOAEL based on quantitative dose-response analysis and 10 for inter-individual variation) was used.
		C	-	-	-	**0.0065 (0.00065)**	0.0066	-	0.003	0.067	US EPA (RSL): Screening level based on an inhalation unit risk (IUR) of 0.00429 per µg/m3 based on lung cancer in occupationally-exposed male workers (Brown and Chu 1983a, b; as cited in US EPA 1988). The risk-based concentration for a cancer risk of 1 in 100,000 is 0.002 µg/m3. A residential scenario exposure factor was applied to the risk-based concentration to derive the screening level.
											WHO: Screening level based on an estimated incremental lifetime cancer risk of 1 in 100,000 and an inhalation unit risk (IUR) of 0.0015 per µg/m3, derived from lung cancer incidences in exposed workers at metal smelters.
											Cal OEHHA: Screening level based on an inhalation unit risk (IUR) of 0.0033 per µg/m3 based on lung tumour incidence in occupationally-exposed workers and an incremental lifetime cancer risk of 1 in 100,000 (Tseng et al. 1968, 1977; as cited in Cal OEHHA 2011).
											TCEQ: Screening level (AMCV and ESL) based on respiratory and lung cancer in occupational workers. The screening value is based on an inhalation unit risk (IUR) of 0.00015 per µg/m3 and an incremental lifetime cancer risk of 1 in 100,000 (TCEQ 2012).

Appendix D
Table D-5b: Air Screening Criteria (Annual)
Osisko Development Corp. Cariboo Gold Project

Parameter	CAS	Carcinogen Classification	ENV (2021) AAQO	CCME (2023) CAAQS	ATSDR (2020) MRL	US EPA (2023, 2024) RSL/NAAQS[a], [b]	WHO (2021) AQG	MECP (2020) AAQC [c]	Cal OEHHA (2020) REL [d]	TCEQ (2023) AMCV/ReV [e]	Toxicological Endpoints and Derivations
Cadmium	7440-43-9	NC	-	-	0.01	0.01	**0.005**	**0.005**	0.02	0.011	ATSDR: Screening value based on a urinary cadmium level associated with 10% extra risk of low molecular weight proteinuria (ATSDR 2012). A urinary cadmium dose corresponding to a 10% excess risk of low molecular proteinuria of 0.5 µg/m3 creatinine was calculated from three occupational exposure studies and used as the point of departure (POD). It was estimated that an exposure of 0.1 µg/m3 in air and 0.3 µg/kg/day in diet would result in urinary cadmium level of 0.5 µg/m3 creatinine. The inhalation concentration was divided by an uncertainty factor of 9 (3 for human variability and 3 as a modifying factor to address the lack of human data to assess the relative sensitivities of the lungs and the kidneys).
											US EPA (RSL): Screening level derived from a Cal OEHHA REL. The US EPA applies a residential scenario exposure factor to derive the screening level.
											WHO: Screening value based on data collected in industrial workers with lung cancer and renal effects. Cadmium exposure may result in various renal alterations, whether it is absorbed via inhalation or contaminated food. WHO (2000) indicated that the lowest estimate of the cumulative exposure to airborne cadmium in industrial workers leading to an increased risk of renal dysfunction (low-molecular-weight proteinuria) or lung cancer was 100 µg/m3-year for an 8-hour exposure, and this was extrapolated to a continuous lifetime exposure estimate of 0.3 µg/m3. WHO (2000) indicated that existing levels of cadmium in the air of most urban or industrial areas are around one-fiftieth of this value. The screening value was derived to prevent a further increase of cadmium in agricultural soils, which is likely to increase exposure to future generations through dietary intake.
											MECP: Screening value based on kidney effects in humans associated with exposure to cadmium compounds (MECP 2006). A LOAEL OF 100 µg/m3-years was identified from the study. A continuous lifetime exposure of 270 ng/m3 for the general population was derived from the cumulative occupational exposure of 100 µg/m3-years. The occupational exposure level was converted into an equivalent continuous lifetime exposure by extrapolating the occupational LOAEL from 8 hours to 24 hours, from 225 working days to 365 days and distributed over an average human lifetime of 75 years (100 µg/m3-years x 8/24 hours x 225/365 days x 1/75 years = 270 ng/m3), resulting in an adjusted LOAEL of 0.27 µg/m^3. An uncertainty factor of 10 for intraspecies variability and an uncertainty factor of 5 for use of a LOAEL were applied.
											Cal OEHHA: Screening value based on kidney and respiratory system effects in an occupational study (Lauwerys et al., 1974; as cited in Cal OEHHA 2008b). A LOAEL of 21 µg/m3 and a NOAEL of 1.4 µg/m3 were identified. Cal OEHHA derived an average occupational exposure concentration of 0.5 µg/m3 and assumed exposure occurred 5 days per week, 8 hours per day with an average exposure duration of 4.1 years. The NOAEL was converted to an average occupational exposure of 0.5 µg/m3 and an uncertainty factor of 30 (3 for use of a subchronic study and 10 for intraspecies uncertainty) was applied.
											TCEQ: Screening value based on kidney effects in humans (TCEQ 2016). A meta-analysis of multiple studies in humans identified beta2-microgloblulin proteinuria as a critical effect. A human equivalent concentration point of departure (PODHEC) for urine of 0.5 µg cadmium/g creatinine based upon a 10% increase in the critical effect was adjusted to a PODHEC for air of 0.1 µg cadmium/m3 using a pharmacokinetic model. A total uncertainty factor of 9 was used which was comprised of 3 for interspecies sensitivity (i.e., protection of diabetics) and 3 for database uncertainty to derive an AMCV value of 0.011 µg/m^3 based on HQ=1.
		C	-	-	-	**0.016 (0.0016)**	-	-	0.0024	0.02	US EPA (RSL): Screening level based on an inhalation unit risk (IUR) of 0.0018 per µg/m3 for lung, trachea and bronchial cancer deaths in occupational exposure studies. An incremental lifetime cancer risk of 1 in 100,000 was used to convert the IUR to a risk-based concentration of 0.0056 µg/m3. The US EPA applies a residential scenario exposure factor to derive the screening level.
											Cal OEHHA: Screening criteria (ReV) based on human occupational exposure lung cancer data; an inhalation unit risk (IUR) of 0.0042 per µg/m3 was derived and an incremental lifetime cancer risk of 1 in 100,000 was used to convert the IUR to a screening value (Charest-Tardif et al. 2006; as cited in Cal OEHHA 2009).
											TCEQ: The screening value is based upon an inhalation unit risk (IUR) of 0.000487 per µg/m3 considering background lung cancer mortality rates in cadmium smelter workers adjusted for co-exposure to arsenic, worker health and ethnicity (TCEQ 2016). The screening value was derived using an incremental lifetime cancer risk of 1 in 100,000 to adjust the IUR.
Chromium (total or trivalent)	7440-47-3	NC	-	-	-	-	-	-	-	**0.14 [f]**	TCEQ: Screening value (ReV) based on a study where rats were exposed to 0, 17, 54, or 168 mg/m^3 chromic sulphate particulate for 6 hours/day, 5 days/week for 13 weeks (Derelanko et al. 1999; as cited in TCEQ 2009). The critical effects were increased total lung and trachea weight relative to body weight in male and female rats. The benchmark concentration lower confidence limit corresponding to a 10% increase in effect (BMCL10) was 3.45 mg/m^3. The BMCL10 was adjusted for continuous exposure (6 hours/24 hours and 5 days/7 days) and a regional deposition dose ratio (of 1.31, resulting in a point of departure [human equivalent concentration]) (PODHEC) of 0.81 mg/m3. An uncertainty factor of 1000 for interspecies variability (3), intraspecies variability (10), subchronic duration (10), and database limitations (3) was applied. The value was adjusted for the proportion of trivalent chromium in chromium sulphate (0.171) to derive a chronic ReV value of 0.14 µg/m^3 based on HQ=1.

Appendix D
Table D-5b: Air Screening Criteria (Annual)
Osisko Development Corp. Cariboo Gold Project

Parameter	CAS	Carcinogen Classification	ENV (2021) AAQO	CCME (2023) CAAQS	ATSDR (2020) MRL	US EPA (2023, 2024) RSL/NAAQS[a], [b]	WHO (2021) AQG	MECP (2020) AAQC [c]	Cal OEHHA (2020) REL [d]	TCEQ (2023) AMCV/ReV [e]	Toxicological Endpoints and Derivations
Chromium (hexavalent)	18540-29-9	NC	-	-	-	**0.1**	-	-	0.2	0.22	US EPA (RSL): Screening value based on a reference concentration (RfC) of 0.0001 mg/m^3 for lower respiratory effects (lactate dehydrogenase in bronchioalveolar lavage fluid) in rats following inhalation of Cr(VI) particulates, and using a benchmark concentration (BMC) approach. The BMC was 0.016 mg/m3. A regional deposited dose ratio of 2.1576 was applied to account for differences in the deposition pattern of inhaled Cr(VI) dusts in the respiratory tract of humans and Wistar rat test animals. An uncertainty factor of 300 was applied (10 to account for variation in the human population, 10 to account for using a subchronic study rather than a chronic study, and 3 to account for pharmacodynamic differences not accounted for by the regional deposited dose ratio [0.016 mg/m3 x 2.1576 / (300)]. The US EPA applies a residential scenario exposure factor to derive the screening level. Cal OEHHA: Screening value applies to soluble hexavalent chromium compounds other than chromic trioxide (Glaser et al. 1986; as cited in Cal OEHHA 2008c). Sodium dichromate aerosol was inhaled by rats for 22 hours/day, 7 days/week for 90 days. The health effect observed was bronchoalveolar hyperplasia. The LOAEL identified in the study was 50 µg/m3. A NOAEL was not observed as effects were identified at all exposure levels tested in this study. The BMC05 (the benchmark concentration calculated to be associated with a 5% incidence of effect) was 12.50 µg/m3 and adjusted to a human equivalent concentration (HEC) of 24.47 µg/m3 and an uncertainty factor of 100 (3 for subchronic to chronic extrapolation, 3 for interspecies variability and 10 for intraspecies variability) was applied. TCEQ: Cr(VI): Screening value (AMCV) based on NOAEL of 25 µg/m^3 for no observed increase in relative lung weight in rats exposed to 25, 50, 100, or 200 µg Cr(VI)/m^3, as sodium dichromate, for 22 hours/day, 7 days/week for 90 days (Glaser et al. 1985; as cited in (TCEQ 2014). The NOAEL was not adjusted for continuous exposure because the exposure duration in the study closely resembled continuous exposure. An uncertainty factor of 270 (3 for interspecies variation, 10 for intraspecies variation, 3 for extrapolation from sub-chronic to chronic exposure, and 3 for database limitations) was applied to the point of departure [human equivalent concentration]) (PODHEC) of 60.25 µg Cr(VI)/m^3 to derive a resulting AMCV of 0.22 µg/m^3, based on a HQ = 1.0.
		C	-	-	-	**0.00012 (0.000012)**	0.00025	0.0007 (0.00007)	0.000067	0.0043	US EPA: Screening level based on an inhalation unit risk (IUR) of 1.2 x 10-2 per µg/m3, which is based on lung cancer mortality in a cohort of chromate workers. The IUR is based on an assumed 1:6 ratio of Cr(VI):Cr(III). WHO: Screening criteria derived from exposed workers to Cr(VI) assuming a linear dose-response relationship between exposure and lung cancer. An inhalation unit risk (IUR) of 0.04 per µg/m3 was derived from the geometric mean of cancer risk estimates from several occupational studies (epidemiological data sets range from 0.011 to 0.13 per µg/m3 for a lifetime exposure) (WHO 2000). The IUR was converted to a screening value using an incremental lifetime cancer risk of 1 in 100,000. MECP: Screening level is based on lung cancer mortality in occupationally-exposed workers. The inhalation unit risks (IURs) reported in two epidemiological studies were 3.96x10-2 per µg/m3 (Gibb et al. 2000; as cited in (MECP 2011) and 9.15x10-3 per µg/m3 (Luippold et al. 2003; as cited in (MECP 2011). The IURs were converted to screening values using the following equation: screening value (µg/m3) = target risk/IUR, where target risk = 1x10-6. The average of the exposure range associated with a 1x10-6 cancer risk (2.5x10-5 µg/m3 to 1.1x10-4 µg/m3) was selected as the screening value of 0.00007 µg/m3. The screening value was adjusted for a cancer risk of 1 in 100,000 to 0.0007 µg/m3 and is applicable to chromium in the PM10 size fraction based on the potential for lung deposition, retention and ultimately lung carcinogenicity. A screening value of 0.00014 µg/m3 is applicable to the TSP fraction, which incorporates the MECP assumption that approximately 50% of TSP is in the PM10 fraction, and based on a cancer risk of 1 in 1,000,000. The screening value was adjusted for a cancer risk of 1 in 100,000 to 0.0014 µg/m. Cal OEHHA: Screening level based on an inhalation unit risk (IUR) of 0.15 per µg/m3 and an incremental lifetime cancer risk of 1 in 100,000 (Mancusco 1975, US EPA 1984, and CDHS 1985; as cited in Cal OEHHA 2009). The health effects identified were lung cancer mortality in humans occupationally exposed to Cr(VI). TCEQ: Screening level based on an inhalation unit risk (IUR) of 2.3 x 10-3 per µg Cr(VI)/m3 (for a risk level of 1 in 100,000) for lung cancer mortality in humans. The IUR was derived by weighting the IURs from two studies (Crump et al. 2003 and Gibb et al. 2000; as cited in (TCEQ 2014). A weight of 44.4% was given to the Crump et al. 2003 study, from which an IUR of 1.94 x 10-3 was selected, and a weight of 55.6% was given to the Gibb et al. (2000; as cited in (TCEQ 2014) study, from which an IUR of 2.56 x 10-3 was selected. The IUR was converted to an AMCV of 0.0043 µg/m3 using an incremental lifetime cancer risk of 1 in 100,000. This same value was adopted as the chronic ESL.

Appendix D
Table D-5b: Air Screening Criteria (Annual)
Osisko Development Corp. Cariboo Gold Project

Parameter	CAS	Carcinogen Classification	ENV (2021) AAQO	CCME (2023) CAAQS	ATSDR (2020) MRL	US EPA (2023, 2024) RSL/NAAQS[a], [b]	WHO (2021) AQG	MECP (2020) AAQC [c]	Cal OEHHA (2020) REL [d]	TCEQ (2023) AMCV/ReV [e]	Toxicological Endpoints and Derivations
Cobalt	7440-48-4	NC	-	-	0.1	**0.0063**	-	-	-	0.063	ATSDR: Screening value based on a decrease in pulmonary function in occupationally-exposed workers (ATSDR 2004). The same key study was used in US EPA 2008). The NOAEL was 5.3 µg/m3 and adjusted for continuous exposure (1.3 µg/m3) and an uncertainty factor of 10 (for human variability) was applied.
											US EPA: Screening value based on a provisional reference concentration (RfC) of 0.006 mg/m3 based on decreased pulmonary function and respiratory tract irritation in occupationally-exposed workers (US EPA 2008). A NOAEL of 5.3 µg/m3 was identified and adjusted for continuous exposure (1.9 µg/m3). An uncertainty factor of 300 (3 for extrapolating from a subchronic to chronic exposure duration, 10 for database insufficiencies and 10 for human variability) was applied to derive a provisional RfC of 0.006 µg/m3. The US EPA applies a residential scenario exposure factor to derive the screening level.
											TCEQ: Screening value based on respiratory irritation and reduced lung function in humans (TCEQ 2017). A NOAEL of 5.3 µg/m3 was derived from an occupational study in which exposed workers experienced eye, nose, and throat irritation, cough, and reduced lung function. A dosimetric adjustment for the ventilation rate during an 8-hour day was made to reflect to continuous exposure, resulting in a human equivalent concentration point of departure (PODHEC) of 1.89 µg/m3. The PODHEC was then adjusted using a total uncertainty factor of 30 (10 for intrahuman variability, 3 for extrapolation from subchronic to chronic exposure duration, and 1 for database uncertainties) to derive the chronic ReV. It is noted that the screening value is also considered to be protective of developmental endpoints.
		C	-	-	-	**0.0031 (0.00031)**	-	-	-	0.0017	US EPA: Screening level based on a 2 year rat study where adenoma and carcinoma of the lung was observed. An inhalation unit risk (IUR) of 9 per mg/m3 and an incremental lifetime cancer risk of 1 in 100,000 was used to derive a risk-based concentration of 0.0011 µg/m3. The US EPA applies a residential scenario exposure factor to derive the screening level.
											TCEQ: Screening level based on two key studies by the National Toxicology Program (NTP; as cited in (TCEQ 2017). The key studies identified inhalation unit risks (IURs) of 0.0091 per µg cobalt/m3 and 0.003 per µg cobalt/m3 and were associated with an increased incidence of lung adenomas and carcinomas in female rats. The mid-point of the two IURs (i.e., 0.006 per µg cobalt/m3) was selected as the final IUR, and was adjusted to the AMCV using an incremental lifetime cancer risk level of 1 in 100,000. This same value was adopted as the chronic ESL.
Copper	7440-50-8	NC	-	-	-	-	-	-	-	**1**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available), as copper dusts and mists in PM10.
Iron	7439-89-6	NC	-	-	-	-	-	-	-	"Must Meet NAAQS"	TCEQ: No value specific to iron. "Must Meet NAAQS" indicates that, for species of limited concern, the determination of the individual species impacts are not requried if a National Ambient Air Quality Standards (NAAQS) analysis is completed for particulate matter of 2.5 and 10 microns or less (PM2.5 and PM10)
Lead	7439-92-1	NC	-	-	-	**0.15**	0.5	-	-	"Must Meet NAAQS"	US NAAQS: Screening value is a rolling 3-month average based on neurological effects (decrease of less than 2 IQ points) in children, and the potential for cardiovascular and renal effects in adults. An air concentration of less than 0.15 µg/m3 of lead would correspond to a blood lead concentration of approximately 1 µg/dL which leads to less than a 2 IQ point decrease in American children based on an air-to-blood ratio of 1:7.
											WHO: Screening value based on preventing blood lead levels exceeding 100 µg/L in order to protect 98% of the population including children (WHO 2000). Various international expert groups have determined that the earliest signs of adverse effects of lead in young children begin at 100 to 150 µg/L in blood. It also appears that 1 µg/m3 of lead in air directly contributes approximately 19 µg/L of lead in blood in children and 16 µg/L in adults.
											TCEQ: No value specific to lead. "Must Meet NAAQS" indicates that, for species of limited concern, the determination of the individual species impacts are not requried if a National Ambient Air Quality Standards (NAAQS) analysis is completed for particulate matter of 2.5 and 10 microns or less (PM2.5 and PM10).

Appendix D
Table D-5b: Air Screening Criteria (Annual)
Osisko Development Corp. Cariboo Gold Project

Parameter	CAS	Carcinogen Classification	ENV (2021) AAQO	CCME (2023) CAAQS	ATSDR (2020) MRL	US EPA (2023, 2024) RSL/NAAQS[a], [b]	WHO (2021) AQG	MECP (2020) AAQC [c]	Cal OEHHA (2020) REL [d]	TCEQ (2023) AMCV/ReV [e]	Toxicological Endpoints and Derivations
Manganese	7439-96-5	NC	-	-	**0.3** [g]	0.052	0.15	-	0.09	0.84	ATSDR: Screening value for respirable manganese based on abnormal performances in eye-hand coordination in an occupational study (ATSDR 2012). The exposure was determined for each employee based on their jobs and the length of time they had worked at the factory. On average, workers were exposed for an average of 5.3 years to an average concentration of respirable manganese of 0.25 mg/m3. The benchmark concentration lower confidence limit corresponding to a 10% incidence of effect (BMCL10) of 142 µg/m3 was adjusted for continuous exposure and then an uncertainty factor of 100 was applied (10 for human variability and 10 for database limitations).
											US EPA: Screening value based on a reference concentration (RfC) of 0.05 µg/m3 for impairment of neurobehavioural function in occupationally-exposed workers. A NOAEL was not available because a single geometric mean exposure concentration was calculated for this cross-sectional study and effects were observed in workers who had been exposed. The LOAEL was 150 µg/m3 and the LOAEL adjusted for a human equivalent concentration (LOAELHEC) was 50 µg/m3. An uncertainty factor of 1,000 (10 to protect sensitive individuals, 10 for using a LOAEL and 10 for database limitations) was applied. The US EPA applies a residential scenario exposure factor to derive the screening level.
											WHO: Screening value based on neurotoxic effects observed in occupationally-exposed workers and an estimated NOAEL of 30 µg/m3 (WHO 2000). The screening value was derived using a benchmark approach and by dividing by a factor of 4.2 for continuous exposure and an uncertainty factor of 50 (10 for interindividual variation and 5 for developmental effects in younger children).
											Cal OEHHA: Screening value based on impairment of neurobehavioral function in humans (occupational study) for manganese and compounds. A benchmark concentration lower confidence limit corresponding to a 5% response (BMCL05) of 72 µg/m3 was obtained and adjusted for continuous exposure, resulting in a value of 26 µg/m3 (Roels et al. 1992; as cited in Cal OEHHA 2014). An uncertainty factor of 300 (3 for extrapolation from subchronic to chronic exposure duration, 100 for intraspecies differences [10 for adults to children and 10 for the more sensitive developing brains of newborns and infant children]) was used to derive the REL.
											TCEQ: Screening value based on the same key study as ATSDR, ysing the same point of departure of 142 µg/m3 (see details from ATSDR above), an uncertainty factor of 60 was applied (10 for intrahuman variability and 6 for database uncertainties) to derive the AMCV, based on an HQ=1.
Mercury	7439-97-6	NC	-	-	**0.2**	0.31	1	-	0.03	0.025	ATSDR: Screening value based on neurological effects (hand tremors) in 26 male workers exposed to metallic mercury for an average of 15.3±2.6 years (ATSDR 1999). A NOAEL was not observed in this study as a single mean concentration was calculated from personal air monitors of workers and effects were identified in workers. A LOAEL of 0.026 mg/m3 associated with an increased frequency of hand tremors was determined and adjusted for continuous exposure (by multiplying 5/7 days and 8/24 hour = 0.0062 mg/m3). An uncertainty factor of 30 (3 for using a LOAEL and 10 for human variability) was applied.
											US EPA: Screening value based on a reference concentration (RfC) of 0.0003 mg/m3 for hand tremors, increases in memory disturbance and central nervous system effects in occupational workers (Fawer et al. 1983; as cited in US EPA 1995). A NOAEL was not observed in this study as a single mean concentration was calculated from personal air monitors of workers and effects were identified in workers. A LOAEL of 0.025 mg/m3 was calculated as a time weighted average and adjusted using occupational ventilation rates and workweek hours to a LOAEL of 0.009 mg/m3. An uncertainty factor of 30 (10 to protect sensitive individuals and 3 for a lack of a database) was used. The US EPA applies a residential scenario exposure factor to derive the screening level.
											WHO: Screening value based on the LOAELs for mercury vapour (15 to 30 µg/m3, tremors, renal tubular effects, and changes in plasma enzymes) and applying an uncertainty factor of 20 (10 for uncertainty in variable sensitivities in higher risk populations and 2 for extrapolating from LOAEL to NOAEL).
											Cal OEHHA: Screening value based on neurotoxicity as measured by tremor, memory and sleep disturbances, decreased performance on neurobehavioural tests and decreased electroencephalography activity in occupational studies (Piikivi and Hanninen 1989; as cited in Cal OEHHA 2014). Humans were exposed to mercury for 8 hours/day, 5 days/week for 13.7 to 15.6 years. A NOAEL was not observed as only a single exposure concentration was assessed and effects were seen at this level. A LOAEL of 0.025 mg/m3 was adjusted for continuous exposure (0.009 mg/m3) and an uncertainty factor of 300 (10 for neurotoxicity being a moderate to severe effect, 3 to reflect interindividual variability and 10 for the higher susceptibility of the developing nervous system) was applied to derive the screening value.
											TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available) as metallic mercury and inorganic mercury forms in PM10.

Appendix D
Table D-5b: Air Screening Criteria (Annual)
Osisko Development Corp. Cariboo Gold Project

Parameter	CAS	Carcinogen Classification	ENV (2021) AAQO	CCME (2023) CAAQS	ATSDR (2020) MRL	US EPA (2023, 2024) RSL/NAAQS[a], [b]	WHO (2021) AQG	MECP (2020) AAQC [c]	Cal OEHHA (2020) REL [d]	TCEQ (2023) AMCV/ReV [e]	Toxicological Endpoints and Derivations
Nickel	7440-02-0	NC	-	-	0.09	**0.015,** 0.094, 0.021	-	0.02 (PM10) 0.04 (SPM)	0.014	0.23	ATSDR: Screening value based on chronic active inflammation and lung fibrosis in rats exposed to nickel sulphate hexahydrate (6 hours/day, 5 days/week for 2 years) (ATSDR 2005). The NOAEL was 0.03 mg/m3 and adjusted for continuous exposure (5/7 days and 6/24 hours = 0.0054 mg/m3) and to a human equivalent concentration (HEC) (0.0027 mg/m3). An uncertainty factor of 30 (3 for animal to human extrapolation and 10 for human variability) was applied to derive the screening value.
											US EPA: For nickel refinery dust and nickel subsulphide (regional screening level [RSL] of 0.015 µg/m3), the screening value is based on a Cal OEHHA REL of 0.014 µg/m3 (see below). A residential scenario exposure factor was applied by US EPA to derive a screening level. For nickel soluble salts (RSL of 0.094 µg/m3), the screening value is based on a chronic ATSDR minimal risk level of 0.09 µg/m3 (see below). US EPA applied a residential scenario exposure factor to the ATSDR minimal risk level to derive a screening level. For nickel oxide (RSL of 0.021 µg/m3), the screening value is based on a Cal OEHHA REL derivation for nickel oxide. Health effects (active pulmonary inflammation and alveolar proteinosis) were observed in mice following exposure to nickel oxide for 6 hours/day, 5 days/week for 104 weeks. A benchmark concentration lower confidence limit corresponding to a 5% response (BMCL05) of 117 µg/m3 was obtained and adjusted for continuous exposure, resulting in a value of 20.9 µg/m3. This value was then adjusted to a human equivalent concentration (HEC) of 2.0 µg/m3. An uncertainty factor of 100 (3 for interspecies variability and 30 for intraspecies variability) was applied to derive an inhalation REL of 0.02 µg/m3. A residential scenario exposure factor was applied by US EPA to derive a screening level.
											MECP: Screening value is based on health effects and calculated using an annual averaging period. The screening value of 0.04 µg/m3 is based upon consideration of both carcinogenic and non-carcinogenic effects due to nickel and nickel compounds (MECP 2011a); a cancer risk level of 1 in 1,000,000 is considered. The MECP considers that the carcinogenic effects are of a greater potency than non-carcinogenic effects. Although the non-carcinogenic critical effects of the various nickel compounds were reviewed by the MECP, their potencies were not discussed in detail. Therefore, adjustment of the MECP value considering a cancer risk level of 1 in 1,000,000 may not necessarily be protective of non-carcinogenic endpoints. Therefore, no adjustment of the MECP value has been made. The MECP screening value of 0.04 µg/m3 is based on nickel in TSP assuming that approximately 50% of ambient TSP is made up of PM10.
											Cal OEHHA: Screening value based on pathological changes in lung, lymph nodes and nasal epithelium in rats exposed to nickel and nickel compounds (except nickel oxide) for 6 hours/day, 5 days/week for 104 weeks (Benson et al. 1987; as cited in Cal OEHHA 2012). The benchmark dose level corresponding to a 5% response level (BMDL05) was 30.5 µg/m3 and the human equivalent concentration (BMDLHEC05) was 1.4 µg/m3. An uncertainty factor of 100 (3 for interspecies differences and 30 for intraspecies differences) was applied.
											TCEQ: Screening value based on chronic active lung inflammation and associated lesions in rats exposed to nickel sulphate hexahydrate for 6 hours/day, 5 days/week for 2 years (NTP 1996c; as cited in TCEQ 2017). The NOAEL/point of departure (POD) was 0.03 mg nickel/m3, the POD adjusted for continuous exposure was 5.357 µg nickel/m3 and the human equivalent concentration (HEC) was 7.034 µg/m3. An uncertainty factor of 30 (3 for interspecies variability and 10 for intraspecies variability) was applied to derive the AMCV, based on HQ=1.
		C	-	-	-	0.12, 0.11, 0.058	**0.025**	0.04	0.038	0.059	US EPA: Screening level for nickel refinery dust (RSL of 0.12 µg/m3) is based on an inhalation unit risk (IUR) of 0.00024 per µg/m3 which was derived from several epidemiological studies (excess lung cancer mortality in four studies of nickel refinery workers) (Enterline and Marsh 1982, Chovil et al. 1981, Peto et al. 1984, Magnus et al. 1982; as cited in US EPA 1987). The risk-based concentration for a cancer risk of 1 in 100,000 is 0.042 µg/m3. A residential scenario exposure factor was applied to the risk-based concentration to derive the screening level. Screening value for nickel soluble salts (RSL of 0.11 µg/m3) is based on an IUR of 0.00026 per µg/m3 from Cal OEHHA (see below). A residential scenario exposure factor was applied to the risk-based concentration to derive the screening level. Screening value for nickel subsulphide (RSL of 0.058 µg/m3) is based on an IUR of 0.00048 per µg/m3, which was based on excess lung cancer mortality observed in four (4) studies of workers exposed to nickel compounds (Enterline and Marsh 1982, Chovil et al. 1981, Peto et al. 1984, Magnus et al. 1982; as cited in US EPA 1987). The IUR was the incremental unit risk estimate of nickel refinery dust (2.4 x 10 4 per µg/m3) used with a multiplication factor of 2.0 to account for a nickel subsulphide composition of about 50% in the refinery dust. The risk-based concentration for a cancer risk of 1 in 100,000 is 0.021 µg/m3. A residential scenario exposure factor was applied to the risk-based concentration to derive the screening level.
											WHO: Screening level based on an inhalation unit risk (IUR) of 0.00038 µg/m3 for 1 µg/m3 of nickel in the air, based on lung cancer incidences in exposed human workers. The concentration corresponding to an incremental lifetime risk of 1 in 100,000 is 0.025 µg/m3.
											MCEP: Refer to the description under the non-cancer endpoint provided above.
											Cal OEHHA: Screening value based on an inhalation unit risk (IUR) of 0.00026 per µg/m3 and an incremental lifetime cancer risk of 1 in 100,000 (Chovil et al. 1981, Roberts et al. 1984, Muir et al. 1985; as cited in Cal OEHHA 2011). The IUR is calculated from Ontario nickel refinery worker lung cancer mortality data.
											TCEQ: Screening level based on lung cancer in workers exposed to various forms of nickel in air (Grimsrud et al. 2003; and Enterline and Marsh 1983; as cited in TCEQ 2017). An inhalation unit risk (IUR) of 0.00017 per µg/m3 was used to derive the AMCV, based on an incremental lifetime risk of 1 in 100,000. This value was adopted as the chronic ESL.

Appendix D
Table D-5b: Air Screening Criteria (Annual)
Osisko Development Corp. Cariboo Gold Project

Parameter	CAS	Carcinogen Classification	ENV (2021) AAQO	CCME (2023) CAAQS	ATSDR (2020) MRL	US EPA (2023, 2024) RSL/NAAQS[a], [b]	WHO (2021) AQG	MECP (2020) AAQC [c]	Cal OEHHA (2020) REL [d]	TCEQ (2023) AMCV/ReV [e]	Toxicological Endpoints and Derivations
Selenium	7782-49-2	NC	-	-	-	**21**	-	-	20	0.2	US EPA: Screening value based on the REL from Cal OEHHA (see below). The US EPA applies a residential scenario exposure factor to derive the screening level. Cal OEHHA: Screening value based on environmental exposure of selenium (in soil and food supplies) to people in China over a lifetime in their diets (as selenium subsulphide) (Kuper et al. 1988; as cited in Cal OEHHA 2008c). Health effects were clinical selenosis (liver, blood, skin and central nervous system). The LOAEL was 0.023 mg/kg/day and the NOAEL was 0.015 mg/kg/day. The inhalation chronic REL is based on the oral chronic REL and an inhalation extrapolation factor of 3,500 µg/m3 per mg/kg/day. An uncertainty factor of 3 to account for intraspecies differences was applied. One of the assumptions of route-to-route extrapolation assumes that a chemical is equally absorbed by both oral and inhalation routes; Cal OEHHA indicated that the available data are not adequate to depart from the default assumption of equal absorption across the lungs and gastrointestinal tract. TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available), as selenium in PM.
Polycyclic Aromatic Hydrocarbons											
1-Methylnaphthalene	90-12-0	NC	-	-	-	-	-	-	-	**20**	TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available).
2-Methylnaphthalene	91-57-6	NC	-	-	-	-	-	-	-	**20**	TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available).
Acenaphthene	83-32-9	NC	-	-	-	-	-	-	-	**10**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV), supporting documentation not available) in PM.
Acenaphthylene	208-96-8	NC	-	-	-	-	-	-	-	**10**	TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available) in PM.
Anthracene	120-12-7	NC	-	-	-	-	-	-	-	**0.1**	TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available) in PM.
Benzo(a)anthracene	56-55-3	C	-	-	-	**0.17 (0.017)**	-	-	0.091	0.05	US EPA: Screening level based on the Cal OEHHA inhalation unit risk (IUR). Cal OEHHA: Screening level based on a potency equivalence factor (PEF) of 0.1 relative to benzo(a)pyrene (inhalation unit risk [IUR] = 0.00011 per µg/m3 (US EPA/IRIS 1996; as cited in Cal OEHHA 2009). TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available) in PM.
Benzo(a)pyrene	50-32-8	NC	-	-	-	**0.0021**	-	-	-	-	US EPA: Screening value was calculated from a reference concentration (RfC) of 0.000002 mg/m3 based on developmental toxicity in rats exposed to 25, 75 and 100 µg/m3 of benzo(a)pyrene for 4 hours daily for 10 days . A LOAEL of 25 µg/m3 for decreased embryo/fetal survival was selected as the POD and adjusted to account for discontinuous exposure (PODADJ) and then adjusted to human equivalent concentration (HEC) resulting in a PODHEC of 4.6 µg/m3. An uncertainty factor of 3000 (3 for extrapolating from animals to humans, 10 for interindividual variability, 10 for extrapolating from subchronic to chronic exposure, and 10 for database limitations) was applied. The US EPA applies a residential scenario exposure factor to derive the screening level.
		C	-	-	-	**0.017 (0.0017)** [g]	0.00012	0.0001 (0.00001)	0.0091	0.017	US EPA: Screening value based on incidence of upper respiratory tract and upper digestive tract tumors in male hamsters exposed to benzo(a)pyrene for a lifetime (US EPA 2017). The inhalation unit risk was derived using linear extrapolation from a benchmark concentration level of 0.16 mg/m3. The US EPA screening value was selected as it is more current than WHO. WHO: Based on epidemiological data from studies on coke-oven workers exposed to a mixture of PAHs, an inhalation unit risk (IUR) for benzo(a)pyrene as an indicator in air constituent was determined to be 8.7 × 10-5 per ng/m3. The corresponding concentrations of benzo(a)pyrene producing an incremental lifetime cancer risk of 1 in 100,000 is 0.12 ng/m3. MECP: Screening level based on carcinogenic potential endpoint from an evaluation of coke-oven worker epidemiological studies by the WHO that derived an inhalation unit risk (IUR) value of 8.7x10-5 per ng/m3 for benzo(a)pyrene, equivalent to 0.1 ng/m3 of benzo(a)pyrene at a risk level of 1 in 100,000. Screening value for benzo(a)pyrene as a surrogate for total PAHs. Cal OEHHA: Screening level based on respiratory tract tumors in hamsters. A linearized multistage model was fit to the respiratory tract tumor data resulting from inhalation exposure of hamsters to benzo(a)pyrene (Thyssen et al. 1981; as cited in Cal OEHHA 2009). A human equivalent inhalation unit risk (IUR) of 0.0011 per µg/m3 was derived and an incremental lifetime cancer risk of 1 in 100,000 was used to convert the IUR to a screening value (US EPA/IRIS 1996; as cited in Cal OEHHA 2009). TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available) in PM.
Benzo(b)fluoranthene	205-99-2	C	-	-	-	**0.17 (0.017)**	-	-	0.091	0.05	US EPA: Screening value based on the Cal OEHHA inhalation unit risk (IUR). Cal OEHHA: Screening value based on a potency equivalence factor (PEF) of 0.1 relative to benzo(a)pyrene (inhalation unit risk (IUR) = 0.00011 per µg/m3; supporting documentation for benzo(a)pyrene available) (US EPA/IRIS 1996; as cited in Cal OEHHA 2009). TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available) in PM.
Benzo(g,h,i)perylene		C	-	-	-	-	-	-	-	**0.05**	TCEQ: Screening level based on a health endpoint (interim, supporting documentation not available), in PM.
Benzo(k)fluoranthene		C	-	-	-	**1.7 (0.17)**	-	-	0.091	0.05	US EPA: Screening level based on the Cal OEHHA inhalation unit risk (IUR). Cal OEHHA: Screening level based on a potency equivalence factor (PEF) of 0.1 relative to benzo(a)pyrene (inhalation unit risk [IUR] = 0.00011 per µg/m3; supporting documentation for benzo(a)pyrene available) (US EPA/IRIS 1996; as cited in Cal OEHHA 2009). TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available) in PM.
Chrysene	218-01-9	C	-	-	-	**17 (1.7)**	-	-	0.91	0.05	US EPA: Screening level based on the Cal OEHHA inhalation unit risk (IUR). Cal OEHHA: Screening level based on a potency equivalence factor (PEF) of 0.01 relative to benzo(a)pyrene (inhalation unit risk [IUR] = 0.00011 per µg/m3; supporting documentation for benzo(a)pyrene available) (US EPA/IRIS 1996; as cited in Cal OEHHA 2009). TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available) in PM.
Dibenz(a,h)anthracene	53-70-3	C	-	-	-	**0.017 (0.0017)**	-	-	0.0083	0.05	US EPA: Screening level based on the inhalation unit risk of 6E-04. Cal OEHHA: Screening criteria based on an oral slope factor of 4.1 per mg/kg/day derived using a linearized multistage model with dose-response data from a drinking water study which reported alveolar carcinomas of the lung in male mice due to dibenz(a,h)anthracene (Snell and Stewart 1962; as cited in Cal OEHHA 2009). An inhalation unit risk (IUR) was derived from the oral slope factor with the assumption that dibenz(a,h)anthracene was equally absorbed and equally potent by oral and inhalation routes and that a 70 kg person inhales 20 m3 of air per day. An incremental lifetime cancer risk of 1 in 100,000 was used to convert the IUR (0.0012 per µg/m3) to a screening value. TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available) in PM.

Appendix D
Table D-5b: Air Screening Criteria (Annual)
Osisko Development Corp. Cariboo Gold Project

Parameter	CAS	Carcinogen Classification	ENV (2021) AAQO	CCME (2023) CAAQS	ATSDR (2020) MRL	US EPA (2023, 2024) RSL/NAAQS[a], [b]	WHO (2021) AQG	MECP (2020) AAQC [c]	Cal OEHHA (2020) REL [d]	TCEQ (2023) AMCV/ReV [e]	Toxicological Endpoints and Derivations
Fluoranthene	206-44-0	NC	-	-	-	-	-	-	-	**0.05**	TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available) in PM.
Fluorene	86-73-7	NC	-	-	-	-	-	-	-	**1**	TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available) in PM.
Indeno(1,2,3-c,d)pyrene	193-39-5	C	-	-	-	**0.17 (0.017)**	-	-	0.091	0.05	US EPA: Screening value based on the Cal OEHHA inhalation unit risk (IUR). Cal OEHHA: Screening value based on a potency equivalence factor (PEF) of 0.1 relative to benzo(a)pyrene (inhalation unit risk (IUR) = 0.00011 per µg/m3; supporting documentation available) (US EPA/IRIS 1996; as cited in Cal OEHHA 2009). TCEQ: Screening value based on a health endpoint (interim ESL, supporting documentation not available) in PM.
Naphthalene	91-20-3	NC	-	-	4 (0.0007 ppm)	**3.1**	10	-	9	50	ATSDR: Screening value based on induced nasal lesions in rats exposed to naphthalene, from two chronic inhalation toxicity and carcinogenicity studies with mice (ATSDR 2005). The LOAEL identified was 10 ppm (52.4 mg/m3), adjusted for continuous exposure US EPA: Non-carcinogenic screening value based on a reference concentration (RfC) of 0.003 mg/m3 for nasal effects (hyperplasia and metaplasia in respiratory and olfactory epithelium) in mice. The human equivalent (LOAELHEC) was 9.3 mg/m3 and an uncertainty factor of 3000 (10 for sensitive individuals, 10 for interspecies extrapolation, 10 for use of LOAEL, 3 for database limitations) was applied. The US EPA applies a residential scenario exposure factor to derive the screening level. WHO: Non-carcinogenic screening value based on respiratory tract lesions leading to inflammation and olfactory epithelial metaplasia in animal studies (rats) when chronically exposed to 53 mg/m3 of naphthalene for 6 hours/day, 5 days/week for 104 weeks (WHO 2010). The LOAEL was 53 mg/m3 and adjusted for continuous exposure (6 hours/24 hours, 5 days/7days) to obtain a value of about 10 mg/m3. An uncertainty factor of 1000 (10 for using a LOAEL rather than a NOAEL, 10 for interspecies variation, and 10 for inter-individual variation) was applied. Cal OEHHA: Screening value based on LOAEL of 10 ppm for nasal inflammation, olfactory epithelial metaplasia, and respiratory epithelial hyperplasia in mice exposed to 0, 10, or 30 ppm naphthalene vapour for 6 hours/day, 5 days/week for 104 weeks (NTP 1992; as cited in Cal OEHHA 2014). The LOAEL was adjusted for continuous exposure (6 hours/24 hours, 5 days/7days). Uncertainty factors were applied for use of a LOAEL (10), interspecies variability (10), and intraspecies variability (10). TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available) in PM.
Phenanthrene	85-01-8	NC	-	-	-	-	-	-	-	**0.8**	TCEQ: Screening value based on a health endpoint (interim ESL and AMCV, supporting documentation not available) in PM.
Pyrene	129-00-0	NC	-	-	-	-	-	-	-	**0.05**	TCEQ: Screening value based on a health endpoint (interim, supporting documentation not available).

Notes:
- = no guideline available or not applicable; AMCV= Ambient Monitoring Comparison Value, AQG = Air Quality Guideline; ATSDR = Agency for Toxic Substances and Disease Registry; C = carcinogenic; Cal OEHHA = California Office of Environmental Health Hazard Assessment; CCME = Canadian Council of Ministers of the Environment; ENV = British Columbia Ministry of Environment and Climate Change Strategy; ESL = Effects Screening Level; IUR= Inhalation unit risk; LOAEL= Lowest observed adverse effect level; MECP = Ontario Ministry of the Environment, Conservation and Parks; MRL = Minimal Risk Level; NAAQO = National Ambient Air Quality Objectives; NAAQS = National Ambient Air Quality Standard; NOAEL= No observed adverse effect level; NC = Non-carcinogenic; PM= Particulate Matter; REL = Reference Exposure Level; ReV= Reference value; TCEQ = Texas Commission on Environmental Quality; US EPA = United States Environmental Protection Agency; WHO = World Health Organization.

Concentrations are in microgram per cubic metre (µg/m^3), unless otherwise noted.
Concentrations in parts per million (ppm) were converted to mg/m3 by applying the formula: molecular weight (grams per mol) x ppm / 24.45.
Carcinogenic parameters have been adjusted based on incremental lifetime cancer risk of 10-5; values in parantheses are unadjusted values based on incremental lifetime cancer risk of 10-6.
(a) US EPA values recorded as ppm or ppb have been converted to µg/m^3 assuming 25 °C and an atmospheric pressure of 1.
(b) RSLs are based on a target HQ of 1 (non-carcinogenic values) and a carcinogenic risk of $10^{-6.}$
(c) MECP derived carcinogenic AAQC based on a target cancer risk of 10^{-6} (value in brackets). For the purpose of this assessment, carcinogenic AAQC were adjusted to a target cancer risk of 10^{-5} (value not in brackets).
(d) Cal OEHHA IURs are based on a cancer risk level of 1 in 1,000,000 (10^{-6}); for this assessment carcinogenic REL were calculated for risk level of 1 in 100,000 by dividing 10^{-6} by the IUR then multiplying by a factor of 10 .
(e) Fpr non-carcinogenic values Air Monitoring Comparison Value (AMCV), which are based on the Reference Value (ReV) adjusted to HQ=1, are preferentially selected over the Effect Screening Level (ESL), are based on the Reference Value adjusted to HQ=0.3, where available. Where values are the same (i.e., interim values), then both AMCV and ESL are selected. ReV are toxicological studies derived from relevant studies and are presented in available supporting documentation associated with the parameter.
(f) Acute ReV, based on an HQ=1, was preferentially selected over acute ESL, based on HQ=0.3 as AMCV were not available. See footnote (a) for TCEQ selection approach.
(g) Selected values are preferentially selected over more conservative criteria of the primary sources if criteria is based on more current studies.
Bold and Shaded = selected screening value

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ATTACHMENT 1:

Risk Estimates (Multimedia and Inhalation)
– Human Health and Ecological Risk Assessment, 2021 Submission

ATTACHMENT 4

Risk Estimates for Acute and Chronic Inhalation Assessment

Table 4A: Risk Estimates for Inhalation HHRA - Mine Site and Highway 26 (1-Hour)
Cariboo Gold Project
Wells, BC

Parameter	Air Criteria ($\mu g/m^3$)	Existing Conditions ($\mu g/m^3$)	Existing Conditions HQ	MPOI-Mine Site	MPOI-Highway 26	Sugar Creek Loop Trail	Cornish X-Country Ski Trail 1	Nine Mile Lake Rec Site	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Jubilee Trail / Wendle Park	Cow Mountain Trails 1	Chisholm Creek Rec Site	Groundhog Lake Ski Trail	Proserpine Trail	Cariboo Wagon Road (Stanley to Barkerville)	Cow Mountain Trails 2
Construction																	
Criteria Air Contaminants																	
Nitrogen Dioxide (Project Only)	79	-	-	**13**	-	-	0.18	-	0.096	**0.8**	-	**0.25**	-	-	-	-	-
Nitrogen Dioxide (Baseline+Project)	79	74	0.94	**14**	-	-	**1.1**	-	1.0	**1.7**	-	**1.2**	-	-	-	-	-
Nitrogen Dioxide (ARM Conversion)	79	74	0.94	**1.7**	-	-	**1.1**	-	**1.1**	**1.2**	-	**1.1**	-	-	-	-	-
Diesel Particulate Matter	2	-	-	**33**	-	-	-	-	-	**2.2**	-	-	-	-	-	-	-
Metals																	
Aluminum	30	0.3309	0.011	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Project Only)	8.3	0.73	0.09	**9.8**	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	8.3	0.73	0.09	**9.9**	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon	13.5	3.5	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons																	
Benzo(a)pyrene	0.00125	0.00242	1.9	**2.2**	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds																	
Acrolein	1.4	-	-	**1.4**	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	10	-	-	**2.1**	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations																	
Criteria Air Contaminants																	
Nitrogen Dioxide (Project Only)	79	-	-	**6.2**	-	-	0.09	-	-	**0.43**	-	0.13	-	-	-	-	-
Nitrogen Dioxide (Baseline+Project)	79	74	1	**7.2**	-	-	1.0	-	-	**1.4**	-	**1.1**	-	-	-	-	-
Nitrogen Dioxide (ARM Conversion)	79	74	1	**1.5**	-	-	**1.1**	-	-	**1.1**	-	**1.1**	-	-	-	-	-
Diesel Particulate Matter	2	-	-	**13**	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																	
Aluminum (Project Only)	30	0.33	0.01	**1.3**	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (Baseline+Project)	30	0.33	0.01	**1.3**	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Project Only)	8.3	0.73	0.09	**5.5**	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	8.3	0.73	0.09	**5.6**	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (Project Only)	67.5	3.5	0.05	**1.9**	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (Baseline+Project)	67.5	3.5	0.05	**2.0**	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds																	
Acrolein	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Table 4A: Risk Estimates for Inhalation HHRA - Mine Site and Highway 26 (1-Hour)
Cariboo Gold Project
Wells, BC

Parameter	Air Criteria (µg/m^3)	Existing Conditions (µg/m^3)	Ned's Connector Trail	Groundhog Lake Snowmobile Trail	Yanks Peak Trail (X-DIST)	Jubilee Trail	Williams Creek Trail	Trail Buffer 1-Legal Objective	Viewing Point along Hwy 26	Water Access - Jack of Clubs Lake	Wells Baseball Diamond	Wells Elementary School	Nugget Hills RV Park	Valley Mountain Pass	Outfitter Area	Trapline TR0515T017 Cabin	Barkerville Provincial Park Campground
Construction																	
Criteria Air Contaminants																	
Nitrogen Dioxide (Project Only)	79	-	-	-	-	-	-	-	0.065	**2.0**	**2.8**	**1.9**	**3.4**	**1.6**	**3.1**	-	-
Nitrogen Dioxide (Baseline+Project)	79	74	-	-	-	-	-	-	1.0	**3.0**	**3.8**	**2.9**	**4.3**	**2.6**	**4.0**	-	-
Nitrogen Dioxide (ARM Conversion)	79	74	-	-	-	-	-	-	**1.1**	**1.3**	**1.3**	**1.2**	**1.3**	**1.2**	**1.3**	-	-
Diesel Particulate Matter	2	-	-	-	-	-	-	-	-	**5.3**	**6.9**	**4.4**	**7.7**	**4.0**	**12**	-	-
Metals																	
Aluminum	30	0.3309	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Project Only)	8.3	0.73	-	-	-	-	-	-	-	**1.7**	**2.2**	**1.2**	**2.4**	**1.1**	**4.5**	-	-
Iron (Baseline+Project)	8.3	0.73	-	-	-	-		-	-	**1.8**	**2.3**	**1.3**	**2.4**	**1.2**	**4.6**	-	-
Silicon	13.5	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons																	
Benzo(a)pyrene	0.00125	0.00242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds																	
Acrolein	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations																	
Criteria Air Contaminants																	
Nitrogen Dioxide (Project Only)	79	-	-	-	-	-	-	-	-	**1.1**	**2.0**	**1.5**	**2.7**	**1.1**	**1.3**	-	-
Nitrogen Dioxide (Baseline+Project)	79	74	-	-	-	-	-	-	-	**2.1**	**3.0**	**2.5**	**3.7**	**2.1**	**2.2**	-	-
Nitrogen Dioxide (ARM Conversion)	79	74	-	-	-	-	-	-	-	**1.2**	**1.3**	**1.2**	**1.3**	**1.2**	**1.2**	-	-
Diesel Particulate Matter	2	-	-	-	-	-	-	-	-	**1.7**	**2.4**	**1.6**	**2.7**	**1.4**	**3.6**	-	-
Metals																	
Aluminum (Project Only)	30	0.33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (Baseline+Project)	30	0.33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Project Only)	8.3	0.73	-	-	-	-	-	-	-	-	**1.0**	-	**1.1**	-	**1.4**	-	-
Iron (Baseline+Project)	8.3	0.73	-	-	-	-	-	-	-	-	**1.1**	-	**1.2**	-	**1.5**	-	-
Silicon (Project Only)	67.5	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (Baseline+Project)	67.5	3.5	-	-	-	-	-	-	-	**0.3**	**0.3**	-	**0.3**	-	**0.3**	-	-
Volatile Organic Compounds																	
Acrolein	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Table 4A: Risk Estimates for Inhalation HHRA - Mine Site and Highway 26 (1-Hour)
Cariboo Gold Project
Wells, BC

Parameter	Air Criteria ($\mu g/m^3$)	Existing Conditions ($\mu g/m^3$)	New Barkerville Residential	Historic Barkerville Town and Park	Forest Rose Campground	Government Hill Campground	Mine Site Camp	Transect 15m	Transect 25m	Transect 50m	Transect 75m	Transect 100m	Transect 150m	Transect 200m	Transect 250m	Transect 500m	Transect 1000m
Construction																	
Criteria Air Contaminants																	
Nitrogen Dioxide (Project Only)	79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (Baseline+Project)	79	74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (ARM Conversion)	79	74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diesel Particulate Matter	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																	
Aluminum	30	0.3309	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Project Only)	8.3	0.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	8.3	0.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon	13.5	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons																	
Benzo(a)pyrene	0.00125	0.00242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds																	
Acrolein	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations																	
Criteria Air Contaminants																	
Nitrogen Dioxide (Project Only)	79	-	-	-	-	-	**30**	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (Baseline+Project)	79	74	-	-	-	-	**31**	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (ARM Conversion)	79	74	-	-	-	-	**3.2**	-	-	-	-	-	-	-	-	-	-
Diesel Particulate Matter	2	-	-	-	-	-	**20**	-	-	-	-	-	-	-	-	-	-
Metals																	
Aluminum (Project Only)	30	0.33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (Baseline+Project)	30	0.33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Project Only)	8.3	0.73	-	-	-	-	**8.2**	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	8.3	0.73	-	-	-	-	**8.3**	-	-	-	-	-	-	-	-	-	-
Silicon (Project Only)	67.5	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (Baseline+Project)	67.5	3.5	-	-	-	-	**0.9**	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds																	
Acrolein	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	10	-	-	-	-	-	**1.3**	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Table 4B: Risk Estimates for Inhalation HHRA - QR Mill and 500 Nyland Lake Road (1-Hour)
Cariboo Gold Project
Wells, BC

Parameter	Air Criteria ($\mu g/m^3$)	Existing Conditions ($\mu g/m^3$)	Existing Conditions HQ	MPOI-QR Mill	MPOI-500 Nyland Lake Road	Maude Lake Rec Site	Le Bourdais Lake	Quesnel Forks	Trail Buffer 2	Trail Buffer 3	Trail Buffer 4	Little Lake Rec Site	Prior Lake Rec Site	Trapline TR0515T020 Cabin 1	Trapline TR0515T020 Cabin 2	Trapline TR0502T045	SW2
Operations																	
Criteria Air Contaminants																	
Nitrogen Dioxide (Project Only)	79	-	-	**0.97**	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (Baseline+Project)	79	74	0.94	**1.9**	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (ARM Conversion)	79	153	**1.9**	**1.2**	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																	
Iron (Project Only)	8.3	0.73	0.09	**3.0**	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	8.3	0.73	0.09	**3.1**	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes

"-" = did not exceed air criteria; hazard quotient not calculated.

Air quality predictions were not provided for the Construction Case as emissions are expected to be negligible.

Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Table 4B: Risk Estimates for Inhalation HHRA - QR Mill and 500 Nyland Lake Road (1-Hour)
Cariboo Gold Project
Wells, BC

Parameter	Air Criteria ($\mu g/m^3$)	Existing Conditions ($\mu g/m^3$)	Existing Conditions HQ	QR Mill Camp	Transect 15m	Transect 25m	Transect 50m	Transect 75m	Transect 100m	Transect 150m	Transect 200m	Transect 250m	Transect 500m	Transect 1000m
Operations														
Criteria Air Contaminants														
Nitrogen Dioxide (Project Only)	79	-	-	**1.1**	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (Baseline+Project)	79	74	0.94	**2.1**	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (ARM Conversion)	79	153	**1.9**	**1.2**	-	-	-	-	-	-	-	-	-	-
Metals														
Iron (Project Only)	8.3	0.73	0.09	**4.2**	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	8.3	0.73	0.09	**4.3**	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Air quality predictions were not provided for the Construction Case as emissions are expected to be negligible.

Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Parameter	Air Criteria (µg/m^3)	Existing Conditions (µg/m^3)	Existing Conditions HQ	MPOI-Mine Site	MPOI-Highway 26	Sugar Creek Loop Trail	Cornish X-Country Ski Trail 1	Nine Mile Lake Rec Site	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Jubilee Trail / Wendle Park	Cow Mountain Trails 1	Chisholm Creek Rec Site	Groundhog Lake Ski Trail	Proserpine Trail	Cariboo Wagon Road (Stanley to Barkerville)	Cow Mountain Trails 2
Construction																	
Criteria Air Contaminants																	
Nitrogen Dioxide	200	-	-	**1.4**	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (ARM Conversion)	200	-	-	0.46	-	-	-	-	-	-	-	-	-	-	-	-	-
PM2.5 (Project Only)	25	-	-	0.36	-	0.00027	0.0077	0.0011	0.0032	0.034	0.0016	0.0097	0.00035	0.00044	0.00033	0.00073	0.0017
PM2.5 (Baseline+Project)	25	25	1.0	**1.4**	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PM10 (Project Only)	50	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-
PM10 (Baseline+Project)	50	43	0.86	**1.9**	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																	
Aluminum	12	0.14	0.011	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Project Only)	4	0.3	0.08	**1.3**	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	4	0.3	0.08	**1.4**	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon	27	1.5	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations																	
Criteria Air Contaminants																	
Nitrogen Dioxide	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (ARM Conversion)	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PM2.5 (Project Only)	25	-	-	0.33	0.023	0.00051	0.011	0.002	0.0052	0.04	0.0029	0.013	0.0015	0.001	0.00083	0.0013	0.0042
PM2.5 (Baseline+Project)	25	25	1.0	**1.3**	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PM10 (Project Only)	50	-	-	**1.9**	-	-	-	-	-	0.19	-	-	-	-	-	-	-
PM10 (Baseline+Project)	50	43	0.86	**2.8**	-	-	-	-	-	**1.1**	-	-	-	-	-	-	-
Metals																	
Aluminum (Project Only)	12	0.14	0.011	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (Baseline+Project)	12	0.14	0.011	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Project Only)	4	0.3	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	4	0.3	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (Project Only)	27	1.5	0.05	**1.5**	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (Baseline+Project)	27	1.5	0.05	**1.6**	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Table 4C: Risk Estimates for Inhalation HHRA - Mine Site and Highway 26 (24-Hour)
Cariboo Gold Project
Wells, BC

Parameter	Air Criteria (µg/m^3)	Existing Conditions (µg/m^3)	Ned's Connector Trail	Groundhog Lake Snowmobile Trail	Yanks Peak Trail (X-DIST)	Jubilee Trail	Williams Creek Trail	Trail Buffer 1-Legal Objective	Viewing Point along Hwy 26	Water Access - Jack of Clubs Lake	Wells Baseball Diamond	Wells Elementary School	Nugget Hills RV Park	Valley Mountain Pass	Outfitter Area	Trapline TR0515T017 Cabin	Barkerville Provincial Park Campground
Construction																	
Criteria Air Contaminants																	
Nitrogen Dioxide	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (ARM Conversion)	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PM2.5 (Project Only)	25	-	0.0018	0.0021	0.00045	0.00079	0.00099	0.00079	0.0027	0.13	0.2	0.11	0.16	0.092	0.064	0.00058	0.0029
PM2.5 (Baseline+Project)	25	25	1.0	1.0	1.0	1.0	1.0	1.0	1.0	**1.1**	**1.2**	**1.1**	**1.2**	**1.1**	**1.1**	1.0	1.0
PM10 (Project Only)	50	-	-	-	-	-	-	-	-	0.26	0.36	0.18	0.34	0.17	0.33	-	-
PM10 (Baseline+Project)	50	43	-	-	-	-	-	-	-	**1.1**	**1.2**	1.0	**1.2**	1.0	**1.2**	-	-
Metals																	
Aluminum	12	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Project Only)	4	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	4	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon	27	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations																	
Criteria Air Contaminants																	
Nitrogen Dioxide	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (ARM Conversion)	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PM2.5 (Project Only)	25	-	0.0069	0.017	0.0011	0.0014	0.0027	0.0015	0.025	0.12	0.18	0.13	0.18	0.088	0.055	0.0011	0.0046
PM2.5 (Baseline+Project)	25	25	1.0	1.0	1.0	1.0	1.0	1.0	1.0	**1.1**	**1.2**	**1.1**	**1.2**	**1.1**	**1.1**	1.0	1.0
PM10 (Project Only)	50	-	-	0.15	-	-	-	-	-	0.33	0.41	0.22	0.48	0.29	0.27	-	-
PM10 (Baseline+Project)	50	43	-	1.0	-	-	-	-	-	**1.2**	**1.3**	**1.1**	**1.3**	**1.2**	**1.1**	-	-
Metals																	
Aluminum (Project Only)	12	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (Baseline+Project)	12	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Project Only)	4	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	4	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (Project Only)	27	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (Baseline+Project)	27	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Table 4C: Risk Estimates for Inhalation HHRA - Mine Site and Highway 26 (24-Hour)
Cariboo Gold Project
Wells, BC

Parameter	Air Criteria (µg/m^3)	Existing Conditions (µg/m^3)	New Barkerville Residential	Historic Barkerville Town and Park	Forest Rose Campground	Government Hill Campground	Mine Site Camp	Transect 15m	Transect 25m	Transect 50m	Transect 75m	Transect 100m	Transect 150m	Transect 200m	Transect 250m	Transect 500m	Transect 1000m
Construction																	
Criteria Air Contaminants																	
Nitrogen Dioxide	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (ARM Conversion)	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PM2.5 (Project Only)	25	-	0.0019	0.0013	0.0029	0.0016	-	-	-	-	-	-	-	-	-	-	-
PM2.5 (Baseline+Project)	25	25	1.0	1.0	1.0	1.0	-	-	-	-	-	-	-	-	-	-	-
PM10 (Project Only)	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PM10 (Baseline+Project)	50	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																	
Aluminum	12	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Project Only)	4	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	4	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon	27	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations																	
Criteria Air Contaminants																	
Nitrogen Dioxide	200	-	-	-	-	-	**1.3**	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (ARM Conversion)	200	-	-	-	-	-	0.46	-	-	-	-	-	-	-	-	-	-
PM2.5 (Project Only)	25	-	0.0035	0.0026	0.0043	0.0032	**1.7**	0.023	0.019	0.014	0.0101	0.009	0.0073	0.0062	0.0052	0.0024	0.00102
PM2.5 (Baseline+Project)	25	25	1.0	1.0	1.0	1.0	**2.8**	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PM10 (Project Only)	50	-	-	-	-	-	**2.1**	-	-	-	-	-	-	-	-	-	-
PM10 (Baseline+Project)	50	43	-	-	-	-	**2.9**	-	-	-	-	-	-	-	-	-	-
Metals																	
Aluminum (Project Only)	12	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (Baseline+Project)	12	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Project Only)	4	0.3	-	-	-	-	**2.4**	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	4	0.3	-	-	-	-	**2.5**	-	-	-	-	-	-	-	-	-	-
Silicon (Project Only)	27	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (Baseline+Project)	27	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Parameter	Air Criteria ($\mu g/m^3$)	Existing Conditions ($\mu g/m^3$)	Existing Conditions HQ	MPOI-QR Mill	MPOI-500 Nyland Lake Road	Maude Lake Rec Site	Le Bourdais Lake	Quesnel Forks	Trail Buffer 2	Trail Buffer 3	Trail Buffer 4	Little Lake Rec Site	Prior Lake Rec Site	Trapline TR0515T020 Cabin 1	Trapline TR0515T020 Cabin 2	Trapline TR0502T045	SW2
Operations																	
Criteria Air Contaminants																	
PM2.5 (Project Only)	25	-	-	**0.26**	0.098	0.0013	0.0011	0.002	0.0049	0.0078	0.0013	0.00097	0.00068	0.0011	0.0011	0.026	0.0082
PM2.5 (Baseline+Project)	25	25	1.0	**1.3**	**1.1**	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PM10 (Project Only)	50	-	-	0.92	0.72	-	-	-	-	-	-	-	-	-	-	0.24	-
PM10 (Baseline+Project)	50	43	0.86	**1.8**	**1.6**	-	-	-	-	-	-	-	-	-	-	**1.1**	-
Metals																	
Iron (Project Only)	4	0.3	0.08	**1.7**	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	4	0.3	0.08	**1.8**	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes

"-" = did not exceed air criteria; hazard quotient not calculated.
Air quality predictions were not provided for the Construction Case as emissions are expected to be negligible.

Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Table 4D: Risk Estimates for Inhalation HHRA - QR Mill and 500 Nyland Lake Road (24-Hour)
Cariboo Gold Project
Wells, BC

Parameter	Air Criteria ($\mu g/m^3$)	Existing Conditions ($\mu g/m^3$)	Existing Conditions HQ	QR Mill Camp	Transect 15m	Transect 25m	Transect 50m	Transect 75m	Transect 100m	Transect 150m	Transect 200m	Transect 250m	Transect 500m	Transect 1000m
Operations														
Criteria Air Contaminants														
PM2.5 (Project Only)	25	-	-	**0.35**	0.098	0.08	0.059	0.055	0.047	0.031	0.026	0.021	0.013	0.0088
PM2.5 (Baseline+Project)	25	25	1.0	**1.3**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	1.0	1.0	1.0	1.0	1.0
PM10 (Project Only)	50	-	-	0.54	0.72	0.59	0.46	0.41	0.35	0.27	0.23	0.22	0.14	-
PM10 (Baseline+Project)	50	43	0.86	**1.4**	**1.6**	**1.4**	**1.3**	**1.3**	**1.2**	**1.1**	**1.1**	**1.1**	1.0	-
Metals														
Iron (Project Only)	4	0.3	0.08	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	4	0.3	0.08	-	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Air quality predictions were not provided for the Construction Case as emissions are expected to be negligible.

Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Attachment 4

Table 4E: Risk Estimates for the Chronic Inhalation HHRA - Mine Site and Highway 26 (Construction) – Non-Indigenous Resident
Cariboo Gold Project
Wells, BC

Hazard Quotients - Mine Site Construction Phase

Receptor Location	Wells Baseball Diamond	Wells Elementary School	Nugget Hills RV Park	New Barkerville Residential
Existing Conditions Case				
Nitrogen Dioxide	1.1E-01	1.1E-01	1.1E-01	
PM2.5	2.0E-01	2.0E-01	2.0E-01	2.0E-01
PM10	1.4E-01			
DPM	**NV**			
Acrolein	**NV**	**NV**	**NV**	
Operation Case				
Nitrogen Dioxide	2.3E-01	1.7E-01	1.6E-01	
PM2.5	2.4E-01	2.2E-01	2.1E-01	2.0E-01
PM10	1.8E-01			
DPM	3.8E-02			
Acrolein	1.7E-02	8.8E-03	7.2E-03	
Project Only Case				
Nitrogen Dioxide	1.6E-01	8.6E-02	7.1E-02	
PM2.5	3.8E-02	1.9E-02	1.6E-02	1.3E-04
PM10	4.2E-02			
DPM	3.8E-02			
Acrolein	1.7E-02	8.8E-03	7.2E-03	

Notes:
Bold = hazard quotient greater than 1.0

Incremental Lifetime Cancer Risks -Mine Site Construction Phase

Receptor Location	Wells Baseball Diamond	Wells Elementary School	Nugget Hills RV Park	New Barkerville Residential
Existing Conditions Case				
DPM	**NV**	**NV**	**NV**	
Operation Case				
DPM	**2.4E-05**	**1.2E-05**	1.0E-05	
Project Only Case				
DPM	**2.4E-05**	**1.2E-05**	1.0E-05	

Notes:

Bold = incremental lifetime cancer risk greater than $1x10^{-5}$

Attachment 4

Table 4F: Risk Estimates for the Chronic Inhalation HHRA - Mine Site and Highway 26 (Construction) – Indigenous Resident
Cariboo Gold Project
Wells, BC

Hazard Quotients - Mine Site Construction Phase

Receptor Location	Wells Baseball Diamond	Wells Elementary School	Nugget Hills RV Park	New Barkerville Residential
Existing Conditions Case				
Nitrogen Dioxide	1.1E-01	1.1E-01	1.1E-01	1.1E-01
PM2.5	2.0E-01	2.0E-01	2.0E-01	2.0E-01
PM10	1.4E-01			
DPM	**NV**	**NV**	**NV**	
Acrolein	**NV**	**NV**	**NV**	
Operation Case				
Nitrogen Dioxide	2.3E-01	1.7E-01	1.6E-01	
PM2.5	2.4E-01	2.2E-01	2.1E-01	2.0E-01
PM10	1.8E-01			
DPM	3.8E-02			
Acrolein	1.7E-02	8.8E-03	7.2E-03	
Project Only Case				
Nitrogen Dioxide	1.6E-01	8.6E-02	7.1E-02	5.8E-04
PM2.5	3.8E-02	1.9E-02	1.6E-02	1.3E-04
PM10	4.2E-02			
DPM	3.8E-02	2.0E-02	1.6E-02	
Acrolein	1.7E-02	8.8E-03	7.2E-03	

Notes:
Bold = hazard quotient greater than 1.0

Incremental Lifetime Cancer Risks - Mine Site Construction Phase

Receptor Location	Wells Baseball Diamond	Wells Elementary School	Nugget Hills RV Park	New Barkerville Residential
Existing Conditions Case				
DPM	**NV**	**NV**	**NV**	
Operation Case				
DPM	**2.4E-05**	**1.2E-05**	1.0E-05	
Project Only Case				
DPM	**2.4E-05**	**1.2E-05**	1.0E-05	

Notes:

Bold = incremental lifetime cancer risk greater than $1x10^{-5}$

Table 4G: Risk Estimates for the Chronic Inhalation HHRA - Mine Site and Highway 26 (Construction) – Indigenous Land User
Cariboo Gold Project
Wells, BC

Hazard Quotients - Mine Site Construction Phase

Receptor Location	Sugar Creek Loop Trail	Cornish X-Country Ski Trail 1	Nine Mile Lake Rec Site	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Jubilee Trail / Wendle Park	Cow Mountain Trails 1	Chisholm Creek Rec Site	Groundhog Lake Ski Trail	Prosperine Trail	Cariboo Wagon Road (Stanley to Barkerville)	Cow Mountain Trails 2	Ned's Connector Trail	Groundhog Lake Snowmobile Trail	Yanks Peak Trail (X-DIST)	Jubilee Trail
Existing Conditions Case																
PM2.5 DPM	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**
Operation Case																
PM2.5 DPM	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**
Project Only Case																
PM2.5 DPM	9.5E-05	5.0E-03	6.9E-04	2.4E-03	2.9E-02	1.1E-03	3.1E-03	1.4E-04	1.5E-04	1.3E-04	1.8E-04	6.6E-04	6.1E-04	7.4E-04	2.1E-04	4.7E-04

Notes:
Bold = hazard quotient greater than 1.0

Incremental Lifetime Cancer Risks - Mine Site Construction Phase

Receptor Location	Sugar Creek Loop Trail	Cornish X-Country Ski Trail 1	Nine Mile Lake Rec Site	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Jubilee Trail / Wendle Park	Cow Mountain Trails 1	Chisholm Creek Rec Site	Groundhog Lake Ski Trail	Prosperine Trail	Cariboo Wagon Road (Stanley to Barkerville)	Cow Mountain Trails 2	Ned's Connector Trail	Groundhog Lake Snowmobile Trail	Yanks Peak Trail (X-DIST)	Jubilee Trail
Existing Conditions Case																
DPM					**NV**											
Operation Case																
DPM					**1.8E-05**											
Project Only Case																
DPM					**1.8E-05**											

Notes:

Bold = incremental lifetime cancer risk greater than $1x10^{-5}$

Table 4G: Risk Estimates for the Chronic Inhalation HHRA - Mine Site and Highway 26 (Construction) – Indigenous Land User
Cariboo Gold Project
Wells, BC

Hazard Quotients - Mine Site Construction Phase

Receptor Location	Williams Creek Trail	Trail Buffer 1-Legal Objective	Viewing Point along Hwy 26	Water Access - Jack of Clubs Lake	Valley Mountain Pass	Outfitter Area	Trapline TR0515T017 Cabin	Barkerville Provincial Park Campground	Historic Barkerville Town and Park	Forest Rose Campground	Government Hill Campground
Existing Conditions Case											
PM2.5 DPM	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**
Operation Case											
PM2.5 DPM	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.3E+00**	**1.3E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**
Project Only Case											
PM2.5 DPM	3.2E-04	2.3E-04	9.3E-04	6.1E-02	6.5E-02	2.6E-02	2.2E-04	1.2E-03	5.1E-04	1.2E-03	6.9E-04

Notes:
Bold = hazard quotient greater than 1.0

Incremental Lifetime Cancer Risks - Mine Site Construc

Receptor Location	Williams Creek Trail	Trail Buffer 1-Legal Objective	Viewing Point along Hwy 26	Water Access - Jack of Clubs Lake	Valley Mountain Pass	Outfitter Area	Trapline TR0515T017 Cabin	Barkerville Provincial Park Campground	Historic Barkerville Town and Park	Forest Rose Campground	Government Hill Campground
Existing Conditions Case											
DPM				**NV**	**NV**	**NV**					
Operation Case											
DPM				**3.8E-05**	**4.0E-05**	**1.6E-05**					
Project Only Case											
DPM				**3.8E-05**	**4.0E-05**	**1.6E-05**					

Notes:

Bold = incremental lifetime cancer risk greater than $1x10^{-5}$

Table 4H: Risk Estimates for the Chronic Inhalation HHRA - Mine Site and Highway 26 (Construction) – Hiker
Cariboo Gold Project
Wells, BC

Hazard Quotients - Mine Site Construction Phase

Receptor Location	Sugar Creek Loop Trail	Cornish X-Country Ski Trail 1	Nine Mile Lake Rec Site	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Jubilee Trail / Wendle Park	Cow Mountain Trails 1	Chisholm Creek Rec Site	Groundhog Lake Ski Trail	Proserpine Trail	Cariboo Wagon Road (Stanley to Barkerville)	Cow Mountain Trails 2	Ned's Connector Trail	Groundhog Lake Snowmobile Trail	Yanks Peak Trail (X-DIST)	Jubilee Trail
Existing Conditions Case																
PM2.5	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01
DPM																
Acrolein					NV											
Operation Case																
PM2.5	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.2E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01
DPM																
Acrolein					1.3E-03											
Project Only Case																
PM2.5	9.1E-06	4.8E-04	6.5E-05	2.3E-04	2.8E-03	1.0E-04	3.0E-04	1.3E-05	1.5E-05	1.2E-05	1.7E-05	6.3E-05	5.8E-05	7.0E-05	2.0E-05	4.5E-05
DPM																
Acrolein					1.3E-03											

Notes:
Bold = hazard quotient greater than 1.0

Incremental Lifetime Cancer Risks - Mine Site Construction Phase

Receptor Location	Sugar Creek Loop Trail	Cornish X-Country Ski Trail 1	Nine Mile Lake Rec Site	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Jubilee Trail / Wendle Park	Cow Mountain Trails 1	Chisholm Creek Rec Site	Groundhog Lake Ski Trail	Proserpine Trail	Cariboo Wagon Road (Stanley to Barkerville)	Cow Mountain Trails 2	Ned's Connector Trail	Groundhog Lake Snowmobile Trail	Yanks Peak Trail (X-DIST)	Jubilee Trail
Existing Conditions Case																
DPM					NV											
Operation Case																
DPM					1.8E-06											
Project Only Case																
DPM					1.8E-06											

Notes:
Bold = incremental lifetime cancer risk greater than $1x10^{-5}$

Table 4H: Risk Estimates for the Chronic Inhalation HHRA - Mine Site and Highway 26 (Construction) – Hiker
Cariboo Gold Project
Wells, BC

Hazard Quotients - Mine Site Construction Phase

Receptor Location	Williams Creek Trail	Viewing Point along Hwy 26	Water Access - Jack of Clubs Lake	Valley Mountain Pass	Barkerville Provincial Park Campground	Historic Barkerville Town and Park	Forest Rose Campground	Government Hill Campground
Existing Conditions Case								
PM2.5	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01
DPM								
Acrolein			**NV**	**NV**				
Operation Case								
PM2.5	1.1E-01	1.1E-01	1.2E-01	1.2E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01
DPM								
Acrolein			2.5E-03	2.7E-03				
Project Only Case								
PM2.5	3.0E-05	8.8E-05	5.8E-03	6.2E-03	1.1E-04	4.8E-05	1.1E-04	6.6E-05
DPM								
Acrolein			2.5E-03	2.7E-03				

Notes:
Bold = hazard quotient greater than 1.0

Incremental Lifetime Cancer Risks - Mine Site Construction

Receptor Location	Williams Creek Trail	Viewing Point along Hwy 26	Water Access - Jack of Clubs Lake	Valley Mountain Pass	Barkerville Provincial Park Campground	Historic Barkerville Town and Park	Forest Rose Campground	Government Hill Campground
Existing Conditions Case								
DPM			**NV**	**NV**				
Operation Case								
DPM			3.6E-06	3.8E-06				
Project Only Case								
DPM			3.6E-06	3.8E-06				

Notes:
Bold = incremental lifetime cancer risk greater than $1x10^{-5}$

Attachment 4

Table 4I: Risk Estimates for the Chronic Inhalation HHRA - Mine Site and Highway 26 (Construction) – Camper
Cariboo Gold Project
Wells, BC

Hazard Quotients - Mine Site Construction Phase

Receptor Location	Nine Mile Lake Rec Site	Chisholm Creek Rec Site	Viewing Point along Hwy 26	Barkerville Provincial Park Campground	Historic Barkerville Town and Park	Forest Rose Campground	Government Hill Campground
Existing Conditions Case							
PM2.5	5.1E-01	5.1E-01	5.1E-01	5.1E-01	5.1E-01	5.1E-01	5.1E-01
Operation Case							
PM2.5	5.1E-01	5.1E-01	5.1E-01	5.1E-01	5.1E-01	5.1E-01	5.1E-01
Project Only Case							
PM2.5	2.9E-04	5.9E-05	4.0E-04	5.0E-04	2.2E-04	4.9E-04	3.0E-04

Notes:
Bold = hazard quotient greater than 1.0

Attachment 4

Table 4J: Risk Estimates for the Chronic Inhalation HHRA - Mine Site and Highway 26 (Construction) – Sport Fisher/Hunter
Cariboo Gold Project
Wells, BC

Hazard Quotients - Mine Site Construction Phase

Receptor Location	Yanks Peak Trail (X-DIST)	Outfitter Area	Trapline TR0515T017 Cabin
Existing Conditions Case			
PM2.5 DPM	2.1E-01	2.1E-01	2.1E-01
Operation Case			
PM2.5 DPM	2.1E-01	2.2E-01	2.1E-01
Project Only Case			
PM2.5 DPM	3.8E-05	4.7E-03	3.9E-05

Notes:
Bold = hazard quotient greater than 1.0

Incremental Lifetime Cancer Risks - Mine Site Construction Phase

Receptor Location	Yanks Peak Trail (X-DIST)	Outfitter Area	Trapline TR0515T017 Cabin
Existing Conditions Case			
DPM		**NV**	
Operation Case			
DPM		2.9E-06	
Project Only Case			
DPM		2.9E-06	

Notes:

Bold = incremental lifetime cancer risk greater than $1x10^{-5}$

Attachment 4

Table 4K: Risk Estimates for the Chronic Inhalation HHRA - Mine Site and Highway 26 (Operations) – Non-Indigenous Resident
Cariboo Gold Project
Wells, BC

Hazard Quotients - Mine Site Operations Phase

Receptor Location	Wells Baseball Diamond	Wells Elementary School	Nugget Hills RV Park	New Barkerville Residential
Existing Conditions Case				
PM2.5	2.0E-01	2.0E-01	2.0E-01	2.0E-01
PM10	1.4E-01			
Operation Case				
PM2.5	2.3E-01	2.2E-01	2.2E-01	2.0E-01
PM10	1.7E-01			
Project Only Case				
PM2.5	3.3E-02	2.0E-02	2.1E-02	2.4E-04
PM10	3.3E-02			

Notes:
Bold = hazard quotient greater than 1.0

Incremental Lifetime Cancer Risks - Mine Site Operations Phase

Receptor Location	Wells Baseball Diamond	Wells Elementary School	Nugget Hills RV Park	New Barkerville Residential
Existing Conditions Case				
DPM	**NV**	**NV**	**NV**	
Operation Case				
DPM	3.9E-06	2.3E-06	2.0E-06	
Project Only Case				
DPM	3.9E-06	2.3E-06	2.0E-06	

Notes:

Bold = incremental lifetime cancer risk greater than $1x10^{-5}$

Attachment 4

Table 4L: Risk Estimates for the Chronic Inhalation HHRA - Mine Site and Highway 26 (Operations) – Indigenous Resident
Cariboo Gold Project
Wells, BC

Hazard Quotients - Mine Site Operations Phase

Receptor Location	Wells Baseball Diamond	Wells Elementary School	Nugget Hills RV Park	New Barkerville Residential
Existing Conditions Case				
PM2.5	2.0E-01	2.0E-01	2.0E-01	2.0E-01
PM10	1.4E-01			
DPM	**NV**	**NV**	**NV**	
Iron	1.8E-02			
Operation Case				
PM2.5	2.3E-01	2.2E-01	2.2E-01	2.0E-01
PM10	1.7E-01			
DPM	6.3E-03	3.7E-03	3.2E-03	
Iron	6.7E-02			
Project Only Case				
PM2.5	3.3E-02	2.0E-02	2.1E-02	2.4E-04
PM10	3.3E-02			
DPM	6.3E-03	3.7E-03	3.2E-03	
Iron	5.0E-02			

Notes:
Bold = hazard quotient greater than 1.0

Incremental Lifetime Cancer Risks - Mine Site Operations Phase

Receptor Location	Wells Baseball Diamond	Wells Elementary School	Nugget Hills RV Park	New Barkerville Residential
Existing Conditions Case				
DPM	**NV**	**NV**	**NV**	
Operation Case				
DPM	3.9E-06	2.3E-06	2.0E-06	
Project Only Case				
DPM	3.9E-06	2.3E-06	2.0E-06	

Notes:

Bold = incremental lifetime cancer risk greater than $1x10^{-5}$

Hazard Quotients - Mine Site Operations Phase

Receptor Location	Sugar Creek Loop Trail	Cornish X-Country Ski Trail 1	Nine Mile Lake Rec Site	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Jubilee Trail / Wendle Park	Cow Mountain Trails 1	Chisholm Creek Rec Site	Groundhog Lake Ski Trail	Proserpine Trail	Cariboo Wagon Road (Stanley to Barkerville)	Cow Mountain Trails 2	Ned's Connector Trail	Groundhog Lake Snowmobile Trail	Yanks Peak Trail (X-DIST)	Jubilee Trail	Williams Creek Trail	Trail Buffer 1-Legal Objective	Viewing Point along Hwy 26
Existing Conditions Case																			
PM2.5 DPM	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**
Operation Case																			
PM2.5 DPM	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**
Project Only Case																			
PM2.5 DPM	1.6E-04	7.3E-03	1.1E-03	3.7E-03	3.4E-02	1.7E-03	4.3E-03	6.3E-04	3.0E-04	2.5E-04	3.5E-04	1.3E-03	2.2E-03	5.3E-03	3.8E-04	7.6E-04	7.4E-04	4.2E-04	2.1E-02

Notes:
Bold = hazard quotient greater than 1.0

Incremental Lifetime Cancer Risks - Mine Site Operations Phase

Receptor Location	Sugar Creek Loop Trail	Cornish X-Country Ski Trail 1	Nine Mile Lake Rec Site	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Jubilee Trail / Wendle Park	Cow Mountain Trails 1	Chisholm Creek Rec Site	Groundhog Lake Ski Trail	Proserpine Trail	Cariboo Wagon Road (Stanley to Barkerville)	Cow Mountain Trails 2	Ned's Connector Trail	Groundhog Lake Snowmobile Trail	Yanks Peak Trail (X-DIST)	Jubilee Trail	Williams Creek Trail	Trail Buffer 1-Legal Objective	Viewing Point along Hwy 26
Existing Conditions Case																			
DPM																			
Operation Case																			
DPM																			
Project Only Case																			
DPM																			

Notes:

Bold = incremental lifetime cancer risk greater than $1x10^{-5}$

Hazard Quotients - Mine Site Operations Phase

Receptor Location	Water Access - Jack of Clubs Lake	Valley Mountain Pass	Outfitter Area	Trapline TR0515T017 Cabin	Barkerville Provincial Park Campground	Historic Barkerville Town and Park	Forest Rose Campground	Government Hill Campground	Transect 15m	Transect 25m	Transect 50m	Transect 75m	Transect 100m	Transect 150m	Transect 200m	Transect 250m	Transect 500m	Transect 1000m
Existing Conditions Case																		
PM2.5	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**
DPM	**NV**	**NV**																
Operation Case																		
PM2.5	**1.2E+00**	**1.3E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**
DPM	9.9E-03	1.2E-02																
Project Only Case																		
PM2.5	6.0E-02	7.5E-02	2.5E-02	3.6E-04	2.0E-03	1.1E-03	2.0E-03	1.3E-03	2.5E-02	2.2E-02	1.5E-02	1.0E-02	8.4E-03	7.0E-03	5.5E-03	4.3E-03	1.5E-03	5.5E-04
DPM	9.9E-03	1.2E-02																

Notes:
Bold = hazard quotient greater than 1.0

Incremental Lifetime Cancer Risks - Mine Site Operations Ph

Receptor Location	Water Access - Jack of Clubs Lake	Valley Mountain Pass	Outfitter Area	Trapline TR0515T017 Cabin	Barkerville Provincial Park Campground	Historic Barkerville Town and Park	Forest Rose Campground	Government Hill Campground	Transect 15m	Transect 25m	Transect 50m	Transect 75m	Transect 100m	Transect 150m	Transect 200m	Transect 250m	Transect 500m	Transect 1000m
Existing Conditions Case																		
DPM	**NV**	**NV**																
Operation Case																		
DPM	6.1E-06	7.4E-06																
Project Only Case																		
DPM	6.1E-06	7.4E-06																

Notes:

Bold = incremental lifetime cancer risk greater than $1x10^{-5}$

Hazard Quotients - Mine Site Operations Phase

Receptor Location	Sugar Creek Loop Trail	Cornish X-Country Ski Trail 1	Nine Mile Lake Rec Site	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Jubilee Trail / Wendle Park	Cow Mountain Trails 1	Chisholm Creek Rec Site	Groundhog Lake Ski Trail	Proserpine Trail	Cariboo Wagon Road (Stanley to Barkerville)	Cow Mountain Trails 2	Ned's Connector Trail	Groundhog Lake Snowmobile Trail	Yanks Peak Trail (X-DIST)	Jubilee Trail
Existing Conditions Case																
PM2.5	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01
Operation Case																
PM2.5	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.2E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01
Project Only Case																
PM2.5	1.6E-05	6.9E-04	1.1E-04	3.5E-04	3.2E-03	1.6E-04	4.1E-04	6.0E-05	2.9E-05	2.4E-05	3.3E-05	1.3E-04	2.1E-04	5.0E-04	3.6E-05	7.3E-05

Notes:
Bold = hazard quotient greater than 1.0

Incremental Lifetime Cancer Risks - Mine Site Operations Phase

Receptor Location	Sugar Creek Loop Trail	Cornish X-Country Ski Trail 1	Nine Mile Lake Rec Site	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Jubilee Trail / Wendle Park	Cow Mountain Trails 1	Chisholm Creek Rec Site	Groundhog Lake Ski Trail	Proserpine Trail	Cariboo Wagon Road (Stanley to Barkerville)	Cow Mountain Trails 2	Ned's Connector Trail	Groundhog Lake Snowmobile Trail	Yanks Peak Trail (X-DIST)	Jubilee Trail
Existing Conditions Case																
DPM																
Operation Case																
DPM																
Project Only Case																
DPM																

Notes:

Bold = incremental lifetime cancer risk greater than $1x10^{-5}$

Table 4N: Risk Estimates for the Chronic Inhalation HHRA - Mine Site and Highway 26 (Operations) – Hiker
Cariboo Gold Project
Wells, BC

Hazard Quotients - Mine Site Operations Phase

Receptor Location	Williams Creek Trail	Viewing Point along Hwy 26	Water Access - Jack of Clubs Lake	Valley Mountain Pass	Barkerville Provincial Park Campground	Historic Barkerville Town and Park	Forest Rose Campground	Government Hill Campground
Existing Conditions Case								
PM2.5	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01
Operation Case								
PM2.5	1.1E-01	1.2E-01	1.2E-01	1.2E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01
Project Only Case								
PM2.5	7.0E-05	2.0E-03	5.7E-03	7.2E-03	1.9E-04	1.0E-04	1.9E-04	1.3E-04

Notes:
Bold = hazard quotient greater than 1.0

Incremental Lifetime Cancer Risks - Mine Site Operations P

Receptor Location	Williams Creek Trail	Viewing Point along Hwy 26	Water Access - Jack of Clubs Lake	Valley Mountain Pass	Barkerville Provincial Park Campground	Historic Barkerville Town and Park	Forest Rose Campground	Government Hill Campground
Existing Conditions Case								
DPM			**NV**	**NV**				
Operation Case								
DPM			5.8E-07	7.0E-07				
Project Only Case								
DPM			5.8E-07	7.0E-07				

Notes:

Bold = incremental lifetime cancer risk greater than $1x10^{-5}$

Attachment 4

Table 4O: Risk Estimates for the Chronic Inhalation HHRA - Mine Site and Highway 26 (Operations) – Camper
Cariboo Gold Project
Wells, BC

Hazard Quotients - Mine Site Operations Phase

Receptor Location	Nine Mile Lake Rec Site	Chisholm Creek Rec Site	Viewing Point along Hwy 26	Barkerville Provincial Park Campground	Historic Barkerville Town and Park	Forest Rose Campground	Government Hill Campground
Existing Conditions Case							
PM2.5	5.1E-01	5.1E-01	5.1E-01	5.1E-01	5.1E-01	5.1E-01	5.1E-01
Operation Case							
PM2.5	5.1E-01	5.1E-01	5.2E-01	5.1E-01	5.1E-01	5.1E-01	5.1E-01
Project Only Case							
PM2.5	4.7E-04	2.7E-04	9.1E-03	8.5E-04	4.5E-04	8.4E-04	5.6E-04

Notes:
Bold = hazard quotient greater than 1.0

Attachment 4

Table 4P: Risk Estimates for the Chronic Inhalation HHRA - Mine Site and Highway 26 (Operations) – Sport Fisher/Hunter
Cariboo Gold Project
Wells, BC

Hazard Quotients - Mine Site Operations Phase

Receptor Location	Yanks Peak Trail (X-DIST)	Outfitter Area	Trapline TR0515T017 Cabin
Existing Conditions Case			
PM2.5	2.1E-01	2.1E-01	2.1E-01
Operation Case			
PM2.5	2.1E-01	2.2E-01	2.1E-01
Project Only Case			
PM2.5	6.7E-05	4.5E-03	6.5E-05

Notes:
Bold = hazard quotient greater than 1.0

Attachment 4

Table 4Q: Risk Estimates for the Chronic Inhalation HHRA - Mine Site and Highway 26 (Operations) – Mine Camp Worker
Cariboo Gold Project
Wells, BC

Hazard Quotients - Mine Site Operations Phase

Receptor Location	Mine Site Camp
Existing Conditions Case	
Nitrogen Dioxide	2.3E-01
PM2.5	4.2E-01
PM10	3.0E-01
DPM	**NV**
Arsenic	8.8E-03
Iron	3.8E-02
Acrolein	**NV**
Operation Case	
Nitrogen Dioxide	6.4E-01
PM2.5	9.0E-01
PM10	6.2E-01
DPM	9.4E-02
Arsenic	4.4E-01
Iron	6.8E-01
Acrolein	2.9E-02
Project Only Case	
Nitrogen Dioxide	5.4E-01
PM2.5	4.8E-01
PM10	3.2E-01
DPM	9.4E-02
Arsenic	4.3E-01
Iron	6.4E-01
Acrolein	2.9E-02

Notes:
Bold = hazard quotient greater than 1.0

Incremental Lifetime Cancer Risks - Mine Site Operations Phase

Receptor Location	Mine Site Camp
Existing Conditions Case	
DPM	**NV**
Arsenic	3.2E-07
Operation Case	
DPM	**5.8E-05**
Arsenic	**1.6E-05**
Project Only Case	
DPM	**5.8E-05**
Arsenic	**1.5E-05**

Notes:

Bold = incremental lifetime cancer risk greater than $1x10^{-5}$

Hazard Quotients - QR Operations Phase

Receptor Location	Maude Lake Rec Site	Le Bourdais Lake	Quesnel Forks	Trail Buffer 2	Trail Buffer 3	Trail Buffer 4	Little Lake Rec Site	Prior Lake Rec Site	Trapline TR0515T020 Cabin 1	Trapline TR0515T020 Cabin 2	Trapline TR0502T045	SW2
Existing Conditions Case												
PM2.5 PM10	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**
Operation Case												
PM2.5 PM10	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**
Project Only Case												
PM2.5 PM10	4.7E-04	3.5E-04	6.5E-04	1.6E-03	2.7E-03	5.3E-04	3.6E-04	2.5E-04	4.0E-04	3.5E-04	7.9E-03	2.6E-03

Notes:
Bold = hazard quotient greater than 1.0

Hazard Quotients - QR Operations Phase

Receptor Location	Transect 15m	Transect 25m	Transect 50m	Transect 75m	Transect 100m	Transect 150m	Transect 200m	Transect 250m	Transect 500m	Transect 1000m
Existing Conditions Case										
PM2.5	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**
PM10	8.4E-01									
Operation Case										
PM2.5	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**	**1.2E+00**
PM10	1.0E+00									
Project Only Case										
PM2.5	4.3E-02	3.6E-02	2.5E-02	2.1E-02	1.7E-02	1.2E-02	9.9E-03	8.5E-03	5.1E-03	2.2E-03
PM10	1.7E-01									

Notes:
Bold = hazard quotient greater than 1.0

Attachment 4

Table 4S: Risk Estimates for the Chronic Inhalation HHRA - QR Mill and 500 Nyland Lake Road (Operations) – Hiker
Cariboo Gold Project
Wells, BC

Hazard Quotients - QR Operations Phase

Receptor Location	Maude Lake Rec Site	Le Bourdais Lake	Quesnel Forks	Little Lake Rec Site	Prior Lake Rec Site	SW2
Existing Conditions Case						
PM2.5	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01
Operation Case						
PM2.5	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01	1.1E-01
Project Only Case						
PM2.5	4.5E-05	3.4E-05	6.1E-05	3.4E-05	2.4E-05	2.5E-04

Notes:
Bold = hazard quotient greater than 1.0

Attachment 4

Table 4T: Risk Estimates for the Chronic Inhalation HHRA - QR Mill and 500 Nyland Lake Road (Operations) – Camper
Cariboo Gold Project
Wells, BC

Hazard Quotients - QR Operations Phase

Receptor Location	Maude Lake Rec Site	Little Lake Rec Site	Prior Lake Rec Site
Existing Conditions Case			
PM2.5	5.1E-01	5.1E-01	5.1E-01
Operation Case			
PM2.5	5.1E-01	5.1E-01	5.1E-01
Project Only Case			
PM2.5	2.0E-04	1.5E-04	1.1E-04

Notes:
Bold = hazard quotient greater than 1.0

Attachment 4

Table 4U: Risk Estimates for the Chronic Inhalation HHRA - QR Mill and 500 Nyland Lake Road (Operations) – Sport Fisher/Hunter
Cariboo Gold Project

Hazard Quotients - QR Operations Phase

Receptor Location	Trapline TR0515T020 Cabin 1	Trapline TR0515T020 Cabin 2	Trapline TR0502T045
Existing Conditions Case			
PM2.5	2.1E-01	2.1E-01	2.1E-01
Operation Case			
PM2.5	2.1E-01	2.1E-01	2.1E-01
Project Only Case			
PM2.5	7.1E-05	6.3E-05	1.4E-03

Notes:
Bold = hazard quotient greater than 1.0

Attachment 4

Table 4V: Risk Estimates for the Chronic Inhalation HHRA - QR Mill and 500 Nyland Lake Road (Operations) – Mine Camp Worker
Cariboo Gold Project
Wells, BC

Hazard Quotients - QR Operations Phase

Receptor Location	QR Mill Camp
Existing Conditions Case	
PM2.5	4.2E-01
PM10	3.0E-01
Arsenic	8.8E-03
Iron	3.8E-02
Operation Case	
PM2.5	5.2E-01
PM10	4.0E-01
Arsenic	3.1E-01
Iron	4.2E-01
Project Only Case	
PM2.5	9.6E-02
PM10	1.0E-01
Arsenic	3.0E-01
Iron	3.8E-01

Notes:
Bold = hazard quotient greater than 1.0

Incremental Lifetime Cancer Risks - QR Operations Phase

Receptor Location	QR Mill Camp
Existing Conditions Case	
DPM	**NV**
Arsenic	3.2E-07
Operation Case	
DPM	5.5E-06
Arsenic	**1.1E-05**
Project Only Case	
DPM	5.5E-06
Arsenic	**1.1E-05**

Notes:
Bold = incremental lifetime cancer risk greater than $1x10^{-5}$

ATTACHMENT 2

Risk Estimates

Table 2A: Risk Estimates - Non-Indigenous Resident
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Wells Baseball Diamond																				
Antimony	0.056	0.056	0.057	0.056	0.056	0.029	0.028	0.028	0.029	0.029	0.032	0.032	0.032	0.032	0.032					
Arsenic	0.33	0.33	0.33	0.33	0.33	0.087	0.088	0.088	0.087	0.087	0.098	0.098	0.098	0.098	0.098	2.6E-05	2.7E-05	2.7E-05	2.6E-05	2.6E-05
Cadmium	0.015	0.015	0.015	0.015	0.015	0.0077	0.0065	0.0066	0.0077	0.0077	0.0085	0.0074	0.0074	0.0085	0.0085	2.3E-08	1.5E-09	2.4E-09	2.3E-08	2.3E-08
Cobalt	0.14	0.14	0.14	0.14	0.14	0.012	0.012	0.012	0.012	0.012	0.013	0.014	0.014	0.013	0.013					
Manganese	0.15	0.18	0.17	0.15	0.15	0.017	0.027	0.023	0.017	0.017	0.02	0.03	0.026	0.02	0.02					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0017	0.0018	0.0018	0.0017	0.0017	0.00068	0.00068	0.00068	0.00068	0.00068	0.00076	0.00076	0.00076	0.00076	0.00076					
Nickel	0.12	0.12	0.11	0.12	0.12	0.066	0.064	0.06	0.066	0.066	0.073	0.071	0.067	0.073	0.073	5.9E-08	4.5E-08	1.0E-08	5.9E-08	5.9E-08
Selenium	0.023	0.023	0.023	0.023	0.023	0.013	0.013	0.013	0.013	0.013	0.014	0.014	0.014	0.014	0.014					
Wells Elementary School																				
Antimony	0.056	0.056	0.056	0.056	0.056	0.029	0.028	0.028	0.029	0.029	0.032	0.032	0.032	0.032	0.032					
Arsenic	0.33	0.33	0.34	0.33	0.33	0.087	0.087	0.091	0.087	0.086	0.098	0.097	0.1	0.098	0.096	2.6E-05	2.6E-05	2.8E-05	2.6E-05	2.6E-05
Cadmium	0.015	0.033	0.075	0.042	0.022	0.0077	0.016	0.038	0.022	0.011	0.0085	0.018	0.042	0.024	0.012	2.3E-08	5.7E-10	1.1E-09	2.3E-08	2.3E-08
Cobalt	0.14	0.14	0.14	0.14	0.14	0.012	0.011	0.011	0.011	0.011	0.013	0.013	0.013	0.012	0.012					
Manganese	0.15	0.17	0.17	0.15	0.15	0.017	0.023	0.022	0.017	0.017	0.02	0.026	0.025	0.02	0.02					
Methylmercury	0.019	0.029	0.031	0.028	0.029	0.0042	0.0063	0.0067	0.006	0.0063	0.011	0.017	0.018	0.016	0.017					
Molybdenum	0.0017	0.0018	0.0018	0.0017	0.0017	0.00068	0.00068	0.00068	0.00068	0.00068	0.00076	0.00076	0.00076	0.00076	0.00076					
Nickel	0.12	0.11	0.12	0.12	0.12	0.066	0.062	0.063	0.067	0.066	0.073	0.069	0.071	0.074	0.073	5.9E-08	1.7E-08	7.3E-09	5.9E-08	5.9E-08
Selenium	0.023	0.045	0.089	0.055	0.031	0.013	0.025	0.049	0.031	0.017	0.014	0.028	0.055	0.035	0.019					
Nugget Hills RV Park																				
Antimony	0.056	0.056	0.057	0.057	0.056	0.029	0.028	0.028	0.029	0.029	0.032	0.032	0.032	0.033	0.032					
Arsenic	0.33	0.33	0.33	0.32	0.33	0.087	0.087	0.088	0.084	0.087	0.098	0.098	0.098	0.094	0.098	2.6E-05	2.6E-05	2.7E-05	2.6E-05	2.6E-05
Cadmium	0.015	0.015	0.015	0.018	0.015	0.0077	0.0065	0.0066	0.0089	0.0077	0.0085	0.0073	0.0074	0.0098	0.0085	2.3E-08	5.8E-10	2.3E-09	2.3E-08	2.3E-08
Cobalt	0.14	0.14	0.14	0.14	0.14	0.012	0.012	0.012	0.011	0.012	0.013	0.014	0.014	0.012	0.013					
Manganese	0.15	0.17	0.17	0.15	0.15	0.017	0.023	0.022	0.017	0.017	0.02	0.026	0.025	0.02	0.02					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0017	0.0018	0.0018	0.0017	0.0017	0.00068	0.00068	0.00068	0.00068	0.00068	0.00076	0.00076	0.00076	0.00076	0.00076					
Nickel	0.12	0.11	0.11	0.12	0.12	0.066	0.061	0.06	0.066	0.066	0.073	0.068	0.067	0.073	0.073	5.9E-08	1.7E-08	7.3E-09	5.9E-08	5.9E-08
Selenium	0.023	0.023	0.023	0.027	0.023	0.013	0.013	0.013	0.015	0.013	0.014	0.014	0.014	0.017	0.014					
New Barkerville Residential																				
Antimony	0.056	0.056	0.056	0.056	0.056	0.029	0.028	0.028	0.029	0.029	0.032	0.032	0.032	0.032	0.032					
Arsenic	0.33	0.33	0.33	0.33	0.33	0.087	0.087	0.087	0.087	0.087	0.098	0.098	0.098	0.098	0.098	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05
Cadmium	0.015	0.015	0.015	0.015	0.015	0.0077	0.0065	0.0065	0.0077	0.0077	0.0085	0.0073	0.0073	0.0085	0.0085	2.3E-08	1.0E-10	1.7E-10	2.3E-08	2.3E-08
Cobalt	0.14	0.14	0.14	0.14	0.14	0.012	0.012	0.012	0.012	0.012	0.013	0.014	0.014	0.013	0.013					
Manganese	0.15	0.17	0.17	0.15	0.15	0.017	0.02	0.02	0.017	0.017	0.02	0.024	0.024	0.02	0.02					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0017	0.0018	0.0018	0.0017	0.0017	0.00068	0.00068	0.00068	0.00068	0.00068	0.00076	0.00076	0.00076	0.00076	0.00076					
Nickel	0.12	0.11	0.11	0.12	0.12	0.066	0.059	0.059	0.066	0.066	0.073	0.066	0.066	0.073	0.073	5.9E-08	2.5E-09	2.4E-09	5.9E-08	5.9E-08
Selenium	0.023	0.023	0.023	0.023	0.023	0.013	0.013	0.013	0.013	0.013	0.014	0.014	0.014	0.014	0.014					

Notes

Shaded value indicates hazard quotient greater than 0.2 (or 1.0 for lead) or incremental lifetime cancer risk greater than 1 in 100,000 ($1x10^{-5}$).

Table 2B: Risk Estimates - Indigenous Resident
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Wells Baseball Diamond																				
Antimony	0.14	0.19	0.19	0.14	0.14	0.065	0.078	0.078	0.065	0.065	0.057	0.067	0.067	0.057	0.057					
Arsenic	0.66	0.72	0.73	0.66	0.66	0.22	0.24	0.24	0.22	0.22	0.19	0.2	0.2	0.19	0.19	6.6E-05	7.2E-05	7.4E-05	6.6E-05	6.6E-05
Cadmium	1.1	1.3	1.4	1.1	1.1	0.76	0.93	0.97	0.8	0.77	0.53	0.65	0.69	0.57	0.54	2.3E-08	1.5E-09	2.4E-09	2.3E-08	2.3E-08
Cobalt	0.82	1.1	1.1	0.82	0.82	0.48	0.68	0.68	0.48	0.48	0.32	0.46	0.46	0.32	0.32					
Manganese	1.5	2.6	2.6	1.5	1.5	0.37	0.66	0.65	0.37	0.37	0.29	0.52	0.52	0.29	0.29					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.013	0.026	0.031	0.017	0.014	0.0047	0.0093	0.012	0.0074	0.0052	0.0038	0.0073	0.0092	0.0056	0.0041					
Nickel	0.23	0.29	0.29	0.23	0.23	0.12	0.16	0.16	0.13	0.12	0.12	0.14	0.14	0.12	0.12	5.9E-08	4.5E-08	1.0E-08	5.9E-08	5.9E-08
Selenium	0.6	0.65	0.7	0.64	0.6	0.31	0.34	0.38	0.34	0.31	0.2	0.22	0.24	0.22	0.2					
Wells Elementary School																				
Antimony	0.14	0.19	0.19	0.14	0.14	0.065	0.078	0.078	0.065	0.065	0.057	0.067	0.067	0.057	0.057					
Arsenic	0.66	0.68	0.95	0.66	0.55	0.22	0.22	0.35	0.22	0.17	0.19	0.19	0.27	0.19	0.15	6.6E-05	6.7E-05	1.0E-04	6.5E-05	5.1E-05
Cadmium	1.1	2.0	3.5	2.1	1.3	0.76	1.2	2.0	1.2	0.87	0.53	0.84	1.3	0.84	0.61	2.3E-08	5.7E-10	1.1E-09	2.3E-08	2.3E-08
Cobalt	0.82	1.1	1.1	0.76	0.76	0.48	0.65	0.65	0.45	0.45	0.32	0.44	0.44	0.3	0.3					
Manganese	1.5	2.6	2.6	1.5	1.5	0.37	0.65	0.65	0.36	0.36	0.29	0.52	0.52	0.29	0.29					
Methylmercury	0.67	1.0	1.1	0.96	1.0	0.13	0.2	0.21	0.19	0.2	0.2	0.3	0.32	0.28	0.3					
Molybdenum	0.013	0.026	0.031	0.017	0.014	0.0047	0.0093	0.012	0.0074	0.0052	0.0038	0.0073	0.0091	0.0056	0.0041					
Nickel	0.23	0.36	0.53	0.34	0.25	0.12	0.19	0.27	0.18	0.14	0.12	0.16	0.21	0.15	0.12	5.9E-08	1.7E-08	7.3E-09	5.9E-08	5.9E-08
Selenium	0.6	1.4	3.0	1.8	0.89	0.31	0.73	1.5	0.92	0.46	0.2	0.47	0.98	0.58	0.29					
Nugget Hills RV Park																				
Antimony	0.14	0.19	0.19	0.16	0.14	0.065	0.078	0.078	0.077	0.065	0.057	0.067	0.067	0.064	0.057					
Arsenic	0.66	0.72	0.73	0.46	0.66	0.22	0.24	0.24	0.13	0.22	0.19	0.2	0.2	0.13	0.19	6.6E-05	7.2E-05	7.3E-05	4.0E-05	6.6E-05
Cadmium	1.1	1.3	1.4	1.2	1.1	0.76	0.93	0.97	0.84	0.77	0.53	0.65	0.69	0.59	0.54	2.3E-08	5.8E-10	2.3E-09	2.3E-08	2.3E-08
Cobalt	0.82	1.1	1.1	0.76	0.82	0.48	0.68	0.68	0.45	0.48	0.32	0.46	0.46	0.3	0.32					
Manganese	1.5	2.6	2.6	1.5	1.5	0.37	0.65	0.65	0.36	0.37	0.29	0.52	0.52	0.29	0.29					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.013	0.026	0.031	0.017	0.014	0.0047	0.0093	0.012	0.0074	0.0052	0.0038	0.0073	0.0092	0.0056	0.0041					
Nickel	0.23	0.29	0.29	0.24	0.23	0.12	0.15	0.16	0.13	0.12	0.12	0.14	0.14	0.12	0.12	5.9E-08	1.7E-08	7.3E-09	5.9E-08	5.9E-08
Selenium	0.6	0.65	0.7	0.79	0.6	0.31	0.34	0.38	0.42	0.31	0.2	0.22	0.24	0.27	0.2					
New Barkerville Residential																				
Antimony	0.14	0.19	0.19	0.14	0.14	0.065	0.078	0.078	0.065	0.065	0.057	0.067	0.067	0.057	0.057					
Arsenic	0.66	0.72	0.73	0.66	0.66	0.22	0.24	0.24	0.22	0.22	0.19	0.2	0.2	0.19	0.19	6.6E-05	7.2E-05	7.3E-05	6.6E-05	6.6E-05
Cadmium	1.1	1.3	1.4	1.1	1.1	0.76	0.93	0.97	0.8	0.77	0.53	0.65	0.68	0.57	0.54	2.3E-08	1.0E-10	1.7E-10	2.3E-08	2.3E-08
Cobalt	0.82	1.1	1.1	0.82	0.82	0.48	0.68	0.68	0.48	0.48	0.32	0.46	0.46	0.32	0.32					
Manganese	1.5	2.6	2.6	1.5	1.5	0.37	0.65	0.65	0.37	0.37	0.29	0.52	0.52	0.29	0.29					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.013	0.026	0.031	0.017	0.014	0.0047	0.0093	0.012	0.0074	0.0052	0.0038	0.0073	0.0092	0.0056	0.0041					
Nickel	0.23	0.29	0.29	0.23	0.23	0.12	0.15	0.16	0.13	0.12	0.12	0.13	0.14	0.12	0.12	5.9E-08	2.5E-09	2.4E-09	5.9E-08	5.9E-08
Selenium	0.6	0.65	0.7	0.64	0.6	0.31	0.34	0.38	0.34	0.31	0.2	0.22	0.24	0.22	0.2					

Notes

Shaded value indicates hazard quotient greater than 0.2 (or 1.0 for lead) or incremental lifetime cancer risk greater than 1 in 100,000 ($1x10^{-5}$).

Table 2C: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Cariboo Wagon Road (Stanley to Barkerville)																				
Antimony	0.13	0.16	0.16	0.13	0.13	0.064	0.073	0.073	0.064	0.064	0.055	0.062	0.062	0.055	0.055					
Arsenic	0.75	0.8	0.8	0.75	0.75	0.3	0.31	0.31	0.3	0.3	0.27	0.28	0.28	0.27	0.27	5.1E-05	5.6E-05	5.6E-05	5.1E-05	5.1E-05
Cadmium	1.1	1.3	1.4	1.1	1.1	0.76	0.92	0.97	0.81	0.77	0.54	0.65	0.68	0.57	0.55	3.4E-08	8.9E-11	1.4E-10	3.4E-08	3.4E-08
Cobalt	0.7	0.97	0.97	0.71	0.7	0.47	0.66	0.66	0.47	0.47	0.32	0.44	0.44	0.32	0.32					
Manganese	2.3	3.4	3.4	2.3	2.3	0.66	0.87	0.87	0.66	0.66	0.59	0.71	0.71	0.59	0.59					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.022	0.038	0.042	0.026	0.022	0.0068	0.012	0.015	0.0095	0.0073	0.0055	0.0096	0.011	0.0074	0.0059					
Nickel	0.15	0.22	0.22	0.16	0.15	0.08	0.12	0.12	0.09	0.08	0.07	0.093	0.095	0.07	0.07	8.8E-08	2.9E-09	2.8E-09	8.8E-08	8.8E-08
Selenium	0.59	0.64	0.69	0.64	0.6	0.3	0.34	0.37	0.34	0.31	0.19	0.22	0.24	0.22	0.2					
Jubilee Trail																				
Antimony	0.069	0.11	0.11	0.069	0.069	0.031	0.04	0.04	0.031	0.031	0.022	0.029	0.029	0.022	0.022					
Arsenic	0.22	0.27	0.27	0.23	0.22	0.032	0.045	0.045	0.033	0.032	0.029	0.039	0.04	0.029	0.029	9.7E-06	1.4E-05	1.4E-05	9.7E-06	9.7E-06
Cadmium	1.0	1.3	1.3	1.1	1.0	0.74	0.9	0.95	0.79	0.76	0.53	0.64	0.67	0.56	0.54	3.4E-08	9.7E-11	1.4E-10	3.4E-08	3.4E-08
Cobalt	0.58	0.84	0.84	0.58	0.58	0.41	0.6	0.6	0.42	0.41	0.28	0.4	0.4	0.28	0.28					
Manganese	2.1	3.3	3.3	2.1	2.1	0.62	0.83	0.83	0.62	0.62	0.55	0.67	0.67	0.55	0.55					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.02	0.036	0.041	0.025	0.021	0.0062	0.011	0.014	0.0089	0.0066	0.0049	0.009	0.011	0.0068	0.0053					
Nickel	0.1	0.16	0.17	0.1	0.1	0.052	0.085	0.089	0.055	0.052	0.038	0.061	0.064	0.04	0.039	8.8E-08	3.1E-09	2.9E-09	8.8E-08	8.8E-08
Selenium	0.034	0.084	0.13	0.077	0.042	0.02	0.053	0.091	0.055	0.027	0.014	0.037	0.062	0.038	0.019					
Proserpine Trail																				
Antimony	0.069	0.11	0.11	0.069	0.069	0.031	0.04	0.04	0.031	0.031	0.022	0.029	0.029	0.022	0.022					
Arsenic	0.22	0.27	0.27	0.23	0.22	0.032	0.045	0.045	0.033	0.032	0.029	0.039	0.04	0.029	0.029	9.7E-06	1.4E-05	1.4E-05	9.7E-06	9.7E-06
Cadmium	1.0	1.3	1.3	1.1	1.0	0.74	0.9	0.95	0.79	0.76	0.53	0.64	0.67	0.56	0.54	3.4E-08	8.9E-11	1.2E-10	3.4E-08	3.4E-08
Cobalt	0.58	0.84	0.84	0.58	0.58	0.41	0.6	0.6	0.42	0.41	0.28	0.4	0.4	0.28	0.28					
Manganese	2.1	3.3	3.3	2.1	2.1	0.62	0.83	0.83	0.62	0.62	0.55	0.67	0.67	0.55	0.55					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.02	0.036	0.041	0.025	0.021	0.0062	0.011	0.014	0.0089	0.0066	0.0049	0.009	0.011	0.0068	0.0053					
Nickel	0.1	0.16	0.17	0.1	0.1	0.052	0.085	0.089	0.055	0.052	0.038	0.061	0.064	0.04	0.039	8.8E-08	2.8E-09	2.8E-09	8.8E-08	8.8E-08
Selenium	0.034	0.084	0.13	0.077	0.042	0.02	0.053	0.091	0.055	0.027	0.014	0.037	0.062	0.038	0.019					
Sugar Creek Loop Trail																				
Antimony	0.069	0.11	0.11	0.069	0.069	0.031	0.04	0.04	0.031	0.031	0.022	0.029	0.029	0.022	0.022					
Arsenic	0.22	0.27	0.27	0.23	0.22	0.032	0.045	0.045	0.033	0.032	0.029	0.039	0.04	0.029	0.029	9.7E-06	1.4E-05	1.4E-05	9.7E-06	9.7E-06
Cadmium	1.0	1.3	1.3	1.1	1.0	0.74	0.9	0.95	0.79	0.76	0.53	0.64	0.67	0.56	0.54	3.4E-08	8.9E-11	1.3E-10	3.4E-08	3.4E-08
Cobalt	0.58	0.84	0.84	0.58	0.58	0.41	0.6	0.6	0.42	0.41	0.28	0.4	0.4	0.28	0.28					
Manganese	2.1	3.3	3.3	2.1	2.1	0.62	0.83	0.83	0.62	0.62	0.55	0.67	0.67	0.55	0.55					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.02	0.036	0.041	0.025	0.021	0.0062	0.011	0.014	0.0089	0.0066	0.0049	0.009	0.011	0.0068	0.0053					
Nickel	0.1	0.16	0.17	0.1	0.1	0.052	0.085	0.089	0.055	0.052	0.038	0.061	0.064	0.04	0.039	8.8E-08	2.9E-09	2.8E-09	8.8E-08	8.8E-08
Selenium	0.034	0.084	0.13	0.077	0.042	0.02	0.053	0.091	0.055	0.027	0.014	0.037	0.062	0.038	0.019					
Yanks Peak Trail																				
Antimony	0.069	0.11	0.11	0.069	0.069	0.031	0.04	0.04	0.031	0.031	0.022	0.029	0.029	0.022	0.022					
Arsenic	0.22	0.27	0.27	0.23	0.22	0.032	0.045	0.045	0.033	0.032	0.029	0.039	0.04	0.029	0.029	9.7E-06	1.4E-05	1.4E-05	9.7E-06	9.7E-06
Cadmium	1.0	1.3	1.3	1.1	1.0	0.74	0.9	0.95	0.79	0.76	0.53	0.64	0.67	0.56	0.54	3.4E-08	9.0E-11	2.5E-10	3.4E-08	3.4E-08
Cobalt	0.58	0.84	0.84	0.58	0.58	0.41	0.6	0.6	0.42	0.41	0.28	0.4	0.4	0.28	0.28					
Manganese	2.1	3.3	3.3	2.1	2.1	0.62	0.83	0.83	0.62	0.62	0.55	0.67	0.68	0.55	0.55					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.02	0.036	0.041	0.025	0.021	0.0062	0.011	0.014	0.0089	0.0066	0.0049	0.009	0.011	0.0068	0.0053					
Nickel	0.1	0.16	0.17	0.1	0.1	0.052	0.085	0.089	0.055	0.052	0.038	0.061	0.064	0.04	0.039	8.8E-08	2.9E-09	4.7E-09	8.8E-08	8.8E-08
Selenium	0.034	0.084	0.13	0.077	0.042	0.02	0.053	0.091	0.055	0.027	0.014	0.037	0.062	0.038	0.019					

Table 2C: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Groundhog Lake Ski Trail																				
Antimony	0.1	0.14	0.14	0.1	0.1	0.048	0.057	0.057	0.048	0.048	0.037	0.044	0.044	0.037	0.037					
Arsenic	0.7	0.75	0.75	0.71	0.7	0.27	0.29	0.29	0.27	0.27	0.24	0.25	0.25	0.24	0.24	5.0E-05	5.4E-05	5.4E-05	5.0E-05	5.0E-05
Cadmium	1.1	1.3	1.4	1.1	1.1	0.76	0.92	0.97	0.81	0.77	0.54	0.65	0.68	0.57	0.55	3.4E-08	8.9E-11	1.2E-10	3.4E-08	3.4E-08
Cobalt	0.7	0.96	0.97	0.7	0.7	0.47	0.66	0.66	0.47	0.47	0.32	0.44	0.44	0.32	0.32					
Manganese	2.3	3.4	3.4	2.3	2.3	0.66	0.87	0.87	0.66	0.66	0.59	0.71	0.71	0.59	0.59					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.021	0.037	0.042	0.025	0.022	0.0065	0.012	0.014	0.0092	0.0069	0.0052	0.0092	0.011	0.007	0.0055					
Nickel	0.15	0.22	0.22	0.16	0.15	0.08	0.11	0.12	0.08	0.08	0.07	0.092	0.094	0.07	0.07	8.8E-08	2.8E-09	2.8E-09	8.8E-08	8.8E-08
Selenium	0.59	0.64	0.69	0.64	0.6	0.3	0.34	0.37	0.34	0.31	0.19	0.22	0.24	0.22	0.2					
Chisholm Creek Rec Site																				
Antimony	0.069	0.11	0.11	0.069	0.069	0.031	0.04	0.04	0.031	0.031	0.022	0.029	0.029	0.022	0.022					
Arsenic	0.22	0.27	0.27	0.23	0.22	0.032	0.045	0.045	0.033	0.032	0.029	0.039	0.04	0.029	0.029	9.7E-06	1.4E-05	1.4E-05	9.7E-06	9.7E-06
Cadmium	1.0	1.3	1.3	1.1	1.0	0.74	0.9	0.95	0.79	0.76	0.53	0.64	0.67	0.56	0.54	3.4E-08	8.9E-11	1.2E-09	3.4E-08	3.4E-08
Cobalt	0.58	0.84	0.84	0.58	0.58	0.41	0.6	0.6	0.42	0.41	0.28	0.4	0.4	0.28	0.28					
Manganese	2.1	3.3	3.3	2.1	2.1	0.62	0.83	0.83	0.62	0.62	0.55	0.67	0.67	0.55	0.55					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.02	0.036	0.041	0.025	0.021	0.0062	0.011	0.014	0.0089	0.0066	0.0049	0.009	0.011	0.0068	0.0053					
Nickel	0.1	0.16	0.17	0.1	0.1	0.052	0.085	0.089	0.055	0.052	0.038	0.061	0.064	0.04	0.039	8.8E-08	2.8E-09	3.0E-09	8.8E-08	8.8E-08
Selenium	0.034	0.084	0.13	0.077	0.042	0.02	0.053	0.091	0.055	0.027	0.014	0.037	0.062	0.038	0.019					
Nine Mile Lake Rec Site																				
Antimony	0.069	0.11	0.11	0.069	0.069	0.031	0.04	0.04	0.031	0.031	0.022	0.029	0.029	0.022	0.022					
Arsenic	0.22	0.27	0.27	0.23	0.22	0.032	0.045	0.045	0.033	0.032	0.029	0.039	0.04	0.029	0.029	9.7E-06	1.4E-05	1.4E-05	9.7E-06	9.7E-06
Cadmium	1.0	1.3	1.3	1.1	1.0	0.74	0.9	0.95	0.79	0.76	0.53	0.64	0.67	0.56	0.54	3.4E-08	9.3E-11	1.8E-10	3.4E-08	3.4E-08
Cobalt	0.58	0.84	0.84	0.58	0.58	0.41	0.6	0.6	0.42	0.41	0.28	0.4	0.4	0.28	0.28					
Manganese	2.1	3.3	3.3	2.1	2.1	0.62	0.83	0.83	0.62	0.62	0.55	0.67	0.67	0.55	0.55					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.02	0.036	0.041	0.025	0.021	0.0062	0.011	0.014	0.0089	0.0066	0.0049	0.009	0.011	0.0068	0.0053					
Nickel	0.1	0.16	0.17	0.1	0.1	0.052	0.085	0.089	0.055	0.052	0.038	0.061	0.064	0.04	0.039	8.8E-08	3.0E-09	2.9E-09	8.8E-08	8.8E-08
Selenium	0.034	0.084	0.13	0.077	0.042	0.02	0.053	0.091	0.055	0.027	0.014	0.037	0.062	0.038	0.019					
Trail Buffer 1 - Legal Objective																				
Antimony	0.069	0.11	0.11	0.069	0.069	0.031	0.04	0.04	0.031	0.031	0.022	0.029	0.029	0.022	0.022					
Arsenic	0.22	0.27	0.27	0.23	0.22	0.032	0.045	0.045	0.033	0.032	0.029	0.039	0.04	0.029	0.029	9.7E-06	1.4E-05	1.4E-05	9.7E-06	9.7E-06
Cadmium	1.0	1.3	1.3	1.1	1.0	0.74	0.9	0.95	0.79	0.76	0.53	0.64	0.67	0.56	0.54	3.4E-08	9.0E-11	2.8E-10	3.4E-08	3.4E-08
Cobalt	0.58	0.84	0.84	0.58	0.58	0.41	0.6	0.6	0.42	0.41	0.28	0.4	0.4	0.28	0.28					
Manganese	2.1	3.3	3.3	2.1	2.1	0.62	0.83	0.83	0.62	0.62	0.55	0.67	0.67	0.55	0.55					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.02	0.036	0.041	0.025	0.021	0.0062	0.011	0.014	0.0089	0.0066	0.0049	0.009	0.011	0.0068	0.0053					
Nickel	0.1	0.16	0.17	0.1	0.1	0.052	0.085	0.089	0.055	0.052	0.038	0.061	0.064	0.04	0.039	8.8E-08	2.9E-09	2.9E-09	8.8E-08	8.8E-08
Selenium	0.034	0.084	0.13	0.077	0.042	0.02	0.053	0.091	0.055	0.027	0.014	0.037	0.062	0.038	0.019					
Viewing Point along Hwy 26																				
Antimony	0.12	0.16	0.16	0.12	0.12	0.059	0.068	0.068	0.059	0.059	0.05	0.056	0.057	0.05	0.05					
Arsenic	0.99	1.0	1.0	0.99	0.99	0.43	0.44	0.44	0.43	0.43	0.41	0.42	0.43	0.41	0.41	5.9E-05	6.4E-05	6.4E-05	5.9E-05	5.9E-05
Cadmium	1.1	1.3	1.4	1.1	1.1	0.76	0.92	0.98	0.81	0.77	0.54	0.65	0.7	0.57	0.55	3.4E-08	9.6E-11	5.4E-08	3.4E-08	3.4E-08
Cobalt	0.7	0.97	0.97	0.71	0.7	0.47	0.66	0.66	0.47	0.47	0.32	0.44	0.44	0.32	0.32					
Manganese	2.4	3.5	3.5	2.4	2.4	0.75	0.97	0.97	0.75	0.75	0.7	0.82	0.82	0.7	0.7					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.021	0.037	0.042	0.025	0.022	0.0065	0.012	0.015	0.0092	0.007	0.0052	0.0093	0.011	0.007	0.0055					
Nickel	0.16	0.22	0.23	0.16	0.16	0.09	0.12	0.12	0.09	0.09	0.07	0.097	0.1	0.08	0.07	8.8E-08	3.0E-09	1.1E-08	8.8E-08	8.8E-08
Selenium	0.59	0.64	0.69	0.64	0.6	0.3	0.34	0.37	0.34	0.31	0.19	0.22	0.24	0.22	0.2					

Table 2C: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Trapline TR0515T017 Cabin																				
Antimony	0.069	0.11	0.11	0.069	0.069	0.031	0.04	0.04	0.031	0.031	0.022	0.029	0.029	0.022	0.022					
Arsenic	0.22	0.27	0.27	0.23	0.22	0.032	0.045	0.045	0.033	0.032	0.029	0.039	0.04	0.029	0.029	9.7E-06	1.4E-05	1.4E-05	9.7E-06	9.7E-06
Cadmium	1.0	1.3	1.3	1.1	1.0	0.74	0.9	0.95	0.79	0.76	0.53	0.64	0.67	0.56	0.54	3.4E-08	9.0E-11	8.9E-11	3.4E-08	3.4E-08
Cobalt	0.58	0.84	0.84	0.58	0.58	0.41	0.6	0.6	0.42	0.41	0.28	0.4	0.4	0.28	0.28					
Manganese	2.1	3.3	3.3	2.1	2.1	0.62	0.83	0.83	0.62	0.62	0.55	0.67	0.67	0.55	0.55					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.02	0.036	0.041	0.025	0.021	0.0062	0.011	0.014	0.0089	0.0066	0.0049	0.009	0.011	0.0068	0.0053					
Nickel	0.1	0.16	0.17	0.1	0.1	0.052	0.085	0.089	0.055	0.052	0.038	0.061	0.064	0.04	0.039	8.8E-08	2.9E-09	2.8E-09	8.8E-08	8.8E-08
Selenium	0.034	0.084	0.13	0.077	0.042	0.02	0.053	0.091	0.055	0.027	0.014	0.037	0.062	0.038	0.019					
Highway 26 Transect 200 m																				
Antimony	0.12	0.16	0.16	0.12	0.12	0.059	0.068	0.068	0.059	0.059	0.05	0.056	0.057	0.05	0.05					
Arsenic	0.99	1.0	1.0	0.99	0.99	0.43	0.44	0.44	0.43	0.43	0.41	0.42	0.43	0.41	0.41	5.9E-05	6.4E-05	6.4E-05	5.9E-05	5.9E-05
Cadmium	1.1	1.3	1.4	1.1	1.1	0.76	0.92	0.97	0.81	0.77	0.54	0.65	0.69	0.57	0.55	3.4E-08	8.8E-11	1.5E-08	3.4E-08	3.4E-08
Cobalt	0.7	0.97	0.97	0.71	0.7	0.47	0.66	0.66	0.47	0.47	0.32	0.44	0.44	0.32	0.32					
Manganese	2.4	3.5	3.5	2.4	2.4	0.75	0.97	0.97	0.75	0.75	0.7	0.82	0.82	0.7	0.7					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.021	0.037	0.042	0.025	0.022	0.0065	0.012	0.015	0.0092	0.007	0.0052	0.0093	0.011	0.007	0.0055					
Nickel	0.16	0.22	0.23	0.16	0.16	0.09	0.12	0.12	0.09	0.09	0.07	0.097	0.1	0.08	0.07	8.8E-08	2.8E-09	5.1E-09	8.8E-08	8.8E-08
Selenium	0.59	0.64	0.69	0.64	0.6	0.3	0.34	0.37	0.34	0.31	0.19	0.22	0.24	0.22	0.2					
Cow Mountain Trails 1																				
Antimony	0.15	0.2	0.2	0.15	0.15	0.073	0.086	0.086	0.073	0.073	0.066	0.076	0.076	0.066	0.066					
Arsenic	1.1	1.1	1.1	1.1	1.1	0.43	0.45	0.45	0.43	0.43	0.42	0.43	0.43	0.42	0.42	6.0E-05	6.6E-05	6.7E-05	6.0E-05	6.0E-05
Cadmium	1.1	1.3	1.4	1.1	1.1	0.76	0.92	0.97	0.81	0.77	0.54	0.65	0.68	0.57	0.54	3.4E-08	1.7E-10	9.3E-10	3.4E-08	3.4E-08
Cobalt	0.71	1.0	1.0	0.71	0.71	0.47	0.67	0.67	0.47	0.47	0.32	0.45	0.45	0.32	0.32					
Manganese	1.6	2.7	2.7	1.6	1.6	0.4	0.68	0.68	0.4	0.4	0.33	0.55	0.55	0.33	0.33					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.012	0.025	0.029	0.016	0.012	0.0043	0.0088	0.012	0.007	0.0048	0.0033	0.0067	0.0085	0.0051	0.0036					
Nickel	0.18	0.24	0.25	0.18	0.18	0.09	0.12	0.13	0.1	0.09	0.08	0.1	0.11	0.08	0.08	8.8E-08	4.3E-09	3.9E-09	8.8E-08	8.8E-08
Selenium	0.59	0.64	0.69	0.64	0.6	0.3	0.34	0.37	0.34	0.31	0.19	0.22	0.24	0.22	0.2					
Cow Mountain Trails 2																				
Antimony	0.12	0.17	0.17	0.12	0.12	0.059	0.071	0.072	0.059	0.059	0.05	0.06	0.06	0.05	0.05					
Arsenic	1.1	1.1	1.1	1.1	1.1	0.44	0.46	0.46	0.44	0.44	0.43	0.44	0.45	0.43	0.43	6.1E-05	6.7E-05	6.8E-05	6.1E-05	6.1E-05
Cadmium	1.1	1.3	1.4	1.1	1.1	0.76	0.92	0.97	0.81	0.77	0.54	0.65	0.68	0.57	0.54	3.4E-08	1.5E-10	2.6E-10	3.4E-08	3.4E-08
Cobalt	0.71	1.0	1.0	0.71	0.71	0.47	0.67	0.67	0.47	0.47	0.32	0.45	0.45	0.32	0.32					
Manganese	1.5	2.6	2.6	1.5	1.5	0.39	0.67	0.67	0.39	0.39	0.32	0.54	0.54	0.32	0.32					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.013	0.026	0.03	0.017	0.014	0.0049	0.0094	0.012	0.0076	0.0054	0.004	0.0073	0.0092	0.0058	0.0043					
Nickel	0.17	0.24	0.24	0.18	0.17	0.09	0.12	0.13	0.09	0.09	0.08	0.1	0.1	0.08	0.08	8.8E-08	3.7E-09	3.7E-09	8.8E-08	8.8E-08
Selenium	0.59	0.65	0.69	0.64	0.6	0.3	0.34	0.37	0.34	0.31	0.19	0.22	0.24	0.22	0.2					
Jubilee Trail / Wendle Park																				
Antimony	0.072	0.12	0.12	0.072	0.072	0.031	0.044	0.044	0.031	0.031	0.022	0.032	0.032	0.022	0.022					
Arsenic	0.29	0.35	0.36	0.29	0.29	0.039	0.055	0.057	0.039	0.039	0.036	0.05	0.051	0.037	0.037	1.1E-05	1.7E-05	1.8E-05	1.1E-05	1.1E-05
Cadmium	1.0	1.3	1.3	1.1	1.0	0.74	0.9	0.95	0.79	0.75	0.52	0.64	0.67	0.56	0.53	3.4E-08	1.5E-10	2.5E-10	3.4E-08	3.4E-08
Cobalt	0.59	0.89	0.89	0.59	0.59	0.41	0.61	0.61	0.42	0.41	0.28	0.41	0.41	0.28	0.28					
Manganese	1.4	2.5	2.5	1.4	1.4	0.35	0.63	0.63	0.35	0.35	0.28	0.5	0.5	0.28	0.28					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.011	0.024	0.028	0.015	0.012	0.004	0.0085	0.011	0.0067	0.0044	0.003	0.0064	0.0083	0.0049	0.0034					
Nickel	0.12	0.18	0.18	0.12	0.12	0.058	0.091	0.094	0.062	0.059	0.045	0.067	0.069	0.047	0.045	8.8E-08	3.8E-09	3.6E-09	8.8E-08	8.8E-08
Selenium	0.033	0.086	0.13	0.076	0.041	0.019	0.053	0.091	0.054	0.026	0.014	0.037	0.062	0.037	0.018					

Table 2C: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Ned's Connector Trail																				
Antimony	0.12	0.17	0.17	0.14	0.12	0.059	0.072	0.072	0.069	0.059	0.05	0.06	0.06	0.062	0.05					
Arsenic	1.1	1.2	1.2	1.0	1.1	0.45	0.47	0.47	0.44	0.45	0.44	0.45	0.45	0.48	0.44	6.1E-05	6.7E-05	6.8E-05	3.9E-05	6.1E-05
Cadmium	1.1	1.3	1.4	2.4	1.1	0.76	0.92	0.97	1.4	0.77	0.54	0.65	0.68	0.94	0.54	3.4E-08	1.5E-10	2.6E-10	3.4E-08	3.4E-08
Cobalt	0.71	1.0	1.0	1.2	0.71	0.47	0.67	0.67	0.7	0.47	0.32	0.45	0.45	0.46	0.32					
Manganese	1.5	2.6	2.6	1.7	1.5	0.39	0.67	0.67	0.48	0.39	0.32	0.54	0.54	0.42	0.32					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.013	0.026	0.031	0.017	0.014	0.005	0.0095	0.012	0.0077	0.0055	0.0041	0.0074	0.0093	0.0059	0.0044					
Nickel	0.17	0.24	0.24	0.35	0.17	0.09	0.12	0.13	0.18	0.09	0.08	0.1	0.1	0.14	0.08	8.8E-08	3.7E-09	4.0E-09	8.8E-08	8.8E-08
Selenium	0.59	0.65	0.69	1.4	0.6	0.3	0.34	0.37	0.71	0.31	0.19	0.22	0.24	0.45	0.2					
Williams Creek Trail																				
Antimony	0.1	0.16	0.16	0.1	0.1	0.048	0.061	0.061	0.048	0.048	0.038	0.048	0.048	0.038	0.038					
Arsenic	1.0	1.1	1.1	1.0	1.0	0.42	0.44	0.44	0.42	0.42	0.4	0.42	0.42	0.4	0.4	6.0E-05	6.6E-05	6.6E-05	6.0E-05	6.0E-05
Cadmium	1.1	1.3	1.4	1.1	1.1	0.76	0.92	0.97	0.81	0.77	0.54	0.65	0.68	0.57	0.54	3.4E-08	1.5E-10	2.1E-10	3.4E-08	3.4E-08
Cobalt	0.71	1.0	1.0	0.71	0.71	0.47	0.67	0.67	0.47	0.47	0.32	0.45	0.45	0.32	0.32					
Manganese	1.6	2.7	2.7	1.6	1.6	0.4	0.68	0.68	0.4	0.4	0.33	0.55	0.55	0.33	0.33					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.012	0.025	0.029	0.016	0.012	0.0043	0.0088	0.012	0.007	0.0047	0.0033	0.0066	0.0085	0.0051	0.0036					
Nickel	0.17	0.23	0.23	0.17	0.17	0.09	0.12	0.12	0.09	0.09	0.07	0.096	0.098	0.08	0.07	8.8E-08	3.6E-09	3.6E-09	8.8E-08	8.8E-08
Selenium	0.59	0.64	0.69	0.64	0.6	0.3	0.34	0.37	0.34	0.31	0.19	0.22	0.24	0.22	0.2					
Cornish X-Country Ski Trail 1																				
Antimony	0.12	0.17	0.17	0.12	0.12	0.055	0.068	0.068	0.055	0.055	0.046	0.056	0.056	0.046	0.046					
Arsenic	3.0	3.1	3.1	3.0	3.0	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.3E-04	1.3E-04	1.3E-04	1.3E-04	1.3E-04
Cadmium	1.1	1.3	1.4	1.1	1.1	0.76	0.92	0.97	0.81	0.77	0.54	0.65	0.68	0.57	0.54	3.4E-08	1.8E-10	4.1E-10	3.4E-08	3.4E-08
Cobalt	0.71	1.0	1.0	0.71	0.71	0.47	0.67	0.67	0.47	0.47	0.32	0.45	0.45	0.32	0.32					
Manganese	1.6	2.8	2.8	1.6	1.6	0.45	0.73	0.73	0.45	0.45	0.38	0.61	0.61	0.38	0.38					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.012	0.025	0.029	0.016	0.013	0.0043	0.0088	0.012	0.007	0.0048	0.0033	0.0067	0.0086	0.0051	0.0036					
Nickel	0.16	0.22	0.23	0.16	0.16	0.08	0.11	0.12	0.08	0.08	0.07	0.09	0.092	0.07	0.07	8.8E-08	4.7E-09	4.0E-09	8.8E-08	8.8E-08
Selenium	0.59	0.64	0.69	0.63	0.6	0.3	0.34	0.37	0.34	0.31	0.19	0.22	0.24	0.22	0.2					
Cornish X-Country Ski Trail 2																				
Antimony	0.11	0.16	0.16	0.11	0.11	0.051	0.064	0.064	0.051	0.051	0.041	0.051	0.051	0.041	0.041					
Arsenic	1.3	1.4	1.4	1.3	1.3	0.58	0.6	0.6	0.58	0.58	0.59	0.6	0.6	0.59	0.59	6.9E-05	7.5E-05	7.6E-05	6.9E-05	6.9E-05
Cadmium	1.1	1.3	1.4	1.1	1.1	0.76	0.92	0.97	0.8	0.77	0.54	0.65	0.68	0.57	0.54	3.4E-08	1.6E-10	3.2E-10	3.4E-08	3.4E-08
Cobalt	0.71	1.0	1.0	0.71	0.71	0.47	0.67	0.67	0.47	0.47	0.32	0.45	0.45	0.32	0.32					
Manganese	1.9	3.0	3.0	1.9	1.9	0.58	0.86	0.86	0.58	0.58	0.53	0.75	0.75	0.53	0.53					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.012	0.025	0.029	0.016	0.013	0.0043	0.0088	0.012	0.007	0.0048	0.0033	0.0067	0.0085	0.0051	0.0036					
Nickel	0.16	0.22	0.22	0.16	0.16	0.08	0.11	0.12	0.08	0.08	0.07	0.089	0.092	0.07	0.07	8.8E-08	4.1E-09	3.8E-09	8.8E-08	8.8E-08
Selenium	0.59	0.64	0.69	0.63	0.6	0.3	0.34	0.37	0.34	0.31	0.19	0.22	0.24	0.22	0.2					
Cornish X-Country Ski Trail 3																				
Antimony	0.11	0.16	0.16	0.11	0.11	0.05	0.062	0.063	0.05	0.05	0.04	0.049	0.049	0.04	0.04					
Arsenic	1.3	1.2	1.7	1.2	1.1	0.56	0.52	0.73	0.53	0.45	0.56	0.52	0.69	0.53	0.46	6.7E-05	6.6E-05	1.1E-04	6.6E-05	5.0E-05
Cadmium	1.1	2.0	3.5	2.1	1.3	0.76	1.2	2.0	1.2	0.88	0.54	0.84	1.3	0.85	0.61	3.4E-08	3.8E-10	9.2E-10	3.4E-08	3.4E-08
Cobalt	0.71	0.95	0.96	0.65	0.65	0.47	0.64	0.65	0.45	0.44	0.32	0.43	0.44	0.3	0.3					
Manganese	1.6	2.7	2.8	1.6	1.6	0.45	0.72	0.79	0.44	0.42	0.38	0.59	0.67	0.38	0.35					
Methylmercury	0.67	1.0	1.1	0.96	1.0	0.13	0.2	0.21	0.19	0.2	0.2	0.3	0.32	0.28	0.3					
Molybdenum	0.013	0.036	0.068	0.033	0.016	0.0049	0.015	0.034	0.017	0.0068	0.0039	0.014	0.034	0.016	0.0059					
Nickel	0.16	0.3	0.49	0.28	0.18	0.08	0.15	0.24	0.14	0.09	0.07	0.12	0.18	0.11	0.08	8.8E-08	1.1E-08	5.5E-09	8.8E-08	8.8E-08
Selenium	0.59	1.4	3.0	1.8	0.88	0.3	0.73	1.5	0.91	0.45	0.19	0.46	0.98	0.58	0.29					

Table 2C: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Groundhog Lake Snowmobile Trail																				
Antimony	0.14	0.19	0.19	0.17	0.14	0.069	0.083	0.083	0.079	0.07	0.061	0.073	0.073	0.063	0.063					
Arsenic	1.5	1.5	1.5	1.2	1.5	0.69	0.67	0.68	0.53	0.66	0.71	0.68	0.69	0.57	0.67	7.6E-05	8.0E-05	8.1E-05	5.0E-05	7.4E-05
Cadmium	1.1	1.3	1.4	1.2	1.1	0.76	0.92	0.97	0.84	0.77	0.54	0.65	0.68	0.59	0.55	3.4E-08	1.5E-10	3.1E-10	3.4E-08	3.4E-08
Cobalt	0.73	1.0	1.0	0.65	0.73	0.48	0.68	0.68	0.44	0.48	0.33	0.46	0.47	0.3	0.33					
Manganese	2.0	3.1	3.1	1.6	2.0	0.63	0.93	0.93	0.42	0.65	0.59	0.83	0.83	0.35	0.6					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.033	0.03	0.034	0.016	0.018	0.017	0.012	0.014	0.007	0.0077	0.017	0.010	0.012	0.0051	0.0069					
Nickel	0.23	0.29	0.3	0.18	0.23	0.12	0.16	0.16	0.1	0.12	0.12	0.14	0.14	0.08	0.12	8.8E-08	3.7E-09	5.4E-09	8.8E-08	8.8E-08
Selenium	0.8	0.72	0.76	0.79	0.67	0.43	0.38	0.42	0.42	0.36	0.34	0.27	0.29	0.27	0.25					
Barkerville Provincial Park Campground																				
Antimony	0.13	0.18	0.18	0.13	0.13	0.065	0.077	0.077	0.065	0.065	0.056	0.066	0.066	0.056	0.056					
Arsenic	1.5	1.6	1.6	1.5	1.5	0.68	0.69	0.69	0.68	0.68	0.69	0.71	0.71	0.69	0.69	7.5E-05	8.1E-05	8.2E-05	7.5E-05	7.5E-05
Cadmium	1.1	1.3	1.4	1.1	1.1	0.76	0.92	0.97	0.8	0.77	0.54	0.65	0.68	0.57	0.54	3.4E-08	1.5E-10	2.7E-10	3.4E-08	3.4E-08
Cobalt	0.71	1.0	1.0	0.71	0.71	0.47	0.67	0.67	0.47	0.47	0.32	0.45	0.45	0.32	0.32					
Manganese	1.6	2.7	2.7	1.6	1.6	0.42	0.7	0.7	0.42	0.42	0.35	0.57	0.57	0.35	0.35					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.012	0.025	0.03	0.017	0.013	0.0046	0.0091	0.012	0.0073	0.0051	0.0036	0.007	0.0089	0.0055	0.0039					
Nickel	0.17	0.23	0.24	0.17	0.17	0.09	0.12	0.12	0.09	0.09	0.08	0.098	0.1	0.08	0.08	8.8E-08	3.8E-09	3.7E-09	8.8E-08	8.8E-08
Selenium	0.59	0.64	0.69	0.63	0.6	0.3	0.34	0.37	0.34	0.31	0.19	0.22	0.24	0.22	0.2					
Forest Rose Campground																				
Antimony	0.14	0.19	0.19	0.14	0.14	0.068	0.081	0.081	0.068	0.068	0.061	0.07	0.071	0.061	0.061					
Arsenic	0.68	0.74	0.75	0.68	0.68	0.25	0.27	0.27	0.25	0.25	0.26	0.27	0.27	0.26	0.26	2.9E-05	3.5E-05	3.6E-05	2.9E-05	2.9E-05
Cadmium	1.0	1.3	1.4	1.1	1.1	0.75	0.91	0.96	0.8	0.76	0.53	0.64	0.67	0.56	0.54	3.4E-08	1.5E-10	2.7E-10	3.4E-08	3.4E-08
Cobalt	0.66	0.97	0.97	0.67	0.66	0.45	0.65	0.65	0.45	0.45	0.3	0.44	0.44	0.3	0.3					
Manganese	2.2	3.3	3.3	2.2	2.2	0.8	1.1	1.1	0.8	0.8	0.78	1.0	1.0	0.78	0.78					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.013	0.026	0.03	0.017	0.013	0.0048	0.0092	0.012	0.0075	0.0052	0.0037	0.0071	0.009	0.0056	0.004					
Nickel	0.18	0.24	0.24	0.18	0.18	0.09	0.12	0.13	0.1	0.09	0.08	0.1	0.11	0.08	0.08	8.8E-08	3.8E-09	3.7E-09	8.8E-08	8.8E-08
Selenium	0.82	0.88	0.92	0.87	0.83	0.42	0.46	0.49	0.46	0.43	0.27	0.29	0.32	0.29	0.27					
Government Hill Campground																				
Antimony	0.11	0.17	0.17	0.11	0.11	0.054	0.067	0.067	0.054	0.054	0.045	0.054	0.054	0.045	0.045					
Arsenic	1.8	1.8	1.8	1.8	1.8	0.81	0.83	0.83	0.81	0.81	0.84	0.86	0.86	0.85	0.84	8.4E-05	9.0E-05	9.1E-05	8.4E-05	8.4E-05
Cadmium	1.1	1.3	1.4	1.1	1.1	0.76	0.92	0.97	0.81	0.77	0.54	0.65	0.68	0.57	0.54	3.4E-08	1.5E-10	2.4E-10	3.4E-08	3.4E-08
Cobalt	0.71	1.0	1.0	0.71	0.71	0.47	0.67	0.67	0.47	0.47	0.32	0.45	0.45	0.32	0.32					
Manganese	1.6	2.7	2.7	1.6	1.6	0.4	0.68	0.68	0.4	0.4	0.33	0.55	0.55	0.33	0.33					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.012	0.026	0.03	0.017	0.013	0.0047	0.0092	0.012	0.0075	0.0052	0.0038	0.0072	0.009	0.0056	0.0041					
Nickel	0.17	0.23	0.24	0.18	0.17	0.09	0.12	0.12	0.09	0.09	0.08	0.098	0.1	0.08	0.08	8.8E-08	3.7E-09	3.6E-09	8.8E-08	8.8E-08
Selenium	0.59	0.64	0.69	0.64	0.6	0.3	0.34	0.37	0.34	0.31	0.19	0.22	0.24	0.22	0.2					
Water Access – Jack of Clubs Lake																				
Antimony	0.22	0.27	0.27	0.22	0.22	0.12	0.13	0.13	0.12	0.12	0.12	0.13	0.13	0.12	0.12					
Arsenic	27	28	28	28	27	17	17	17	17	17	19	19	19	19	19	1.0E-03	1.0E-03	1.0E-03	1.0E-03	1.0E-03
Cadmium	1.0	1.6	2.1	1.6	1.2	0.75	1.0	1.3	1.0	0.81	0.53	0.72	0.89	0.7	0.57	3.4E-08	7.5E-10	2.8E-08	3.4E-08	3.4E-08
Cobalt	0.66	0.92	0.97	0.64	0.6	0.45	0.63	0.65	0.44	0.42	0.3	0.43	0.44	0.3	0.29					
Manganese	1.7	3.0	3.1	1.9	1.8	0.47	0.82	0.91	0.57	0.49	0.41	0.71	0.81	0.52	0.43					
Methylmercury	0.92	14	14	14	14	0.18	2.7	2.7	2.7	2.7	0.27	4.1	4.1	4.0	4.0					
Molybdenum	0.012	0.093	0.22	0.14	0.032	0.0045	0.039	0.098	0.06	0.014	0.0034	0.032	0.08	0.05	0.011					
Nickel	0.2	0.42	0.69	0.47	0.25	0.1	0.21	0.35	0.24	0.13	0.09	0.17	0.26	0.19	0.11	8.8E-08	2.2E-08	1.1E-08	8.8E-08	8.8E-08
Selenium	0.83	0.31	0.36	0.3	0.26	0.42	0.17	0.21	0.17	0.14	0.27	0.11	0.14	0.11	0.089					

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Valley Mountain Pass																				
Antimony	0.13	0.18	0.18	0.13	0.13	0.065	0.077	0.078	0.065	0.065	0.056	0.066	0.066	0.056	0.056					
Arsenic	1.5	1.6	1.6	1.5	1.5	0.67	0.69	0.69	0.67	0.67	0.69	0.7	0.71	0.69	0.69	7.5E-05	8.1E-05	8.2E-05	7.5E-05	7.5E-05
Cadmium	1.1	1.3	1.4	1.1	1.1	0.76	0.92	0.97	0.81	0.77	0.54	0.65	0.68	0.57	0.54	3.4E-08	6.8E-10	3.3E-09	3.4E-08	3.4E-08
Cobalt	0.71	1.0	1.0	0.72	0.71	0.47	0.67	0.67	0.48	0.47	0.32	0.45	0.45	0.32	0.32					
Manganese	1.9	3.0	3.0	1.9	1.9	0.58	0.87	0.87	0.58	0.58	0.53	0.76	0.76	0.53	0.53					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.012	0.025	0.029	0.016	0.013	0.0043	0.0088	0.012	0.007	0.0048	0.0033	0.0067	0.0086	0.0051	0.0036					
Nickel	0.18	0.25	0.25	0.19	0.19	0.1	0.13	0.13	0.1	0.1	0.08	0.11	0.11	0.09	0.08	8.8E-08	2.0E-08	8.1E-09	8.8E-08	8.8E-08
Selenium	0.59	0.64	0.69	0.64	0.6	0.3	0.34	0.37	0.34	0.31	0.19	0.22	0.24	0.22	0.2					
Historic Barkerville Town and Park																				
Antimony	0.11	0.17	0.17	0.11	0.11	0.054	0.067	0.067	0.054	0.054	0.045	0.054	0.054	0.045	0.045					
Arsenic	1.8	1.8	1.8	1.8	1.8	0.81	0.83	0.83	0.81	0.81	0.84	0.86	0.86	0.85	0.84	8.4E-05	9.0E-05	9.1E-05	8.4E-05	8.4E-05
Cadmium	1.1	1.3	1.4	1.1	1.1	0.76	0.92	0.97	0.81	0.77	0.54	0.65	0.68	0.57	0.54	3.4E-08	1.5E-10	2.3E-10	3.4E-08	3.4E-08
Cobalt	0.71	1.0	1.0	0.71	0.71	0.47	0.67	0.67	0.47	0.47	0.32	0.45	0.45	0.32	0.32					
Manganese	1.6	2.7	2.7	1.6	1.6	0.4	0.68	0.68	0.4	0.4	0.33	0.55	0.55	0.33	0.33					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.012	0.026	0.03	0.017	0.013	0.0047	0.0092	0.012	0.0075	0.0052	0.0038	0.0072	0.009	0.0056	0.0041					
Nickel	0.17	0.23	0.24	0.18	0.17	0.09	0.12	0.12	0.09	0.09	0.08	0.098	0.1	0.08	0.08	8.8E-08	3.6E-09	3.7E-09	8.8E-08	8.8E-08
Selenium	0.59	0.64	0.69	0.64	0.6	0.3	0.34	0.37	0.34	0.31	0.19	0.22	0.24	0.22	0.2					
Outfitter Area																				
Antimony	0.22	0.27	0.27	0.22	0.22	0.12	0.13	0.13	0.12	0.12	0.12	0.13	0.13	0.12	0.12					
Arsenic	33	33	33	33	33	17	18	18	18	17	20	20	20	20	20	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03
Cadmium	1.0	1.6	2.0	1.6	1.2	0.75	1.0	1.3	1.0	0.81	0.53	0.72	0.88	0.7	0.57	3.4E-08	4.1E-10	2.5E-09	3.4E-08	3.4E-08
Cobalt	0.66	0.92	0.97	0.64	0.6	0.45	0.63	0.65	0.44	0.42	0.3	0.43	0.44	0.3	0.29					
Manganese	1.7	3.0	3.1	1.9	1.8	0.47	0.81	0.91	0.57	0.49	0.41	0.7	0.81	0.52	0.43					
Methylmercury	0.92	14	14	14	14	0.18	2.7	2.7	2.7	2.7	0.27	4.1	4.1	4.0	4.0					
Molybdenum	0.012	0.093	0.22	0.14	0.032	0.0045	0.039	0.098	0.06	0.014	0.0034	0.032	0.08	0.05	0.011					
Nickel	0.2	0.42	0.69	0.47	0.25	0.1	0.21	0.35	0.24	0.13	0.09	0.17	0.26	0.19	0.11	8.8E-08	1.2E-08	5.2E-09	8.8E-08	8.8E-08
Selenium	0.83	0.31	0.36	0.3	0.26	0.42	0.17	0.21	0.17	0.14	0.27	0.11	0.14	0.11	0.089					
Le Bourdais Lake																				
Antimony	0.22	0.087	0.31	0.14	0.15	0.15	0.051	0.19	0.09	0.1	0.099	0.035	0.13	0.061	0.068					
Arsenic	0.19	0.19	0.21	0.19	0.18	0.026	0.027	0.032	0.024	0.023	0.024	0.025	0.03	0.023	0.023	6.7E-06	6.9E-06	9.0E-06	6.3E-06	6.2E-06
Cadmium	0.76	0.86	0.91	0.76	0.76	0.48	0.55	0.57	0.48	0.48	0.33	0.38	0.4	0.34	0.33	3.4E-08	3.4E-08	3.4E-10	3.4E-08	3.4E-08
Cobalt	0.58	0.82	0.84	0.58	0.58	0.41	0.58	0.59	0.41	0.41	0.27	0.39	0.39	0.27	0.27					
Manganese	1.1	1.1	2.4	1.1	1.1	0.27	0.27	0.6	0.27	0.27	0.22	0.22	0.48	0.22	0.22					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.18	0.18	0.15	0.18	0.18	0.047	0.047	0.039	0.046	0.046	0.041	0.041	0.033	0.04	0.04					
Nickel	0.14	0.17	0.19	0.14	0.14	0.062	0.08	0.089	0.06	0.06	0.045	0.059	0.063	0.044	0.044	8.9E-08	8.9E-08	3.9E-09	8.9E-08	8.9E-08
Selenium	0.046	0.049	0.14	0.077	0.047	0.033	0.036	0.1	0.058	0.034	0.023	0.024	0.069	0.039	0.023					
Quesnel Forks																				
Antimony	0.22	0.087	0.31	0.14	0.15	0.15	0.051	0.19	0.09	0.1	0.099	0.035	0.13	0.061	0.068					
Arsenic	0.19	0.19	0.21	0.19	0.18	0.026	0.027	0.032	0.024	0.023	0.024	0.025	0.03	0.023	0.023	6.7E-06	6.9E-06	9.0E-06	6.3E-06	6.2E-06
Cadmium	0.76	0.86	0.91	0.76	0.76	0.48	0.55	0.57	0.48	0.48	0.33	0.38	0.4	0.34	0.33	3.4E-08	3.4E-08	3.4E-10	3.4E-08	3.4E-08
Cobalt	0.58	0.82	0.84	0.58	0.58	0.41	0.58	0.59	0.41	0.41	0.27	0.39	0.39	0.27	0.27					
Manganese	1.1	1.1	2.4	1.1	1.1	0.27	0.27	0.6	0.27	0.27	0.22	0.22	0.48	0.22	0.22					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.18	0.18	0.15	0.18	0.18	0.047	0.047	0.039	0.046	0.046	0.041	0.041	0.033	0.04	0.04					
Nickel	0.14	0.17	0.19	0.14	0.14	0.062	0.08	0.089	0.06	0.06	0.045	0.059	0.063	0.044	0.044	8.9E-08	8.9E-08	3.9E-09	8.9E-08	8.9E-08
Selenium	0.046	0.049	0.14	0.077	0.047	0.033	0.036	0.1	0.058	0.034	0.023	0.024	0.069	0.039	0.023					

Table 2C: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Little Lake Rec Site																				
Antimony	0.22	0.087	0.31	0.14	0.15	0.15	0.051	0.19	0.09	0.1	0.099	0.035	0.13	0.061	0.068					
Arsenic	0.19	0.19	0.21	0.19	0.18	0.026	0.027	0.032	0.024	0.023	0.024	0.025	0.03	0.023	0.023	6.7E-06	6.9E-06	9.0E-06	6.3E-06	6.2E-06
Cadmium	0.76	0.86	0.91	0.76	0.76	0.48	0.55	0.57	0.48	0.48	0.33	0.38	0.4	0.34	0.33	3.4E-08	3.4E-08	3.4E-10	3.4E-08	3.4E-08
Cobalt	0.58	0.82	0.84	0.58	0.58	0.41	0.58	0.59	0.41	0.41	0.27	0.39	0.39	0.27	0.27					
Manganese	1.1	1.1	2.4	1.1	1.1	0.27	0.27	0.6	0.27	0.27	0.22	0.22	0.48	0.22	0.22					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.18	0.18	0.15	0.18	0.18	0.047	0.047	0.039	0.046	0.046	0.041	0.041	0.033	0.04	0.04					
Nickel	0.14	0.17	0.19	0.14	0.14	0.062	0.08	0.089	0.06	0.06	0.045	0.059	0.063	0.044	0.044	8.9E-08	8.9E-08	3.9E-09	8.9E-08	8.9E-08
Selenium	0.046	0.049	0.14	0.077	0.047	0.033	0.036	0.1	0.058	0.034	0.023	0.024	0.069	0.039	0.023					
Maude Lake Rec Site																				
Antimony	0.22	0.087	0.31	0.14	0.15	0.15	0.051	0.19	0.09	0.1	0.099	0.035	0.13	0.061	0.068					
Arsenic	0.19	0.19	0.21	0.19	0.18	0.026	0.027	0.032	0.024	0.023	0.024	0.025	0.03	0.023	0.023	6.7E-06	6.9E-06	9.0E-06	6.3E-06	6.2E-06
Cadmium	0.76	0.86	0.91	0.76	0.76	0.48	0.55	0.57	0.48	0.48	0.33	0.38	0.4	0.34	0.33	3.4E-08	3.4E-08	3.4E-10	3.4E-08	3.4E-08
Cobalt	0.58	0.82	0.84	0.58	0.58	0.41	0.58	0.59	0.41	0.41	0.27	0.39	0.39	0.27	0.27					
Manganese	1.1	1.1	2.4	1.1	1.1	0.27	0.27	0.6	0.27	0.27	0.22	0.22	0.48	0.22	0.22					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.18	0.18	0.15	0.18	0.18	0.047	0.047	0.039	0.046	0.046	0.041	0.041	0.033	0.04	0.04					
Nickel	0.14	0.17	0.19	0.14	0.14	0.062	0.08	0.089	0.06	0.06	0.045	0.059	0.063	0.044	0.044	8.9E-08	8.9E-08	3.9E-09	8.9E-08	8.9E-08
Selenium	0.046	0.049	0.14	0.077	0.047	0.033	0.036	0.1	0.058	0.034	0.023	0.024	0.069	0.039	0.023					
Prior Lake Rec Site																				
Antimony	0.22	0.087	0.31	0.14	0.15	0.15	0.051	0.19	0.09	0.1	0.099	0.035	0.13	0.061	0.068					
Arsenic	0.19	0.19	0.21	0.19	0.18	0.026	0.027	0.032	0.024	0.023	0.024	0.025	0.03	0.023	0.023	6.7E-06	6.9E-06	9.0E-06	6.3E-06	6.2E-06
Cadmium	0.76	0.86	0.91	0.76	0.76	0.48	0.55	0.57	0.48	0.48	0.33	0.38	0.4	0.34	0.33	3.4E-08	3.4E-08	3.4E-10	3.4E-08	3.4E-08
Cobalt	0.58	0.82	0.84	0.58	0.58	0.41	0.58	0.59	0.41	0.41	0.27	0.39	0.39	0.27	0.27					
Manganese	1.1	1.1	2.4	1.1	1.1	0.27	0.27	0.6	0.27	0.27	0.22	0.22	0.48	0.22	0.22					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.18	0.18	0.15	0.18	0.18	0.047	0.047	0.039	0.046	0.046	0.041	0.041	0.033	0.04	0.04					
Nickel	0.14	0.17	0.19	0.14	0.14	0.062	0.08	0.089	0.06	0.06	0.045	0.059	0.063	0.044	0.044	8.9E-08	8.9E-08	3.8E-09	8.9E-08	8.9E-08
Selenium	0.046	0.049	0.14	0.077	0.047	0.033	0.036	0.1	0.058	0.034	0.023	0.024	0.069	0.039	0.023					
Trail Buffer 2																				
Antimony	0.22	0.087	0.31	0.14	0.15	0.15	0.051	0.19	0.09	0.1	0.099	0.035	0.13	0.061	0.068					
Arsenic	0.19	0.19	0.21	0.19	0.18	0.026	0.027	0.032	0.024	0.023	0.024	0.025	0.03	0.023	0.023	6.7E-06	6.9E-06	9.0E-06	6.3E-06	6.2E-06
Cadmium	0.76	0.86	0.91	0.76	0.76	0.48	0.55	0.57	0.48	0.48	0.33	0.38	0.4	0.34	0.33	3.4E-08	3.4E-08	3.5E-10	3.4E-08	3.4E-08
Cobalt	0.58	0.82	0.84	0.58	0.58	0.41	0.58	0.59	0.41	0.41	0.27	0.39	0.39	0.27	0.27					
Manganese	1.1	1.1	2.4	1.1	1.1	0.27	0.27	0.6	0.27	0.27	0.22	0.22	0.49	0.22	0.22					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.18	0.18	0.15	0.18	0.18	0.047	0.047	0.039	0.046	0.046	0.041	0.041	0.033	0.04	0.04					
Nickel	0.14	0.17	0.19	0.14	0.14	0.062	0.08	0.089	0.06	0.06	0.045	0.059	0.064	0.044	0.044	8.9E-08	8.9E-08	4.1E-09	8.9E-08	8.9E-08
Selenium	0.046	0.049	0.14	0.077	0.047	0.033	0.036	0.1	0.058	0.034	0.023	0.024	0.069	0.039	0.023					
Trail Buffer 4																				
Antimony	0.22	0.087	0.31	0.14	0.15	0.15	0.051	0.19	0.09	0.1	0.099	0.035	0.13	0.061	0.068					
Arsenic	0.19	0.19	0.21	0.19	0.18	0.026	0.027	0.032	0.024	0.023	0.024	0.025	0.03	0.023	0.023	6.7E-06	6.9E-06	9.0E-06	6.3E-06	6.2E-06
Cadmium	0.76	0.86	0.91	0.76	0.76	0.48	0.55	0.57	0.48	0.48	0.33	0.38	0.4	0.34	0.33	3.4E-08	3.4E-08	3.4E-10	3.4E-08	3.4E-08
Cobalt	0.58	0.82	0.84	0.58	0.58	0.41	0.58	0.59	0.41	0.41	0.27	0.39	0.39	0.27	0.27					
Manganese	1.1	1.1	2.4	1.1	1.1	0.27	0.27	0.6	0.27	0.27	0.22	0.22	0.48	0.22	0.22					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.18	0.18	0.15	0.18	0.18	0.047	0.047	0.039	0.046	0.046	0.041	0.041	0.033	0.04	0.04					
Nickel	0.14	0.17	0.19	0.14	0.14	0.062	0.08	0.089	0.06	0.06	0.045	0.059	0.063	0.044	0.044	8.9E-08	8.9E-08	3.9E-09	8.9E-08	8.9E-08
Selenium	0.046	0.049	0.14	0.077	0.047	0.033	0.036	0.1	0.058	0.034	0.023	0.024	0.069	0.039	0.023					

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
500 Road Transect 200 m																				
Antimony	0.25	0.12	0.34	0.18	0.19	0.17	0.071	0.21	0.11	0.12	0.12	0.054	0.15	0.079	0.087					
Arsenic	0.92	0.92	0.95	0.92	0.92	0.42	0.42	0.43	0.42	0.42	0.41	0.41	0.41	0.41	0.41	5.5E-05	5.5E-05	5.7E-05	5.4E-05	5.4E-05
Cadmium	0.8	0.9	0.95	0.8	0.8	0.5	0.57	0.59	0.5	0.5	0.35	0.4	0.41	0.35	0.35	3.4E-08	3.4E-08	3.4E-10	3.4E-08	3.4E-08
Cobalt	0.71	0.95	0.97	0.71	0.71	0.47	0.64	0.65	0.47	0.47	0.31	0.43	0.44	0.31	0.31					
Manganese	1.3	1.3	2.6	1.3	1.3	0.33	0.33	0.66	0.33	0.33	0.28	0.28	0.54	0.28	0.28					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.19	0.19	0.16	0.19	0.19	0.051	0.052	0.043	0.051	0.051	0.046	0.046	0.038	0.045	0.045					
Nickel	0.18	0.21	0.23	0.18	0.18	0.08	0.11	0.11	0.08	0.08	0.07	0.08	0.087	0.07	0.07	8.9E-08	8.9E-08	3.8E-09	8.9E-08	8.9E-08
Selenium	0.61	0.61	0.7	0.64	0.61	0.32	0.32	0.39	0.34	0.32	0.2	0.21	0.25	0.22	0.2					
Trapline TR0515T020 Cabin 1																				
Antimony	0.22	0.087	0.31	0.14	0.15	0.15	0.051	0.19	0.09	0.1	0.099	0.035	0.13	0.061	0.068					
Arsenic	0.19	0.19	0.21	0.19	0.18	0.026	0.027	0.032	0.024	0.023	0.024	0.025	0.03	0.023	0.023	6.7E-06	6.9E-06	9.0E-06	6.3E-06	6.2E-06
Cadmium	0.76	0.86	0.91	0.76	0.76	0.48	0.55	0.57	0.48	0.48	0.33	0.38	0.4	0.34	0.33	3.4E-08	3.4E-08	3.4E-10	3.4E-08	3.4E-08
Cobalt	0.58	0.82	0.84	0.58	0.58	0.41	0.58	0.59	0.41	0.41	0.27	0.39	0.39	0.27	0.27					
Manganese	1.1	1.1	2.4	1.1	1.1	0.27	0.27	0.6	0.27	0.27	0.22	0.22	0.48	0.22	0.22					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.18	0.18	0.15	0.18	0.18	0.047	0.047	0.039	0.046	0.046	0.041	0.041	0.033	0.04	0.04					
Nickel	0.14	0.17	0.19	0.14	0.14	0.062	0.08	0.089	0.06	0.06	0.045	0.059	0.063	0.044	0.044	8.9E-08	8.9E-08	3.9E-09	8.9E-08	8.9E-08
Selenium	0.046	0.049	0.14	0.077	0.047	0.033	0.036	0.1	0.058	0.034	0.023	0.024	0.069	0.039	0.023					
Trapline TR0515T020 Cabin 2																				
Antimony	0.22	0.087	0.31	0.14	0.15	0.15	0.051	0.19	0.09	0.1	0.099	0.035	0.13	0.061	0.068					
Arsenic	0.19	0.19	0.21	0.19	0.18	0.026	0.027	0.032	0.024	0.023	0.024	0.025	0.03	0.023	0.023	6.7E-06	6.9E-06	9.0E-06	6.3E-06	6.2E-06
Cadmium	0.76	0.86	0.91	0.76	0.76	0.48	0.55	0.57	0.48	0.48	0.33	0.38	0.4	0.34	0.33	3.4E-08	3.4E-08	3.4E-10	3.4E-08	3.4E-08
Cobalt	0.58	0.82	0.84	0.58	0.58	0.41	0.58	0.59	0.41	0.41	0.27	0.39	0.39	0.27	0.27					
Manganese	1.1	1.1	2.4	1.1	1.1	0.27	0.27	0.6	0.27	0.27	0.22	0.22	0.48	0.22	0.22					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.18	0.18	0.15	0.18	0.18	0.047	0.047	0.039	0.046	0.046	0.041	0.041	0.033	0.04	0.04					
Nickel	0.14	0.17	0.19	0.14	0.14	0.062	0.08	0.089	0.06	0.06	0.045	0.059	0.063	0.044	0.044	8.9E-08	8.9E-08	3.8E-09	8.9E-08	8.9E-08
Selenium	0.046	0.049	0.14	0.077	0.047	0.033	0.036	0.1	0.058	0.034	0.023	0.024	0.069	0.039	0.023					
Trail Buffer 3																				
Antimony	0.29	0.16	0.39	0.21	0.23	0.19	0.09	0.23	0.13	0.14	0.13	0.068	0.16	0.093	0.1					
Arsenic	0.74	0.74	0.79	0.74	0.74	0.27	0.27	0.28	0.27	0.27	0.27	0.27	0.28	0.26	0.26	3.7E-05	3.7E-05	4.2E-05	3.6E-05	3.6E-05
Cadmium	1.5	1.6	1.7	1.5	1.5	0.76	0.84	0.87	0.76	0.76	0.54	0.59	0.62	0.54	0.54	3.4E-08	3.4E-08	4.5E-10	3.4E-08	3.4E-08
Cobalt	0.69	0.93	0.88	0.69	0.69	0.45	0.62	0.61	0.45	0.45	0.3	0.42	0.41	0.3	0.3					
Manganese	1.0	1.0	2.0	1.0	1.0	0.27	0.27	0.52	0.27	0.27	0.23	0.23	0.43	0.23	0.23					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.24	0.24	0.22	0.24	0.24	0.054	0.054	0.052	0.053	0.053	0.042	0.042	0.041	0.041	0.041					
Nickel	0.26	0.29	0.31	0.25	0.25	0.11	0.14	0.14	0.11	0.11	0.09	0.1	0.11	0.09	0.09	9.0E-08	9.0E-08	5.2E-09	9.0E-08	9.0E-08
Selenium	0.96	0.96	1.1	0.99	0.96	0.49	0.5	0.57	0.52	0.5	0.32	0.32	0.36	0.33	0.32					
SW2																				
Antimony	3.0	3.0	5.0	1.6	0.24	1.5	1.4	2.4	0.79	0.14	1.0	0.97	1.6	0.54	0.098					
Arsenic	2.0	2.0	1.8	0.76	0.45	0.9	0.9	0.8	0.27	0.12	0.77	0.77	0.68	0.24	0.11	1.7E-04	1.7E-04	1.5E-04	4.7E-05	1.8E-05
Cadmium	1.6	1.5	2.3	1.6	1.2	0.84	0.81	1.2	0.82	0.62	0.59	0.58	0.81	0.58	0.45	3.4E-08	3.4E-08	4.5E-10	3.4E-08	3.4E-08
Cobalt	0.69	0.93	0.88	0.69	0.72	0.45	0.62	0.61	0.45	0.46	0.3	0.42	0.41	0.3	0.31					
Manganese	2.3	2.0	3.4	1.6	1.0	0.99	0.86	1.3	0.62	0.26	1.0	0.87	1.3	0.61	0.22					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.26	0.26	0.24	0.24	0.24	0.069	0.066	0.059	0.056	0.053	0.059	0.056	0.05	0.045	0.042					
Nickel	0.41	0.34	0.33	0.25	0.21	0.19	0.16	0.15	0.11	0.09	0.14	0.12	0.12	0.09	0.07	9.0E-08	9.0E-08	5.1E-09	9.0E-08	9.0E-08
Selenium	1.9	2.4	4.3	2.8	0.74	0.97	1.2	2.2	1.4	0.38	0.62	0.77	1.4	0.9	0.25					

Table 2C: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Trapline TR0502T045																				
Antimony	0.25	0.12	0.35	0.17	0.18	0.16	0.067	0.21	0.11	0.12	0.11	0.049	0.14	0.074	0.082					
Arsenic	0.66	0.66	0.71	0.66	0.66	0.22	0.22	0.23	0.21	0.21	0.18	0.18	0.19	0.18	0.18	4.5E-05	4.5E-05	5.0E-05	4.5E-05	4.5E-05
Cadmium	1.1	1.2	1.3	1.1	1.1	0.59	0.67	0.7	0.6	0.59	0.43	0.48	0.51	0.44	0.44	3.4E-08	3.4E-08	4.7E-10	3.4E-08	3.4E-08
Cobalt	0.77	1.0	0.95	0.77	0.77	0.48	0.66	0.64	0.48	0.48	0.32	0.44	0.43	0.32	0.32					
Manganese	1.0	1.0	2.0	1.0	1.0	0.26	0.26	0.51	0.26	0.26	0.22	0.22	0.42	0.22	0.22					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.24	0.24	0.22	0.24	0.24	0.054	0.054	0.052	0.053	0.053	0.042	0.042	0.041	0.042	0.042					
Nickel	0.22	0.24	0.27	0.21	0.21	0.09	0.12	0.12	0.09	0.09	0.07	0.09	0.094	0.07	0.07	9.0E-08	9.0E-08	5.5E-09	9.0E-08	9.0E-08
Selenium	0.61	0.61	0.71	0.64	0.61	0.32	0.32	0.39	0.34	0.32	0.2	0.2	0.25	0.22	0.2					

Notes

Shaded value indicates hazard quotient greater than 0.2 (or 1.0 for lead) or incremental lifetime cancer risk greater than 1 in 100,000 ($1x10^{-5}$).

Table 2D: Risk Estimates - Hiker
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Cariboo Wagon Road (Stanley to Barkerville)															
Antimony	0.002	0.0025	0.0025	0.002	0.002	0.0004	0.00046	0.00046	0.0004	0.0004					
Arsenic	0.044	0.045	0.045	0.044	0.044	0.0039	0.0042	0.0042	0.0039	0.0039	7.3E-07	8.3E-07	8.3E-07	7.3E-07	7.3E-07
Cadmium	0.0029	0.0026	0.0026	0.0029	0.0029	0.0012	0.00054	0.00054	0.0012	0.0012	3.2E-09	8.4E-12	1.3E-11	3.2E-09	3.2E-09
Cobalt	0.0024	0.0024	0.0024	0.0024	0.0024	0.00022	0.00019	0.00019	0.00022	0.00022					
Manganese	0.088	0.13	0.13	0.088	0.088	0.015	0.024	0.024	0.015	0.015					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0002	0.0003	0.0003	0.0002	0.0002	0.000054	0.000069	0.000069	0.000054	0.000054					
Nickel	0.0035	0.004	0.004	0.0035	0.0035	0.0008	0.00064	0.00064	0.0008	0.0008	8.2E-09	2.7E-10	2.7E-10	8.2E-09	8.2E-09
Selenium	0.00048	0.00082	0.00082	0.00048	0.00048	0.0001	0.0002	0.0002	0.0001	0.0001					
Jubilee Trail															
Antimony	0.002	0.0025	0.0025	0.002	0.002	0.0004	0.00046	0.00046	0.0004	0.0004					
Arsenic	0.044	0.045	0.045	0.044	0.044	0.0039	0.0042	0.0042	0.0039	0.0039	7.3E-07	8.3E-07	8.3E-07	7.3E-07	7.3E-07
Cadmium	0.0029	0.0026	0.0026	0.0029	0.0029	0.0012	0.00054	0.00054	0.0012	0.0012	3.2E-09	9.1E-12	1.4E-11	3.2E-09	3.2E-09
Cobalt	0.0024	0.0024	0.0024	0.0024	0.0024	0.00022	0.00019	0.00019	0.00022	0.00022					
Manganese	0.088	0.13	0.13	0.088	0.088	0.015	0.024	0.024	0.015	0.015					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0002	0.0003	0.0003	0.0002	0.0002	0.000054	0.000069	0.000069	0.000054	0.000054					
Nickel	0.0035	0.004	0.004	0.0035	0.0035	0.0008	0.00065	0.00064	0.0008	0.0008	8.2E-09	2.9E-10	2.7E-10	8.2E-09	8.2E-09
Selenium	0.00048	0.00082	0.00082	0.00048	0.00048	0.0001	0.0002	0.0002	0.0001	0.0001					
Proserpine Trail															
Antimony	0.002	0.0025	0.0025	0.002	0.002	0.0004	0.00046	0.00046	0.0004	0.0004					
Arsenic	0.044	0.045	0.045	0.044	0.044	0.0039	0.0042	0.0042	0.0039	0.0039	7.3E-07	8.3E-07	8.3E-07	7.3E-07	7.3E-07
Cadmium	0.0029	0.0026	0.0026	0.0029	0.0029	0.0012	0.00054	0.00054	0.0012	0.0012	3.2E-09	8.3E-12	1.1E-11	3.2E-09	3.2E-09
Cobalt	0.0024	0.0024	0.0024	0.0024	0.0024	0.00022	0.00019	0.00019	0.00022	0.00022					
Manganese	0.088	0.13	0.13	0.088	0.088	0.015	0.024	0.024	0.015	0.015					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0002	0.0003	0.0003	0.0002	0.0002	0.000054	0.000069	0.000069	0.000054	0.000054					
Nickel	0.0035	0.004	0.004	0.0035	0.0035	0.0008	0.00064	0.00064	0.0008	0.0008	8.2E-09	2.7E-10	2.7E-10	8.2E-09	8.2E-09
Selenium	0.00048	0.00082	0.00082	0.00048	0.00048	0.0001	0.0002	0.0002	0.0001	0.0001					
Sugar Creek Loop Trail															
Antimony	0.002	0.0025	0.0025	0.002	0.002	0.0004	0.00046	0.00046	0.0004	0.0004					
Arsenic	0.044	0.045	0.045	0.044	0.044	0.0039	0.0042	0.0042	0.0039	0.0039	7.3E-07	8.3E-07	8.3E-07	7.3E-07	7.3E-07
Cadmium	0.0029	0.0026	0.0026	0.0029	0.0029	0.0012	0.00054	0.00054	0.0012	0.0012	3.2E-09	8.3E-12	1.2E-11	3.2E-09	3.2E-09
Cobalt	0.0024	0.0024	0.0024	0.0024	0.0024	0.00022	0.00019	0.00019	0.00022	0.00022					
Manganese	0.088	0.13	0.13	0.088	0.088	0.015	0.024	0.024	0.015	0.015					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0002	0.0003	0.0003	0.0002	0.0002	0.000054	0.000069	0.000069	0.000054	0.000054					
Nickel	0.0035	0.004	0.004	0.0035	0.0035	0.0008	0.00064	0.00064	0.0008	0.0008	8.2E-09	2.7E-10	2.6E-10	8.2E-09	8.2E-09
Selenium	0.00048	0.00082	0.00082	0.00048	0.00048	0.0001	0.0002	0.0002	0.0001	0.0001					

Table 2D: Risk Estimates - Hiker
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Yanks Peak Trail															
Antimony	0.002	0.0025	0.0025	0.002	0.002	0.0004	0.00046	0.00047	0.0004	0.0004					
Arsenic	0.044	0.045	0.045	0.044	0.044	0.0039	0.0042	0.0042	0.0039	0.0039	7.3E-07	8.3E-07	8.4E-07	7.3E-07	7.3E-07
Cadmium	0.0029	0.0026	0.0026	0.0029	0.0029	0.0012	0.00054	0.00054	0.0012	0.0012	3.2E-09	8.4E-12	2.3E-11	3.2E-09	3.2E-09
Cobalt	0.0024	0.0024	0.0024	0.0024	0.0024	0.00022	0.00019	0.00019	0.00022	0.00022					
Manganese	0.088	0.13	0.13	0.088	0.088	0.015	0.024	0.024	0.015	0.015					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0002	0.0003	0.0003	0.0002	0.0002	0.000054	0.000069	0.000069	0.000054	0.000054					
Nickel	0.0035	0.004	0.004	0.0035	0.0035	0.0008	0.00064	0.00065	0.0008	0.0008	8.2E-09	2.7E-10	4.4E-10	8.2E-09	8.2E-09
Selenium	0.00048	0.00082	0.00082	0.00048	0.00048	0.0001	0.0002	0.0002	0.0001	0.0001					
Groundhog Lake Ski Trail															
Antimony	0.002	0.0025	0.0025	0.002	0.002	0.0004	0.00046	0.00046	0.0004	0.0004					
Arsenic	0.044	0.045	0.045	0.044	0.044	0.0039	0.0042	0.0042	0.0039	0.0039	7.3E-07	8.3E-07	8.3E-07	7.3E-07	7.3E-07
Cadmium	0.0029	0.0026	0.0026	0.0029	0.0029	0.0012	0.00054	0.00054	0.0012	0.0012	3.2E-09	8.4E-12	1.2E-11	3.2E-09	3.2E-09
Cobalt	0.0024	0.0024	0.0024	0.0024	0.0024	0.00022	0.00019	0.00019	0.00022	0.00022					
Manganese	0.088	0.13	0.13	0.088	0.088	0.015	0.024	0.024	0.015	0.015					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0002	0.0003	0.0003	0.0002	0.0002	0.000054	0.000069	0.000069	0.000054	0.000054					
Nickel	0.0035	0.004	0.004	0.0035	0.0035	0.0008	0.00064	0.00064	0.0008	0.0008	8.2E-09	2.7E-10	2.7E-10	8.2E-09	8.2E-09
Selenium	0.00048	0.00082	0.00082	0.00048	0.00048	0.0001	0.0002	0.0002	0.0001	0.0001					
Viewing Point along Hwy 26															
Antimony	0.002	0.0025	0.0026	0.002	0.002	0.0004	0.00046	0.00049	0.0004	0.0004					
Arsenic	0.044	0.045	0.045	0.044	0.044	0.0039	0.0042	0.0043	0.0039	0.0039	7.3E-07	8.3E-07	8.6E-07	7.3E-07	7.3E-07
Cadmium	0.0029	0.0026	0.0039	0.0029	0.0029	0.0012	0.00054	0.0018	0.0012	0.0012	3.2E-09	9.0E-12	5.0E-09	3.2E-09	3.2E-09
Cobalt	0.0024	0.0024	0.0024	0.0024	0.0024	0.00022	0.00019	0.00019	0.00022	0.00022					
Manganese	0.088	0.13	0.13	0.088	0.088	0.015	0.024	0.025	0.015	0.015					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0002	0.0003	0.0003	0.0002	0.0002	0.000054	0.000069	0.000069	0.000054	0.000054					
Nickel	0.0035	0.004	0.004	0.0035	0.0035	0.0008	0.00065	0.0007	0.0008	0.0008	8.2E-09	2.9E-10	1.0E-09	8.2E-09	8.2E-09
Selenium	0.00048	0.00082	0.00082	0.00048	0.00048	0.0001	0.0002	0.0002	0.0001	0.0001					
Cow Mountain Trails 1															
Antimony	0.0025	0.0034	0.0034	0.0025	0.0025	0.00046	0.00059	0.0006	0.00046	0.00046					
Arsenic	0.062	0.063	0.064	0.062	0.062	0.0053	0.0058	0.0058	0.0053	0.0053	9.4E-07	1.1E-06	1.1E-06	9.4E-07	9.4E-07
Cadmium	0.0032	0.0035	0.0035	0.0032	0.0032	0.0012	0.0007	0.00072	0.0012	0.0012	3.2E-09	1.6E-11	8.7E-11	3.2E-09	3.2E-09
Cobalt	0.0055	0.0057	0.0057	0.0055	0.0055	0.00043	0.00044	0.00044	0.00043	0.00043					
Manganese	0.075	0.11	0.11	0.075	0.075	0.012	0.02	0.02	0.012	0.012					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00011	0.00019	0.00019	0.00011	0.00011	0.000033	0.000041	0.000041	0.000033	0.000033					
Nickel	0.0044	0.0047	0.0047	0.0044	0.0044	0.0009	0.00075	0.00075	0.0009	0.0009	8.3E-09	4.1E-10	3.6E-10	8.3E-09	8.3E-09
Selenium	0.00054	0.001	0.001	0.00054	0.00054	0.00011	0.00023	0.00023	0.00011	0.00011					

Table 2D: Risk Estimates - Hiker
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Cow Mountain Trails 2															
Antimony	0.0025	0.0034	0.0034	0.0025	0.0025	0.00046	0.00059	0.0006	0.00046	0.00046					
Arsenic	0.062	0.063	0.064	0.062	0.062	0.0053	0.0058	0.0058	0.0053	0.0053	9.4E-07	1.1E-06	1.1E-06	9.4E-07	9.4E-07
Cadmium	0.0032	0.0035	0.0035	0.0032	0.0032	0.0012	0.0007	0.00071	0.0012	0.0012	3.2E-09	1.4E-11	2.4E-11	3.2E-09	3.2E-09
Cobalt	0.0055	0.0057	0.0057	0.0055	0.0055	0.00043	0.00044	0.00044	0.00043	0.00043					
Manganese	0.075	0.11	0.11	0.075	0.075	0.012	0.02	0.02	0.012	0.012					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00011	0.00019	0.00019	0.00011	0.00011	0.000033	0.000041	0.000041	0.000033	0.000033					
Nickel	0.0044	0.0047	0.0047	0.0044	0.0044	0.0009	0.00075	0.00075	0.0009	0.0009	8.3E-09	3.4E-10	3.4E-10	8.3E-09	8.3E-09
Selenium	0.00054	0.001	0.001	0.00054	0.00054	0.00011	0.00023	0.00023	0.00011	0.00011					
Jubilee Trail / Wendle Park															
Antimony	0.0025	0.0034	0.0034	0.0025	0.0025	0.00046	0.00059	0.0006	0.00046	0.00046					
Arsenic	0.062	0.063	0.064	0.062	0.062	0.0053	0.0058	0.0058	0.0053	0.0053	9.4E-07	1.1E-06	1.1E-06	9.4E-07	9.4E-07
Cadmium	0.0032	0.0035	0.0035	0.0032	0.0032	0.0012	0.0007	0.00071	0.0012	0.0012	3.2E-09	1.4E-11	2.3E-11	3.2E-09	3.2E-09
Cobalt	0.0055	0.0057	0.0057	0.0055	0.0055	0.00043	0.00044	0.00044	0.00043	0.00043					
Manganese	0.075	0.11	0.11	0.075	0.075	0.012	0.02	0.02	0.012	0.012					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00011	0.00019	0.00019	0.00011	0.00011	0.000033	0.000041	0.000041	0.000033	0.000033					
Nickel	0.0044	0.0047	0.0047	0.0044	0.0044	0.0009	0.00075	0.00075	0.0009	0.0009	8.3E-09	3.5E-10	3.4E-10	8.3E-09	8.3E-09
Selenium	0.00054	0.001	0.001	0.00054	0.00054	0.00011	0.00023	0.00023	0.00011	0.00011					
Ned's Connector Trail															
Antimony	0.0025	0.0034	0.0034	0.0025	0.0025	0.00046	0.00059	0.0006	0.00046	0.00046					
Arsenic	0.062	0.063	0.064	0.062	0.062	0.0053	0.0058	0.0058	0.0053	0.0053	9.4E-07	1.1E-06	1.1E-06	9.4E-07	9.4E-07
Cadmium	0.0032	0.0035	0.0035	0.0032	0.0032	0.0012	0.0007	0.00071	0.0012	0.0012	3.2E-09	1.4E-11	2.5E-11	3.2E-09	3.2E-09
Cobalt	0.0055	0.0057	0.0057	0.0055	0.0055	0.00043	0.00044	0.00044	0.00043	0.00043					
Manganese	0.075	0.11	0.11	0.075	0.075	0.012	0.02	0.02	0.012	0.012					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00011	0.00019	0.00019	0.00011	0.00011	0.000033	0.000041	0.000041	0.000033	0.000033					
Nickel	0.0044	0.0047	0.0047	0.0044	0.0044	0.0009	0.00075	0.00075	0.0009	0.0009	8.3E-09	3.4E-10	3.7E-10	8.3E-09	8.3E-09
Selenium	0.00054	0.001	0.001	0.00054	0.00054	0.00011	0.00023	0.00023	0.00011	0.00011					
Williams Creek Trail															
Antimony	0.0025	0.0034	0.0034	0.0025	0.0025	0.00046	0.00059	0.0006	0.00046	0.00046					
Arsenic	0.062	0.063	0.064	0.062	0.062	0.0053	0.0058	0.0058	0.0053	0.0053	9.4E-07	1.1E-06	1.1E-06	9.4E-07	9.4E-07
Cadmium	0.0032	0.0035	0.0035	0.0032	0.0032	0.0012	0.0007	0.00071	0.0012	0.0012	3.2E-09	1.4E-11	1.9E-11	3.2E-09	3.2E-09
Cobalt	0.0055	0.0057	0.0057	0.0055	0.0055	0.00043	0.00044	0.00044	0.00043	0.00043					
Manganese	0.075	0.11	0.11	0.075	0.075	0.012	0.019	0.02	0.012	0.012					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00011	0.00019	0.00019	0.00011	0.00011	0.000033	0.000041	0.000041	0.000033	0.000033					
Nickel	0.0044	0.0047	0.0047	0.0044	0.0044	0.0009	0.00075	0.00075	0.0009	0.0009	8.3E-09	3.4E-10	3.4E-10	8.3E-09	8.3E-09
Selenium	0.00054	0.001	0.001	0.00054	0.00054	0.00011	0.00023	0.00023	0.00011	0.00011					

Table 2D: Risk Estimates - Hiker
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Cornish X-Country Ski Trail 1															
Antimony	0.0025	0.0034	0.0034	0.0025	0.0025	0.00046	0.00059	0.0006	0.00046	0.00046					
Arsenic	0.062	0.063	0.064	0.062	0.062	0.0053	0.0058	0.0058	0.0053	0.0053	9.4E-07	1.1E-06	1.1E-06	9.4E-07	9.4E-07
Cadmium	0.0032	0.0035	0.0035	0.0032	0.0032	0.0012	0.00071	0.00071	0.0012	0.0012	3.2E-09	1.7E-11	3.9E-11	3.2E-09	3.2E-09
Cobalt	0.0055	0.0057	0.0057	0.0055	0.0055	0.00043	0.00044	0.00044	0.00043	0.00043					
Manganese	0.075	0.11	0.11	0.075	0.075	0.012	0.02	0.02	0.012	0.012					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00011	0.00019	0.00019	0.00011	0.00011	0.000033	0.000041	0.000041	0.000033	0.000033					
Nickel	0.0044	0.0047	0.0047	0.0044	0.0044	0.0009	0.00075	0.00075	0.0009	0.0009	8.3E-09	4.4E-10	3.7E-10	8.3E-09	8.3E-09
Selenium	0.00054	0.001	0.001	0.00054	0.00054	0.00011	0.00023	0.00023	0.00011	0.00011					
Cornish X-Country Ski Trail 2															
Antimony	0.0025	0.0034	0.0034	0.0025	0.0025	0.00046	0.00059	0.0006	0.00046	0.00046					
Arsenic	0.062	0.063	0.064	0.062	0.062	0.0053	0.0058	0.0058	0.0053	0.0053	9.4E-07	1.1E-06	1.1E-06	9.4E-07	9.4E-07
Cadmium	0.0032	0.0035	0.0035	0.0032	0.0032	0.0012	0.0007	0.00071	0.0012	0.0012	3.2E-09	1.5E-11	3.0E-11	3.2E-09	3.2E-09
Cobalt	0.0055	0.0057	0.0057	0.0055	0.0055	0.00043	0.00044	0.00044	0.00043	0.00043					
Manganese	0.075	0.11	0.11	0.075	0.075	0.012	0.02	0.02	0.012	0.012					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00011	0.00019	0.00019	0.00011	0.00011	0.000033	0.000041	0.000041	0.000033	0.000033					
Nickel	0.0044	0.0047	0.0047	0.0044	0.0044	0.0009	0.00075	0.00075	0.0009	0.0009	8.3E-09	3.8E-10	3.5E-10	8.3E-09	8.3E-09
Selenium	0.00054	0.001	0.001	0.00054	0.00054	0.00011	0.00023	0.00023	0.00011	0.00011					
Cornish X-Country Ski Trail 3															
Antimony	0.0025	0.0034	0.0034	0.0025	0.0025	0.00046	0.00059	0.0006	0.00046	0.00046					
Arsenic	0.062	0.063	0.064	0.062	0.062	0.0053	0.0058	0.0058	0.0053	0.0053	9.4E-07	1.1E-06	1.1E-06	9.4E-07	9.4E-07
Cadmium	0.0032	0.0035	0.0035	0.0032	0.0032	0.0012	0.00071	0.00072	0.0012	0.0012	3.2E-09	3.5E-11	8.6E-11	3.2E-09	3.2E-09
Cobalt	0.0055	0.0057	0.0057	0.0055	0.0055	0.00043	0.00046	0.00045	0.00043	0.00043					
Manganese	0.075	0.11	0.11	0.075	0.075	0.012	0.02	0.02	0.012	0.012					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00011	0.00019	0.00019	0.00011	0.00011	0.000033	0.000041	0.000041	0.000033	0.000033					
Nickel	0.0044	0.0048	0.0048	0.0044	0.0044	0.0009	0.0008	0.00076	0.0009	0.0009	8.3E-09	1.0E-09	5.2E-10	8.3E-09	8.3E-09
Selenium	0.00054	0.001	0.001	0.00054	0.00054	0.00011	0.00023	0.00023	0.00011	0.00011					
Groundhog Lake Snowmobile Trail															
Antimony	0.0025	0.0034	0.0034	0.0025	0.0025	0.00046	0.00059	0.0006	0.00046	0.00046					
Arsenic	0.062	0.063	0.064	0.062	0.062	0.0053	0.0058	0.0058	0.0053	0.0053	9.4E-07	1.1E-06	1.1E-06	9.4E-07	9.4E-07
Cadmium	0.0032	0.0035	0.0035	0.0032	0.0032	0.0012	0.0007	0.00071	0.0012	0.0012	3.2E-09	1.4E-11	2.9E-11	3.2E-09	3.2E-09
Manganese	0.075	0.11	0.11	0.075	0.075	0.012	0.02	0.02	0.012	0.012					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00011	0.00019	0.00019	0.00011	0.00011	0.000033	0.000041	0.000041	0.000033	0.000033					
Nickel	0.0044	0.0047	0.0048	0.0044	0.0044	0.0009	0.00075	0.00076	0.0009	0.0009	8.3E-09	3.5E-10	5.1E-10	8.3E-09	8.3E-09
Selenium	0.00054	0.001	0.001	0.00054	0.00054	0.00011	0.00023	0.00023	0.00011	0.00011					

Table 2D: Risk Estimates - Hiker
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Water Access – Jack of Clubs Lake															
Antimony	0.0025	0.0034	0.0034	0.0025	0.0025	0.00046	0.00059	0.00062	0.00046	0.00046					
Arsenic	0.062	0.063	0.064	0.062	0.062	0.0053	0.0058	0.0059	0.0053	0.0053	9.4E-07	1.1E-06	1.2E-06	9.4E-07	9.4E-07
Cadmium	0.0032	0.0035	0.0042	0.0032	0.0032	0.0012	0.00072	0.0014	0.0012	0.0012	3.2E-09	7.0E-11	2.6E-09	3.2E-09	3.2E-09
Cobalt	0.0055	0.0058	0.0057	0.0055	0.0055	0.00043	0.00051	0.00045	0.00043	0.00043					
Manganese	0.075	0.11	0.11	0.075	0.075	0.012	0.021	0.02	0.012	0.012					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00011	0.00019	0.00019	0.00011	0.00011	0.000033	0.000041	0.000041	0.000033	0.000033					
Nickel	0.0044	0.0048	0.0048	0.0044	0.0044	0.0009	0.0008	0.0008	0.0009	0.0009	8.3E-09	2.1E-09	9.9E-10	8.3E-09	8.3E-09
Selenium	0.00054	0.001	0.001	0.00054	0.00054	0.00011	0.00023	0.00023	0.00011	0.00011					
Valley Mountain Pass															
Antimony	0.0025	0.0034	0.0034	0.0025	0.0025	0.00046	0.00059	0.00061	0.00046	0.00046					
Arsenic	0.062	0.063	0.064	0.062	0.062	0.0053	0.0058	0.0059	0.0053	0.0053	9.4E-07	1.1E-06	1.2E-06	9.4E-07	9.4E-07
Cadmium	0.0032	0.0035	0.0036	0.0032	0.0032	0.0012	0.00072	0.00078	0.0012	0.0012	3.2E-09	6.4E-11	3.1E-10	3.2E-09	3.2E-09
Cobalt	0.0055	0.0058	0.0057	0.0055	0.0055	0.00043	0.0005	0.00046	0.00043	0.00043					
Manganese	0.075	0.11	0.11	0.075	0.075	0.012	0.02	0.02	0.012	0.012					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00011	0.00019	0.00019	0.00011	0.00011	0.000033	0.000041	0.000041	0.000033	0.000033					
Nickel	0.0044	0.0048	0.0048	0.0044	0.0044	0.0009	0.0008	0.0008	0.0009	0.0009	8.3E-09	1.9E-09	7.6E-10	8.3E-09	8.3E-09
Selenium	0.00054	0.001	0.001	0.00054	0.00054	0.00011	0.00023	0.00023	0.00011	0.00011					
Historic Barkerville Town and Park															
Antimony	0.0025	0.0034	0.0034	0.0025	0.0025	0.00046	0.00059	0.0006	0.00046	0.00046					
Arsenic	0.062	0.063	0.064	0.062	0.062	0.0053	0.0058	0.0058	0.0053	0.0053	9.4E-07	1.1E-06	1.1E-06	9.4E-07	9.4E-07
Cadmium	0.0032	0.0035	0.0035	0.0032	0.0032	0.0012	0.0007	0.00071	0.0012	0.0012	3.2E-09	1.4E-11	2.2E-11	3.2E-09	3.2E-09
Cobalt	0.0055	0.0057	0.0057	0.0055	0.0055	0.00043	0.00044	0.00044	0.00043	0.00043					
Manganese	0.075	0.11	0.11	0.075	0.075	0.012	0.019	0.02	0.012	0.012					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00011	0.00019	0.00019	0.00011	0.00011	0.000033	0.000041	0.000041	0.000033	0.000033					
Nickel	0.0044	0.0047	0.0047	0.0044	0.0044	0.0009	0.00075	0.00075	0.0009	0.0009	8.3E-09	3.4E-10	3.4E-10	8.3E-09	8.3E-09
Selenium	0.00054	0.001	0.001	0.00054	0.00054	0.00011	0.00023	0.00023	0.00011	0.00011					
Le Bourdais Lake															
Antimony	0.0024	0.0024	0.0031	0.0024	0.0024	0.00039	0.00039	0.0005	0.00039	0.00039					
Arsenic	0.042	0.042	0.042	0.042	0.042	0.0036	0.0036	0.0037	0.0036	0.0036	6.1E-07	6.1E-07	6.6E-07	6.1E-07	6.1E-07
Cadmium	0.0076	0.0076	0.008	0.0076	0.0076	0.0021	0.0021	0.0016	0.0021	0.0021	3.2E-09	3.2E-09	3.2E-11	3.2E-09	3.2E-09
Cobalt	0.003	0.003	0.003	0.003	0.003	0.00028	0.00028	0.00025	0.00028	0.00028					
Manganese	0.071	0.071	0.11	0.071	0.071	0.01	0.01	0.019	0.01	0.01					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0016	0.0016	0.0014	0.0016	0.0016	0.0004	0.0004	0.00033	0.0004	0.0004					
Nickel	0.0055	0.0055	0.0056	0.0055	0.0055	0.0011	0.0011	0.0009	0.0011	0.0011	8.3E-09	8.3E-09	3.6E-10	8.3E-09	8.3E-09
Selenium	0.00038	0.00038	0.00081	0.00038	0.00038	0.000062	0.000062	0.00018	0.000062	0.000062					

Table 2D: Risk Estimates - Hiker
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Quesnel Forks															
Antimony	0.0024	0.0024	0.0031	0.0024	0.0024	0.00039	0.00039	0.0005	0.00039	0.00039					
Arsenic	0.042	0.042	0.042	0.042	0.042	0.0036	0.0036	0.0037	0.0036	0.0036	6.1E-07	6.1E-07	6.6E-07	6.1E-07	6.1E-07
Cadmium	0.0076	0.0076	0.008	0.0076	0.0076	0.0021	0.0021	0.0016	0.0021	0.0021	3.2E-09	3.2E-09	3.2E-11	3.2E-09	3.2E-09
Cobalt	0.003	0.003	0.003	0.003	0.003	0.00028	0.00028	0.00025	0.00028	0.00028					
Manganese	0.071	0.071	0.11	0.071	0.071	0.01	0.01	0.019	0.01	0.01					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0016	0.0016	0.0014	0.0016	0.0016	0.0004	0.0004	0.00033	0.0004	0.0004					
Nickel	0.0055	0.0055	0.0056	0.0055	0.0055	0.0011	0.0011	0.0009	0.0011	0.0011	8.3E-09	8.3E-09	3.7E-10	8.3E-09	8.3E-09
Selenium	0.00038	0.00038	0.00081	0.00038	0.00038	0.000062	0.000062	0.00018	0.000062	0.000062					
SW2															
Antimony	0.0027	0.0027	0.0037	0.0027	0.0027	0.00042	0.00042	0.00058	0.00042	0.00042					
Arsenic	0.07	0.07	0.071	0.07	0.07	0.0058	0.0058	0.0061	0.0058	0.0058	9.6E-07	9.6E-07	1.1E-06	9.6E-07	9.6E-07
Cadmium	0.014	0.014	0.015	0.014	0.014	0.0036	0.0036	0.0033	0.0036	0.0036	3.2E-09	3.2E-09	4.2E-11	3.2E-09	3.2E-09
Cobalt	0.0035	0.0035	0.0032	0.0035	0.0035	0.00035	0.00035	0.00026	0.00035	0.00035					
Manganese	0.06	0.06	0.087	0.06	0.06	0.0086	0.0086	0.015	0.0086	0.0086					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0026	0.0026	0.0024	0.0026	0.0026	0.00064	0.00064	0.00057	0.00064	0.00064					
Nickel	0.007	0.007	0.0074	0.007	0.007	0.0015	0.0015	0.0013	0.0015	0.0015	8.4E-09	8.4E-09	4.8E-10	8.4E-09	8.4E-09
Selenium	0.00049	0.00049	0.0012	0.00049	0.00049	0.000069	0.000069	0.00025	0.000069	0.000069					

Notes
Shaded value indicates hazard quotient greater than 0.2 (or 1.0 for lead) or incremental lifetime cancer risk greater than 1 in 100,000 ($1x10^{-5}$).

Table 2E: Risk Estimates - Camper
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Chisholm Creek Rec Site															
Antimony	0.0033	0.0038	0.0038	0.0033	0.0033	0.00093	0.00069	0.0007	0.00093	0.00093					
Arsenic	0.066	0.068	0.068	0.066	0.066	0.006	0.0063	0.0063	0.006	0.006	1.2E-06	1.2E-06	1.3E-06	1.2E-06	1.2E-06
Cadmium	0.0068	0.0039	0.004	0.0068	0.0068	0.0043	0.00081	0.00093	0.0043	0.0043	1.4E-08	3.8E-11	5.1E-10	1.4E-08	1.4E-08
Cobalt	0.0037	0.0036	0.0036	0.0037	0.0037	0.0005	0.00032	0.00032	0.0005	0.0005					
Manganese	0.13	0.19	0.19	0.13	0.13	0.025	0.037	0.037	0.025	0.025					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00034	0.00045	0.00045	0.00034	0.00034	0.00012	0.0001	0.0001	0.00012	0.00012					
Nickel	0.006	0.006	0.006	0.006	0.006	0.002	0.001	0.001	0.002	0.002	3.7E-08	1.2E-09	1.3E-09	3.7E-08	3.7E-08
Selenium	0.00072	0.0012	0.0012	0.00072	0.00072	0.00016	0.00029	0.00029	0.00016	0.00016					
Nine Mile Lake Rec Site															
Antimony	0.0033	0.0038	0.0038	0.0033	0.0033	0.00093	0.00069	0.0007	0.00093	0.00093					
Arsenic	0.066	0.068	0.068	0.066	0.066	0.006	0.0063	0.0063	0.006	0.006	1.2E-06	1.2E-06	1.3E-06	1.2E-06	1.2E-06
Cadmium	0.0068	0.0039	0.0039	0.0068	0.0068	0.0043	0.00081	0.00082	0.0043	0.0043	1.4E-08	3.9E-11	7.5E-11	1.4E-08	1.4E-08
Cobalt	0.0037	0.0036	0.0036	0.0037	0.0037	0.0005	0.00032	0.00032	0.0005	0.0005					
Manganese	0.13	0.19	0.19	0.13	0.13	0.025	0.037	0.037	0.025	0.025					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00034	0.00045	0.00045	0.00034	0.00034	0.00012	0.0001	0.0001	0.00012	0.00012					
Nickel	0.006	0.006	0.006	0.006	0.006	0.002	0.001	0.001	0.002	0.002	3.7E-08	1.3E-09	1.2E-09	3.7E-08	3.7E-08
Selenium	0.00072	0.0012	0.0012	0.00072	0.00072	0.00016	0.00029	0.00029	0.00016	0.00016					
Barkerville Provincial Park Campground															
Antimony	0.019	0.02	0.02	0.019	0.019	0.0096	0.0094	0.0094	0.0096	0.0096					
Arsenic	0.99	0.99	0.99	0.99	0.99	0.49	0.49	0.49	0.49	0.49	3.1E-05	3.2E-05	3.2E-05	3.1E-05	3.1E-05
Cadmium	0.0083	0.0063	0.0064	0.0083	0.0083	0.0047	0.0014	0.0015	0.0047	0.0047	1.4E-08	6.4E-11	1.1E-10	1.4E-08	1.4E-08
Cobalt	0.016	0.016	0.016	0.016	0.016	0.0035	0.0034	0.0034	0.0035	0.0035					
Manganese	0.22	0.26	0.26	0.22	0.22	0.056	0.065	0.065	0.056	0.056					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00025	0.00033	0.00033	0.00025	0.00025	0.00011	0.000078	0.000078	0.00011	0.00011					
Nickel	0.049	0.048	0.048	0.049	0.049	0.026	0.025	0.025	0.026	0.026	3.7E-08	1.6E-09	1.5E-09	3.7E-08	3.7E-08
Selenium	0.001	0.0017	0.0017	0.001	0.001	0.00025	0.00044	0.00044	0.00025	0.00025					
Forest Rose Campground															
Antimony	0.026	0.027	0.027	0.026	0.026	0.014	0.013	0.013	0.014	0.014					
Arsenic	0.31	0.31	0.31	0.31	0.31	0.12	0.13	0.13	0.12	0.12	8.7E-06	8.9E-06	8.9E-06	8.7E-06	8.7E-06
Cadmium	0.0091	0.0072	0.0072	0.0091	0.0091	0.005	0.0017	0.0017	0.005	0.005	1.4E-08	6.4E-11	1.1E-10	1.4E-08	1.4E-08
Cobalt	0.016	0.016	0.016	0.016	0.016	0.0034	0.0033	0.0033	0.0034	0.0034					
Manganese	0.2	0.24	0.24	0.2	0.2	0.051	0.06	0.06	0.051	0.051					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00029	0.00037	0.00037	0.00029	0.00029	0.00012	0.000092	0.000092	0.00012	0.00012					
Nickel	0.059	0.058	0.058	0.059	0.059	0.032	0.031	0.031	0.032	0.032	3.7E-08	1.6E-09	1.5E-09	3.7E-08	3.7E-08
Selenium	0.0011	0.0018	0.0018	0.0011	0.0011	0.00028	0.00047	0.00047	0.00028	0.00028					

Table 2E: Risk Estimates - Camper
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Government Hill Campground															
Antimony	0.028	0.029	0.029	0.028	0.028	0.015	0.015	0.015	0.015	0.015					
Arsenic	1.3	1.3	1.3	1.3	1.3	0.64	0.64	0.64	0.64	0.64	4.1E-05	4.1E-05	4.1E-05	4.1E-05	4.1E-05
Cadmium	0.0094	0.0075	0.0075	0.0094	0.0094	0.0051	0.0018	0.0018	0.0051	0.0051	1.4E-08	6.3E-11	1.0E-10	1.4E-08	1.4E-08
Cobalt	0.016	0.016	0.016	0.016	0.016	0.0035	0.0033	0.0033	0.0035	0.0035					
Manganese	0.19	0.24	0.24	0.19	0.19	0.047	0.056	0.056	0.047	0.047					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00028	0.00035	0.00035	0.00028	0.00028	0.00012	0.000088	0.000088	0.00012	0.00012					
Nickel	0.05	0.049	0.049	0.05	0.05	0.027	0.025	0.025	0.027	0.027	3.7E-08	1.6E-09	1.5E-09	3.7E-08	3.7E-08
Selenium	0.0015	0.0022	0.0022	0.0015	0.0015	0.00041	0.0006	0.0006	0.00041	0.00041					
Little Lake Rec Site															
Antimony	0.0039	0.0039	0.0047	0.0039	0.0039	0.00091	0.00091	0.00075	0.00091	0.00091					
Arsenic	0.063	0.063	0.064	0.063	0.063	0.0054	0.0054	0.0055	0.0054	0.0054	9.8E-07	9.8E-07	9.9E-07	9.8E-07	9.8E-07
Cadmium	0.014	0.014	0.012	0.014	0.014	0.0057	0.0057	0.0024	0.0057	0.0057	1.4E-08	1.4E-08	1.4E-10	1.4E-08	1.4E-08
Cobalt	0.0047	0.0047	0.0046	0.0047	0.0047	0.0006	0.0006	0.00042	0.0006	0.0006					
Manganese	0.11	0.11	0.16	0.11	0.11	0.018	0.018	0.029	0.018	0.018					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0025	0.0025	0.0021	0.0025	0.0025	0.00064	0.00064	0.00049	0.00064	0.00064					
Nickel	0.009	0.009	0.0084	0.009	0.009	0.003	0.003	0.0014	0.003	0.003	3.7E-08	3.7E-08	1.6E-09	3.7E-08	3.7E-08
Selenium	0.00057	0.00057	0.0012	0.00057	0.00057	0.000093	0.000093	0.00027	0.000093	0.000093					
Maude Lake Rec Site															
Antimony	0.0039	0.0039	0.0047	0.0039	0.0039	0.00091	0.00091	0.00075	0.00091	0.00091					
Arsenic	0.063	0.063	0.064	0.063	0.063	0.0054	0.0054	0.0056	0.0054	0.0054	9.8E-07	9.8E-07	9.9E-07	9.8E-07	9.8E-07
Cadmium	0.014	0.014	0.012	0.014	0.014	0.0057	0.0057	0.0024	0.0057	0.0057	1.4E-08	1.4E-08	1.4E-10	1.4E-08	1.4E-08
Cobalt	0.0047	0.0047	0.0046	0.0047	0.0047	0.0006	0.0006	0.00042	0.0006	0.0006					
Manganese	0.11	0.11	0.16	0.11	0.11	0.018	0.018	0.029	0.018	0.018					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0025	0.0025	0.0021	0.0025	0.0025	0.00064	0.00064	0.00049	0.00064	0.00064					
Nickel	0.009	0.009	0.0084	0.009	0.009	0.003	0.003	0.0014	0.003	0.003	3.7E-08	3.7E-08	1.6E-09	3.7E-08	3.7E-08
Selenium	0.00057	0.00057	0.0012	0.00057	0.00057	0.000093	0.000093	0.00027	0.000093	0.000093					
Prior Lake Rec Site															
Antimony	0.0039	0.0039	0.0047	0.0039	0.0039	0.00091	0.00091	0.00075	0.00091	0.00091					
Arsenic	0.063	0.063	0.064	0.063	0.063	0.0054	0.0054	0.0055	0.0054	0.0054	9.8E-07	9.8E-07	9.9E-07	9.8E-07	9.8E-07
Cadmium	0.014	0.014	0.012	0.014	0.014	0.0057	0.0057	0.0024	0.0057	0.0057	1.4E-08	1.4E-08	1.4E-10	1.4E-08	1.4E-08
Cobalt	0.0047	0.0047	0.0046	0.0047	0.0047	0.0006	0.0006	0.00042	0.0006	0.0006					
Manganese	0.11	0.11	0.16	0.11	0.11	0.018	0.018	0.029	0.018	0.018					
Methylmercury	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0025	0.0025	0.0021	0.0025	0.0025	0.00064	0.00064	0.00049	0.00064	0.00064					
Nickel	0.009	0.009	0.0084	0.009	0.009	0.003	0.003	0.0014	0.003	0.003	3.7E-08	3.7E-08	1.6E-09	3.7E-08	3.7E-08
Selenium	0.00057	0.00057	0.0012	0.00057	0.00057	0.000093	0.000093	0.00027	0.000093	0.000093					

Notes

Shaded value indicates hazard quotient greater than 0.2 (or 1.0 for lead) or incremental lifetime cancer risk greater than 1 in 100,000 ($1x10^{-5}$).

Appendix 7.13-9
Attachment 2
Table 2F: Risk Estimates - Sport Fisher/Hunter
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Teen Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Cariboo Wagon Road (Stanley to Barkerville)																									
Antimony	0.011	0.011	0.011	0.011	0.011	0.0066	0.0066	0.0066	0.0066	0.0066	0.0076	0.0076	0.0076	0.0076	0.0076	0.0076	0.0075	0.0076	0.0076	0.0076					
Arsenic	0.074	0.074	0.074	0.074	0.074	0.045	0.045	0.045	0.045	0.045	0.042	0.042	0.042	0.042	0.042	0.037	0.037	0.037	0.037	0.037	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
Cadmium	0.016	0.017	0.017	0.016	0.016	0.0098	0.0089	0.0091	0.01	0.0099	0.01	0.0096	0.0099	0.011	0.01	0.0096	0.0089	0.0091	0.0098	0.0096	1.4E-08	3.8E-11	5.9E-11	1.4E-08	1.4E-08
Cobalt	0.15	0.2	0.2	0.15	0.15	0.085	0.12	0.12	0.085	0.085	0.1	0.14	0.14	0.1	0.1	0.11	0.15	0.15	0.11	0.11					
Manganese	0.013	0.013	0.013	0.013	0.013	0.013	0.012	0.012	0.013	0.013	0.012	0.011	0.011	0.012	0.012	0.012	0.011	0.011	0.012	0.012					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00079	0.0015	0.0022	0.0015	0.00092	0.00041	0.00072	0.0011	0.00077	0.00047	0.00047	0.00086	0.0013	0.00092	0.00055	0.00047	0.00089	0.0014	0.00096	0.00056					
Nickel	0.014	0.023	0.024	0.015	0.015	0.01	0.014	0.015	0.01	0.01	0.012	0.017	0.018	0.012	0.012	0.012	0.018	0.019	0.013	0.012	3.8E-08	1.2E-09	1.2E-09	3.8E-08	3.8E-08
Selenium	0.16	0.17	0.18	0.17	0.17	0.08	0.085	0.091	0.086	0.081	0.084	0.091	0.099	0.092	0.086	0.068	0.075	0.084	0.076	0.07					
Trapline TR0515T017 Cabin																									
Antimony	0.0067	0.0069	0.0069	0.0067	0.0067	0.0043	0.0042	0.0042	0.0043	0.0043	0.0054	0.0053	0.0053	0.0054	0.0054	0.0057	0.0057	0.0057	0.0057	0.0057					
Arsenic	0.00012	0.00018	0.00027	0.00021	0.00014	0.0051	0.005	0.0051	0.0051	0.0051	0.0044	0.0044	0.0044	0.0045	0.0044	0.0057	0.0057	0.0058	0.0058	0.0057	6.7E-07	5.8E-07	6.0E-07	6.8E-07	6.7E-07
Cadmium	0.0048	0.0058	0.0061	0.0051	0.0049	0.0044	0.0035	0.0036	0.0045	0.0044	0.0052	0.0044	0.0046	0.0054	0.0052	0.0054	0.0047	0.0049	0.0056	0.0054	1.4E-08	3.8E-11	3.8E-11	1.4E-08	1.4E-08
Cobalt	0.12	0.17	0.17	0.12	0.12	0.068	0.098	0.099	0.068	0.068	0.087	0.13	0.13	0.088	0.087	0.092	0.13	0.13	0.093	0.092					
Manganese	0.00031	0.00032	0.00032	0.00032	0.00031	0.0062	0.0051	0.0051	0.0062	0.0062	0.0056	0.0045	0.0045	0.0056	0.0056	0.0062	0.0052	0.0052	0.0062	0.0062					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00059	0.0013	0.002	0.0013	0.00072	0.00032	0.00063	0.001	0.00069	0.00038	0.00039	0.00078	0.0012	0.00085	0.00047	0.00041	0.00083	0.0013	0.00089	0.00049					
Nickel	0.012	0.02	0.021	0.013	0.012	0.008	0.012	0.013	0.008	0.008	0.01	0.015	0.016	0.01	0.01	0.01	0.016	0.017	0.011	0.01	3.8E-08	1.2E-09	1.2E-09	3.8E-08	3.8E-08
Selenium	0.0039	0.012	0.021	0.013	0.0056	0.0023	0.0068	0.013	0.0077	0.0033	0.0032	0.0094	0.017	0.011	0.0046	0.0034	0.010	0.018	0.011	0.0049					
Cow Mountain Trails 1																									
Antimony	0.011	0.011	0.011	0.011	0.011	0.007	0.0069	0.0069	0.007	0.007	0.008	0.0079	0.0079	0.008	0.008	0.008	0.008	0.008	0.008	0.008					
Arsenic	0.074	0.074	0.074	0.074	0.074	0.051	0.051	0.051	0.051	0.051	0.048	0.048	0.048	0.048	0.048	0.044	0.044	0.044	0.044	0.044	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
Cadmium	0.016	0.017	0.017	0.016	0.016	0.0099	0.009	0.0092	0.01	0.0099	0.01	0.0097	0.0099	0.011	0.01	0.0096	0.0089	0.0092	0.0098	0.0096	1.4E-08	7.3E-11	4.0E-10	1.4E-08	1.4E-08
Cobalt	0.15	0.2	0.2	0.15	0.15	0.085	0.12	0.12	0.085	0.085	0.1	0.14	0.14	0.1	0.1	0.11	0.15	0.15	0.11	0.11					
Manganese	0.013	0.013	0.013	0.013	0.013	0.013	0.012	0.012	0.013	0.013	0.012	0.011	0.011	0.012	0.012	0.011	0.01	0.01	0.011	0.011					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00079	0.0015	0.0022	0.0015	0.00092	0.00041	0.00072	0.0011	0.00077	0.00047	0.00047	0.00086	0.0013	0.00092	0.00055	0.00047	0.00089	0.0014	0.00096	0.00056					
Nickel	0.014	0.023	0.024	0.015	0.015	0.01	0.014	0.015	0.011	0.01	0.012	0.018	0.018	0.013	0.012	0.012	0.018	0.019	0.013	0.012	3.8E-08	1.9E-09	1.7E-09	3.8E-08	3.8E-08
Selenium	0.16	0.17	0.18	0.17	0.17	0.08	0.085	0.091	0.086	0.081	0.084	0.091	0.099	0.092	0.086	0.068	0.075	0.084	0.076	0.07					
Williams Creek Trail																									
Antimony	0.011	0.011	0.011	0.011	0.011	0.0067	0.0066	0.0066	0.0067	0.0067	0.0077	0.0076	0.0076	0.0077	0.0077	0.0077	0.0076	0.0076	0.0077	0.0077					
Arsenic	0.074	0.074	0.074	0.074	0.074	0.051	0.051	0.051	0.051	0.051	0.048	0.048	0.048	0.048	0.048	0.044	0.044	0.044	0.044	0.044	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
Cadmium	0.016	0.017	0.017	0.016	0.016	0.0099	0.009	0.0091	0.01	0.0099	0.01	0.0097	0.0099	0.011	0.01	0.0096	0.0089	0.0091	0.0098	0.0096	1.4E-08	6.2E-11	8.9E-11	1.4E-08	1.4E-08
Cobalt	0.15	0.2	0.2	0.15	0.15	0.085	0.12	0.12	0.085	0.085	0.1	0.14	0.14	0.1	0.1	0.11	0.15	0.15	0.11	0.11					
Manganese	0.013	0.013	0.013	0.013	0.013	0.013	0.012	0.012	0.013	0.013	0.012	0.011	0.011	0.012	0.012	0.011	0.01	0.01	0.011	0.011					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00079	0.0015	0.0022	0.0015	0.00092	0.0004	0.00072	0.0011	0.00077	0.00047	0.00047	0.00086	0.0013	0.00092	0.00055	0.00047	0.00089	0.0014	0.00096	0.00056					
Nickel	0.014	0.023	0.024	0.015	0.015	0.01	0.014	0.015	0.01	0.01	0.012	0.017	0.018	0.012	0.012	0.012	0.018	0.019	0.013	0.012	3.8E-08	1.5E-09	1.5E-09	3.8E-08	3.8E-08
Selenium	0.16	0.17	0.18	0.17	0.17	0.08	0.085	0.091	0.086	0.081	0.084	0.091	0.099	0.092	0.086	0.068	0.075	0.084	0.076	0.07					
Water Access – Jack of Clubs Lake																									
Antimony	0.011	0.011	0.011	0.011	0.011	0.0084	0.0083	0.0084	0.0084	0.0084	0.0093	0.0092	0.0093	0.0093	0.0093	0.0095	0.0094	0.0095	0.0095	0.0095					
Arsenic	0.016	0.016	0.031	0.022	0.0093	0.57	0.57	0.57	0.57	0.56	0.53	0.53	0.54	0.53	0.53	0.59	0.59	0.6	0.6	0.59	6.8E-05	6.8E-05	7.0E-05	6.8E-05	6.7E-05
Cadmium	0.01	0.087	0.21	0.14	0.039	0.0071	0.043	0.1	0.068	0.021	0.0078	0.042	0.10	0.066	0.021	0.0075	0.035	0.081	0.054	0.018	1.4E-08	3.2E-10	1.2E-08	1.4E-08	1.4E-08
Cobalt	0.14	0.18	0.19	0.13	0.12	0.078	0.1	0.11	0.074	0.07	0.097	0.13	0.14	0.093	0.089	0.1	0.14	0.14	0.097	0.094					
Manganese	0.0095	0.0065	0.0065	0.0065	0.0065	0.013	0.012	0.011	0.011	0.011	0.012	0.011	0.01	0.01	0.01	0.012	0.012	0.011	0.011	0.011					
Methylmercury	0.27	3.9	3.9	3.9	3.9	0.055	0.82	0.82	0.82	0.82	0.053	0.78	0.78	0.78	0.78	0.099	1.5	1.5	1.5	1.5					
Molybdenum	0.00089	0.015	0.04	0.025	0.0048	0.00045	0.0063	0.017	0.01	0.0021	0.00051	0.006	0.016	0.0099	0.002	0.0005	0.005	0.013	0.0081	0.0017					
Nickel	0.014	0.063	0.13	0.084	0.027	0.01	0.034	0.069	0.044	0.017	0.012	0.037	0.07	0.045	0.018	0.012	0.034	0.061	0.039	0.018	3.8E-08	9.4E-09	4.5E-09	3.8E-08	3.8E-08
Selenium	0.23	0.074	0.084	0.076	0.068	0.11	0.037	0.043	0.038	0.034	0.12	0.041	0.049	0.042	0.036	0.096	0.035	0.044	0.037	0.03					
Outfitter Area																									
Antimony	0.011	0.011	0.011	0.011	0.011	0.0084	0.0083	0.0084	0.0084	0.0084	0.0093	0.0092	0.0093	0.0093	0.0093	0.0095	0.0094	0.0095	0.0095	0.0095					
Arsenic	0.016	0.016	0.031	0.022	0.0093	0.57	0.57	0.57	0.57	0.56	0.53	0.53	0.54	0.53	0.53	0.59	0.59	0.6	0.6	0.59	6.8E-05	6.7E-05	7.0E-05	6.8E-05	6.7E-05
Cadmium	0.01	0.087	0.21	0.14	0.039	0.0071	0.043	0.1	0.068	0.021	0.0078	0.042	0.098	0.066	0.021	0.0075	0.035	0.08	0.054	0.018	1.4E-08	1.8E-10	1.1E-09	1.4E-08	1.4E-08
Cobalt	0.14	0.18	0.19	0.13	0.12	0.078	0.1	0.11	0.074	0.07	0.097	0.13	0.14	0.093	0.089	0.1	0.14	0.14	0.097	0.094					
Manganese	0.0095	0.0065	0.0065	0.0065	0.0065	0.013	0.011	0.011	0.011	0.011	0.012	0.01	0.0098	0.01	0.01	0.012	0.011	0.01	0.011	0.011					
Methylmercury	0.27	3.9	3.9	3.9	3.9	0.055	0.82	0.82	0.82	0.82	0.053	0.78	0.78	0.78	0.78	0.099	1.5	1.5	1.5	1.5					
Molybdenum	0.00089	0.015	0.04	0.025	0.0048	0.00045	0.0063	0.017	0.01	0.0021	0.00051	0.006	0.016	0.0099	0.002	0.0005	0.005	0.013	0.0081	0.0017					
Nickel	0.014	0.063	0.13	0.084	0.027	0.01	0.034	0.069	0.044	0.017	0.012	0.037	0.07	0.045	0.018	0.012	0.034	0.061	0.039	0.018	3.8E-08	5.0E-09	2.2E-09	3.8E-08	3.8E-08
Selenium	0.23	0.074	0.084	0.076	0.068	0.11	0.037	0.043	0.038	0.034	0.12	0.041	0.049	0.042	0.036	0.096	0.035	0.044	0.037	0.03					

Table 2F: Risk Estimates - Sport Fisher/Hunter
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Teen Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates					Composite Receptor Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Trapline TR0515T020 Cabin 1																									
Antimony	0.047	0.015	0.058	0.027	0.031	0.028	0.009	0.034	0.016	0.019	0.035	0.011	0.043	0.021	0.024	0.038	0.012	0.046	0.022	0.025					
Arsenic	0.00063	0.00086	0.00048	0.00019	0.00013	0.0053	0.0054	0.0051	0.005	0.005	0.0047	0.0049	0.0045	0.0044	0.0043	0.006	0.0062	0.0058	0.0057	0.0056	7.3E-07	7.7E-07	6.2E-07	6.7E-07	6.6E-07
Cadmium	0.0048	0.0057	0.0057	0.0048	0.0048	0.0046	0.0051	0.0036	0.0046	0.0046	0.0053	0.006	0.0045	0.0053	0.0053	0.0055	0.0062	0.0048	0.0056	0.0056	1.5E-08	1.5E-08	1.5E-10	1.5E-08	1.5E-08
Cobalt	0.12	0.17	0.17	0.12	0.12	0.068	0.099	0.098	0.068	0.068	0.087	0.13	0.13	0.087	0.087	0.092	0.13	0.13	0.092	0.092					
Manganese	0.00032	0.00032	0.00034	0.00033	0.00031	0.0064	0.0064	0.0053	0.0064	0.0064	0.0057	0.0057	0.0047	0.0058	0.0057	0.0064	0.0064	0.0053	0.0064	0.0064					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00089	0.00096	0.00097	0.00078	0.00079	0.00048	0.00051	0.00049	0.00042	0.00042	0.00058	0.00062	0.0006	0.00051	0.00051	0.00061	0.00066	0.00064	0.00054	0.00054					
Nickel	0.013	0.02	0.02	0.012	0.012	0.008	0.013	0.012	0.008	0.008	0.01	0.016	0.015	0.01	0.01	0.011	0.017	0.016	0.011	0.011	3.8E-08	3.8E-08	1.7E-09	3.8E-08	3.8E-08
Selenium	0.0075	0.0082	0.023	0.014	0.0077	0.0044	0.0048	0.013	0.008	0.0045	0.0061	0.0067	0.019	0.011	0.0063	0.0065	0.007	0.02	0.012	0.0066					
Trapline TR0515T020 Cabin 2																									
Antimony	0.047	0.015	0.058	0.027	0.031	0.028	0.009	0.034	0.016	0.019	0.035	0.011	0.043	0.021	0.024	0.038	0.012	0.046	0.022	0.025					
Arsenic	0.00063	0.00086	0.00048	0.00019	0.00013	0.0053	0.0054	0.0051	0.005	0.005	0.0047	0.0049	0.0045	0.0044	0.0043	0.006	0.0062	0.0058	0.0057	0.0056	7.3E-07	7.7E-07	6.2E-07	6.7E-07	6.6E-07
Cadmium	0.0048	0.0057	0.0057	0.0048	0.0048	0.0046	0.0051	0.0036	0.0046	0.0046	0.0053	0.006	0.0045	0.0053	0.0053	0.0055	0.0062	0.0048	0.0056	0.0056	1.5E-08	1.5E-08	1.5E-10	1.5E-08	1.5E-08
Cobalt	0.12	0.17	0.17	0.12	0.12	0.068	0.099	0.098	0.068	0.068	0.087	0.13	0.13	0.087	0.087	0.092	0.13	0.13	0.092	0.092					
Manganese	0.00032	0.00032	0.00034	0.00033	0.00031	0.0064	0.0064	0.0053	0.0064	0.0064	0.0057	0.0057	0.0047	0.0058	0.0057	0.0064	0.0064	0.0053	0.0064	0.0064					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.00089	0.00096	0.00097	0.00078	0.00079	0.00048	0.00051	0.00049	0.00042	0.00042	0.00058	0.00062	0.0006	0.00051	0.00051	0.00061	0.00066	0.00064	0.00054	0.00054					
Nickel	0.013	0.02	0.02	0.012	0.012	0.008	0.013	0.012	0.008	0.008	0.01	0.016	0.015	0.01	0.01	0.011	0.017	0.016	0.011	0.011	3.8E-08	3.8E-08	1.6E-09	3.8E-08	3.8E-08
Selenium	0.0075	0.0082	0.023	0.014	0.0077	0.0044	0.0048	0.013	0.008	0.0045	0.0061	0.0067	0.019	0.011	0.0063	0.0065	0.007	0.02	0.012	0.0066					
Trail Buffer 3																									
Antimony	0.06	0.028	0.07	0.04	0.045	0.035	0.016	0.041	0.023	0.026	0.042	0.018	0.05	0.028	0.031	0.043	0.018	0.051	0.028	0.031					
Arsenic	0.041	0.041	0.041	0.04	0.04	0.032	0.032	0.032	0.032	0.032	0.03	0.03	0.03	0.03	0.03	0.029	0.029	0.029	0.029	0.029	6.7E-06	6.7E-06	6.6E-06	6.6E-06	6.6E-06
Cadmium	0.12	0.12	0.12	0.12	0.12	0.061	0.061	0.06	0.061	0.061	0.059	0.06	0.058	0.059	0.059	0.049	0.049	0.048	0.049	0.049	1.5E-08	1.5E-08	1.9E-10	1.5E-08	1.5E-08
Cobalt	0.13	0.18	0.18	0.13	0.13	0.073	0.1	0.1	0.073	0.073	0.092	0.13	0.13	0.092	0.092	0.096	0.14	0.14	0.096	0.096					
Manganese	0.0071	0.0071	0.0072	0.0072	0.0071	0.0095	0.0095	0.0085	0.0095	0.0095	0.0087	0.0087	0.0078	0.0088	0.0087	0.0087	0.0087	0.0078	0.0087	0.0087					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0011	0.0011	0.0011	0.00093	0.00095	0.00054	0.00058	0.00056	0.00048	0.00049	0.00064	0.00068	0.00067	0.00057	0.00058	0.00066	0.00071	0.00069	0.00059	0.00059					
Nickel	0.025	0.032	0.032	0.024	0.024	0.015	0.019	0.019	0.015	0.015	0.017	0.022	0.022	0.016	0.016	0.017	0.022	0.022	0.016	0.016	3.8E-08	3.8E-08	2.2E-09	3.8E-08	3.8E-08
Selenium	0.27	0.27	0.28	0.27	0.27	0.13	0.13	0.14	0.14	0.13	0.14	0.14	0.15	0.14	0.14	0.11	0.11	0.13	0.12	0.11					
SW2																									
Antimony	0.8	0.78	1.3	0.42	0.05	0.39	0.39	0.64	0.21	0.028	0.39	0.37	0.62	0.2	0.033	0.32	0.3	0.51	0.17	0.033					
Arsenic	0.31	0.31	0.26	0.072	0.013	0.16	0.16	0.14	0.045	0.016	0.15	0.15	0.13	0.042	0.015	0.13	0.13	0.11	0.038	0.016	4.0E-05	4.0E-05	3.4E-05	1.0E-05	2.9E-06
Cadmium	0.17	0.1	0.3	0.15	0.034	0.086	0.054	0.15	0.076	0.019	0.083	0.052	0.14	0.074	0.019	0.068	0.043	0.12	0.061	0.017	1.5E-08	1.5E-08	1.9E-10	1.5E-08	1.5E-08
Cobalt	0.13	0.18	0.18	0.13	0.14	0.073	0.1	0.1	0.075	0.078	0.092	0.13	0.13	0.093	0.097	0.096	0.14	0.14	0.097	0.1					
Manganese	0.033	0.03	0.035	0.023	0.0047	0.023	0.021	0.023	0.018	0.0087	0.021	0.02	0.021	0.017	0.008	0.019	0.018	0.019	0.015	0.0082					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.001	0.0011	0.0011	0.00092	0.00095	0.00054	0.00057	0.00055	0.00048	0.00049	0.00064	0.00068	0.00066	0.00057	0.00058	0.00066	0.00071	0.00069	0.00058	0.00059					
Nickel	0.065	0.047	0.039	0.025	0.013	0.035	0.026	0.022	0.015	0.009	0.035	0.029	0.025	0.017	0.011	0.031	0.028	0.024	0.016	0.012	3.8E-08	3.8E-08	2.2E-09	3.8E-08	3.8E-08
Selenium	0.54	0.67	1.2	0.78	0.21	0.26	0.33	0.59	0.38	0.1	0.28	0.34	0.62	0.4	0.11	0.22	0.28	0.5	0.33	0.087					
Trapline TR0502T045																									
Antimony	0.051	0.019	0.062	0.032	0.036	0.03	0.011	0.036	0.019	0.021	0.038	0.014	0.045	0.023	0.026	0.039	0.014	0.048	0.024	0.027					
Arsenic	0.074	0.074	0.074	0.074	0.074	0.046	0.046	0.046	0.046	0.046	0.043	0.043	0.043	0.043	0.043	0.039	0.039	0.039	0.038	0.038	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
Cadmium	0.016	0.017	0.017	0.016	0.016	0.01	0.011	0.0091	0.01	0.01	0.011	0.011	0.0098	0.011	0.011	0.0098	0.01	0.009	0.0098	0.0098	1.5E-08	1.5E-08	2.0E-10	1.5E-08	1.5E-08
Cobalt	0.15	0.2	0.2	0.15	0.15	0.085	0.12	0.12	0.085	0.085	0.1	0.14	0.14	0.1	0.1	0.11	0.15	0.15	0.11	0.11					
Manganese	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.012	0.013	0.013	0.012	0.012	0.011	0.012	0.012	0.011	0.011	0.01	0.011	0.011					
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Molybdenum	0.0011	0.0012	0.0012	0.00098	0.00099	0.00056	0.0006	0.00058	0.0005	0.00051	0.00066	0.0007	0.00068	0.00059	0.00059	0.00068	0.00072	0.0007	0.0006	0.00061					
Nickel	0.015	0.022	0.023	0.015	0.015	0.01	0.015	0.014	0.01	0.01	0.012	0.018	0.017	0.012	0.012	0.013	0.018	0.018	0.012	0.012	3.8E-08	3.8E-08	2.3E-09	3.8E-08	3.8E-08
Selenium	0.17	0.17	0.18	0.17	0.17	0.083	0.083	0.092	0.086	0.083	0.087	0.088	0.1	0.092	0.088	0.072	0.072	0.085	0.077	0.072					

Notes

Shaded value indicates hazard quotient greater than 0.2 (or 1.0 for lead) or incremental lifetime cancer risk greater than 1 in 100,000 ($1x10^{-5}$).

ATTACHMENT 2:

Risk Estimates (Multimedia and Inhalation)
– Human Health and Ecological Risk Assessment, 2022 Submission

Table 4A: Risk Estimates for Inhalation HHRA - Mine Site and Highway 26 (1-Hour)
Cariboo Gold Project
Wells, BC

Parameter	Toxicity Reference Value (µg/m^3)	Existing Conditions (µg/m^3)	Existing Conditions HQ	MPOI-Mine Site	MPOI-Highway 26	Sugar Creek Loop Trail	Cornish X-Country Ski Trail 1	Nine Mile Lake Rec Site	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Jubilee Trail / Wendle Park	Cow Mountain Trails 1	Chisholm Creek Rec Site	Groundhog Lake Ski Trail	Proserpine Trail	Cariboo Wagon Road (Stanley to Barkerville)	Cow Mountain Trails 2	Ned's Connector Trail
Construction																		
Criteria Air Contaminants																		
Nitrogen Dioxide (Project Only)	79	-	-	**4.7**	-	0.0025	0.079	0.011	0.045	0.34	0.018	0.12	0.0044	0.0048	0.0036	0.0058	0.027	0.022
Nitrogen Dioxide (Project Only ARM Conversion)	79	-	-	**1.3**	-	0.0025	0.079	0.011	0.045	0.34	0.018	0.12	0.0044	0.0048	0.0036	0.0058	0.027	0.022
Nitrogen Dioxide (Baseline+Project)	79	74	0.94	**5.6**	-	0.94	1.0	0.95	0.98	**1.3**	0.95	**1.1**	0.94	0.94	0.94	0.94	0.96	0.96
Nitrogen Dioxide (ARM Conversion)	79	74	0.94	**1.4**	-	-	**1.1**	-	-	**1.1**	-	**1.1**	-	-	-	-	-	-
Diesel Particulate Matter	10	-	-	**2.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds																		
Acrolein	7	-	-	**0.23**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	50	-	-	**0.36**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations																		
Criteria Air Contaminants																		
Nitrogen Dioxide (Project Only)	79	-	-	**2.6**	0.0065	0.0022	0.042	0.007	0.028	0.15	0.011	0.047	0.0035	0.0053	0.004	0.0063	0.021	0.026
Nitrogen Dioxide (Project Only ARM Conversion)	79	-	-	**1.1**	-	0.0022	0.042	0.0069	0.028	0.15	0.01	0.046	0.0031	0.0053	0.004	0.0062	0.021	0.026
Nitrogen Dioxide (Baseline+Project)	79	74	0.94	**3.5**	0.94	0.94	0.98	0.94	0.96	**1.1**	0.95	0.98	0.94	0.94	0.94	0.94	0.96	0.96
Nitrogen Dioxide (ARM Conversion)	79	74	0.94	**1.3**	-	-	-	-	-	**1.1**	-	-	-	-	-	-	-	-
Diesel Particulate Matter	10	-	-	**1.2**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds																		
Acrolein	7	-	-	0.041	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	50	-	-	0.093	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Baseline refers to Existing Conditions
Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Parameter	Toxicity Reference Value (µg/m^3)	Existing Conditions (µg/m^3)	Groundhog Lake Snowmobile Trail	Yanks Peak Trail (X-DIST)	Jubilee Trail	Williams Creek Trail	Trail Buffer 1-Legal Objective	Viewing Point along Hwy 26	Water Access - Jack of Clubs Lake	Wells Baseball Diamond	Wells Elementary School	Nugget Hills RV Park	Valley Mountain Pass	Outfitter Area	Trapline TR0515T017 Cabin	Barkerville Provincial Park Campground
Construction																
Criteria Air Contaminants																
Nitrogen Dioxide (Project Only)	79	-	0.027	0.0043	0.0077	0.0095	0.0071	0.03	0.95	**1.3**	0.93	**1.7**	0.8	**1.4**	0.0061	0.026
Nitrogen Dioxide (Project Only ARM Conversion)	79	-	0.027	0.0043	0.0077	0.0095	0.0071	0.03	0.9	0.97	0.89	1.0	0.8	0.98	0.0061	0.026
Nitrogen Dioxide (Baseline+Project)	79	74	0.96	0.94	0.94	0.95	0.94	0.97	**1.9**	**2.2**	**1.9**	**2.7**	**1.7**	**2.3**	0.94	0.96
Nitrogen Dioxide (ARM Conversion)	79	74	-	-	-	-	-	-	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	-	-
Diesel Particulate Matter	10	-	-	-	-	-	-	-	**0.44**	**0.55**	**0.34**	**0.6**	**0.3**	**1.1**	-	-
Volatile Organic Compounds																
Acrolein	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations																
Criteria Air Contaminants																
Nitrogen Dioxide (Project Only)	79	-	0.057	0.0037	0.0051	0.0093	0.0054	0.021	0.39	0.83	0.6	0.61	0.36	0.31	0.0053	0.013
Nitrogen Dioxide (Project Only ARM Conversion)	79	-	0.057	0.0036	0.0051	0.0093	0.0054	0.015	0.38	0.83	0.59	0.61	0.36	0.31	0.0053	0.013
Nitrogen Dioxide (Baseline+Project)	79	74	0.99	0.94	0.94	0.95	0.94	0.96	**1.3**	**1.8**	**1.5**	**1.5**	**1.3**	**1.2**	0.94	0.95
Nitrogen Dioxide (ARM Conversion)	79	74	-	-	-	-	-	-	**1.1**	**1.2**	**1.1**	**1.1**	**1.1**	**1.1**	-	-
Diesel Particulate Matter	10	-	-	-	-	-	-	-	0.13	0.19	0.14	0.0084	0.0073	0.0067	-	-
Volatile Organic Compounds																
Acrolein	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Baseline refers to Existing Conditions
Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Parameter	Toxicity Reference Value (µg/m^3)	Existing Conditions (µg/m^3)	New Barkerville Residential	Historic Barkerville Town and Park	Forest Rose Campground	Government Hill Campground	Mine Site Camp	Transect 15m	Transect 25m	Transect 50m	Transect 75m	Transect 100m	Transect 150m	Transect 200m	Transect 250m	Transect 500m	Transect 1000m
Construction																	
Criteria Air Contaminants																	
Nitrogen Dioxide (Project Only)	79	-	0.018	0.014	0.024	0.016	-	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (Project Only ARM Conversion)	79	-	0.018	0.014	0.024	0.016	-	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (Baseline+Project)	79	74	0.95	0.95	0.96	0.95	-	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (ARM Conversion)	79	74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diesel Particulate Matter	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds																	
Acrolein	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations																	
Criteria Air Contaminants																	
Nitrogen Dioxide (Project Only)	79	-	0.01	0.009	0.014	0.0098	**3.1**	0.0062	0.0053	0.0042	0.0037	0.0033	0.0027	0.0021	0.0019	0.0011	0.00052
Nitrogen Dioxide (Project Only ARM Conversion)	79	-	0.01	0.009	0.014	0.0098	**1.2**	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (Baseline+Project)	79	74	0.95	0.95	0.95	0.95	**4.0**	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Nitrogen Dioxide (ARM Conversion)	79	74	-	-	-	-	**1.3**	-	-	-	-	-	-	-	-	-	-
Diesel Particulate Matter	10	-	-	-	-	-	**0.74**	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds																	
Acrolein	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Baseline refers to Existing Conditions
Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Table 4B: Risk Estimates for Inhalation HHRA - QR Mill and 500 Nyland Lake Road (1-Hour)
Cariboo Gold Project
Wells, BC

Parameter	Toxicity Reference Value (µg/m^3)	Existing Conditions (µg/m^3)	Existing Conditions HQ	MPOI-QR Mill	MPOI-500 Nyland Lake Road	Maude Lake Rec Site	Le Bourdais Lake	Quesnel Forks	Trail Buffer 2	Trail Buffer 3	Trail Buffer 4	Little Lake Rec Site	Prior Lake Rec Site	Trapline TR0515T020 Cabin 1	Trapline TR0515T020 Cabin 2	Trapline TR0502T045	SW2
Operations																	
Criteria Air Contaminants																	
Nitrogen Dioxide (Project Only)	79	-	-	0.97	0.013	0.0023	0.0031	0.0039	0.011	0.031	0.002	0.0019	0.0012	0.0038	0.003	0.037	0.019
Nitrogen Dioxide (Project Only ARM Conversion)	79	-	-	0.9	-	0.0021	0.003	0.0039	0.011	0.031	0.0019	0.0019	0.0012	0.0037	0.003	0.034	0.018
Nitrogen Dioxide (Baseline+Project)	79	74	0.94	**1.9**	0.95	0.94	0.94	0.94	0.95	0.97	0.94	0.94	0.94	0.94	0.94	0.97	0.96
Nitrogen Dioxide (ARM Conversion)	79	74	0.94	**1.2**	-	-	-	-	-	-	-	-	-	-	-	-	-
Diesel Particulate Matter	10	-	-	**0.51**	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Baseline refers to Existing Conditions
Air quality predictions were not provided for the Construction Phase as emissions are expected to be negligible.
Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Table 4B: Risk Estimates for Inhalation HHRA - QR Mill and 500 Nyland Lake Road (1-Hour)
Cariboo Gold Project
Wells, BC

Parameter	Toxicity Reference Value (µg/m^3)	Existing Conditions (µg/m^3)	Existing Conditions HQ	QR Mill Camp	Transect 15m	Transect 25m	Transect 50m	Transect 75m	Transect 100m	Transect 150m	Transect 200m	Transect 250m	Transect 500m	Transect 1000m
Operations														
Criteria Air Contaminants														
Nitrogen Dioxide (Project Only)	79	-	-	**1.1**	0.013	0.011	0.0075	0.0063	0.0053	0.0041	0.0034	0.003	0.0024	0.0014
Nitrogen Dioxide (Project Only ARM Conversion)	79	-	-	0.94	-	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (Baseline+Project)	79	74	0.94	**2.1**	0.95	0.95	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Nitrogen Dioxide (ARM Conversion)	79	74	0.94	**1.2**	-	-	-	-	-	-	-	-	-	-
Diesel Particulate Matter	10	-	-	**0.54**	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Baseline refers to Existing Conditions
Air quality predictions were not provided for the Construction Phase as emissions are expected to be negligible.
Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Table 4C: Risk Estimates for Inhalation HHRA - Mine Site and Highway 26 (24-Hour)
Cariboo Gold Project
Wells, BC

Parameter	Toxicity Reference Value (µg/m^3)	Existing Conditions (µg/m^3)	Existing Conditions HQ	MPOI-Mine Site	MPOI-Highway 26	Sugar Creek Loop Trail	Cornish X-Country Ski Trail 1	Nine Mile Lake Rec Site	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Jubilee Trail / Wendle Park	Cow Mountain Trails 1	Chisholm Creek Rec Site	Groundhog Lake Ski Trail	Proserpine Trail	Cariboo Wagon Road (Stanley to Barkerville)	Cow Mountain Trails 2
Construction																	
Criteria Air Contaminants																	
PM2.5 (Project Only)	25	-	-	0.22	-	0.00016	0.0046	0.00065	0.0019	0.02	0.00093	0.0058	0.00021	0.00026	0.0002	0.00043	0.001
PM2.5 (Baseline+Project)	25	25	1.0	**1.2**	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PM10 (Project Only)	50	-	-	0.9	-	0.00052	0.013	0.0032	0.013	0.063	0.0039	0.024	0.00096	0.00072	0.00056	0.00093	0.0038
PM10 (Baseline+Project)	50	43	0.86	**1.8**	-	0.86	0.87	0.86	0.87	0.92	0.86	0.88	0.86	0.86	0.86	0.86	0.86
Metals																	
Iron (Project Only)	4	0.3	0.075	**1.3**	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	4	0.3	0.075	**1.4**	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations																	
Criteria Air Contaminants																	
PM2.5 (Project Only)	25	-	-	0.13	0.023	0.00033	0.0071	0.0012	0.0034	0.019	0.0018	0.0064	0.0013	0.00061	0.00052	0.00071	0.0024
PM2.5 (Baseline+Project)	25	25	1.0	**1.1**	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PM10 (Project Only)	50	-	-	0.66	0.059	0.0011	0.023	0.007	0.024	0.081	0.0079	0.024	0.0039	0.0029	0.0021	0.0023	0.013
PM10 (Baseline+Project)	50	43	0.86	**1.5**	0.92	0.86	0.88	0.87	0.88	0.94	0.87	0.88	0.86	0.86	0.86	0.86	0.87
Metals																	
Iron (Project Only)	4	0.3	0.075	**1.2**	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	4	0.3	0.075	**1.3**	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Baseline refers to Existing Conditions
Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Table 4C: Risk Estimates for Inhalation HHRA - Mine Site and Highway 26 (24-Hour)
Cariboo Gold Project
Wells, BC

Parameter	Toxicity Reference Value (µg/m^3)	Existing Conditions (µg/m^3)	Ned's Connector Trail	Groundhog Lake Snowmobile Trail	Yanks Peak Trail (X-DIST)	Jubilee Trail	Williams Creek Trail	Trail Buffer 1-Legal Objective	Viewing Point along Hwy 26	Water Access - Jack of Clubs Lake	Wells Baseball Diamond	Wells Elementary School	Nugget Hills RV Park	Valley Mountain Pass	Outfitter Area	Trapline TR0515T017 Cabin	Barkerville Provincial Park Campground
Construction																	
Criteria Air Contaminants																	
PM2.5 (Project Only)	25	-	0.001	0.0012	0.00026	0.00047	0.00059	0.00048	0.0016	0.078	0.12	0.067	0.093	0.055	0.039	0.00034	0.0017
PM2.5 (Baseline+Project)	25	25	1.0	1.0	1.0	1.0	1.0	1.0	1.0	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	1.0	1.0	1.0
PM10 (Project Only)	50	-	0.0029	0.0043	0.0009	0.0023	0.0017	0.0023	0.0072	0.22	0.3	0.15	0.28	0.14	0.29	0.0011	0.007
PM10 (Baseline+Project)	50	43	0.86	0.86	0.86	0.86	0.86	0.86	0.87	**1.1**	**1.2**	1.0	**1.1**	1.0	**1.1**	0.86	0.87
Metals																	
Iron (Project Only)	4	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	4	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations																	
Criteria Air Contaminants																	
PM2.5 (Project Only)	25	-	0.0038	0.011	0.00058	0.00092	0.0016	0.0011	0.023	0.053	0.091	0.064	0.058	0.038	0.025	0.0007	0.0025
PM2.5 (Baseline+Project)	25	25	1.0	1.0	1.0	1.0	1.0	1.0	1.0	**1.1**	**1.1**	**1.1**	**1.1**	1.0	1.0	1.0	1.0
PM10 (Project Only)	50	-	0.031	0.088	0.0024	0.0043	0.0078	0.0037	0.068	0.16	0.22	0.13	0.17	0.12	0.10	0.0022	0.012
PM10 (Baseline+Project)	50	43	0.89	0.95	0.86	0.86	0.87	0.86	0.93	1.0	**1.1**	0.99	1.0	0.98	0.96	0.86	0.87
Metals																	
Iron (Project Only)	4	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	4	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Baseline refers to Existing Conditions
Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Table 4C: Risk Estimates for Inhalation HHRA - Mine Site and Highway 26 (24-Hour)
Cariboo Gold Project
Wells, BC

Parameter	Toxicity Reference Value (µg/m^3)	Existing Conditions (µg/m^3)	New Barkerville Residential	Historic Barkerville Town and Park	Forest Rose Campground	Government Hill Campground	Mine Site Camp	Transect 15m	Transect 25m	Transect 50m	Transect 75m	Transect 100m	Transect 150m	Transect 200m	Transect 250m	Transect 500m	Transect 1000m
Construction																	
Criteria Air Contaminants																	
PM2.5 (Project Only)	25	-	0.0012	0.00079	0.0017	0.00098	-	-	-	-	-	-	-	-	-	-	-
PM2.5 (Baseline+Project)	25	25	1.0	1.0	1.0	1.0	-	-	-	-	-	-	-	-	-	-	-
PM10 (Project Only)	50	-	0.0053	0.0035	0.0063	0.0049	-	-	-	-	-	-	-	-	-	-	-
PM10 (Baseline+Project)	50	43	0.87	0.86	0.87	0.86	-	-	-	-	-	-	-	-	-	-	-
Metals																	
Iron (Project Only)	4	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	4	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations																	
Criteria Air Contaminants																	
PM2.5 (Project Only)	25	-	0.0019	0.0015	0.0025	0.0018	0.26	0.023	0.019	0.014	0.01	0.009	0.0073	0.0062	0.0052	0.0024	0.001
PM2.5 (Baseline+Project)	25	25	1.0	1.0	1.0	1.0	**1.3**	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PM10 (Project Only)	50	-	0.011	0.0097	0.011	0.011	0.48	0.055	0.05	0.037	0.032	0.029	0.023	0.018	0.016	0.0081	0.0035
PM10 (Baseline+Project)	50	43	0.87	0.87	0.87	0.87	**1.3**	0.91	0.91	0.9	0.89	0.89	0.88	0.88	0.88	0.87	0.86
Metals																	
Iron (Project Only)	4	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	4	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Baseline refers to Existing Conditions
Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Parameter	Toxicity Reference Value (µg/m^3)	Existing Conditions (µg/m^3)	Existing Conditions HQ	MPOI-QR Mill	MPOI-500 Nyland Lake Road	Maude Lake Rec Site	Le Bourdais Lake	Quesnel Forks	Trail Buffer 2	Trail Buffer 3	Trail Buffer 4	Little Lake Rec Site	Prior Lake Rec Site	Trapline TR0515T020 Cabin 1	Trapline TR0515T020 Cabin 2	Trapline TR0502T045	SW2
Operations																	
Criteria Air Contaminants																	
PM2.5 (Project Only)	25	-	-	0.26	0.098	0.0013	0.001	0.0019	0.0044	0.0075	0.0012	0.00094	0.00066	0.0011	0.00099	0.025	0.0079
PM2.5 (Baseline+Project)	25	25	1.0	**1.3**	**1.1**	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PM10 (Project Only)	50	-	-	0.51	0.72	0.015	0.017	0.0077	0.016	0.024	0.0084	0.0049	0.0033	0.019	0.017	0.22	0.066
PM10 (Baseline+Project)	50	43	0.86	**1.4**	**1.6**	0.87	0.88	0.87	0.88	0.88	0.87	0.86	0.86	0.88	0.88	**1.1**	0.93
Metals																	
Iron (Project Only)	4	0.3	0.075	**1.3**	0.99	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	4	0.3	0.075	**1.4**	**1.1**	-	-	-	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Baseline refers to Existing Conditions
Air quality predictions were not provided for the Construction Phase as emissions are expected to be negligible.
Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Parameter	Toxicity Reference Value (µg/m^3)	Existing Conditions (µg/m^3)	Existing Conditions HQ	QR Mill Camp	Transect 15m	Transect 25m	Transect 50m	Transect 75m	Transect 100m	Transect 150m	Transect 200m	Transect 250m	Transect 500m	Transect 1000m
Operations														
Criteria Air Contaminants														
PM2.5 (Project Only)	25	-	-	0.34	0.098	0.08	0.059	0.055	0.047	0.031	0.026	0.021	0.013	0.0088
PM2.5 (Baseline+Project)	25	25	1.0	**1.3**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	1.0	1.0	1.0	1.0	1.0
PM10 (Project Only)	50	-	-	0.48	0.72	0.59	0.46	0.41	0.35	0.27	0.23	0.22	0.14	0.091
PM10 (Baseline+Project)	50	43	0.86	**1.3**	**1.6**	**1.4**	**1.3**	**1.3**	**1.2**	**1.1**	**1.1**	**1.1**	1.0	0.95
Metals														
Iron (Project Only)	4	0.3	0.075	0.98	1.0	-	-	-	-	-	-	-	-	-
Iron (Baseline+Project)	4	0.3	0.075	**1.1**	**1.1**	-	-	-	-	-	-	-	-	-

Notes
"-" = did not exceed air criteria; hazard quotient not calculated.
Baseline refers to Existing Conditions
Air quality predictions were not provided for the Construction Phase as emissions are expected to be negligible.
Bold and shaded value indicates hazard quotient greater than 1 (for criteria air contaminants where predictions include baseline and NO2 ambient ratio method) or hazard quotient greater than 0.2 for other constituents of potential concern.

Attachment 4

Table 4E: Risk Estimates for Chronic Inhalation HHRA - Non-Indigenous and Indigenous Resident
Cariboo Gold Project
Wells, BC

Hazard Quotients for Community Resident (Non-Indigenous and Indigenous)

Constituent of Potential Concern	MPOI-Residence	Wells Baseball Diamond	Wells Elementary School	Nugget Hills RV Park	New Barkerville Residential
Existing Conditions					
Nitrogen Dioxide	0.11	0.11	0.11	0.11	0.11
PM2.5	0.2	0.2	0.2	0.2	0.2
PM10	0.14	0.14	0.14	0.14	0.14
Diesel Particulate Matter	-	-	-	-	
Acrolein	-	-	-	-	
Construction					
Nitrogen Dioxide (Project Only)	0.039	0.058	0.027	0.023	0.00019
Nitrogen Dioxide (Existing Conditions+Project)	0.15	0.17	0.14	0.13	0.11
Nitrogen Dioxide (ARM Conversion)	0.14	0.15	0.13	0.13	0.11
PM2.5 (Project Only)		0.023	0.011	0.0096	0.000079
PM2.5 (Existing Conditions+Project)		0.22	0.21	0.21	0.2
PM10 (Project Only)		0.036	0.013	0.013	0.00011
PM10 (Existing Conditions+Project)		0.18	0.15	0.15	0.14
Diesel Particulate Matter		0.012	0.0054	0.0049	
Acrolein		0.014	0.0074	0.0061	
Operations					
Nitrogen Dioxide (Project Only)	0.017	0.017	0.011	0.0055	0.0001
Nitrogen Dioxide (Existing Conditions+Project)	0.13	0.13	0.12	0.11	0.11
Nitrogen Dioxide (ARM Conversion)	0.12	0.13	0.12	0.12	0.11
PM2.5 (Project Only)		0.017	0.0096	0.0098	0.00015
PM2.5 (Existing Conditions+Project)		0.21	0.21	0.21	0.2
PM10 (Project Only)		0.018	0.0084	0.012	0.00022
PM10 (Existing Conditions+Project)		0.16	0.15	0.15	0.14
Diesel Particulate Matter		0.0026	0.0013	0.00093	
Acrolein		0.00066	0.00039	0.00024	

Notes:
- = not available
Blank = not a COPC at receptor location
Shaded value = hazard quotient greater than 0.2 or 1.0

Incremental Lifetime Cancer Risks for Community Resident (Non-Indigenous and Indigenous)

Constituent of Potential Concern	MPOI-Residence	Wells Baseball Diamond	Wells Elementary School	Nugget Hills RV Park	New Barkerville Residential
Existing Conditions					
Diesel Particulate Matter		-	-	-	
Construction					
Diesel Particulate Matter		1.8E-05	8.1E-06	7.3E-06	
Operations					
Diesel Particulate Matter		3.9E-06	2.0E-06	1.4E-06	

Notes:
- = not available
Shaded value = incremental lifetime cancer risk greater than $1x10^{-5}$

Target Organ Sums for Community Resident (Non-Indigenous and Indigenous)

Respiratory Effects	MPOI-Residence	Wells Baseball Diamond	Wells Elementary School	Nugget Hills RV Park	New Barkerville Residential
Existing Conditions	0.45	0.45	0.45	0.45	0.45
Construction (Project Only)	0.039	0.14	0.064	0.057	0.00038
Construction (Existing Conditions+Project)	0.14	0.58	0.51	0.5	0.45
Operations (Project Only)	0.017	0.055	0.03	0.028	0.00047
Operations (Existing Conditions+Project)	0.12	0.5	0.48	0.48	0.45

Notes:
Shaded value = hazard quotient greater than 1.0

Table 4F: Risk Estimates for Chronic Inhalation HHRA - Indigenous Land User
Cariboo Gold Project
Wells, BC

Hazard Quotients for Indigenous Land User

Constituent of Potential Concern	Cariboo Wagon Road (Stanley to Barkerville)	Jubilee Trail	Proserpine Trail	Sugar Creek Loop Trail	Yanks Peak Trail	Groundhog Lake Ski Trail	Chisholm Creek Rec Site	Nine Mile Lake Rec Site	Trail Buffer 1 - Legal Objective	Viewing Point along Hwy 26	Trapline TR0515T017 Cabin	Highway 26 Transect 200 m	Cow Mountain Trails 1	Cow Mountain Trails 2	Jubilee Trail / Wendle Park	Ned's Connector Trail
Existing Conditions																
Nitrogen Dioxide	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
PM2.5	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
PM10	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Diesel Particulate Matter																
Acrolein																
Construction																
Nitrogen Dioxide (Project Only)	0.00027	0.00069	0.00019	0.00014	0.00031	0.00023	0.00021	0.001	0.00035	0.0014	0.00032	-	0.0047	0.00096	0.0016	0.00089
Nitrogen Dioxide (Existing Conditions+Project)	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	-	0.66	0.66	0.66	0.66
Nitrogen Dioxide (ARM Conversion)	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	-	0.66	0.66	0.66	0.66
PM2.5 (Project Only)	0.00011	0.00028	0.000075	0.000057	0.00013	0.000092	0.000083	0.00041	0.00014	0.00056	0.00013	-	0.0019	0.00039	0.00065	0.00036
PM2.5 (Existing Conditions+Project)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	-	1.2	1.2	1.2	1.2
PM10 (Project Only)	0.00015	0.00039	0.00011	0.00008	0.00017	0.00013	0.00012	0.00057	0.0002	0.00081	0.00018	-	0.0028	0.00054	0.00091	0.0005
PM10 (Existing Conditions+Project)	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	-	0.85	0.84	0.84	0.84
Diesel Particulate Matter																
Acrolein																
Operations																
Nitrogen Dioxide (Project Only)	0.00016	0.00035	0.00012	0.000076	0.00017	0.00014	0.00013	0.00053	0.00018	0.0016	0.00018	0.00029	0.0017	0.00058	0.00075	0.00082
Nitrogen Dioxide (Existing Conditions+Project)	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Nitrogen Dioxide (ARM Conversion)	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
PM2.5 (Project Only)	0.00025	0.00051	0.00019	0.00011	0.00026	0.00022	0.00056	0.00072	0.00031	0.021	0.00023	0.0055	0.0026	0.00092	0.0011	0.0015
PM2.5 (Existing Conditions+Project)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
PM10 (Project Only)	0.0003	0.0006	0.00024	0.00013	0.00033	0.00028	0.00085	0.00081	0.00039	0.034	0.00025	0.0091	0.0032	0.0014	0.0013	0.0031
PM10 (Existing Conditions+Project)	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.88	0.84	0.85	0.85	0.84	0.84	0.85
Diesel Particulate Matter																
Acrolein																

Notes:
- = not available
Blank = not a COPC at receptor location
Shaded value = hazard quotient greater than 0.2 or 1.0

Incremental Lifetime Cancer Risks for Indigenous Land User

Constituent of Potential Concern	Cariboo Wagon Road (Stanley to Barkerville)	Jubilee Trail	Proserpine Trail	Sugar Creek Loop Trail	Yanks Peak Trail	Groundhog Lake Ski Trail	Chisholm Creek Rec Site	Nine Mile Lake Rec Site	Trail Buffer 1 - Legal Objective	Viewing Point along Hwy 26	Trapline TR0515T017 Cabin	Highway 26 Transect 200 m	Cow Mountain Trails 1	Cow Mountain Trails 2	Jubilee Trail / Wendle Park	Ned's Connector Trail
Existing Conditions																
Diesel Particulate Matter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction																
Diesel Particulate Matter																
Operations																
Diesel Particulate Matter																

Notes:
- = not available
Blank = not a COPC at receptor location
Shaded value = incremental lifetime cancer risk greater than $1x10^{-5}$

Target Organ Sums for Indigenous Land User

Respiratory Effects	Cariboo Wagon Road (Stanley to Barkerville)	Jubilee Trail	Proserpine Trail	Sugar Creek Loop Trail	Yanks Peak Trail	Groundhog Lake Ski Trail	Chisholm Creek Rec Site	Nine Mile Lake Rec Site	Trail Buffer 1 - Legal Objective	Viewing Point along Hwy 26	Trapline TR0515T017 Cabin	Highway 26 Transect 200 m	Cow Mountain Trails 1	Cow Mountain Trails 2	Jubilee Trail / Wendle Park	Ned's Connector Trail
Existing Conditions	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Construction (Project Only)	0.00053	0.0014	0.00037	0.00028	0.00061	0.00045	0.00041	0.002	0.00069	0.0027	0.00063	-	0.0094	0.0019	0.0032	0.0018
Construction (Existing Conditions+Project)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	-	2.7	2.7	2.7	2.7
Operations (Project Only)	0.00072	0.0015	0.00055	0.00032	0.00076	0.00065	0.0015	0.0021	0.00088	0.056	0.00067	0.015	0.0075	0.0029	0.0032	0.0055
Operations (Existing Conditions+Project)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7

Notes:
- = not available
Shaded value = hazard quotient greater than 1.0

Table 4F: Risk Estimates for Chronic Inhalation HHRA - Indigenous Land User
Cariboo Gold Project
Wells, BC

Hazard Quotients for Indigenous Land User

Constituent of Potential Concern	Williams Creek Trail	Cornish X-Country Ski Trail 1	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Groundhog Lake Snowmobile Trail	Barkerville Provincial Park Campground	Forest Rose Campground	Government Hill Campground	Water Access – Jack of Clubs Lake	Valley Mountain Pass	Historic Barkerville Town and Park	Outfitter Area	Le Bourdais Lake	Quesnel Forks	Little Lake Rec Site	Maude Lake Rec Site
Existing Conditions																
Nitrogen Dioxide	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
PM2.5	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
PM10	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Diesel Particulate Matter				-					-	-		-				
Acrolein									-	-						
Construction																
Nitrogen Dioxide (Project Only)	0.00046	0.0072	0.0035	0.043	0.0011	0.0017	0.0017	0.001	0.095	0.096	0.00074	0.042	-	-	-	-
Nitrogen Dioxide (Existing Conditions+Project)	0.66	0.66	0.66	0.7	0.66	0.66	0.66	0.66	0.75	0.75	0.66	0.7	-	-	-	-
Nitrogen Dioxide (ARM Conversion)	0.66	0.66	0.66	0.69	0.66	0.66	0.66	0.66	0.73	0.73	0.66	0.69	-	-	-	-
PM2.5 (Project Only)	0.00019	0.003	0.0014	0.018	0.00044	0.0007	0.00069	0.00041	0.038	0.039	0.0003	0.016	-	-	-	-
PM2.5 (Existing Conditions+Project)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	-	-	-	-
PM10 (Project Only)	0.00026	0.004	0.002	0.024	0.00061	0.00097	0.00096	0.00057	0.061	0.056	0.00042	0.027	-	-	-	-
PM10 (Existing Conditions+Project)	0.84	0.85	0.84	0.87	0.84	0.84	0.84	0.84	0.9	0.9	0.84	0.87	-	-	-	-
Diesel Particulate Matter				0.009					0.02	0.02		0.0089				
Acrolein									0.023	0.024						
Operations																
Nitrogen Dioxide (Project Only)	0.00031	0.0034	0.0017	0.015	0.0016	0.00084	0.00085	0.00056	0.025	0.027	0.00043	0.0094	0.000093	0.00021	0.000094	0.00011
Nitrogen Dioxide (Existing Conditions+Project)	0.66	0.66	0.66	0.67	0.66	0.66	0.66	0.66	0.68	0.68	0.66	0.67	0.66	0.66	0.66	0.66
Nitrogen Dioxide (ARM Conversion)	0.66	0.66	0.66	0.67	0.66	0.66	0.66	0.66	0.68	0.69	0.66	0.67	0.66	0.66	0.66	0.66
PM2.5 (Project Only)	0.00052	0.0044	0.0024	0.018	0.004	0.0012	0.0013	0.00086	0.033	0.037	0.0007	0.013	0.00034	0.0006	0.00034	0.00045
PM2.5 (Existing Conditions+Project)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
PM10 (Project Only)	0.00082	0.0045	0.0027	0.019	0.0098	0.0017	0.0017	0.0013	0.043	0.044	0.0011	0.015	0.00066	0.0010	0.00062	0.0011
PM10 (Existing Conditions+Project)	0.84	0.85	0.85	0.86	0.85	0.84	0.84	0.84	0.89	0.89	0.84	0.86	0.84	0.84	0.84	0.84
Diesel Particulate Matter				0.0021					0.0041	0.0043		0.0015				
Acrolein									0.00099	0.0011						

Notes:
- = not available
Blank = not a COPC at receptor location
Shaded value = hazard quotient greater than 0.2 or 1.0

Incremental Lifetime Cancer Risks for Indigenous Land User

Constituent of Potential Concern	Williams Creek Trail	Cornish X-Country Ski Trail 1	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Groundhog Lake Snowmobile Trail	Barkerville Provincial Park Campground	Forest Rose Campground	Government Hill Campground	Water Access – Jack of Clubs Lake	Valley Mountain Pass	Historic Barkerville Town and Park	Outfitter Area	Le Bourdais Lake	Quesnel Forks	Little Lake Rec Site	Maude Lake Rec Site
Existing Conditions																
Diesel Particulate Matter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction																
Diesel Particulate Matter				3.4E-06					7.7E-06	7.6E-06		3.3E-06				
Operations																
Diesel Particulate Matter				8.0E-07					1.5E-06	1.6E-06		5.7E-07				

Notes:
- = not available
Blank = not a COPC at receptor location
Shaded value = incremental lifetime cancer risk greater than $1x10^{-5}$

Target Organ Sums for Indigenous Land User

Respiratory Effects	Williams Creek Trail	Cornish X-Country Ski Trail 1	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Groundhog Lake Snowmobile Trail	Barkerville Provincial Park Campground	Forest Rose Campground	Government Hill Campground	Water Access – Jack of Clubs Lake	Valley Mountain Pass	Historic Barkerville Town and Park	Outfitter Area	Le Bourdais Lake	Quesnel Forks	Little Lake Rec Site	Maude Lake Rec Site
Existing Conditions	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Construction (Project Only)	0.00091	0.014	0.007	0.094	0.0021	0.0034	0.0033	0.002	0.24	0.24	0.0015	0.093	-	-	-	-
Construction (Existing Conditions+Project)	2.7	2.7	2.7	2.8	2.7	2.7	2.7	2.7	2.9	2.9	2.7	2.8	-	-	-	-
Operations (Project Only)	0.0017	0.012	0.0069	0.054	0.015	0.0038	0.0038	0.0027	0.11	0.11	0.0023	0.039	0.0011	0.0018	0.0011	0.0016
Operations (Existing Conditions+Project)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.8	2.8	2.7	2.7	2.7	2.7	2.7	2.7

Notes:
- = not available
Shaded value = hazard quotient greater than 1.0

Table 4F: Risk Estimates for Chronic Inhalation HHRA - Indigenous Land User
Cariboo Gold Project
Wells, BC

Hazard Quotients for Indigenous Land User

Constituent of Potential Concern	Prior Lake Rec Site	Trail Buffer 2	Trail Buffer 4	500 Road Transect 200 m	Trapline TR0515T020 Cabin 1	Trapline TR0515T020 Cabin 2	Trail Buffer 3	SW2	Trapline TR0502T045
Existing Conditions									
Nitrogen Dioxide	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
PM2.5	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
PM10	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Diesel Particulate Matter									
Acrolein									
Construction									
Nitrogen Dioxide (Project Only)	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (Existing Conditions+Project)	-	-	-	-	-	-	-	-	-
Nitrogen Dioxide (ARM Conversion)	-	-	-	-	-	-	-	-	-
PM2.5 (Project Only)	-	-	-	-	-	-	-	-	-
PM2.5 (Existing Conditions+Project)	-	-	-	-	-	-	-	-	-
PM10 (Project Only)	-	-	-	-	-	-	-	-	-
PM10 (Existing Conditions+Project)	-	-	-	-	-	-	-	-	-
Diesel Particulate Matter									
Acrolein									
Operations									
Nitrogen Dioxide (Project Only)	0.000068	0.00056	0.00012	0.00034	0.00011	0.000092	0.00086	0.0006	0.0013
Nitrogen Dioxide (Existing Conditions+Project)	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Nitrogen Dioxide (ARM Conversion)	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
PM2.5 (Project Only)	0.00024	0.0015	0.0005	0.0099	0.00038	0.00033	0.0025	0.0025	0.0077
PM2.5 (Existing Conditions+Project)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
PM10 (Project Only)	0.00044	0.0024	0.0011	0.039	0.00071	0.00065	0.004	0.0062	0.021
PM10 (Existing Conditions+Project)	0.84	0.84	0.84	0.88	0.84	0.84	0.85	0.85	0.86
Diesel Particulate Matter									
Acrolein									

Notes:
- = not available
Blank = not a COPC at receptor location
Shaded value = hazard quotient greater than 0.2 or 1.0

Incremental Lifetime Cancer Risks for Indigenous Land User

Constituent of Potential Concern	Prior Lake Rec Site	Trail Buffer 2	Trail Buffer 4	500 Road Transect 200 m	Trapline TR0515T020 Cabin 1	Trapline TR0515T020 Cabin 2	Trail Buffer 3	SW2	Trapline TR0502T045
Existing Conditions									
Diesel Particulate Matter	-	-	-	-	-	-	-	-	-
Construction									
Diesel Particulate Matter									
Operations									
Diesel Particulate Matter									

Notes:
- = not available
Blank = not a COPC at receptor location
Shaded value = incremental lifetime cancer risk greater than $1x10^{-5}$

Target Organ Sums for Indigenous Land User

Respiratory Effects	Prior Lake Rec Site	Trail Buffer 2	Trail Buffer 4	500 Road Transect 200 m	Trapline TR0515T020 Cabin 1	Trapline TR0515T020 Cabin 2	Trail Buffer 3	SW2	Trapline TR0502T045
Existing Conditions	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Construction (Project Only)	-	-	-	-	-	-	-	-	-
Construction (Existing Conditions+Project)	-	-	-	-	-	-	-	-	-
Operations (Project Only)	0.00074	0.0044	0.0017	0.05	0.0012	0.0011	0.0073	0.0093	0.03
Operations (Existing Conditions+Project)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7

Notes:
- = not available
Shaded value = hazard quotient greater than 1.0

Hazard Quotients for Hiker

Constituent of Potential Concern	Cariboo Wagon Road (Stanley to Barkerville)	Jubilee Trail	Proserpine Trail	Sugar Creek Loop Trail	Yanks Peak Trail	Groundhog Lake Ski Trail	Viewing Point along Hwy 26	Cow Mountain Trails 1	Cow Mountain Trails 2	Jubilee Trail / Wendle Park	Ned's Connector Trail	Williams Creek Trail	Cornish X-Country Ski Trail 1	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Groundhog Lake Snowmobile Trail	Water Access – Jack of Clubs Lake	Valley Mountain Pass	Historic Barkerville Town and Park	Le Bourdais Lake	Quesnel Forks	SW2
Existing Conditions																						
Nitrogen Dioxide	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063
PM2.5	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
PM10	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Diesel Particulate Matter															-		-	-				
Acrolein																	-	-				
Construction																						
Nitrogen Dioxide (Project Only)	0.000026	0.000065	0.000018	0.000013	0.000029	0.000022	0.00013	0.00045	0.000092	0.00015	0.000085	0.000044	0.00069	0.00034	0.0041	0.0001	0.0091	0.0091	0.000071	-	-	-
Nitrogen Dioxide (Existing Conditions+Project)	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.067	0.063	0.072	0.072	0.063	-	-	-
Nitrogen Dioxide (ARM Conversion)	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.066	0.063	0.069	0.069	0.063	-	-	-
PM2.5 (Project Only)	0.00001	0.000027	0.0000072	0.0000054	0.000012	0.0000087	0.000053	0.00018	0.000037	0.000062	0.000035	0.000018	0.00028	0.00014	0.0017	0.000042	0.0036	0.0037	0.000029	-	-	-
PM2.5 (Existing Conditions+Project)	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.11	-	-	-
PM10 (Project Only)	0.000015	0.000037	0.00001	0.0000076	0.000017	0.000012	0.000077	0.00027	0.000051	0.000087	0.000048	0.000025	0.00038	0.00019	0.0023	0.000058	0.0058	0.0053	0.00004	-	-	-
PM10 (Existing Conditions+Project)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.081	0.08	0.083	0.08	0.086	0.086	0.08	-	-	-
Diesel Particulate Matter															0.00086		0.0019	0.0019				
Acrolein																	0.0022	0.0023				
Operations																						
Nitrogen Dioxide (Project Only)	0.000016	0.000033	0.000012	0.0000072	0.000016	0.000014	0.00015	0.00016	0.000055	0.000072	0.000078	0.00003	0.00033	0.00017	0.0014	0.00015	0.0023	0.0026	0.000041	0.0000088	0.00002	0.000057
Nitrogen Dioxide (Existing Conditions+Project)	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.064	0.063	0.065	0.065	0.063	0.063	0.063	0.063
Nitrogen Dioxide (ARM Conversion)	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.064	0.063	0.065	0.066	0.063	0.063	0.063	0.063
PM2.5 (Project Only)	0.000024	0.000049	0.000018	0.000011	0.000024	0.000021	0.002	0.00025	0.000087	0.0001	0.00015	0.00005	0.00042	0.00023	0.0017	0.00038	0.0031	0.0036	0.000067	0.000032	0.000057	0.00024
PM2.5 (Existing Conditions+Project)	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.11	0.11	0.11	0.11
PM10 (Project Only)	0.000029	0.000058	0.000023	0.000013	0.000031	0.000027	0.0032	0.0003	0.00013	0.00012	0.0003	0.000078	0.00043	0.00026	0.0018	0.00094	0.0041	0.0042	0.00011	0.000063	0.000095	0.00059
PM10 (Existing Conditions+Project)	0.08	0.08	0.08	0.08	0.08	0.08	0.083	0.081	0.08	0.08	0.081	0.08	0.081	0.08	0.082	0.081	0.084	0.084	0.08	0.08	0.08	0.081
Diesel Particulate Matter															0.0002		0.00039	0.00041				
Acrolein																	0.000095	0.00011				

Notes:
- = not available
Blank = not a COPC at receptor location
Shaded value = hazard quotient greater than 0.2 or 1.0

Incremental Lifetime Cancer Risks for Hiker

Constituent of Potential Concern	Cariboo Wagon Road (Stanley to Barkerville)	Jubilee Trail	Proserpine Trail	Sugar Creek Loop Trail	Yanks Peak Trail	Groundhog Lake Ski Trail	Viewing Point along Hwy 26	Cow Mountain Trails 1	Cow Mountain Trails 2	Jubilee Trail / Wendle Park	Ned's Connector Trail	Williams Creek Trail	Cornish X-Country Ski Trail 1	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Groundhog Lake Snowmobile Trail	Water Access – Jack of Clubs Lake	Valley Mountain Pass	Historic Barkerville Town and Park	Le Bourdais Lake	Quesnel Forks	SW2
Existing Conditions																						
Diesel Particulate Matter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction																						
Diesel Particulate Matter															3.2E-07		7.3E-07	7.2E-07				
Operations																						
Diesel Particulate Matter															7.5E-08		1.5E-07	1.5E-07				

Notes:
- = not available
Blank = not a COPC at receptor location
Shaded value = incremental lifetime cancer risk greater than $1x10^{-5}$

Target Organ Sums for Hiker

Respiratory Effects	Cariboo Wagon Road (Stanley to Barkerville)	Jubilee Trail	Proserpine Trail	Sugar Creek Loop Trail	Yanks Peak Trail	Groundhog Lake Ski Trail	Viewing Point along Hwy 26	Cow Mountain Trails 1	Cow Mountain Trails 2	Jubilee Trail / Wendle Park	Ned's Connector Trail	Williams Creek Trail	Cornish X-Country Ski Trail 1	Cornish X-Country Ski Trail 2	Cornish X-Country Ski Trail 3	Groundhog Lake Snowmobile Trail	Water Access – Jack of Clubs Lake	Valley Mountain Pass	Historic Barkerville Town and Park	Le Bourdais Lake	Quesnel Forks	SW2
Existing Conditions	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Construction (Project Only)	0.000051	0.00013	0.000035	0.000026	0.000058	0.000043	0.00026	0.0009	0.00018	0.0003	0.00017	0.000087	0.0014	0.00067	0.0089	0.0002	0.023	0.022	0.00014	-	-	-
Construction (Existing Conditions+Project)	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.28	0.28	0.26	-	-	-
Operations (Project Only)	0.000069	0.00014	0.000052	0.00003	0.000072	0.000062	0.0053	0.00071	0.00028	0.0003	0.00052	0.00016	0.0012	0.00066	0.0051	0.0015	0.01	0.011	0.00022	0.0001	0.00017	0.00089
Operations (Existing Conditions+Project)	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.27	0.27	0.26	0.26	0.26	0.26

Notes:
- = not available
Shaded value = hazard quotient greater than 1.0

Attachment 4

Table 4H: Risk Estimates for Chronic Inhalation HHRA - Camper

Cariboo Gold Project

Wells, BC

Hazard Quotients for Camper

Constituent of Potential Concern	Chisholm Creek Rec Site	Nine Mile Lake Rec Site	Barkerville Provincial Park Campground	Forest Rose Campground	Government Hill Campground	Little Lake Rec Site	Maude Lake Rec Site	Prior Lake Rec Site
Existing Conditions								
Nitrogen Dioxide	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
PM2.5	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
PM10	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
Construction								
Nitrogen Dioxide (Project Only)	0.000088	0.00043	0.00073	0.00072	0.00044	-	-	-
Nitrogen Dioxide (Existing Conditions+Project	0.28	0.28	0.28	0.28	0.28	-	-	-
Nitrogen Dioxide (ARM Conversion)	0.28	0.28	0.28	0.28	0.28	-	-	-
PM2.5 (Project Only)	0.000036	0.00018	0.0003	0.00029	0.00018	-	-	-
PM2.5 (Existing Conditions+Project)	0.51	0.51	0.51	0.51	0.51	-	-	-
PM10 (Project Only)	0.000051	0.00024	0.00041	0.00041	0.00025	-	-	-
PM10 (Existing Conditions+Project)	0.36	0.36	0.36	0.36	0.36	-	-	-
Operations								
Nitrogen Dioxide (Project Only)	0.000054	0.00023	0.00036	0.00036	0.00024	0.00004	0.000048	0.000029
Nitrogen Dioxide (Existing Conditions+Project	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Nitrogen Dioxide (ARM Conversion)	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
PM2.5 (Project Only)	0.00024	0.00031	0.00053	0.00054	0.00037	0.00014	0.00019	0.0001
PM2.5 (Existing Conditions+Project)	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
PM10 (Project Only)	0.00036	0.00035	0.00072	0.00072	0.00054	0.00027	0.00045	0.00019
PM10 (Existing Conditions+Project)	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36

Notes:

- = not available

Shaded value = hazard quotient greater than 0.2 or 1.0

Target Organ Sums for Camper

Respiratory Effects	Chisholm Creek Rec Site	Nine Mile Lake Rec Site	Barkerville Provincial Park Campground	Forest Rose Campground	Government Hill Campground	Little Lake Rec Site	Maude Lake Rec Site	Prior Lake Rec Site
Existing Conditions	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Construction (Project Only)	0.00017	0.00085	0.0014	0.0014	0.00086	-	-	-
Construction (Existing Conditions+Project)	1.2	1.2	1.2	1.2	1.2	-	-	-
Operations (Project Only)	0.00066	0.00088	0.0016	0.0016	0.0011	0.00045	0.00069	0.00032
Operations (Existing Conditions+Project)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

Notes:

- = not available

Shaded value = hazard quotient greater than 1.0

Table 4I: Risk Estimates for Chronic Inhalation HHRA - Sport Fisher / Hunter
Cariboo Gold Project
Wells, BC

Hazard Quotients for Sport Fisher/Hunter

Constituent of Potential Concern	Cariboo Wagon Road (Stanley to Barkerville)	Trapline TR0515T017 Cabin	Cow Mountain Trails 1	Williams Creek Trail	Water Access – Jack of Clubs Lake	Outfitter Area	Trapline TR0515T020 Cabin 1	Trapline TR0515T020 Cabin 2	Trail Buffer 3	SW2	Trapline TR0502T045
Existing Conditions											
Nitrogen Dioxide	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
PM2.5	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
PM10	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Diesel Particulate Matter					-	-					
Acrolein					-						
Construction											
Nitrogen Dioxide (Project Only)	0.000048	0.000058	0.00085	0.000083	0.017	0.0074	-	-	-	-	-
Nitrogen Dioxide (Existing Conditions+Project)	0.12	0.12	0.12	0.12	0.13	0.12	-	-	-	-	-
Nitrogen Dioxide (ARM Conversion)	0.12	0.12	0.12	0.12	0.13	0.12	-	-	-	-	-
PM2.5 (Project Only)	0.00002	0.000023	0.00034	0.000034	0.0067	0.0029	-	-	-	-	-
PM2.5 (Existing Conditions+Project)	0.21	0.21	0.21	0.21	0.22	0.22	-	-	-	-	-
PM10 (Project Only)	0.000027	0.000032	0.0005	0.000046	0.011	0.0048	-	-	-	-	-
PM10 (Existing Conditions+Project)	0.15	0.15	0.15	0.15	0.16	0.16	-	-	-	-	-
Diesel Particulate Matter					0.0037	0.0016					
Acrolein					0.0041						
Operations											
Nitrogen Dioxide (Project Only)	0.000029	0.000032	0.0003	0.000056	0.0044	0.0017	0.000019	0.000016	0.00015	0.00011	0.00024
Nitrogen Dioxide (Existing Conditions+Project)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Nitrogen Dioxide (ARM Conversion)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
PM2.5 (Project Only)	0.000045	0.000041	0.00047	0.000093	0.0058	0.0023	0.000067	0.000059	0.00044	0.00045	0.0014
PM2.5 (Existing Conditions+Project)	0.21	0.21	0.21	0.21	0.22	0.21	0.21	0.21	0.21	0.21	0.21
PM10 (Project Only)	0.000054	0.000046	0.00057	0.00015	0.0076	0.0027	0.00013	0.00012	0.00071	0.0011	0.0037
PM10 (Existing Conditions+Project)	0.15	0.15	0.15	0.15	0.16	0.15	0.15	0.15	0.15	0.15	0.15
Diesel Particulate Matter					0.00073	0.00027					
Acrolein					0.00018						

Notes:
- = not available
Blank = not a COPC at receptor location
Shaded value = hazard quotient greater than 0.2 or 1.0

Incremental Lifetime Cancer Risks for Sport Fisher/Hunter

Constituent of Potential Concern	Cariboo Wagon Road (Stanley to Barkerville)	Trapline TR0515T017 Cabin	Cow Mountain Trails 1	Williams Creek Trail	Water Access – Jack of Clubs Lake	Outfitter Area	Trapline TR0515T020 Cabin 1	Trapline TR0515T020 Cabin 2	Trail Buffer 3	SW2	Trapline TR0502T045
Existing Conditions											
Diesel Particulate Matter	-	-	-	-	-	-	-	-	-	-	-
Construction											
Diesel Particulate Matter					4.7E-06	2.0E-06					
Operations											
Diesel Particulate Matter					9.3E-07	3.4E-07					

Notes:
- = not available
Blank = not a COPC at receptor location
Shaded value = incremental lifetime cancer risk greater than $1x10^{-5}$

Target Organ Sums for Sport Fisher/Hunter

Respiratory Effects	Cariboo Wagon Road (Stanley to Barkerville)	Trapline TR0515T017 Cabin	Cow Mountain Trails 1	Williams Creek Trail	Water Access – Jack of Clubs Lake	Outfitter Area	Trapline TR0515T020 Cabin 1	Trapline TR0515T020 Cabin 2	Trail Buffer 3	SW2	Trapline TR0502T045
Existing Conditions	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Construction (Project Only)	0.000095	0.00011	0.0017	0.00016	0.042	0.017	-	-	-	-	-
Construction (Existing Conditions+Project)	0.48	0.48	0.48	0.48	0.52	0.49	-	-	-	-	-
Operations (Project Only)	0.00013	0.00012	0.0013	0.0003	0.019	0.0069	0.00021	0.00019	0.0013	0.0017	0.0053
Operations (Existing Conditions+Project)	0.48	0.48	0.48	0.48	0.5	0.49	0.48	0.48	0.48	0.48	0.49

Notes:
- = not available
Shaded value = hazard quotient greater than 1.0

Attachment 4

Table 4J: Risk Estimates for Chronic Inhalation HHRA - Mine Camp Worker
Cariboo Gold Project
Wells, BC

Hazard Quotients for Mine Camp Worker

Constituent of Potential Concern	Mine Site Camp	QR Mill Camp
Existing Conditions		
Nitrogen Dioxide	0.23	0.23
PM2.5	0.42	0.42
PM10	0.3	0.3
Diesel Particulate Matter	-	
Arsenic		0.00013
Iron		0.038
Operations		
Nitrogen Dioxide (Project Only)	0.073	0.034
Nitrogen Dioxide (Existing Conditions+Project)	0.31	0.27
Nitrogen Dioxide (ARM Conversion)	0.29	0.26
PM2.5 (Project Only)	0.12	0.094
PM2.5 (Existing Conditions+Project)	0.54	0.52
PM10 (Project Only)	0.13	0.093
PM10 (Existing Conditions+Project)	0.43	0.39
Diesel Particulate Matter	0.013	
Arsenic (Project Only)		0.0037
Arsenic (Existing Conditions+Project)		0.0038
Iron (Project Only)		0.32
Iron (Existing Conditions+Project)		0.36

Notes:
- = not available
Blank = not a COPC at receptor location
Shaded value = hazard quotient greater than 0.2 or 1.0

Incremental Lifetime Cancer Risks for Mine Camp Worker

Constituent of Potential Concern	Mine Site Camp	QR Mill Camp
Existing Conditions		
Diesel Particulate Matter	-	
Arsenic		3.7E-07
Operations		
Diesel Particulate Matter	8.3E-06	
Arsenic (Project Only)		1.0E-05
Arsenic (Existing Conditions+Project)		1.1E-05

Notes:
- = not available
Blank = not a COPC at receptor location
Shaded value = incremental lifetime cancer risk greater than $1x10^{-5}$

Target Organ Sums for Sport Fisher/Hunter

Respiratory Effects	Mine Site Camp	QR Mill Camp
Existing Conditions	0.96	1.0
Operations (Project Only)	0.33	0.55
Operations (Existing Conditions+Project)	1.3	1.5

Notes:
Shaded value = hazard quotient greater than 1.0

Table 2A: Risk Estimates - Non-Indigenous Resident
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Wells Baseball Diamond															
Cobalt	0.13	0.13	0.13	0.13	0.13	0.011	0.012	0.011	0.011	0.011	0.013	0.013	0.013	0.012	0.012
Manganese	0.15	0.15	0.15	0.15	0.15	0.017	0.022	0.018	0.017	0.017	0.019	0.025	0.02	0.019	0.019
Methylmercury	0.019	0.029	0.031	0.028	0.029	0.0042	0.0063	0.0067	0.006	0.0063	0.011	0.017	0.018	0.016	0.017
Molybdenum	0.0017	0.0016	0.0016	0.0017	0.0017	0.00067	0.00065	0.00065	0.00067	0.00067	0.00076	0.00073	0.00073	0.00075	0.00075
Selenium	0.021	0.043	0.084	0.053	0.03	0.012	0.024	0.047	0.03	0.017	0.013	0.027	0.053	0.033	0.019
Wells Elementary School															
Cobalt	0.13	0.13	0.13	0.13	0.13	0.011	0.011	0.011	0.011	0.011	0.013	0.013	0.013	0.012	0.012
Manganese	0.15	0.15	0.15	0.15	0.15	0.017	0.018	0.017	0.017	0.017	0.019	0.02	0.019	0.019	0.019
Methylmercury	0.019	0.029	0.031	0.028	0.029	0.0042	0.0063	0.0067	0.006	0.0063	0.011	0.017	0.018	0.016	0.017
Molybdenum	0.0017	0.0016	0.0016	0.0017	0.0017	0.00067	0.00065	0.00065	0.00067	0.00067	0.00076	0.00073	0.00073	0.00075	0.00075
Selenium	0.021	0.043	0.084	0.053	0.03	0.012	0.024	0.047	0.03	0.017	0.013	0.027	0.053	0.033	0.019
Nugget Hills RV Park															
Cobalt	0.13	0.13	0.13	0.13	0.13	0.011	0.011	0.011	0.011	0.011	0.013	0.013	0.013	0.012	0.013
Manganese	0.15	0.15	0.15	0.14	0.15	0.017	0.018	0.017	0.016	0.017	0.019	0.021	0.019	0.019	0.019
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.0017	0.0016	0.0016	0.0017	0.0017	0.00067	0.00065	0.00065	0.00067	0.00067	0.00076	0.00073	0.00073	0.00075	0.00076
Selenium	0.021	0.021	0.021	0.026	0.021	0.012	0.012	0.012	0.015	0.012	0.013	0.013	0.013	0.016	0.013
New Barkerville Residential															
Cobalt	0.13	0.13	0.13	0.13	0.13	0.011	0.011	0.011	0.011	0.011	0.013	0.012	0.012	0.013	0.013
Manganese	0.15	0.14	0.14	0.15	0.15	0.017	0.016	0.016	0.017	0.017	0.019	0.018	0.018	0.019	0.019
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.0017	0.0016	0.0016	0.0017	0.0017	0.00067	0.00065	0.00065	0.00067	0.00067	0.00076	0.00073	0.00073	0.00076	0.00076
Selenium	0.021	0.021	0.021	0.021	0.021	0.012	0.012	0.012	0.012	0.012	0.013	0.013	0.013	0.013	0.013

Notes
Shaded value indicates hazard quotient greater than 0.2.

Table 2B: Risk Estimates - Indigenous Resident
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Wells Baseball Diamond															
Cobalt	0.78	1.0	1.0	0.74	0.74	0.46	0.65	0.65	0.44	0.44	0.31	0.44	0.44	0.3	0.3
Manganese	1.5	1.6	1.6	1.5	1.5	0.41	0.45	0.44	0.4	0.4	0.32	0.35	0.34	0.31	0.31
Methylmercury	0.67	1.0	1.1	0.96	1.0	0.13	0.2	0.21	0.19	0.2	0.2	0.3	0.32	0.28	0.3
Molybdenum	0.016	0.021	0.023	0.017	0.017	0.0064	0.0096	0.011	0.0074	0.007	0.005	0.0073	0.008	0.0057	0.0055
Selenium	0.52	1.3	2.8	1.7	0.85	0.27	0.69	1.5	0.88	0.44	0.17	0.44	0.93	0.56	0.28
Wells Elementary School															
Cobalt	0.78	1.0	1.0	0.74	0.74	0.46	0.65	0.65	0.44	0.44	0.31	0.44	0.44	0.3	0.3
Manganese	1.5	1.6	1.6	1.5	1.5	0.41	0.44	0.44	0.4	0.4	0.32	0.34	0.34	0.31	0.31
Methylmercury	0.67	1.0	1.1	0.96	1.0	0.13	0.2	0.21	0.19	0.2	0.2	0.3	0.32	0.28	0.3
Molybdenum	0.016	0.021	0.023	0.017	0.017	0.0064	0.0096	0.011	0.0074	0.007	0.005	0.0073	0.008	0.0057	0.0055
Selenium	0.52	1.3	2.8	1.7	0.85	0.27	0.69	1.5	0.88	0.44	0.17	0.44	0.93	0.56	0.28
Nugget Hills RV Park															
Cobalt	0.78	1.0	1.0	0.74	0.78	0.46	0.65	0.65	0.44	0.46	0.31	0.44	0.44	0.3	0.31
Manganese	1.5	1.6	1.6	1.5	1.5	0.41	0.44	0.44	0.39	0.41	0.32	0.34	0.34	0.31	0.32
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.016	0.021	0.023	0.017	0.017	0.0064	0.0096	0.011	0.0074	0.0071	0.005	0.0073	0.008	0.0057	0.0055
Selenium	0.52	0.56	0.6	0.76	0.53	0.27	0.3	0.33	0.4	0.28	0.17	0.19	0.22	0.26	0.18
New Barkerville Residential															
Cobalt	0.78	1.0	1.0	0.78	0.78	0.46	0.65	0.65	0.46	0.46	0.31	0.44	0.44	0.31	0.31
Manganese	1.5	1.6	1.6	1.5	1.5	0.41	0.44	0.44	0.41	0.41	0.32	0.34	0.34	0.32	0.32
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.016	0.021	0.023	0.017	0.017	0.0064	0.0096	0.011	0.0075	0.0071	0.005	0.0073	0.008	0.0058	0.0055
Selenium	0.52	0.56	0.6	0.57	0.53	0.27	0.3	0.33	0.31	0.28	0.17	0.19	0.22	0.2	0.18

Notes
Shaded value indicates hazard quotient greater than 0.2.

Table 2C: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Cariboo Wagon Road (Stanley to Barkerville)															
Cobalt	0.67	0.93	0.93	0.67	0.67	0.45	0.65	0.65	0.45	0.45	0.3	0.43	0.43	0.3	0.3
Manganese	1.4	1.5	1.5	1.4	1.4	0.44	0.47	0.47	0.44	0.44	0.38	0.4	0.4	0.38	0.38
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.028	0.033	0.034	0.029	0.029	0.0091	0.012	0.013	0.01	0.0097	0.0072	0.0093	0.01	0.0079	0.0077
Selenium	0.52	0.55	0.6	0.56	0.52	0.26	0.29	0.33	0.3	0.27	0.17	0.19	0.21	0.19	0.17
Jubilee Trail															
Cobalt	0.55	0.82	0.82	0.56	0.56	0.4	0.59	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.3	1.4	1.4	1.3	1.3	0.4	0.43	0.43	0.4	0.4	0.34	0.36	0.36	0.34	0.34
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.026	0.031	0.033	0.028	0.027	0.0085	0.012	0.013	0.0095	0.0091	0.0066	0.0087	0.0095	0.0073	0.0071
Selenium	0.034	0.068	0.12	0.081	0.043	0.02	0.048	0.087	0.058	0.027	0.014	0.033	0.059	0.04	0.019
Proserpine Trail															
Cobalt	0.55	0.82	0.82	0.56	0.56	0.4	0.59	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.3	1.4	1.4	1.3	1.3	0.4	0.43	0.43	0.4	0.4	0.34	0.36	0.36	0.34	0.34
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.026	0.031	0.033	0.028	0.027	0.0085	0.012	0.013	0.0095	0.0091	0.0066	0.0087	0.0095	0.0073	0.0071
Selenium	0.034	0.068	0.12	0.081	0.043	0.02	0.048	0.087	0.058	0.027	0.014	0.033	0.059	0.04	0.019
Sugar Creek Loop Trail															
Cobalt	0.55	0.82	0.82	0.56	0.56	0.4	0.59	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.3	1.4	1.4	1.3	1.3	0.4	0.43	0.43	0.4	0.4	0.34	0.36	0.36	0.34	0.34
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.026	0.031	0.033	0.028	0.027	0.0085	0.012	0.013	0.0095	0.0091	0.0066	0.0087	0.0095	0.0073	0.0071
Selenium	0.034	0.068	0.12	0.081	0.043	0.02	0.048	0.087	0.058	0.027	0.014	0.033	0.059	0.04	0.019
Yanks Peak Trail															
Cobalt	0.55	0.82	0.82	0.56	0.56	0.4	0.59	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.3	1.4	1.4	1.3	1.3	0.4	0.43	0.43	0.4	0.4	0.34	0.36	0.36	0.34	0.34
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.026	0.031	0.033	0.028	0.027	0.0085	0.012	0.013	0.0095	0.0091	0.0066	0.0087	0.0095	0.0073	0.0071
Selenium	0.034	0.068	0.12	0.081	0.043	0.02	0.048	0.087	0.058	0.027	0.014	0.033	0.059	0.04	0.019

Appendix 7.13-9
Attachment 2
Table 2C: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Groundhog Lake Ski Trail															
Cobalt	0.67	0.93	0.93	0.67	0.67	0.45	0.65	0.65	0.45	0.45	0.3	0.43	0.43	0.3	0.3
Manganese	1.4	1.5	1.5	1.4	1.4	0.44	0.47	0.47	0.44	0.44	0.38	0.4	0.4	0.38	0.38
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.027	0.032	0.034	0.029	0.028	0.0088	0.012	0.013	0.0098	0.0094	0.0068	0.0089	0.0097	0.0076	0.0073
Selenium	0.52	0.55	0.6	0.56	0.52	0.26	0.29	0.33	0.3	0.27	0.17	0.19	0.21	0.19	0.17
Chisholm Creek Rec Site															
Cobalt	0.55	0.82	0.82	0.56	0.56	0.4	0.59	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.3	1.4	1.4	1.3	1.3	0.4	0.43	0.43	0.4	0.4	0.34	0.36	0.36	0.34	0.34
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.026	0.031	0.033	0.028	0.027	0.0085	0.012	0.013	0.0095	0.0091	0.0066	0.0087	0.0095	0.0073	0.0071
Selenium	0.034	0.068	0.12	0.081	0.043	0.02	0.048	0.087	0.058	0.027	0.014	0.033	0.059	0.04	0.019
Nine Mile Lake Rec Site															
Cobalt	0.55	0.82	0.82	0.56	0.56	0.4	0.59	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.3	1.4	1.4	1.3	1.3	0.4	0.43	0.43	0.4	0.4	0.34	0.36	0.36	0.34	0.34
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.026	0.031	0.033	0.028	0.027	0.0085	0.012	0.013	0.0095	0.0091	0.0066	0.0087	0.0095	0.0073	0.0071
Selenium	0.034	0.068	0.12	0.081	0.043	0.02	0.048	0.087	0.058	0.027	0.014	0.033	0.059	0.04	0.019
Trail Buffer 1 - Legal Objective															
Cobalt	0.55	0.82	0.82	0.56	0.56	0.4	0.59	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.3	1.4	1.4	1.3	1.3	0.4	0.43	0.43	0.4	0.4	0.34	0.36	0.36	0.34	0.34
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.026	0.031	0.033	0.028	0.027	0.0085	0.012	0.013	0.0095	0.0091	0.0066	0.0087	0.0095	0.0073	0.0071
Selenium	0.034	0.068	0.12	0.081	0.043	0.02	0.048	0.087	0.058	0.027	0.014	0.033	0.059	0.04	0.019
Viewing Point along Hwy 26															
Cobalt	0.67	0.93	0.93	0.67	0.67	0.45	0.65	0.65	0.45	0.45	0.3	0.43	0.43	0.3	0.3
Manganese	1.6	1.6	1.6	1.6	1.6	0.51	0.54	0.54	0.51	0.51	0.46	0.47	0.48	0.46	0.45
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.027	0.032	0.034	0.029	0.028	0.0088	0.012	0.013	0.0098	0.0094	0.0068	0.009	0.0097	0.0076	0.0073
Selenium	0.52	0.55	0.6	0.56	0.53	0.26	0.29	0.33	0.3	0.27	0.17	0.19	0.21	0.2	0.17

Table 2C: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Trapline TR0515T017 Cabin															
Cobalt	0.55	0.82	0.82	0.56	0.56	0.4	0.59	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.3	1.4	1.4	1.3	1.3	0.4	0.43	0.43	0.4	0.4	0.34	0.36	0.36	0.34	0.34
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.026	0.031	0.033	0.028	0.027	0.0085	0.012	0.013	0.0095	0.0091	0.0066	0.0087	0.0095	0.0073	0.0071
Selenium	0.034	0.068	0.12	0.081	0.043	0.02	0.048	0.087	0.058	0.027	0.014	0.033	0.059	0.04	0.019
Highway 26 Transect 200 m															
Cobalt	0.67	0.93	0.93	0.67	0.67	0.45	0.65	0.65	0.45	0.45	0.3	0.43	0.43	0.3	0.3
Manganese	1.6	1.6	1.6	1.6	1.6	0.51	0.54	0.54	0.51	0.51	0.46	0.47	0.47	0.46	0.45
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.027	0.032	0.034	0.029	0.028	0.0088	0.012	0.013	0.0098	0.0094	0.0068	0.009	0.0097	0.0076	0.0073
Selenium	0.52	0.55	0.6	0.56	0.53	0.26	0.29	0.33	0.3	0.27	0.17	0.19	0.21	0.2	0.17
Cow Mountain Trails 1															
Cobalt	0.67	0.94	0.94	0.68	0.67	0.45	0.65	0.65	0.45	0.45	0.3	0.43	0.43	0.3	0.3
Manganese	1.6	1.6	1.6	1.6	1.6	0.45	0.47	0.47	0.44	0.44	0.36	0.37	0.37	0.36	0.35
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.014	0.02	0.021	0.016	0.016	0.006	0.009	0.01	0.007	0.0066	0.0045	0.0066	0.0074	0.0053	0.005
Selenium	0.52	0.55	0.6	0.56	0.53	0.27	0.29	0.33	0.3	0.27	0.17	0.19	0.21	0.2	0.17
Cow Mountain Trails 2															
Cobalt	0.67	0.94	0.94	0.68	0.68	0.45	0.65	0.65	0.45	0.45	0.3	0.43	0.43	0.3	0.3
Manganese	1.6	1.6	1.6	1.6	1.6	0.44	0.46	0.46	0.43	0.43	0.35	0.37	0.37	0.35	0.35
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.016	0.021	0.022	0.017	0.017	0.0066	0.0097	0.011	0.0076	0.0072	0.0052	0.0073	0.0081	0.0059	0.0057
Selenium	0.52	0.55	0.6	0.56	0.53	0.27	0.29	0.33	0.3	0.27	0.17	0.19	0.21	0.2	0.17
Jubilee Trail / Wendle Park															
Cobalt	0.56	0.82	0.83	0.56	0.56	0.4	0.59	0.59	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.5	1.5	1.5	1.5	1.5	0.4	0.42	0.42	0.39	0.39	0.32	0.33	0.33	0.31	0.31
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.014	0.019	0.02	0.015	0.015	0.0057	0.0087	0.0098	0.0067	0.0063	0.0043	0.0064	0.0072	0.005	0.0048
Selenium	0.034	0.069	0.12	0.081	0.043	0.02	0.048	0.087	0.058	0.027	0.014	0.033	0.059	0.04	0.019

Table 2C: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Ned's Connector Trail															
Cobalt	0.67	0.94	0.94	0.64	0.68	0.45	0.65	0.65	0.44	0.45	0.3	0.43	0.43	0.29	0.3
Manganese	1.6	1.6	1.6	1.7	1.6	0.44	0.46	0.47	0.53	0.43	0.35	0.37	0.37	0.46	0.35
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.016	0.021	0.022	0.017	0.017	0.0066	0.0097	0.011	0.0077	0.0072	0.0052	0.0073	0.0081	0.006	0.0057
Selenium	0.52	0.55	0.6	1.3	0.53	0.27	0.29	0.33	0.69	0.27	0.17	0.19	0.21	0.44	0.17
Williams Creek Trail															
Cobalt	0.68	0.94	0.94	0.68	0.68	0.45	0.65	0.65	0.45	0.45	0.3	0.43	0.43	0.3	0.3
Manganese	1.6	1.6	1.6	1.6	1.6	0.44	0.47	0.47	0.44	0.44	0.36	0.37	0.37	0.35	0.35
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.014	0.02	0.021	0.016	0.015	0.006	0.009	0.01	0.007	0.0066	0.0045	0.0066	0.0074	0.0052	0.005
Selenium	0.52	0.55	0.6	0.56	0.53	0.27	0.29	0.33	0.3	0.27	0.17	0.19	0.21	0.2	0.17
Cornish X-Country Ski Trail 1															
Cobalt	0.68	0.94	0.94	0.68	0.68	0.45	0.65	0.65	0.45	0.45	0.3	0.43	0.43	0.3	0.3
Manganese	1.7	1.7	1.7	1.7	1.7	0.49	0.52	0.52	0.49	0.49	0.41	0.43	0.43	0.41	0.41
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.015	0.02	0.021	0.016	0.016	0.006	0.0091	0.01	0.0071	0.0067	0.0046	0.0067	0.0074	0.0053	0.005
Selenium	0.52	0.55	0.6	0.56	0.53	0.26	0.29	0.33	0.3	0.27	0.17	0.19	0.21	0.2	0.17
Cornish X-Country Ski Trail 2															
Cobalt	0.68	0.94	0.94	0.68	0.68	0.45	0.65	0.65	0.45	0.45	0.3	0.43	0.43	0.3	0.3
Manganese	1.9	1.9	1.9	1.9	1.9	0.63	0.65	0.65	0.62	0.62	0.56	0.58	0.58	0.56	0.56
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.014	0.02	0.021	0.016	0.016	0.006	0.0091	0.01	0.007	0.0066	0.0045	0.0067	0.0074	0.0053	0.005
Selenium	0.52	0.55	0.6	0.56	0.53	0.27	0.29	0.33	0.3	0.27	0.17	0.19	0.21	0.2	0.17
Cornish X-Country Ski Trail 3															
Cobalt	0.67	0.94	0.94	0.64	0.64	0.45	0.65	0.65	0.43	0.43	0.3	0.43	0.44	0.29	0.29
Manganese	1.6	1.7	1.8	1.7	1.6	0.44	0.51	0.58	0.48	0.45	0.36	0.42	0.49	0.4	0.37
Methylmercury	0.67	1.0	1.1	0.96	1.0	0.13	0.2	0.21	0.19	0.2	0.2	0.3	0.32	0.28	0.3
Molybdenum	0.015	0.022	0.031	0.02	0.016	0.0062	0.011	0.016	0.0096	0.0072	0.0048	0.0085	0.014	0.0081	0.0056
Selenium	0.52	1.3	2.8	1.7	0.85	0.27	0.69	1.5	0.88	0.44	0.17	0.44	0.93	0.56	0.28

Appendix 7.13-9
Attachment 2
Table 2C: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Groundhog Lake Snowmobile Trail															
Cobalt	0.7	0.96	0.96	0.64	0.7	0.46	0.66	0.66	0.43	0.46	0.31	0.44	0.45	0.29	0.32
Manganese	2.0	2.1	2.1	1.6	2.0	0.69	0.71	0.72	0.45	0.68	0.63	0.65	0.65	0.37	0.63
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.029	0.034	0.036	0.016	0.03	0.015	0.018	0.019	0.007	0.015	0.014	0.016	0.017	0.0052	0.015
Selenium	0.69	0.73	0.77	0.76	0.7	0.38	0.4	0.44	0.4	0.38	0.29	0.31	0.34	0.26	0.3
Barkerville Provincial Park Campground															
Cobalt	0.68	0.94	0.94	0.68	0.68	0.45	0.65	0.65	0.45	0.45	0.3	0.43	0.43	0.3	0.3
Manganese	1.6	1.7	1.7	1.6	1.6	0.46	0.49	0.49	0.46	0.46	0.38	0.39	0.39	0.37	0.37
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.015	0.02	0.022	0.017	0.016	0.0063	0.0094	0.01	0.0073	0.0069	0.0049	0.007	0.0077	0.0056	0.0053
Selenium	0.52	0.55	0.6	0.56	0.52	0.26	0.29	0.33	0.3	0.27	0.17	0.19	0.21	0.19	0.17
Forest Rose Campground															
Cobalt	0.61	0.88	0.88	0.61	0.61	0.42	0.62	0.62	0.42	0.42	0.28	0.41	0.41	0.28	0.28
Manganese	2.3	2.3	2.3	2.3	2.3	0.84	0.87	0.87	0.84	0.84	0.81	0.82	0.82	0.81	0.81
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.015	0.02	0.022	0.017	0.016	0.0064	0.0094	0.01	0.0074	0.007	0.0049	0.007	0.0078	0.0057	0.0054
Selenium	0.57	0.6	0.65	0.61	0.58	0.29	0.32	0.36	0.33	0.3	0.19	0.2	0.23	0.21	0.19
Government Hill Campground															
Cobalt	0.68	0.94	0.94	0.68	0.68	0.45	0.65	0.65	0.45	0.45	0.3	0.43	0.43	0.3	0.3
Manganese	1.6	1.6	1.6	1.6	1.6	0.45	0.47	0.47	0.44	0.44	0.36	0.38	0.38	0.36	0.36
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.015	0.02	0.022	0.017	0.016	0.0064	0.0095	0.011	0.0074	0.007	0.005	0.0071	0.0078	0.0057	0.0054
Selenium	0.52	0.55	0.6	0.56	0.53	0.27	0.29	0.33	0.3	0.27	0.17	0.19	0.21	0.2	0.17
Water Access – Jack of Clubs Lake															
Cobalt	0.61	0.88	0.9	0.62	0.58	0.42	0.62	0.63	0.42	0.41	0.28	0.42	0.43	0.29	0.27
Manganese	1.6	1.8	2.0	1.8	1.7	0.46	0.56	0.67	0.57	0.48	0.39	0.48	0.59	0.5	0.4
Methylmercury	8.9	14	14	14	14	1.8	2.7	2.7	2.7	2.7	2.6	4.1	4.1	4.0	4.0
Molybdenum	0.015	0.2	0.52	0.33	0.07	0.0061	0.08	0.21	0.13	0.028	0.0046	0.053	0.14	0.085	0.019
Selenium	0.57	2.0	4.5	3.0	0.97	0.29	1.0	2.3	1.5	0.5	0.19	0.64	1.5	0.97	0.32

Table 2C: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Valley Mountain Pass															
Cobalt	0.68	0.94	0.94	0.68	0.68	0.45	0.65	0.65	0.45	0.45	0.3	0.43	0.43	0.3	0.3
Manganese	1.9	2.0	2.0	1.9	1.9	0.63	0.66	0.66	0.62	0.62	0.56	0.59	0.58	0.56	0.56
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.015	0.02	0.021	0.016	0.016	0.006	0.0091	0.01	0.0071	0.0067	0.0046	0.0067	0.0074	0.0053	0.005
Selenium	0.52	0.55	0.6	0.56	0.53	0.27	0.29	0.33	0.3	0.27	0.17	0.19	0.21	0.2	0.17
Historic Barkerville Town and Park															
Cobalt	0.68	0.94	0.94	0.68	0.68	0.45	0.65	0.65	0.45	0.45	0.3	0.43	0.43	0.3	0.3
Manganese	1.6	1.6	1.6	1.6	1.6	0.45	0.47	0.47	0.44	0.44	0.36	0.38	0.38	0.36	0.36
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.015	0.02	0.022	0.017	0.016	0.0064	0.0095	0.011	0.0074	0.007	0.005	0.0071	0.0078	0.0057	0.0054
Selenium	0.52	0.55	0.6	0.56	0.53	0.27	0.29	0.33	0.3	0.27	0.17	0.19	0.21	0.2	0.17
Outfitter Area															
Cobalt	0.61	0.88	0.9	0.62	0.58	0.42	0.62	0.63	0.42	0.41	0.28	0.42	0.43	0.29	0.27
Manganese	1.6	1.8	2.0	1.8	1.7	0.46	0.56	0.67	0.57	0.48	0.39	0.47	0.59	0.5	0.4
Methylmercury	8.9	14	14	14	14	1.8	2.7	2.7	2.7	2.7	2.6	4.1	4.1	4.0	4.0
Molybdenum	0.015	0.2	0.52	0.33	0.07	0.0061	0.08	0.21	0.13	0.028	0.0046	0.053	0.14	0.085	0.019
Selenium	0.57	2.0	4.5	3.0	0.97	0.29	1.0	2.3	1.5	0.5	0.19	0.64	1.5	0.97	0.32
Le Bourdais Lake															
Cobalt	0.57	0.84	0.84	0.57	0.57	0.4	0.6	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.2	1.2	1.2	1.1	1.1	0.32	0.35	0.34	0.31	0.31	0.25	0.27	0.26	0.25	0.25
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.18	0.18	0.19	0.18	0.18	0.046	0.049	0.05	0.047	0.046	0.04	0.042	0.043	0.041	0.041
Selenium	0.027	0.062	0.11	0.074	0.036	0.018	0.046	0.085	0.056	0.025	0.012	0.031	0.057	0.038	0.017
Quesnel Forks															
Cobalt	0.57	0.84	0.84	0.57	0.57	0.4	0.6	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.2	1.2	1.2	1.1	1.1	0.32	0.35	0.34	0.31	0.31	0.25	0.27	0.26	0.25	0.25
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.18	0.18	0.19	0.18	0.18	0.046	0.049	0.05	0.047	0.046	0.04	0.042	0.043	0.041	0.041
Selenium	0.027	0.062	0.11	0.074	0.036	0.018	0.046	0.085	0.056	0.025	0.012	0.031	0.057	0.038	0.017

Table 2C: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Little Lake Rec Site															
Cobalt	0.57	0.84	0.84	0.57	0.57	0.4	0.6	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.2	1.2	1.2	1.1	1.1	0.32	0.35	0.34	0.31	0.31	0.25	0.27	0.26	0.25	0.25
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.18	0.18	0.19	0.18	0.18	0.046	0.049	0.05	0.047	0.046	0.04	0.042	0.043	0.041	0.041
Selenium	0.027	0.062	0.11	0.074	0.036	0.018	0.046	0.085	0.056	0.025	0.012	0.031	0.057	0.038	0.017
Maude Lake Rec Site															
Cobalt	0.57	0.84	0.84	0.57	0.57	0.4	0.6	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.2	1.2	1.2	1.1	1.1	0.32	0.35	0.34	0.31	0.31	0.25	0.27	0.26	0.25	0.25
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.18	0.18	0.19	0.18	0.18	0.046	0.049	0.05	0.047	0.046	0.04	0.042	0.043	0.041	0.041
Selenium	0.027	0.062	0.11	0.074	0.036	0.018	0.046	0.085	0.056	0.025	0.012	0.031	0.057	0.038	0.017
Prior Lake Rec Site															
Cobalt	0.57	0.84	0.84	0.57	0.57	0.4	0.6	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.2	1.2	1.2	1.1	1.1	0.32	0.35	0.34	0.31	0.31	0.25	0.27	0.26	0.25	0.25
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.18	0.18	0.19	0.18	0.18	0.046	0.049	0.05	0.047	0.046	0.04	0.042	0.043	0.041	0.041
Selenium	0.027	0.062	0.11	0.074	0.036	0.018	0.046	0.085	0.056	0.025	0.012	0.031	0.057	0.038	0.017
Trail Buffer 2															
Cobalt	0.57	0.84	0.84	0.57	0.57	0.4	0.6	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.2	1.2	1.2	1.1	1.1	0.32	0.35	0.34	0.31	0.31	0.25	0.27	0.27	0.25	0.25
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.18	0.18	0.19	0.18	0.18	0.046	0.049	0.05	0.047	0.046	0.04	0.042	0.043	0.041	0.041
Selenium	0.027	0.062	0.11	0.074	0.036	0.018	0.046	0.085	0.056	0.025	0.012	0.031	0.057	0.038	0.017
Trail Buffer 4															
Cobalt	0.57	0.84	0.84	0.57	0.57	0.4	0.6	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.2	1.2	1.2	1.1	1.1	0.32	0.35	0.34	0.31	0.31	0.25	0.27	0.26	0.25	0.25
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.18	0.18	0.19	0.18	0.18	0.046	0.049	0.05	0.047	0.046	0.04	0.042	0.043	0.041	0.041
Selenium	0.027	0.062	0.11	0.074	0.036	0.018	0.046	0.085	0.056	0.025	0.012	0.031	0.057	0.038	0.017

Table 2C: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
500 Road Transect 200 m															
Cobalt	0.69	0.95	0.95	0.69	0.69	0.46	0.65	0.65	0.46	0.46	0.31	0.44	0.44	0.31	0.31
Manganese	1.3	1.3	1.3	1.3	1.3	0.37	0.4	0.4	0.37	0.37	0.3	0.32	0.32	0.3	0.3
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.19	0.19	0.19	0.19	0.19	0.05	0.054	0.054	0.051	0.051	0.045	0.047	0.048	0.046	0.045
Selenium	0.51	0.55	0.59	0.56	0.52	0.26	0.29	0.33	0.3	0.27	0.17	0.19	0.21	0.19	0.17
Trapline TR0515T020 Cabin 1															
Cobalt	0.57	0.84	0.84	0.57	0.57	0.4	0.6	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.2	1.2	1.2	1.1	1.1	0.32	0.35	0.34	0.31	0.31	0.25	0.27	0.26	0.25	0.25
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.18	0.18	0.19	0.18	0.18	0.046	0.049	0.05	0.047	0.046	0.04	0.042	0.043	0.041	0.041
Selenium	0.027	0.062	0.11	0.074	0.036	0.018	0.046	0.085	0.056	0.025	0.012	0.031	0.057	0.038	0.017
Trapline TR0515T020 Cabin 2															
Cobalt	0.57	0.84	0.84	0.57	0.57	0.4	0.6	0.6	0.4	0.4	0.27	0.4	0.4	0.27	0.27
Manganese	1.2	1.2	1.2	1.1	1.1	0.32	0.35	0.34	0.31	0.31	0.25	0.27	0.26	0.25	0.25
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.18	0.18	0.19	0.18	0.18	0.046	0.049	0.05	0.047	0.046	0.04	0.042	0.043	0.041	0.041
Selenium	0.027	0.062	0.11	0.074	0.036	0.018	0.046	0.085	0.056	0.025	0.012	0.031	0.057	0.038	0.017
Trail Buffer 3															
Cobalt	0.64	1.0	1.0	0.72	0.71	0.42	0.67	0.67	0.46	0.46	0.28	0.45	0.45	0.31	0.31
Manganese	1.0	1.1	1.1	1.1	1.1	0.29	0.35	0.35	0.31	0.31	0.24	0.29	0.28	0.26	0.25
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.24	0.24	0.24	0.24	0.24	0.052	0.056	0.057	0.053	0.053	0.041	0.043	0.044	0.042	0.042
Selenium	0.029	2.9	3.0	3.0	2.9	0.019	1.5	1.6	1.5	1.5	0.013	0.96	0.99	0.97	0.95
SW2															
Cobalt	0.64	1.0	1.0	0.72	0.71	0.42	0.67	0.67	0.46	0.45	0.29	0.45	0.45	0.31	0.3
Manganese	1.1	1.3	2.7	2.1	1.1	0.3	0.43	1.3	0.91	0.35	0.25	0.37	1.3	0.94	0.31
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.24	0.25	0.25	0.24	0.24	0.056	0.062	0.063	0.055	0.053	0.046	0.05	0.051	0.043	0.042
Selenium	0.03	5.7	7.9	6.6	0.93	0.019	2.9	4.0	3.4	0.48	0.014	1.9	2.6	2.1	0.3

Appendix 7.13-9
Attachment 2
Table 2C: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Trapline TR0502T045															
Cobalt	0.75	1.0	1.0	0.75	0.75	0.47	0.67	0.67	0.47	0.47	0.32	0.45	0.45	0.32	0.32
Manganese	1.1	1.1	1.1	1.1	1.1	0.31	0.34	0.33	0.3	0.3	0.25	0.27	0.27	0.24	0.24
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.24	0.24	0.24	0.24	0.24	0.053	0.056	0.057	0.054	0.053	0.041	0.044	0.044	0.042	0.042
Selenium	0.51	0.55	0.59	0.56	0.52	0.26	0.29	0.33	0.3	0.27	0.17	0.19	0.21	0.19	0.17

Notes
Shaded value indicates hazard quotient greater than 0.2.

Table 2D: Risk Estimates - Hiker
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Cariboo Wagon Road (Stanley to Barkerville)										
Cobalt	0.002	0.0019	0.0019	0.002	0.002	0.00019	0.00015	0.00015	0.00019	0.00019
Manganese	0.059	0.058	0.058	0.059	0.059	0.0097	0.0091	0.0091	0.0097	0.0097
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00024	0.00023	0.00023	0.00024	0.00024	0.000065	0.000051	0.000051	0.000065	0.000065
Selenium	0.00049	0.00049	0.00049	0.00049	0.00049	0.00011	0.00011	0.00011	0.00011	0.00011
Jubilee Trail										
Cobalt	0.002	0.0019	0.0019	0.002	0.002	0.00019	0.00015	0.00015	0.00019	0.00019
Manganese	0.059	0.058	0.058	0.059	0.059	0.0097	0.0091	0.0091	0.0097	0.0097
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00024	0.00023	0.00023	0.00024	0.00024	0.000065	0.000051	0.000051	0.000065	0.000065
Selenium	0.00049	0.00049	0.00049	0.00049	0.00049	0.00011	0.00011	0.00011	0.00011	0.00011
Proserpine Trail										
Cobalt	0.002	0.0019	0.0019	0.002	0.002	0.00019	0.00015	0.00015	0.00019	0.00019
Manganese	0.059	0.058	0.058	0.059	0.059	0.0097	0.0091	0.0091	0.0097	0.0097
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00024	0.00023	0.00023	0.00024	0.00024	0.000065	0.000051	0.000051	0.000065	0.000065
Selenium	0.00049	0.00049	0.00049	0.00049	0.00049	0.00011	0.00011	0.00011	0.00011	0.00011
Sugar Creek Loop Trail										
Cobalt	0.002	0.0019	0.0019	0.002	0.002	0.00019	0.00015	0.00015	0.00019	0.00019
Manganese	0.059	0.058	0.058	0.059	0.059	0.0097	0.0091	0.0091	0.0097	0.0097
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00024	0.00023	0.00023	0.00024	0.00024	0.000065	0.000051	0.000051	0.000065	0.000065
Selenium	0.00049	0.00049	0.00049	0.00049	0.00049	0.00011	0.00011	0.00011	0.00011	0.00011

Table 2D: Risk Estimates - Hiker
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Yanks Peak Trail										
Cobalt	0.002	0.0019	0.0019	0.002	0.002	0.00019	0.00015	0.00015	0.00019	0.00019
Manganese	0.059	0.058	0.058	0.059	0.059	0.0097	0.0091	0.0091	0.0097	0.0097
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00024	0.00023	0.00023	0.00024	0.00024	0.000065	0.000051	0.000051	0.000065	0.000065
Selenium	0.00049	0.00049	0.00049	0.00049	0.00049	0.00011	0.00011	0.00011	0.00011	0.00011
Groundhog Lake Ski Trail										
Cobalt	0.002	0.0019	0.0019	0.002	0.002	0.00019	0.00015	0.00015	0.00019	0.00019
Manganese	0.059	0.058	0.058	0.059	0.059	0.0097	0.0091	0.0091	0.0097	0.0097
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00024	0.00023	0.00023	0.00024	0.00024	0.000065	0.000051	0.000051	0.000065	0.000065
Selenium	0.00049	0.00049	0.00049	0.00049	0.00049	0.00011	0.00011	0.00011	0.00011	0.00011
Viewing Point along Hwy 26										
Cobalt	0.002	0.0019	0.0019	0.002	0.002	0.00019	0.00015	0.00015	0.00019	0.00019
Manganese	0.059	0.058	0.058	0.059	0.059	0.0097	0.0091	0.0094	0.0097	0.0097
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00024	0.00023	0.00023	0.00024	0.00024	0.000065	0.000051	0.000051	0.000065	0.000065
Selenium	0.00049	0.00049	0.00049	0.00049	0.00049	0.00011	0.00011	0.00011	0.00011	0.00011
Cow Mountain Trails 1										
Cobalt	0.0052	0.0052	0.0052	0.0052	0.0052	0.00041	0.00037	0.00036	0.00041	0.00041
Manganese	0.072	0.072	0.072	0.072	0.072	0.012	0.012	0.012	0.012	0.012
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00011	0.000097	0.000097	0.00011	0.00011	0.000033	0.000019	0.000019	0.000033	0.000033
Selenium	0.00053	0.00053	0.00053	0.00053	0.00053	0.00011	0.00011	0.00011	0.00011	0.00011

Table 2D: Risk Estimates - Hiker
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Cow Mountain Trails 2										
Cobalt	0.0052	0.0052	0.0052	0.0052	0.0052	0.00041	0.00036	0.00036	0.00041	0.00041
Manganese	0.072	0.072	0.072	0.072	0.072	0.012	0.012	0.012	0.012	0.012
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00011	0.000097	0.000097	0.00011	0.00011	0.000033	0.000019	0.000019	0.000033	0.000033
Selenium	0.00053	0.00053	0.00053	0.00053	0.00053	0.00011	0.00011	0.00011	0.00011	0.00011
Jubilee Trail / Wendle Park										
Cobalt	0.0052	0.0052	0.0052	0.0052	0.0052	0.00041	0.00036	0.00036	0.00041	0.00041
Manganese	0.072	0.072	0.072	0.072	0.072	0.012	0.012	0.012	0.012	0.012
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00011	0.000097	0.000097	0.00011	0.00011	0.000033	0.000019	0.000019	0.000033	0.000033
Selenium	0.00053	0.00053	0.00053	0.00053	0.00053	0.00011	0.00011	0.00011	0.00011	0.00011
Ned's Connector Trail										
Cobalt	0.0052	0.0052	0.0052	0.0052	0.0052	0.00041	0.00036	0.00037	0.00041	0.00041
Manganese	0.072	0.072	0.072	0.072	0.072	0.012	0.012	0.012	0.012	0.012
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00011	0.000097	0.000097	0.00011	0.00011	0.000033	0.000019	0.000019	0.000033	0.000033
Selenium	0.00053	0.00053	0.00053	0.00053	0.00053	0.00011	0.00011	0.00011	0.00011	0.00011
Williams Creek Trail										
Cobalt	0.0052	0.0052	0.0052	0.0052	0.0052	0.00041	0.00036	0.00036	0.00041	0.00041
Manganese	0.072	0.072	0.072	0.072	0.072	0.012	0.012	0.012	0.012	0.012
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00011	0.000097	0.000097	0.00011	0.00011	0.000033	0.000019	0.000019	0.000033	0.000033
Selenium	0.00053	0.00053	0.00053	0.00053	0.00053	0.00011	0.00011	0.00011	0.00011	0.00011

Table 2D: Risk Estimates - Hiker
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Cornish X-Country Ski Trail 1										
Cobalt	0.0052	0.0052	0.0052	0.0052	0.0052	0.00041	0.00037	0.00036	0.00041	0.00041
Manganese	0.072	0.072	0.072	0.072	0.072	0.012	0.012	0.012	0.012	0.012
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00011	0.000097	0.000097	0.00011	0.00011	0.000033	0.000019	0.000019	0.000033	0.000033
Selenium	0.00053	0.00053	0.00053	0.00053	0.00053	0.00011	0.00011	0.00011	0.00011	0.00011
Cornish X-Country Ski Trail 2										
Cobalt	0.0052	0.0052	0.0052	0.0052	0.0052	0.00041	0.00036	0.00036	0.00041	0.00041
Manganese	0.072	0.072	0.072	0.072	0.072	0.012	0.012	0.012	0.012	0.012
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00011	0.000097	0.000097	0.00011	0.00011	0.000033	0.000019	0.000019	0.000033	0.000033
Selenium	0.00053	0.00053	0.00053	0.00053	0.00053	0.00011	0.00011	0.00011	0.00011	0.00011
Cornish X-Country Ski Trail 3										
Cobalt	0.0052	0.0052	0.0052	0.0052	0.0052	0.00041	0.00039	0.00037	0.00041	0.00041
Manganese	0.072	0.072	0.072	0.072	0.072	0.012	0.012	0.012	0.012	0.012
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00011	0.000097	0.000097	0.00011	0.00011	0.000033	0.000019	0.000019	0.000033	0.000033
Selenium	0.00053	0.00053	0.00053	0.00053	0.00053	0.00011	0.00011	0.00011	0.00011	0.00011
Groundhog Lake Snowmobile Trail										
Manganese	0.072	0.072	0.072	0.072	0.072	0.012	0.012	0.012	0.012	0.012
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00011	0.000097	0.000097	0.00011	0.00011	0.000033	0.000019	0.000019	0.000033	0.000033
Selenium	0.00053	0.00053	0.00053	0.00053	0.00053	0.00011	0.00011	0.00011	0.00011	0.00011

Table 2D: Risk Estimates - Hiker
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Water Access – Jack of Clubs Lake										
Cobalt	0.0052	0.0052	0.0052	0.0052	0.0052	0.00041	0.00044	0.00038	0.00041	0.00041
Manganese	0.072	0.073	0.072	0.072	0.072	0.012	0.013	0.012	0.012	0.012
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00011	0.000097	0.000097	0.00011	0.00011	0.000033	0.000019	0.000019	0.000033	0.000033
Selenium	0.00053	0.00053	0.00053	0.00053	0.00053	0.00011	0.00011	0.00011	0.00011	0.00011
Valley Mountain Pass										
Cobalt	0.0052	0.0052	0.0052	0.0052	0.0052	0.00041	0.00043	0.00039	0.00041	0.00041
Manganese	0.072	0.073	0.072	0.072	0.072	0.012	0.012	0.012	0.012	0.012
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00011	0.000097	0.000097	0.00011	0.00011	0.000033	0.000019	0.000019	0.000033	0.000033
Selenium	0.00053	0.00053	0.00053	0.00053	0.00053	0.00011	0.00011	0.00011	0.00011	0.00011
Historic Barkerville Town and Park										
Cobalt	0.0052	0.0052	0.0052	0.0052	0.0052	0.00041	0.00036	0.00036	0.00041	0.00041
Manganese	0.072	0.072	0.072	0.072	0.072	0.012	0.012	0.012	0.012	0.012
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00011	0.000097	0.000097	0.00011	0.00011	0.000033	0.000019	0.000019	0.000033	0.000033
Selenium	0.00053	0.00053	0.00053	0.00053	0.00053	0.00011	0.00011	0.00011	0.00011	0.00011
Le Bourdais Lake										
Cobalt	0.0024	0.0024	0.0023	0.0024	0.0024	0.00024	0.00024	0.00019	0.00024	0.00024
Manganese	0.059	0.059	0.058	0.059	0.059	0.0095	0.0095	0.0089	0.0095	0.0095
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.0016	0.0016	0.0016	0.0016	0.0016	0.0004	0.0004	0.00038	0.0004	0.0004
Selenium	0.0003	0.0003	0.0003	0.0003	0.0003	0.000056	0.000056	0.000056	0.000056	0.000056

Table 2D: Risk Estimates - Hiker
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Quesnel Forks										
Cobalt	0.0024	0.0024	0.0023	0.0024	0.0024	0.00024	0.00024	0.00019	0.00024	0.00024
Manganese	0.059	0.059	0.058	0.059	0.059	0.0095	0.0095	0.009	0.0095	0.0095
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.0016	0.0016	0.0016	0.0016	0.0016	0.0004	0.0004	0.00038	0.0004	0.0004
Selenium	0.0003	0.0003	0.0003	0.0003	0.0003	0.000056	0.000056	0.000056	0.000056	0.000056
SW2										
Cobalt	0.0035	0.0035	0.0035	0.0035	0.0035	0.00035	0.00035	0.00031	0.00035	0.00035
Manganese	0.06	0.06	0.06	0.06	0.06	0.0086	0.0086	0.0081	0.0086	0.0086
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.0026	0.0026	0.0026	0.0026	0.0026	0.00064	0.00064	0.00063	0.00064	0.00064
Selenium	0.00043	0.00043	0.00043	0.00043	0.00043	0.000066	0.000066	0.000066	0.000066	0.000066

Notes
Shaded value indicates hazard quotient greater than 0.2.

Table 2E: Risk Estimates - Camper
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Chisholm Creek Rec Site										
Cobalt	0.0031	0.0029	0.0029	0.0031	0.0031	0.00046	0.00025	0.00025	0.00046	0.00046
Manganese	0.09	0.088	0.088	0.09	0.09	0.017	0.014	0.014	0.017	0.017
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.0004	0.00034	0.00034	0.0004	0.0004	0.00014	0.000076	0.000076	0.00014	0.00014
Selenium	0.00074	0.00074	0.00074	0.00074	0.00074	0.00016	0.00016	0.00016	0.00016	0.00016
Nine Mile Lake Rec Site										
Cobalt	0.0031	0.0029	0.0029	0.0031	0.0031	0.00046	0.00025	0.00025	0.00046	0.00046
Manganese	0.09	0.088	0.088	0.09	0.09	0.017	0.014	0.014	0.017	0.017
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.0004	0.00034	0.00034	0.0004	0.0004	0.00014	0.000076	0.000076	0.00014	0.00014
Selenium	0.00074	0.00074	0.00074	0.00074	0.00074	0.00016	0.00016	0.00016	0.00016	0.00016
Barkerville Provincial Park Campground										
Cobalt	0.016	0.016	0.016	0.016	0.016	0.0038	0.0035	0.0035	0.0038	0.0038
Manganese	0.22	0.22	0.22	0.22	0.22	0.06	0.058	0.058	0.06	0.06
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00051	0.00045	0.00045	0.00051	0.00051	0.00026	0.0002	0.0002	0.00026	0.00026
Selenium	0.0012	0.0012	0.0012	0.0012	0.0012	0.00033	0.00033	0.00033	0.00033	0.00033
Forest Rose Campground										
Cobalt	0.016	0.016	0.016	0.016	0.016	0.0039	0.0037	0.0037	0.0039	0.0039
Manganese	0.49	0.49	0.49	0.49	0.49	0.22	0.22	0.22	0.22	0.22
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00055	0.00049	0.00049	0.00055	0.00055	0.00027	0.00021	0.00021	0.00027	0.00027
Selenium	0.0013	0.0013	0.0013	0.0013	0.0013	0.00037	0.00037	0.00037	0.00037	0.00037

Table 2E: Risk Estimates - Camper
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Government Hill Campground										
Cobalt	0.016	0.016	0.016	0.016	0.016	0.0036	0.0034	0.0034	0.0036	0.0036
Manganese	0.19	0.19	0.19	0.19	0.19	0.049	0.047	0.047	0.049	0.049
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.0006	0.00054	0.00054	0.0006	0.0006	0.0003	0.00024	0.00024	0.0003	0.0003
Selenium	0.0019	0.0019	0.0019	0.0019	0.0019	0.00068	0.00068	0.00068	0.00068	0.00068
Little Lake Rec Site										
Cobalt	0.0038	0.0038	0.0035	0.0038	0.0038	0.00053	0.00053	0.00032	0.00053	0.00053
Manganese	0.09	0.09	0.088	0.09	0.09	0.017	0.017	0.014	0.017	0.017
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.0025	0.0025	0.0024	0.0025	0.0025	0.00064	0.00064	0.00057	0.00064	0.00064
Selenium	0.00045	0.00045	0.00045	0.00045	0.00045	0.000084	0.000084	0.000084	0.000084	0.000084
Maude Lake Rec Site										
Cobalt	0.0038	0.0038	0.0035	0.0038	0.0038	0.00053	0.00053	0.00032	0.00053	0.00053
Manganese	0.09	0.09	0.088	0.09	0.09	0.017	0.017	0.014	0.017	0.017
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.0025	0.0025	0.0024	0.0025	0.0025	0.00064	0.00064	0.00057	0.00064	0.00064
Selenium	0.00045	0.00045	0.00045	0.00045	0.00045	0.000084	0.000084	0.000084	0.000084	0.000084
Prior Lake Rec Site										
Cobalt	0.0038	0.0038	0.0035	0.0038	0.0038	0.00053	0.00053	0.00032	0.00053	0.00053
Manganese	0.09	0.09	0.088	0.09	0.09	0.017	0.017	0.014	0.017	0.017
Methylmercury	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.0025	0.0025	0.0024	0.0025	0.0025	0.00064	0.00064	0.00057	0.00064	0.00064
Selenium	0.00045	0.00045	0.00045	0.00045	0.00045	0.000084	0.000084	0.000084	0.000084	0.000084

Notes
Shaded value indicates hazard quotient greater than 0.2.

Table 2F: Risk Estimates - Sport Fisher/Hunter
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Teen Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Cariboo Wagon Road (Stanley to Barkerville)																				
Cobalt	0.14	0.2	0.2	0.14	0.14	0.081	0.11	0.11	0.082	0.081	0.099	0.14	0.14	0.10	0.10	0.1	0.15	0.15	0.1	0.1
Manganese	0.02	0.026	0.026	0.019	0.019	0.016	0.019	0.019	0.016	0.015	0.017	0.02	0.02	0.016	0.016	0.017	0.02	0.021	0.016	0.016
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00081	0.0013	0.0015	0.00098	0.00092	0.00042	0.00065	0.00073	0.0005	0.00047	0.00048	0.00078	0.00088	0.00059	0.00055	0.00049	0.0008	0.00091	0.0006	0.00056
Selenium	0.14	0.15	0.16	0.15	0.14	0.07	0.074	0.079	0.075	0.071	0.073	0.079	0.087	0.081	0.075	0.059	0.065	0.074	0.068	0.061
Trapline TR0515T017 Cabin																				
Cobalt	0.11	0.17	0.17	0.11	0.11	0.066	0.10	0.10	0.067	0.066	0.085	0.13	0.13	0.085	0.085	0.09	0.14	0.14	0.09	0.09
Manganese	0.0099	0.016	0.016	0.0089	0.0087	0.01	0.013	0.013	0.0098	0.0097	0.012	0.015	0.015	0.011	0.011	0.012	0.016	0.016	0.011	0.011
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00062	0.0011	0.0013	0.00079	0.00072	0.00034	0.00057	0.00065	0.00042	0.00039	0.00041	0.0007	0.00081	0.00051	0.00047	0.00043	0.00074	0.00085	0.00054	0.0005
Selenium	0.0038	0.011	0.02	0.013	0.0056	0.0022	0.0062	0.012	0.0077	0.0033	0.0031	0.0087	0.016	0.011	0.0046	0.0033	0.0092	0.017	0.011	0.0048
Cow Mountain Trails 1																				
Cobalt	0.14	0.2	0.2	0.14	0.14	0.082	0.12	0.12	0.082	0.082	0.10	0.14	0.14	0.10	0.10	0.1	0.15	0.15	0.1	0.1
Manganese	0.02	0.026	0.026	0.019	0.019	0.017	0.019	0.019	0.016	0.016	0.018	0.021	0.021	0.017	0.017	0.018	0.021	0.021	0.017	0.017
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00081	0.0013	0.0015	0.00098	0.00092	0.00042	0.00065	0.00073	0.0005	0.00047	0.00048	0.00078	0.00088	0.00059	0.00055	0.00049	0.0008	0.00091	0.0006	0.00056
Selenium	0.14	0.15	0.16	0.15	0.14	0.07	0.074	0.079	0.075	0.071	0.073	0.079	0.087	0.081	0.075	0.059	0.065	0.074	0.068	0.061
Williams Creek Trail																				
Cobalt	0.14	0.2	0.2	0.14	0.14	0.082	0.12	0.12	0.082	0.082	0.10	0.14	0.14	0.10	0.10	0.1	0.15	0.15	0.1	0.1
Manganese	0.02	0.026	0.026	0.019	0.019	0.017	0.019	0.019	0.016	0.016	0.018	0.021	0.021	0.017	0.017	0.018	0.021	0.021	0.017	0.017
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00081	0.0013	0.0015	0.00098	0.00092	0.00042	0.00065	0.00073	0.0005	0.00047	0.00048	0.00078	0.00088	0.00059	0.00055	0.00049	0.0008	0.00091	0.0006	0.00056
Selenium	0.14	0.15	0.16	0.15	0.14	0.07	0.074	0.079	0.075	0.071	0.073	0.079	0.087	0.081	0.075	0.059	0.065	0.074	0.068	0.061
Water Access – Jack of Clubs Lake																				
Cobalt	0.13	0.18	0.19	0.13	0.12	0.073	0.11	0.11	0.073	0.068	0.091	0.13	0.14	0.091	0.087	0.095	0.14	0.14	0.095	0.091
Manganese	0.014	0.026	0.037	0.023	0.014	0.014	0.021	0.026	0.019	0.014	0.015	0.023	0.027	0.019	0.014	0.015	0.023	0.026	0.019	0.015
Methylmercury	2.6	3.9	3.9	3.9	3.9	0.53	0.82	0.82	0.82	0.82	0.51	0.78	0.78	0.78	0.78	0.95	1.5	1.5	1.5	1.5
Molybdenum	0.00086	0.052	0.14	0.088	0.016	0.00044	0.022	0.059	0.037	0.0067	0.0005	0.02	0.055	0.034	0.0063	0.00051	0.016	0.044	0.027	0.0052
Selenium	0.16	0.55	1.3	0.84	0.27	0.077	0.27	0.62	0.41	0.13	0.081	0.28	0.65	0.43	0.14	0.066	0.23	0.52	0.35	0.11
Outfitter Area																				
Cobalt	0.13	0.18	0.19	0.13	0.12	0.073	0.11	0.11	0.073	0.068	0.091	0.13	0.14	0.091	0.087	0.095	0.14	0.14	0.095	0.091
Manganese	0.014	0.026	0.037	0.023	0.014	0.014	0.02	0.025	0.019	0.014	0.015	0.022	0.027	0.019	0.014	0.015	0.022	0.026	0.019	0.015
Methylmercury	2.6	3.9	3.9	3.9	3.9	0.53	0.82	0.82	0.82	0.82	0.51	0.78	0.78	0.78	0.78	0.95	1.5	1.5	1.5	1.5
Molybdenum	0.00086	0.052	0.14	0.088	0.016	0.00044	0.022	0.059	0.037	0.0067	0.0005	0.02	0.055	0.034	0.0063	0.00051	0.016	0.044	0.027	0.0052
Selenium	0.16	0.55	1.3	0.84	0.27	0.077	0.27	0.62	0.41	0.13	0.081	0.28	0.65	0.43	0.14	0.066	0.23	0.52	0.35	0.11

Table 2F: Risk Estimates - Sport Fisher/Hunter
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Teen Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Trapline TR0515T020 Cabin 1																				
Cobalt	0.11	0.17	0.17	0.11	0.11	0.066	0.10	0.1	0.067	0.067	0.085	0.13	0.13	0.085	0.085	0.09	0.14	0.14	0.09	0.09
Manganese	0.0099	0.016	0.016	0.0089	0.0087	0.01	0.014	0.013	0.0099	0.0098	0.012	0.016	0.015	0.011	0.011	0.012	0.017	0.016	0.012	0.011
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00062	0.0011	0.0013	0.00079	0.00072	0.00034	0.0006	0.00065	0.00042	0.00039	0.00041	0.00073	0.00081	0.00051	0.00048	0.00043	0.00077	0.00085	0.00054	0.0005
Selenium	0.0038	0.011	0.02	0.013	0.0056	0.0022	0.0062	0.012	0.0077	0.0033	0.0031	0.0087	0.016	0.011	0.0046	0.0033	0.0092	0.017	0.011	0.0048
Trapline TR0515T020 Cabin 2																				
Cobalt	0.11	0.17	0.17	0.11	0.11	0.066	0.10	0.1	0.067	0.067	0.085	0.13	0.13	0.085	0.085	0.09	0.14	0.14	0.09	0.09
Manganese	0.0099	0.016	0.016	0.0089	0.0087	0.01	0.014	0.013	0.0099	0.0098	0.012	0.016	0.015	0.011	0.011	0.012	0.017	0.016	0.012	0.011
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00062	0.0011	0.0013	0.00079	0.00072	0.00034	0.0006	0.00065	0.00042	0.00039	0.00041	0.00073	0.00081	0.00051	0.00048	0.00043	0.00077	0.00085	0.00054	0.0005
Selenium	0.0038	0.011	0.02	0.013	0.0056	0.0022	0.0062	0.012	0.0077	0.0033	0.0031	0.0087	0.016	0.011	0.0046	0.0033	0.0092	0.017	0.011	0.0048
Trail Buffer 3																				
Cobalt	0.11	0.2	0.2	0.13	0.13	0.067	0.11	0.12	0.076	0.076	0.085	0.14	0.14	0.095	0.094	0.09	0.15	0.15	0.098	0.098
Manganese	0.0099	0.026	0.026	0.013	0.013	0.012	0.02	0.019	0.013	0.013	0.013	0.022	0.021	0.014	0.014	0.014	0.022	0.021	0.015	0.014
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00062	0.0013	0.0015	0.00095	0.00089	0.00034	0.00068	0.00074	0.00049	0.00046	0.00041	0.00081	0.00089	0.00058	0.00054	0.00044	0.00083	0.00092	0.0006	0.00055
Selenium	0.0038	0.84	0.85	0.84	0.83	0.0023	0.41	0.42	0.41	0.41	0.0031	0.43	0.44	0.43	0.43	0.0033	0.35	0.35	0.35	0.34
SW2																				
Cobalt	0.11	0.2	0.2	0.13	0.13	0.067	0.11	0.12	0.076	0.076	0.085	0.14	0.14	0.095	0.094	0.09	0.15	0.15	0.098	0.098
Manganese	0.0099	0.026	0.026	0.015	0.014	0.012	0.021	0.02	0.014	0.014	0.013	0.022	0.022	0.015	0.015	0.014	0.023	0.022	0.015	0.015
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00062	0.0013	0.0015	0.00095	0.00089	0.00034	0.00068	0.00074	0.0005	0.00046	0.00042	0.00081	0.00089	0.00058	0.00054	0.00044	0.00083	0.00092	0.0006	0.00056
Selenium	0.0038	1.6	2.3	1.9	0.26	0.0023	0.8	1.1	0.92	0.13	0.0031	0.83	1.2	0.96	0.13	0.0033	0.67	0.93	0.77	0.11
Trapline TR0502T045																				
Cobalt	0.14	0.2	0.2	0.14	0.14	0.082	0.11	0.12	0.082	0.082	0.10	0.14	0.14	0.10	0.10	0.1	0.15	0.15	0.1	0.1
Manganese	0.02	0.026	0.026	0.019	0.019	0.017	0.021	0.02	0.017	0.016	0.018	0.022	0.022	0.017	0.017	0.018	0.023	0.022	0.017	0.017
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.00081	0.0013	0.0015	0.00098	0.00092	0.00042	0.00068	0.00074	0.00051	0.00048	0.00049	0.00081	0.00089	0.00059	0.00055	0.0005	0.00083	0.00092	0.00061	0.00056
Selenium	0.14	0.15	0.16	0.15	0.14	0.07	0.074	0.079	0.075	0.071	0.073	0.079	0.087	0.081	0.075	0.06	0.065	0.074	0.068	0.061

Notes
Shaded value indicates hazard quotient greater than 0.2.

Attachment 2
Table 2G: Risk Estimates - Mine Camp Worker
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Adult Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure
Cobalt	0.0054	0.0054	0.0054	0.0051	0.0051
Manganese	0.012	0.012	0.012	0.012	0.012
Methylmercury	0.05	0.077	0.077	0.076	0.076
Molybdenum	0.00044	0.00075	0.0013	0.00099	0.00053
Selenium	0.016	0.031	0.044	0.037	0.021

Notes
Shaded value indicates hazard quotient greater than 0.2.

Attachment 2
Table 2H: Risk Estimates - Indigenous Land User
Barkerville Gold Mine Ltd. Cariboo Gold Project
Wells, BC

COPC	Toddler Risk Estimates					Adult Risk Estimates					Woman of Childbearing Age Risk Estimates				
	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure	Existing Conditions	Construction	Operations	Closure	Post-closure
Mine Site LAA															
Cobalt	0.67	0.93	0.93	0.66	0.66	0.45	0.64	0.65	0.44	0.44	0.3	0.43	0.43	0.3	0.3
Manganese	1.6	1.7	1.7	1.6	1.6	0.5	0.54	0.56	0.5	0.5	0.43	0.46	0.48	0.43	0.43
Methylmercury	4.0	6.1	6.1	6.0	6.1	0.79	1.2	1.2	1.2	1.2	1.2	1.8	1.8	1.8	1.8
Molybdenum	0.02	0.041	0.072	0.049	0.026	0.0076	0.017	0.029	0.019	0.01	0.006	0.012	0.021	0.014	0.0077
Selenium	0.6	0.83	1.2	1.0	0.68	0.33	0.45	0.66	0.54	0.37	0.21	0.29	0.42	0.34	0.24
QR Mill LAA															
Cobalt	0.7	0.97	0.97	0.69	0.68	0.46	0.66	0.66	0.45	0.45	0.31	0.44	0.44	0.3	0.3
Manganese	1.2	1.3	1.7	1.5	1.2	0.35	0.41	0.62	0.5	0.36	0.29	0.33	0.57	0.46	0.3
Methylmercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	0.2	0.2	0.2	0.2	0.2	0.05	0.053	0.055	0.05	0.049	0.043	0.046	0.046	0.043	0.042
Selenium	0.58	2.5	3.0	2.7	1.3	0.32	1.3	1.6	1.4	0.68	0.21	0.82	1.0	0.89	0.43

Notes
Shaded value indicates hazard quotient greater than 0.2.

APPENDIX K DETAILED MITIGATION TABLE

OSISKO DEVELOPMENT

CARIBOO GOLD PROJECT

Appendix K: Detailed Mitigations

August 2025



OSISKO DEVELOPMENT

Cariboo Gold Project

PO Box 250
3700 Ski Hill Road
Wells, BC V0K 2R0

1. ACOUSTIC

Table 1-1: Acoustic Detailed Mitigation Table

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Construction equipment will not idle when not actively in use unless there is a safety concern. Construction equipment will be maintained in good working order.	Mine Site, QR Mill, Transmission Line	EAC Section 7.3.5.3	Construction Environmental Management Plan Sections 5.3, 5.8, and 6.2	7.3-1	Monitoring and trigger response actions are described in Community Effects Plan Section 5.3.4.3 Public Strategy Adaptive Management
Use construction equipment with manufacturer recommended noise mitigation measures (e.g. muffler systems) and shall conduct proper equipment maintenance to avoid abrupt noise emission.				7.3-2	
Implement administrative controls, e.g., planning activities considering timing constraints, scheduling specific construction activities away from receptors.		EAC Section 7.3.5.3 Community Effects Plan: Appendix D, Section 1.1.1		7.3-3	
Investigate persistent complaints and implement corrective actions.		EAC Section 7.3.5.3 Community Effects Plan Appendix D, Sec 1.2		7.3-4	
Limit use of back up beepers and use broadband alarms (white noise) in construction equipment, for all equipment.		EAC Section 7.3.5.3		7.3-5	

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Blasting noise and vibration will be monitored at a setback that is representative of receptors, or at the closest receptor during the first few blasts, especially when they occur near the surface area.	Mine Site	EAC Section 7.3.5.3 Appendix D, Section 1.3	Explosives Management Plan Sections 4.1	7.3-6	
Buildings or enclosures that are used to enclose noise processing equipment will include, at a minimum, an enclosure of sandwich sheet metal (about 18 to 20 gauge or better) cladding or an enclosure providing insertion losses shown in section 7.3.7.1 of the Application or better.	Mine Site, QR Mill	EAC Section 7.3.5.3	Construction Environmental Management Plan Sections 5.3	7.3-7	
The doors on buildings enclosing noise generating equipment will be kept closed.				7.3-8	
Generators used during construction will include sound attenuation enclosures with an engine muffler providing a total sound power of no more than 98 dBA.				7.3-9	
Standard noise mitigation measures (e.g. muffler systems) will be installed on mobile equipment and the equipment will be regularly maintained.				7.3-10	
Substation transformers (32 MVA) will be no more than 100 dBA of total sound power level and will include a noise barrier on north and east side of the transformer yard. The barrier is of 4.5 metres height and constructed of material providing a surface density of 20 kg/m². The barriers will also be constructed without gaps within or below its extent.	Mine Site Transmission Line			7.3-11	
All ventilation openings (including intakes and discharge) will have an acoustic louvre (6 inches or better). If the total area of ventilation openings exceeds 8% of the total façade area, a 12-inch acoustic louvre will be required.	Mine Site			7.3-12	

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Fans at ventilation raises at Shaft Zones will be at least 20 dB sound attenuation and Valley Zones ventilation raises will be at least 10 dB sound attenuation.				7.3-13	
A barrier will be installed on the Island Mountain Portal, extending 75 metres on the north side and 60 metres on the east side at a height of 4 metres. It should be constructed of material providing a surface density of 20 kg/m². The barriers will also be constructed without gaps within or below its extent.				7.3-14	
Transformers used at the Cow Portal and Bonanza Ledge Site will be no more than 100 dBA of total sound power level. Fans at ventilation raises and portal exhausts will have at least the following sound attenuation: Portal Exhaust (Cow Zone) Fan sound levels will be below 106 dBA (116 dBA – 10 dB); and Ventilation Raise Exhaust (Shaft Zone) Fan sound levels will be below 104 dBA (124 dBA – 20 dB).	Cow Portal, Bonanza Ledge			7.3-15	

2. EMPLOYMENT AND ECONOMY

Table 2-1: Employment and Economy Detailed Mitigation Table

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Inform RAA and LAA communities and Regional Districts with advance notice regarding anticipated timing of each Project phase, employee numbers, and duration as well as the change in requirements from phase to phase.	All	EAC Section 7.10.5.3	Community Effects Plan Section 5.3.1 Employee Strategy and Section 5.3.2 Public Strategy Community Effects Plan Appendix G: Engagement, Communications and Reporting	7.10-1	Monitoring and trigger response actions are described in Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management and Section 5.3.2.3 Public Strategy Adaptive Management
Develop a gender sensitive socio-economic monitoring plan in consultation with local and regional governments, agencies and residents.				7.10-2	Advanced through upcoming amendment process The Community Involvement Plan and Indigenous Partnership Plan is currently in development and provides a framework for BGM to address specific issues and concerns related to gender that may be raised by the District of Wells or Participating Indigenous nations.
Work with a Community Monitoring Committee to monitor mitigation effectiveness and implement adaptive mitigations during the Project life. Develop the process for this in consultation with local communities and identified diverse groups and governments.				7.10-3	Monitoring and trigger response actions are described in Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Engage with the local communities and identified diverse groups on mine closure and end land use planning to understand issues relating to Project-induced population change associated with Project closure.			Community Effects Plan Table 5.3-16 Community Effects Plan Appendix G: Engagement, Communications and Reporting	7.10-4	Monitoring and trigger response actions are described in Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management
Continue to engage the community to define and refine gender sensitive enhancement measures.			Community Effects Plan Appendix G: Engagement, Communications and Reporting	7.10-5	Monitoring and trigger response actions are described in Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management
Work with identified diverse groups to ensure gender mainstreaming in the Project and social accountability.			Community Effects Plan Section 5.3.1 Employee Strategy	7.10-6	Monitoring and trigger response actions are described in Community Effects Plan Section 5.3.1.6 Employee Strategy
ODV will develop a Hiring Policy to implement a gender inclusive local hiring program and offer equal employment opportunities to all people regardless of their background and sexual orientation.				7.10-7	
Implement an inclusive proactive training program to train local and regional residents and diverse groups on available opportunities and facilitate access to Project's benefits by vulnerable groups.				7.10-8	
ODV will develop a Community Relations Policy and commit to the economic development of host communities by creating employment opportunities and promoting local purchasing. ODV will commit to recruit and provide training opportunities to local and Indigenous communities				7.10-9	

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Achieve equity, diversity, and inclusion in recruitment and procurement practices to attract diverse groups to facilitate their access to Project benefits by identifying barriers and by addressing their strategic gender needs.				7.10-10	
Fund a social work position in the community for four years to help address mental health, domestic violence and Sexual Exploitation and Abuse issues that may be limiting individuals from all groups including diverse groups from participating in employment opportunities.			Community Effects Plan Section 5.3.2 Public Strategy	7.10-11	Monitoring and trigger response actions are described in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management
ODV will develop a Hiring Policy to communicate employment opportunities through a variety of communication means, local and regional, this includes the types of jobs available with the Project as well as skills requirements and training to maximize access by all groups including diverse groups.			Community Effects Plan Section 5.3.1 Employee Strategy Community Effects Plan Appendix A: Workforce Policies and Programs	7.10-12	Monitoring and trigger response actions are described in Community Effects in the Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management
ODV will develop a Responsible Procurement Policy and commit to enabling access and minimizing barriers that inhibit participation of local and regional suppliers of goods and services to supply chain opportunities arising from project's activities. ODV will commit to contributing to the economic development of host communities by creating employment opportunities and promoting local purchasing and local hiring.				7.10-13	
Support ECE training for two people to facilitate hiring and potential expansion of daycare facilities in the LAA.			Community Effects Plan Section 5.3.1 Employee Strategy	7.10-14	Monitoring and trigger response actions to reduce barriers to employment are described in the Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Continue to work with local education and training providers to develop or offer training that supports development of an inclusive local workforce.			Community Effects Plan Section 5.3.1 Employee Strategy	7.10-15	Monitoring and trigger response actions to reducing barriers to employment are described in the Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management
ODV will develop a Responsible Procurement Policy and commit to enabling access and minimizing barriers that inhibit participation of local and regional suppliers of goods and services to supply chain opportunities arising from project's activities.			Community Effects Plan Section 5.3.1 Employee Strategy Community Effects Plan Appendix A: Workforce Policies and Programs	7.10-16	Monitoring and trigger response actions to reduce barriers that inhibit participation of local and regional suppliers is described in Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management
ODV will develop a Community Relations Policy and commit to contributing to the economic development of host communities by creating employment opportunities and promoting local purchasing and local hiring.			Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G: Engagement, Communications and Reporting Strategy Community Effects Plan Appendix A: Workforce Policies and Programs	7.10-17	Monitoring and trigger response actions are described in Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management and 5.3.2.3 Public Strategy Adaptive Management
Enhancement measures as described in 7.10.5.4 aimed at expanding the workforce.			Community Effects Plan Section 5.3.1 Employee Strategy	7.10.18	N/A
Maintain compliance with ODV's corporate policies by having one point of contact for potential contractors.			N/A	7.10-19	N/A

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Structure contracts in a manner that ensure fair access and equal participation of local businesses, regardless of their size, in contracting opportunities.			Community Effects Plan Section 5.3.1 Employee Strategy Community Effects Plan Appendix A: Workforce Policies and Programs	7.10-20	Monitoring and trigger response actions are described in Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management and 5.3.2.3 Public Strategy Adaptive Management
Work with the District of Wells and local residents to identify ways in which the mine can help promote tourism in the area (e.g., moving the headframe to the community).			Community Effects Plan Appendix G Engagement, Communications, and Reporting Strategy	7.10-21	The Community Involvement Plan is currently in development and specifically addresses District of Wells interests.
Pay a competitive wage for all workforce based on qualifications and regardless of their background and gender roles.			Community Effects Plan Section 5.3.1 Employee Strategy Community Effects Plan Appendix A: Workforce Policies and Programs	7.10-22	Monitoring and trigger response actions are described in Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management
Work with the District of Wells to upgrade water and sewer infrastructure with sufficient capacity to support the development in town.			Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	7.10-23	The Community Involvement Plan is currently in development and specifically addresses District of Wells interests. In late 2024, The District of Wells completed a $640,000 water treatment facility upgrade to ensure water quality meets all non-lead related water quality standards.

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Develop mining tourism, in collaboration with local tourism and recreational services providers, to attract additional type of tourists to the area and expand tourism and recreation profile in Wells.			Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	7.10-24	The Community Involvement Plan is currently in development and specifically addresses District of Wells interests.
Work with local Chambers of Commerce and economic development organizations to Identify ways to expand local participation in business opportunities.			Community Effects Plan Section 5.3.1 Employee Strategy	7.10-25	N/A
Provide financial planning, job search support, enhanced mental health support and other supports to workers that could facilitate transition to another position or put them in a better position from which to handle job cessation.			Community Effects Plan Section 5.3.1 Employee Strategy	7.10-26	N/A

3. LAND AND RESOURCE USE

Table 3-1: Land and Resource Use Detailed Mitigations

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Provide advanced notice to stakeholders of Project activities and schedules regarding road impacts and peak Project traffic times.	All	EAC Section 7.11.5.3	Community Effects Plan Section 5.3.3 Traffic Strategy Community Effects Plan Appendix C Traffic Control Plan Section 2.2 and 4.2	7.11-1	N/A
Implement and enforce the Traffic Control Plan, which will include consideration of shift start and ends times.			Community Effects Plan Appendix C Traffic Control Plan Section 2.2 and 4.2	7.11-2	Monitoring and trigger response actions are described in Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management, Section 5.3.2.3 Public Strategy Adaptive Management, and Section 5.3.3.3 Traffic Strategy Adaptive Management
Implement and enforce transportation and access management outlined in ODV's Traffic Control Plan, which will include the development of driver training materials and strategies to limit potential conflicts.			Community Effects Plan Section 5.3.3 Traffic Strategy Community Effects Plan Appendix C Traffic Control Plan Section 2.2 and 4.2	7.11-3	Monitoring and trigger response actions are described in Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management and Section 5.3.3.3 Traffic Strategy Adaptive Management

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Provide advanced notification to relevant stakeholders of Project schedules prior to commencing activities that may be outside conditions considered normal (i.e. noise, dust or vibration during blasting).			Community Effects Plan Section 5.3.3 Traffic Strategy Community Effects Plan Appendix C Traffic Control Plan Section 4.2	7.11-5	Monitoring and trigger response actions are described in Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management
Provide ongoing communication with stakeholders during all phases of the Project.			Community Effects Plan Appendix C Traffic Control Plan Section 5	7.11-6	Monitoring and trigger response actions are described in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management
Place signage on recreational trails and public roads if there is the potential for conflicts with Project activities	Transmission line Transportation Route		Community Effects Plan Appendix C Traffic Control Plan Mitigation Commitments	7.11-7	Monitoring and trigger response actions are described in the Community Effects Plan Section 5.3.3.3 Traffic Strategy Adaptive Management
Use noise abatement and operations scheduling considerations at noise-sensitive locations.	Mine Site, QR Mill		Community Effects Plan Section 5.3.4.Noise Strategy Community Effects Plan Appendix D Noise Section 1.1-1.2	7.11-8	Monitoring and trigger response actions are described in the Community Effects Plan Section 5.3.4.3 Noise Strategy Adaptive Management

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Develop a reclamation and closure plan consistent with end land use objectives developed with stakeholder input.	Mine Site, QR Mill, Transmission Line		Community Effects Plan Section 5.2 Table 5.1-1	7.11-9	The Community Involvement Plan and the Indigenous Partnership Plan are currently in development and provides a framework for developing future plans with the District, the Participating Indigenous nations, and stakeholders.
Provide notice of Project construction activities and schedules to the stakeholders.			Community Effects Plan Section 5.1 Employee Strategy and Section 5.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications, and Reporting Strategy	7.11-10	Monitoring and trigger response actions are described in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management
Discuss appropriate mitigation and access requirements with users of recreations trails near the Mine Site.	Mine Site		Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	7.11-12	N/A
Provide advance notification of Project schedules to relevant stakeholders in close proximity to Project activities prior to commencing activities that may be outside conditions considered normal (i.e. noise, dust or vibration during blasting).	All		Community Effects Plan Section 5.3.2 Public Strategy	7.11-14	Monitoring and trigger response actions are described in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Provide ongoing communication with residents and stakeholders during all phases of the Project.			Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	7.11-15	Monitoring and trigger response actions are described in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management
Place signage if there is the potential for conflicts with Project activities.			Community Effects Plan Appendix C Traffic Control Plan Mitigation Commitments	7.11-16	Monitoring and trigger response actions are described in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management, 5.3.3.3 Traffic Strategy Adaptive Management
Develop a strategy to mitigate pressures on recreation and tourism in the Project Area due to increased population and visitors.			Community Effects Plan Section 5.2 Public Strategy Table 5.1-1.	7.11-17	Monitoring and trigger response actions are described in the Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management
Vegetation clearing, soil stripping, grubbing, and grading for construction, temporary workspace, or storage areas, will occur only within the Certified Project surface footprint.	Mine Site, QR Mill, Transmission Line		Construction Environmental Management Plan Section 5.8	7.11-20	N/A
Use of dust suppression measures along the unpaved haul roads, work areas, and storage piles.			Mine Site Fugitive Dust Management Plan Section 6 QR Mill Fugitive Dust Management Plan Section 6	7.11-22	N/A

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Use low-profile equipment, structures, berming and planting in the management of visibility.	Mine Site		Community Effects Plan Section 5.3.5 Visual Impact Strategy	7.11-23	Monitoring and trigger response actions will be described in the Community Effects Plan Section 5.3.5.3 Visual Impact Adaptive Management
Use building finishes with low reflectance levels and colours that match natural landscapes. Some or all structures on the site will be dark in color to absorb light reflection.			Community Effects Plan Section 5.3.5 Visual Impact Strategy	7.11-24	
Implement monitoring and management procedures for reclamation activities to address potential visual effects over the life of mine and post-closure.	Mine Site, QR Mill, Transmission Line		Community Effects Plan Section 5.3.5 Visual Impact Strategy	7.11-25	
Turn off portable lighting equipment when not in use.	Mine Site, QR Mill		Community Effects Plan 5.3.5 Visual Impact Strategy	7.11-26	
Lighting will be planned to use the lowest luminous level and spill over that still allows a level of light required for worker safety and equipment security.			Community Effects Plan 5.3.5 Visual Impact Strategy	7.11-27	
Install fixed lights.	Mine Site			7.11-28	
Use vegetation as visual screens.				7.11-29	
The emission of light towards the sky will be limited by using luminaires that produce a sober and uniform lighting that will meet operational lighting needs. Luminaires will not produce any emissions above 90 degrees.				7.11-30	

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
On-going communication with stakeholders regarding Project activities.	All		Community Effects Plan 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communication and Reporting Strategy	7.11-33	Monitoring and trigger response actions are described in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management
Implement Reclamation Monitoring Plan taking into consideration visual quality objectives identified by residents, participating Indigenous nations and stakeholders.	Mine Site, QR Mill, Transmission Line		Mine Site Complex Reclamation and Closure Plan Section 4.1 Community Effects Plan Appendix G Engagement, Communication and Reporting Strategy	7.11-34	Monitoring and trigger response actions are described in the Community Effects Plan Section 5.3.5.3 Visual Impact Adaptive Management
Provide notice of Project activities and schedules to the stakeholders regarding road blockages, that may affect traffic and access, and peak Project traffic times.	All		Community Effects Plan 5.3.3 Traffic Strategy Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	7.11-35	Monitoring and trigger response actions are described in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management and Section 5.3.3.3 Traffic Strategy Adaptive Management

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Discuss and develop individual owner agreements.			Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	7.11-36	N/A
Discuss appropriate mitigation and access requirements with tenure holders.	Transmission Line		Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	7.11-37	N/A
Develop and apply monitoring and adaptive management strategy.	All		Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management, Section 5.3.2.3 Public Strategy Adaptive Management, Section 5.3.3.3 Traffic Strategy Adaptive Management, Section 5.3.4.3 Noise Strategy Adaptive Management, Section 5.3.5.3 Visual Impact Strategy Adaptive Management	7.11-38	N/A

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Discuss and develop harvesting strategy and schedule for forestry tenures.	Mine Site, Transmission Line		Community Effects Plan Section 5.3.2 Public Strategy Table 5.1.1	7.11-39	N/A
Provide advance notification of Project schedules to relevant stakeholders.	All		Community Effects Plan Section 5.3.2 Public Strategy	7.11-41	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management
Use of dust suppression measures to mitigate the dust generation potential along the unpaved haul roads, work areas, and storage piles as needed.	Mine Site, QR Mill, Transmission Line		Mine Site Fugitive Dust Management Plan Section 6	7.11-42	N/A

4. INFRASTRUCTURE AND SERVICES

Table 4-1: Infrastructure and Services Detailed Mitigations

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
ODV will develop a Hiring Policy to communicate employment opportunities through a variety of communication means, local and regional, this includes the types of jobs available with the Project as well as skills requirements and training to maximize access by all groups including diverse groups. Implement an inclusive proactive training program to train local and regional residents and diverse groups on available opportunities and facilitate access to Project's benefits by vulnerable groups.	All	EAC Section 7.12.5.3	Community Effects Plan Section 5.3.1 Employee Strategy	7.12-1	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management
ODV will develop a Community Relations Policy and commit to the economic development of host communities by creating employment opportunities and promoting local purchasing. ODV will commit to recruit and provide training opportunities to local and Indigenous communities. ODV has a CODE OF BUSINESS CONDUCT & ETHICS that require all its directors, officers, employees, contractors, and consultants to, at all times, comply and act in accordance with the principles stated in the Code. The code includes specific clauses on: Non-Discriminatory Environment, Harassment-Free Workplace, and Workplace Violence.			Community Effects Plan Section 5.3.1 Employee Strategy and Section 5.3.2 Public Strategy Community Effects Plan Appendix A Workforce Policies and Programs	7.12-2	

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Provide employee assistance programs and benefits, including career planning, employee counselling, family support, transition planning, a pension plan, and group insurance benefit plans to encourage continued or long-term employment with the Project.				7.12-3	
Inform RAA and LAA communities and Regional Districts with advance notice regarding anticipated timing of each Project phase, employee numbers, and duration as well as the change in requirements from phase to phase.			Community Effects Plan Appendix G Engagement, Communications, and Reporting Strategy Community Effects Plan Section 5.3.1 Employee Strategy	7.12-4	N/A
Inform workers from outside the area of the situation regarding community infrastructure, services, and housing in the area so that they can make an informed decision about moving to the area.			Community Effects Plan Section 5.3.1 Employee Strategy	7.12-5	N/A
Develop a socio-economic monitoring plan in consultation with local and regional governments, agencies, and residents.			Community Effects Plan Section 5.3.1 Employee Strategy and Section 5.3.2 Public Strategy Community Effects Plan Appendix G: Engagement, Communications and Reporting Strategy	7.12-6	Advanced through the amendment process

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Work with a Community Monitoring Committee to monitor mitigation effectiveness and implement adaptive mitigations as required during the Project life. Develop the process for this in consultation with local communities and governments.			Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G: Engagement, Communication and Reporting Strategy	7.12-7	The Community Involvement Plan is currently in development and intends to support the process of monitoring mitigations effectiveness throughout the life of the Project through a process collaboratively developed with the District. The Indigenous Partnership Plan is currently in development and intends to support the process of monitoring mitigations effectiveness throughout the life of the Project through a process collaboratively developed with the Participating Indigenous partners. Mitigation monitoring and trigger responses are discussed in the following sections of the Community Effects Plan: Section 5.3.1.6 Employee Strategy Adaptive Management Section 5.3.2.3 Public Strategy Adaptive Management Section 5.3.3.3 Traffic Strategy Adaptive Management Section 5.3.4.3 Noise Strategy Adaptive Management Section 5.3.5.3 Visual Impact Adaptive Management

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Engage with the local communities on mine closure and end land use planning to understand issues relating to Project-induced population change associated with Project closure.			Community Effects Plan Section 5.3.2 Public Strategy	7.12-8	
Develop Project specific water, sewer, electricity, waste and communications systems at the Mine Site and QR Mill.	Mine Site, QR Mill		Project design Mine Site Discharge Management Plan Section 6 QR Mill Discharge Management Plan Section 6 Waste (Refuse and Emissions) Management Plan Sections 5 and 6	7.12-9	N/A

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Develop a Waste (Refuse and Emissions) Management Plan for the Project including discussion of the use of the Wells Transfer Station and Quesnel Regional Landfill with Cariboo Regional District and consideration of innovative ways of handling waste on site.	All		Waste (Refuse and Emissions) Management Plan Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications, and Reporting Strategy	7.12-10	N/A
Work with the District of Wells to upgrade the existing water and sewer systems.			Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	7.12-11	The Community Involvement Plan is currently in development and specifically addresses District of Wells interests.
Source a clean, sustainable source of potable water for the community of Wells.			Community Effects Plan Section 5.3.2 Public Strategy	7.12-12	

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Continue to work with the District of Wells and other interested parties to bring enhanced electricity service to Wells and the surrounding area.			Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	7.12-13	
Inform School Districts regarding anticipated numbers of students by Project phase, within 3 months of the start up of each Project phase.			Community Effects Plan Section 5.3.1 Employee Strategy	7.12-14	N/A
Create relationship with school districts and colleges in the LAA to provide opportunities to local residents.			Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	7.12-15	
Support Early Childhood Education training for two people to facilitate hiring and potential expansion of daycare facilities in the LAA.			Community Effects Plan Section 5.3.1 Employee Strategy	7.12-16	Related monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Provide fitness facilities at the worker camps.	Mine Site		Community Effects Plan Section 5.3.1 Employee Strategy Community Effects Plan Appendix H Worker Accommodations and Offices	7.12-17	N/A
Include information regarding recreation opportunities in the area, uses and activities that can be undertaken and any Indigenous specific concerns regarding use in the area as part of on-boarding.	All		Community Effects Plan Section 5.3.1 Employee Strategy	7.12-18	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management The Indigenous Partnership Plan is currently in development and addresses the specific issues and concerns of the Participating Indigenous nations.
Inform Quesnel, Wells, Cariboo Regional District and Indigenous nations regarding anticipated timing of construction, number of workers and duration of construction so that they can plan and provide input to ODV regarding use in the area.	Mine Site, QR Mill, Transmission Line		Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	7.12-19	Monitoring and trigger response actions are discussed in Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Develop and implement a Traffic Control Plan and provide contractors, sub-contractors, workers, etc. with a copy of the Plan, including key highway and roadway regulations and roadway regulations upon on-boarding.	All		Community Effects Plan Section 5.3.1 Employee Strategy and Section 5.3.3 Traffic Strategy Community Effects Plan Appendix C Traffic Control Plan	7.12-20	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.3.3 Traffic Strategy Adaptive Management
Provide shuttle service from a site in Quesnel to and from the Mine Site and the QR Mill, including fly-in fly-out workers as needed.	Mine Site, QR Mill		Community Effects Plan Section 5.3.1 Employee Strategy	7.12-21	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management
Move large loads at non-peak traffic times.	Transportation Route		Community Effects Plan Appendix C Traffic Control Plan	7.12-22	N/A
Engage with the community on concentrate transport schedules during operations.			Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix C Traffic Control Plan	7.12-23	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management
Upgrade forest service roads, as required, to ensure that they are suitable for Project use.			Community Effects Plan Section 5.3.3 Traffic Strategy	7.12-24	N/A

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Schedule regular traffic coming to the Mine Site or QR Mill (e.g., regular deliveries) so that it is spread out throughout the month and does not coincide with existing peak traffic times.	Mine Site, QR Mill, Transportation Route		Community Effects Plan Section 5.3.1 Employee Strategy Section 5.3.3 Traffic Strategy	7.12-25	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management
Monitor incidents involving Project related vehicles and work to identify measures to reduce incidents.	All		Community Effects Plan Section 5.3.3 Traffic Strategy	7.12-26	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.3.3 Traffic Strategy Adaptive Management
Work with MOTI to relocate the 50 km/h posted speed limit slightly to the west to allow the new access to the Mine Site Complex to be located within the 50 km/h zone.	Transportation Route		Community Effects Plan Appendix C Traffic Control Plan	7.12-27	N/A
Complete a functional design study for the Highway 26/Nyland Lake Road intersection to determine appropriate improvements to sightlines for this location and work with MOTI to implement recommendations.			Community Effects Plan Appendix C Traffic Control Plan	7.12-28	N/A
A new highway bypass will be built before Wells so that Project related traffic does not travel through the community.	Mine Site, Transportation Route		Community Effects Plan Appendix C Traffic Control Plan	7.12-29	N/A
Provide workers, contractors and sub-contractors a copy of the Traffic Control Plan and communicate that they are to be aware of and follow the transportation related bylaws or regulations in Wells.	All		Community Effects Plan Section 5.3.1 Employee Strategy	7.12-30	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.3.3 Traffic Strategy Adaptive Management
Move workers to site by shuttle bus so that there are limited personal vehicles in the area.	Mine Site, QR Mill, Transportation Route		Community Effects Plan Section 5.3.3 Traffic Strategy	7.12-31	Monitoring and trigger response actions are discussed in the Community Effects Plan Section

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Time shift changes so that they do not all occur on the same day or time.	All		Community Effects Plan Section 5.3.2 Public Strategy and Section 5.3.3 Traffic Strategy	7.12-32	5.3.2.3 Public Strategy Adaptive Management
Accommodate workers at camps while at the Mine Site and QR Mill for all workers, except for workers that choose to commute daily that live nearby (e.g., Wells).	Mine Site, QR Mill		Community Effects Plan Section 5.3.1 Employee Strategy	7.12-33	N/A
Implement a worker health and wellbeing program to focus on physical, mental, cultural and social health perspectives.	All		Community Effects Plan Section 5.3.1 Employee Strategy Health Medical Services Management Plan	7.12-34	Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management
Provide means through which workers can stay in touch with their families while at site either remotely or at the site.	Mine Site, QR Mill		Community Effects Plan Section 5.3.1 Employee Strategy	7.12-35	
Provide rooms at the Mine Site Accommodations for all workers who want to stay at the camp.	Mine Site		Community Effects Plan Appendix H Worker Accommodation and Offices	7.12-36	N/A
Provide access to mental health services while at camp and while off-shift.			Community Effects Plan Section 5.3.1 Employee Strategy	7.12-37	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Provide recreation activities at site.			Community Effects Plan Appendix H Worker Accommodation and Offices	7.12-38	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management
Create a positive and respectful camp environment.			Community Effects Plan Section 5.3.1 Employee Strategy Community Effects Plan Appendix A Workforce Policies and Programs	7.12-39	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management
Enforce camp rules and regulations.				7.12-40	
Develop a visiting area where workers families could visit workers after their shifts.				7.12-41	N/A
Provide ODV owned accommodation in Wells that can be used for workers, including contractors.				7.12-42	N/A
Utilize Project specific water, sewer, electricity, waste and communications systems at the Mine Site and QR Mill.	Mine Site, QR Mill		Community Effects Plan Section 5.3.2 Public Strategy	7.12-43	The Community Involvement Plan is currently in development and specifically addresses District of Wells interests.
Continue to work with the District of Wells to upgrade the existing water and sewer systems.				7.12-44	
Implement innovative ways of handling waste on site such as composting bins that the community could also use.				7.12-45	
Inform Quesnel, Wells and CRD regarding operations, potential population increase, etc.	All		Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	7.12-46	N/A

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Waste rock will be moved to the Bonanza Ledge Site on mine roads and will not travel through Wells.	Mine Site		Community Effects Plan Appendix C Traffic Control Plan	7.12-47	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management
Communicate to workers and contractors the key transportation related bylaws or regulations in Wells and include these in the Traffic Control Plan.	All			7.12-48	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.3.3 Traffic Strategy Adaptive Management
Provide access to financial planners			Community Effects Plan Section 5.3.1 Employee Strategy	7.12-49	N/A
Implement a Waste (Refuse and Emissions) Management Plan and discuss use of the Wells Transfer Station and Quesnel Regional Landfill with Cariboo Regional District	Mine Site, QR Mill		Waste (Refuse and Emissions) Management Plan Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications, and Reporting Strategy	7.12-50	N/A
Inform SD 28 regarding closure timing	All			7.12-51	

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Inform Quesnel, Wells, CRD and Indigenous Nations regarding timing of closure.			Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications, and Reporting Strategy	7.12-52	
Provide and make mandatory that contractors and workers have a copy of the Traffic Control Plan, including key highway and road regulations	Transportation routes		Community Effects Plan, Section 5.3.1 Employee Strategy Section 5.3.3 Traffic Strategy	7.12-53	
Inform Quesnel, Wells, CRD and MOTI regarding potential project traffic during closure.	Transportation routes		Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Section 5.3.3 Traffic Strategy Community Effects Plan Appendix G Engagement, Communications, and Reporting Strategy	7.12-54	N/A

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Provide mental health and job training counselling/support to employees as the project approaches closure.	All		Community Effects Plan Section 5.3.1 Employee Strategy Section 5.3.2 Public Strategy	7.12-55	N/A
ODV has provided funding to support improvements to the school building in Wells which will also house the community fitness centre.	All		Community Effects Plan Section 5.3.2 Public Strategy	7.12-56	The Community Involvement Plan is currently in development and specifically addresses District of Wells interests.
Plan shift changes so that traffic does not correspond with existing peak times.	All		Community Effects Plan Section 5.3.3 Traffic Strategy Community Effects Plan Appendix C Traffic Control Plan	7.12-57	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.3.3 Traffic Strategy Adaptive Management

5. HUMAN AND COMMUNITY HEALTH

Table 5-1: Human and Community Detailed Mitigations

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Develop a Hiring Policy to implement a gender inclusive local hiring program and offer equal employment opportunities to all groups including diverse groups.	All	EAC Section 7.14.5.3	Community Effects Plan Section 5.3.1 Employee Strategy Community Effects Plan Appendix A Workforce Policies and Programs Health Medical Services Plan Section 1.3.5	7.14-1	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management and Section 5.3.2.3 Public Strategy Adaptive Management, and Health Medical Services Plan Section 3.4
Develop a Community Relations Policy and commit to ensuring that employees and subcontractors interact with Indigenous and local communities, organizations, groups and individuals with respect and integrity through raising awareness and acceptance of cultural differences and fostering diversity and inclusion.			Community Effects Plan Section 5.3.1 Employee Strategy	7.14-2	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Provide employee assistance programs and benefits, including career planning, employee counselling, financial planning, family support, transition planning, a pension plan, and group insurance benefit plans to encourage employment with the Project.			Community Effects Plan Section 5.3.1 Employee Strategy Community Effects Plan Appendix A Workforce Policies and Plans	7.14-3	N/A
Implement a holistic worker health and wellbeing program to focus on physical, mental, cultural and social health.			Health Medical Service Plan Sections 2.8,2.9,2.10	7.14-4	Effectiveness monitoring is discussed in the Health Medical Service Plan Section 3.4
Inform RAA and LAA communities and Regional Districts with advance notice regarding anticipated timing of each Project phase, employee numbers, and duration as well as the change in requirements from phase to phase.			Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications, and Reporting Strategy	7.14-5	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management
Work with identified diverse groups to ensure gender mainstreaming in the Project and social accountability.				7.14-6	
Inform workers from outside the area of the situation regarding community infrastructure, services and housing in the area so that they can make an informed decision about moving to the area.	All		Community Effects Plan Section 5.2 Mitigation Implementation	7.14-7	N/A

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Develop orientation packages for incoming workers with information about the community, services and amenities, recreation opportunities, key community contacts, local businesses, community groups and volunteer opportunities.			Community Effects Plan Section 5.3.1 Employee Strategy Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	7.14-8	N/A
ODV has a CODE OF BUSINESS CONDUCT & ETHICS that require all its directors, officers, employees, contractors, and consultants to, at all times, comply and act in accordance with the principles stated in the Code. The code includes specific clauses on: Non-Discriminatory Environment, Harassment-Free Workplace, and Workplace Violence.	Mine Site		Community Effects Plan Appendix A Workforce Policies and Programs	7.14-9	Monitoring and trigger response actions are discussed in the Section 5.3.1.6 Employee Strategy Adaptive Management
Develop a socio-economic monitoring plan in consultation with local and regional governments, agencies and residents for all Project phases.	All		Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G: Engagement, Communications and Reporting Strategy	7.14-10	Advanced through the amendment process

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Develop a Health and Medical Services Plan (HMSP) comprised of the following sections: Project Information, Infrastructure, on-site programs and services and collaboration, communication and problem solving and provide it to the health authorities in advance of construction for review. The HMSP will follow the Best Management Guides for Industrial Camps and will be adaptive to workforce demographics (e.g., workers' families, gender, etc.). ODV will engage NH and BC Emergency Health Services in the development of the HMSP			Health Medical Services Plan	7.14-12	Health Medical Service Plan is complete
Communicate with local governments existing ODV corporate policies primarily those referenced in the Application.	All		Community Effects Plan Appendix A Engagement, Communication and Reporting Strategy	7.14-13	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management
Use worker camps for workers at the Mine Site and QR Mill, including into the Closure Phase.	Mine Site, QR Mill		Community Effects Plan Section 5.3.1 Employee Strategy	7.14-14	N/A
Provide on-site and virtual health services covering a broad range of health needs including non urgent care, mental health, addictions, sexual health, disease prevention, and wellness programs, as noted above.			Health Medical Services Plan Section 2.8,2.9,2.10	7.14-15	Effectiveness monitoring is discussed in the Health Medical Services Plan Section 3.4
Provide on-site emergency medical response services; if movement to an emergency room is required, coordinate with Emergency Health Services (EHS) regarding method (e.g., ground ambulance, air ambulance) and location.			Health Medical Service Plan Section 2.8.3 and Section 2.3.4	7.14-16	Effectiveness monitoring is discussed in the Health Medical Services Plan Section 3.4

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Only send cases that require emergency room treatment to the emergency room and will encourage workers not to use the emergency room as a walk-in clinic.	All		Community Effects Plan Section 5.3.2 Public Strategy	7.14-17	Effectiveness monitoring is discussed in Section 5.3.2.3 Public Strategy Adaptive Management
Encourage workers, while at site, to participate in the Wells Volunteer Fire Brigade and develop a mutual aid agreement with the Brigade.			Community Effects Plan Section 5.3.2 Public Strategy	7.14-18	N/A
Ensure that fire protection services are available at the mine site and QR Mill site.	Mine Site, QR Mill			7.14-19	
Maintain a working relationship with emergency service providers in the area so that potential issues can be identified and prevented or dealt with expeditiously.	All		Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix A Engagement, Communication and Reporting Strategy	7.14-20	Monitoring and trigger response actions are discussed in Section 5.3.2.3 Public Strategy Adaptive Management
The shuttle site in Quesnel will be secured and/or will have surveillance to mitigate break and enters in cars left at the site.			Community Effects Plan Section 5.3.3 Traffic Strategy	7.14-21	Community Effects Plan Section 5.3.3.3 Traffic Strategy Adaptive Management
Coordinate with BC Wildfire so that equipment and staff can support wildfire response as required.	All		Community Effects Plan Section 5.3.2 Public Strategy	7.14-22	Coordination will occur through the development and maintenance of the Community Emergency Response Plan discussed in the Community Effects Plan Section 5.3.2.
Communicate the risks to workers at site of going into the backcountry when off shift to reduce the need for search and rescue services.			Community Effects Plan Section 5.3.1 Employee Strategy	7.14-23	N/A

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
In addition to plans and policies identified earlier, develop and implement an Emergency Response Plan as well as plans for handling explosives and hazardous materials.	Mine Site		Explosives Management Plan Occupational Health and Safety Plan Section 6.14 Mine Emergency Response Plan	7.14-24	N/A
Provide means through which workers can stay in touch with their families while at site either remotely or at the site.	Mine Site, QR Mill		Community Effects Plan Section 5.3.1 Employee Strategy Community Effects Plan Appendix H Worker Accommodations and Offices	7.14-25	N/A
Provide rooms at the Mine Site Accommodations for all workers who want to stay at the camp as well as the option for workers to commute should they so desire on a permanent or temporary basis.	Mine Site		Community Effects Plan Section 5.3.1 Employee Strategy	7.14-26	N/A
Provide access to mental health services while at camp.			Community Effects Plan Section 5.3.1 Employee Strategy Health Medical Service Plan 2.8.4	7.14-27	Effectiveness monitoring is discussed in the Community Effects Plan Section 5.3.1.6 Employee Strategy Adaptive Management and the Health Medical Services Plan Section 3.4

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Provide fitness and other recreation opportunities at the worker camps and provide information regarding recreation opportunities in the areas surrounding the camps to workers.			Community Effects Plan Section 5.3.1 Employee Strategy Community Effects Plan Appendix H Worker Accommodations and Offices	7.14-29	N/A
Encourage workers to volunteer in the community.	All		Community Effects Plan Section 5.3.1 Employee Strategy	7.14-30	N/A
Support hiring of a social worker to deal with mental health issues in the Local Assessment Area for a period of four years and reassess after that time based on the findings of the Socio-economic Monitoring Plan.			Community Effects Plan Section 5.3.2 Public Strategy	7.14-31	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management. Socio-economic monitoring/assessment of the Local Assessment Area is planned as part of assessing Project changes and upcoming amendments that can be used to monitor mental health issues.
Pay a competitive wage for all workforce based on qualifications and regardless of their background and gender roles.	All		Community Effects Plan Section 5.3.1 Employee Strategy	7.14-32	N/A

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Undertake mine closure planning, with local communities and service providers through the community advisory committee.	Mine Site, QR Mill, Transmission Line		Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy Mine Site Reclamation and Closure Planning QR Mill Reclamation and Closure Planning	7.14-33	The Community Involvement Plan and the Indigenous Partnership Plan are currently in development and provides a framework for developing future plans, such as reclamation and closure planning, with the District, the Participating Indigenous nations, and stakeholders.
Provide financial planning, job search support, enhanced mental health support and other supports to workers that could facilitate transition to another position or put them in a better position from which to handle job cessation.	All		Community Effects Plan Section 5.3.1 Employee Strategy	7.14-34	N/A

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Accommodate workers at camps while at the Mine Site and QR Mill for all workers, except for workers that choose to commute daily that live nearby (e.g., Wells).			Community Effects Plan Section 5.3.1 Employee Strategy Community Effects Plan Appendix H Worker Accommodations and Offices	7.14-35	N/A
Projected manganese and cobalt water quality concentrations in Lowhee Creek exceeded the drinking water guideline for the protection of human health in the winter months when the creek is expected to be cover in snow and ice. As the exceedances were not marginal, it is recommended that this water not be used as a drinking water source.	Mine Site		Drinking Water and Water Treatment Plan Section 3.1.3.2 Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix J Human Health Monitoring and Management Plan	7.14-36	Monitoring and trigger response actions are discussed in the Human Health Monitoring Plan

6. MALFUNCTIONS AND ACCIDENTS

Table 6-1: Malfunctions and Accidents Detailed Mitigations

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Muster stations will be identified and communicated to all workers.	All	EAC Section 9.4.1	Community Effects Plan Section 5.3.2 Public Strategy Community Emergency Response Plan Occupational Health and Safety Plan Appendix 15 Emergency Preparedness	9.0-1	Management responsibilities are discussed in Section 3 of the Occupational Health and Safety Plan
The fire alarm system will consist of fire and smoke detectors, manual pull stations in strategically located sites in buildings, and audible and visual notifications.			Occupational Health and Safety Plan	9.0-2	
The fire alarm system will be monitored 24 hours per day.			Occupational Health and Safety Plan Appendix 15 Emergency Preparedness	9.0-3	
Buildings, vehicles, and mobile equipment will be equipped with the proper-rated fire extinguishers.				9.0-4	
Underground mobile equipment will be outfitted with fire suppression systems.	Mine Site			9.0-5	
Emergency response to fires will be conducted by mine rescue team including personnel trained in firefighting and proper equipment use.	All		Mine Emergency Response Plan Community Effects Plan Section 5.3.2	9.0-6	N/A

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
All employees will be trained in the safe response to fires, fire alarms, use of standard fire extinguishers, and evacuation procedures.			Public Strategy Community Emergency Response Plan	9.0-7	Management responsibilities are discussed in Section 3 of the Occupational Health and Safety Plan Training is discussed in Section 1.6 of the Mine Emergency Response Plan
Emergency evacuation training will be undertaken once a year for both underground and surface infrastructure.			Mine Emergency Response Plan Community Effects Plan Section 5.3.2 Public Strategy Community Emergency Response Plan Occupational Health and Safety Plan Appendix 15 Emergency Preparedness	9.0-8	
Chemicals and refuse will be properly stored (e.g., ensure flammable and combustible materials are stored in specified known areas).	Mine Site, QR Mill		Chemicals and Materials Storage and Handling Plan Section 4	9.0-9	N/A
Managers will continuously monitor the BC Wildfire rating, weather conditions, and any fires in the Cariboo Regional District (CRD) to assess the risk to personnel, contractors, and equipment of the Project.	All		Mine Emergency Response Plan Community Effects Plan Section 5.3.2 Public Strategy Community Emergency Response Plan	9.0-10	N/A

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Procedures will be implemented to keep travel ways clear, allowing safe egress to refuge.	Mine Site		Community Effects Plan Section 5.3.2 Public Strategy Community Emergency Response Plan	9.0-11	Coordination with local emergency services will occur through the development and maintenance of the Community Emergency Response Plan discussed in the Community Effects Plan Section 5.3.2.
Proper storage of explosives and storage only at specified permitted locations.			Explosives Management Plan Section 4.3.3	9.0-12	N/A
Access to explosive storage is limited to authorized personnel only.			Explosives Management Plan	9.0-13	N/A
Regular emergency planning and safety drills will be executed.	All		Community Effects Plan Section 5.3.2 Public Strategy Community Emergency Response Plan	9.0-14	Management responsibilities are discussed in Section 3 of the Occupational Health and Safety Plan
Comprehensive first aid facilities and qualified first aid attendants will be available.			Community Effects Plan Section 5.3.2 Public Strategy Health Medical Services Plan Section 2.8.3 Occupational Health and Safety Plan Section 6.13	9.0-15	N/A

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Emergency medical vehicles will be available for transportation of injured persons to nearest hospital.			Community Effects Plan Section 5.3.2 Public Strategy Mine Emergency Response Plan Section 6	9.0-16	N/A
Regular monitoring of facilities to increase the probability of detecting geotechnical failures.	Mine Site, QR Mill		Ground Control Management Plan Section 6.2	9.0-17	The ODV Geotechnical Engineer for coordinating the review of the Geotechnical Management Plan and ensuring compliance
If geotechnical issues are identified, preventative geotechnical stability measures will be implemented.			Ground Control Management Plan Section 6	9.0-18	Accountabilities and responsibilities for implementing preventive stability measures are discussed in Section 1.4 of the Ground Control Management Plan
Follow ground control management plan already in place for the existing Bonanza Ledge Phase II mine.	Mine Site			9.0-19	
Regular monitoring of any associated water pond levels.	Mine Site, QR Mill		Mine Site Water Management Plan QR Mill Water Management Plan	9.0-20	Monitoring and trigger response actions are discussed in the Mine Site Water Plan Section 6 and Section 7 and in the QR Mill Water Management Plan Section 6 and Section 7
Develop excess storage capacity in Main Zone Pit (MZP), should this contingency be required.	QR Mill			9.0-21	
Regular monitoring to increase the probability of detecting increased inflow volumes or inadequate pump systems.	Mine Site			9.0-22	
Monitoring water levels in historical underground workings.				9.0-23	
If underground inflow of water issues are identified, preventative and proactive measures will be implemented.				9.0-24	

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Emergency alert system will be deployed immediately to notify underground miners of any emergency.	Mine Site			9.0-25	
Personnel, including mine rescue team, will be trained on evacuation and mustering procedures.			Community Effects Plan Section 5.3.2 Public Strategy Community Emergency Response Plan Mine Emergency Response Plan	9.0-26	Roles and responsibilities are discussed in the Mine Emergency Response Plan Section 3
Underground workings will be dewatered early in mine development, and water level monitoring while dewatering will be implemented.			Ground Control Management Plan Section 3.1.6	9.0-27	N/A
Paste backfill will be placed in the historical underground workings during operations in larger mine openings within the paste backfill distribution network physical limits and without exposing workers to unsecure ground.			Ground Control Management Plan Section 3.1	9.0-28	Implementation, including safety is discussed in the Ground Control Management Plan Section 5.
Proper training of the Fuel Management and Spill Contingency Plan will be provided to all personnel.			Community Effects Plan Section 5.3.2 Public Strategy Community Emergency Response Plan Fuel Management and Spill Contingency Section 2	9.0-29	Section 2.3 of the Fuel Management and Spill Contingency Plan discusses how personnel will be trained on fuel management and spill contingency

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Vehicles will be equipped with appropriate spill response kits.	All		Fuel Management and Spill Contingency Plan Section 2	9.0-30	N/A
Fuel storage locations and other key areas at each site, as well as appropriate personnel, will be equipped with spill response kits.			Community Effects Plan Public Strategy 5.3.2 Fuel Management and Spill Contingency Plan Section 4	9.0-31	
Specific spill hazard assessments will be developed.			Community Effects Plan Section 5.3.2 Public Strategy Fuel Management and Spill Contingency Plan Section 4.3.3	9.0-32	
Implementation of the Fuel Management and Spill Contingency Plan, including procedures that equip vehicles and buildings with spill response equipment and supplies (e.g., spill clean-up kits, booms, etc.) and facilitate immediate response to clean-up spills to land or water, and implementation of remediation measures.	All		Fuel Management and Spill Contingency Plan	9.0-33	
Implementation of and strict adherence to speed limits.			Community Effects Plan Section 5.3.3 Traffic Strategy	9.0-34	Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.3.3 Traffic Strategy Adaptive Management
Implementation of and strict adherence to mandatory seatbelts use.				9.0-35	
Implementation of and strict adherence of communication procedures on roads.				9.0-36	

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Drivers will be appropriately trained by the training department, trained in Project codes of conduct, and require authorization prior to use of mobile equipment.			Community Effects Plan Appendix C Traffic Control Plan	9.0-37	
Regular maintenance of Project roads.				9.0-38	
Proper placement of materials as outlined in the ML/ARD Management Plan.	Mine Site		ML/ARD Management Plan	9.0-39	N/A
Appropriate power system design.	Mine Site, QR Mill	EAC Section 9.5.1	Construction Environmental Management Plan	9.0-40	N/A
Routine monitoring and maintenance of equipment and ventilation system.				9.0-41	Roles and responsibilities are discussed in Section 2 of the Construction Environmental Management Plan
Permitting only authorized entry into electrical rooms.			Occupational Health and Safety Plan Appendix 11 Preventative Maintenance	9.0-42	N/A
Stand-by generators will be maintained for system critical facilities (e.g., communications, light, heat, emergency response facilities, water treatment plant, and sewage treatment plant) in the event of shutdown for routine maintenance or mechanical failure.	Mine Site, QR Mill		Construction Environmental Management Plan	9.0-43	Management and maintenance responsibilities are discussed in Section 2
Training personnel on working alone procedures and communication procedures.	All		Occupational Health and Safety Plan Section 6.9	9.0-44	Orientation, training, and competency are discussed in the Occupational Health and Safety Plan Section 6.21
Real-time weather monitoring.			Occupation Health and Safety Plan Appendix 3 Workplace Hazard Materials Information System	9.0-45	Management responsibilities are discussed in Section 3 of the Occupational Health and Safety Plan

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Equipping vehicles and buildings with winter safety kits (e.g., shovels, blankets, fire starters).			Community Effects Plan Appendix C Traffic Control Plan	9.0-46	N/A
Implementing use of the Emergency WRSF Access Road between the Bonanza Ledge Site and Mine Site Complex, if the Bonanza Ledge Site WRSF Access Road is blocked.	Mine Site	EAC Section 9.4.1 and Section 9.5.1	Community Effects Plan Section 5.3.2 Public Strategy Community Emergency Response Plan	9.0-47	N/A
An outline of the role of the mine rescue team and required training, including the coordination of response with ODV and municipalities and emergency response departments, will be included in the Project Emergency Response Plan, with attached applicable mutual agreements.	All		Community Effects Plan Section 5.3.2 Public Strategy Community Emergency Response Plan Mine Emergency Response Plan Section 3	9.0-48	N/A
Work with the District of Wells to update the Project Emergency Response Plan to ensure the public are notified in a timely manner (i.e., that supports a 24/7 notification system).			Community Effects Plan Section 5.3.2 Public Strategy Community Emergency Response Plan	9.0-49	N/A
If an incident (malfunction or accident) associated with the Project occurs that triggers the Project Emergency Response Plan, this plan will be implemented, including notification of appropriate authorities and deployment of trained personnel.			Community Effects Plan Section 5.3.2 Public Strategy Community Emergency Response Plan	9.0-50	Roles and responsibilities if an incident occurs are detailed in the Mine Emergency Response Plan Section 3 and in Section 5.3.2 Public Strategy Community

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
If an incident occurs and the assessment conducted determines that effects to VCs occurred, adaptive management strategies, in consultation with appropriate regulators and Indigenous Nations, will be implemented to address the recovery and remediation for the affected VCs.				9.0-51	Emergency Response Plan of the Community Effects Plan
Identify the filtered tailings volume limits that can be safely stored.	QR Mill		ML/ARD Management Plan Section 6	9.0-52	Monitoring of tailings is discussed in the ML/ARD Management Plan Section 18
Establish fail safe alarms for the FSTSF.			Mine Emergency Response Plan	9.0-53	If an incident were to occur, roles and responsibilities are discussed in the Mine Emergency Response Plan Section 3
Manage surface water run-off/precipitation and ground water infiltration.	Mine Site, QR Mill		Mine Site Water Management Plan QR Mill Water Management Plan	9.0-54	Monitoring and trigger response actions are discussed in the Mine Site Water Plan Section 6 and Section 7 and in the QR Mill Water Management Plan Section 6 and Section 7
Mechanical fail safe valves or barriers will be appropriately used.			Mine Emergency Response Plan	9.0-55	If an incident were to occur, roles and responsibilities are discussed in the Mine Emergency Response Plan Section 3

7. LHTAKO DENÉ NATION

Table 7-1: Lhtako Dené Nation Detailed Mitigations

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Indigenous nations will be notified of clearing activities including location and schedule prior to start.	All	EAC Section 11.5.5.3	Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy Construction Environmental Management Plan	11.0-2	The Indigenous Partnership Plan is currently in development and intends to address the specific issues and concerns of the Participating Indigenous nations.

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
The first priority to address a traditional land use site that is identified through pre-construction studies of the Transmission Line is to design Project components around the identified site. If the Project components are not able to be designed around a site, mitigation options will be followed, as outlined in the Construction Management Plan that will be developed.	Transmission Line		Archaeological Management and Impact Mitigation Plan Community Effects Plan Appendix G Engagement, Communications, and Reporting Strategy Construction Environmental Management Plan Section 6.3	11.0-3	N/A
Existing traditional land use sites (where identified) will be marked with high-visibility fencing or other barriers to prevent accidental disturbance.	Mine Site, QR Mill, Transmission Line		Archaeological Management and Impact Mitigation Plan and Chance Find Procedures Construction Environmental Management Plan Section 6.3	11.0-4	N/A
Reclamation activities will target revegetation of ecological communities valued for traditional uses to pre-disturbance plant communities.			Mine Site Reclamation and Closure Plan QR Mill Reclamation and Closure Plan	11.0-5	The Indigenous Partnership Plan is currently in development and will address the specific issues and concerns of Participating Indigenous nations. BGM is currently in

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Meet with Lhtako Dené Nation on how to support the caribou recovery initiative.	All		Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	11.0-7	discussions with the Lhtako Dené Nation on how they may support the caribou recovery initiatives.
Wildlife camera study along the Transmission Line ROW.	Transmission Line		Caribou Mitigation and Monitoring Plan Section 8.1 Wildlife Access Management Plan Section 6.2	11.0-8	Adaptive Management for Caribou is discussed in the Section 8.4 of the Caribou Mitigation and Monitoring Plan
Meet with Lhtako Dené Nation on how to support developing salmon enhancement and other stewardship opportunities.	All		Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	11.0-10	The Indigenous Partnership Plan is currently in development and will address the specific issues and concerns of Participating Indigenous nations. Every spring, BGM joins Lhtako Dené Nation members, including Chief and Council, Elders, and youth, and members of the broader community to release sockeye salmon fry into the Bowron Lake.

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
A quarterly monitoring report summary will be shared with Lhtako Dené Nation.			Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	11.0-13	The Indigenous Partnership Plan is currently in development and will address the specific issues and concerns of the affected First Nations.
If any sign of archaeological remains are observed at any time during the proposed Project's activities, work will be halted and a qualified archaeologist and representatives from Lhtako Dené Nation will be notified.	Mine Site, QR Mill, Transmission Line		Community Effects Plan Appendix G Engagement, Communication and Reporting Strategy Archaeological Management and Impact Mitigation Plan and Chance Find Procedures Construction Environmental Management Plan Section 6.3	11.0-15	N/A

8. WILLIAMS LAKE FIRST NATION

Table 8-1: Williams Lake First Nation Detailed Mitigations

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Indigenous nations will be notified of clearing activities including location and schedule prior to start.	All	EAC Section 12.5.5.3	Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy Construction Environmental Management Plan	12.0-1	The Indigenous Partnership Plan is currently in development and intends to address the specific issues and concerns of the Participating Indigenous nations.
Existing traditional land use sites (where identified) will be marked with high visibility fencing or other barriers.	Mine Site, QR Mill, Transmission Line		Archaeological Management and Impact Mitigation Plan Construction Environmental Management Plan Section 6.3	12.0-2	Monitoring for cultural sites is discussed in Section 5 of the Archaeological Management and Impact Plan and Section 6.3 of the Construction Environmental Management Plan Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
If any sign of archaeological remains are observed at any time during the proposed project's activities at QR Mill, work will be halted and a qualified archaeologist and representatives from Williams Lake First Nation will be notified.	QR Mill		Community Effects Plan Appendix G Engagement, Communication and Reporting Strategy Archaeological Management and Impact Mitigation Plan Construction Environmental Management Plan Section 6.3	12.0-4	N/A
A quarterly monitoring report summary will be shared with Williams Lake First Nation.	All		Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy	12.0-8	The Indigenous Partnership Plan is currently in development and will address the specific issues and concerns of the affected First Nations.
Reclamation activities will target revegetation of ecological communities valued for traditional uses to pre-disturbance plant communities	Mine Site, QR Mill, Transmission Line		Mine Site Reclamation and Closure Plan QR Mill Reclamation and Closure Plan	12.0-12	

9. XATŚŪLL FIRST NATION

Table 9-1: Xatśūll First Nation Detailed Mitigations

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
Indigenous nations will be notified of clearing activities including location and schedule prior to start.	All	EAC Section 13.5.5.3	Community Effects Plan Section 5.3.2 Public Strategy Community Effects Plan Appendix G Engagement, Communications and Reporting Strategy Construction Environmental Management Plan	13.0-1	The Indigenous Partnership Plan is currently in development and intends to address the specific issues and concerns of the affected First Nations. BGM is currently in discussion with Xatśūll First Nation about the development of a Participation Agreement. Xatśūll First Nation's involvement in the processes that support their participation in the Project are in development.

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
If existing traditional land use sites are identified through studies conducted prior to construction of the Transmission Line, ODV will consider design modification options to avoid or limit disturbance to the site	Transmission Line		Archaeological Management and Impact Mitigation Plan Community Effects Plan Appendix G Engagement, Communications, and Reporting Strategy Construction Environmental Management Plan Section 6.3	13.0-2	Monitoring for cultural sites is discussed in Section 5 of the Archaeological Management and Impact Plan and Section 6.3 of the Construction Environmental Management Plan Monitoring and trigger response actions are discussed in the Community Effects Plan Section 5.3.2.3 Public Strategy Adaptive Management
Existing traditional land use sites (where identified) will be marked with high visibility fencing or other barriers to prevent accidental disturbance.	Mine Site, QR Mill, Transmission Line		Archaeological Management and Impact Mitigation Plan	13.0-3	N/A

Mitigation Measures	Project Component	Mitigation Source	Management Plan	Chapter 20.1 Mitigation ID	Notes
If any sign of archaeological remains are observed at any time during the proposed project's activities, work will be halted and a qualified archaeologist and representatives from Xatśūll First Nation will be notified.			Community Effects Plan Appendix G Engagement, Communication and Reporting Strategy Archaeological Management and Impact Mitigation Plan Construction Environmental Management Plan Section 6.3	13.0-5	
Reclamation activities will target revegetation of ecological communities valued for traditional uses to pre-disturbance plant communities.	Mine Site, QR Mill, Transmission Line		Mine Site Reclamation and Closure Plan QR Mill Reclamation and Closure Plan	13.0-9	The Indigenous Partnership Plan is currently in development and will address the specific issues and concerns of the affected First Nations.
A quarterly monitoring report summary will be shared with Xatśūll First Nation.	All		Community Effects Plan Appendix G Engagement, Communication and Reporting Strategy	13.0-11	