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6.1 Effects Assessment Approach

This section presents the methods used to identify and assess the potential effects of the proposed Springpole Gold Project (Project) pursuant to the *Canadian Environmental Assessment Act, 2012* (SC 2012, c. 19, s. 52) and associated federal Environmental Impact Statement (EIS) Guidelines for the Project (Appendix B-1) as well as the Ontario *Environmental Assessment Act* (RSO 1990, c. E.18) and associated approved provincial Terms of Reference (ToR; Appendix B-3).

6.1.1 Influence of Consultation with Indigenous Communities, Government and the Public

Consultation has been ongoing for several years prior to and throughout the environmental assessment (EA) process, and will continue with Indigenous communities, government agencies, and the public over the life of the Project. Section 2 provides more detail on the extensive consultation process. The Record of Consultation (Appendix D) includes detailed comments received during the development of the final EIS/EA.

Feedback received through consultation has been addressed through direct responses (in writing and follow-up meetings) and incorporated into the final EIS/EA, as appropriate. The key comments that influenced the effects assessment approach between the draft and final EIS/EA is provided below.

Description of the Existing Environment

The Ministry of the Environment, Conservation and Parks (MECP) requested clarification of whether the description of the existing environment addresses components of the environment (including natural, social, economic, cultural, built). A comprehensive description of all components of the existing environment, including the natural, social, economic, cultural and built environment is provided in Section 6.2 to Section 6.26, as outlined in Table 6.1-1. The description of the existing baseline conditions for each of these sections is supported by a detailed baseline report.

Traditional Knowledge and Traditional Land Use Information

Cat Lake First Nation, Lac Seul First Nation and the Northwestern Ontario Métis Community (NWOMC) requested clarification on how the Traditional Knowledge and Land and Resource Use information was used to inform the EIS/EA. Traditional Knowledge and Land and Resource Use information received from Indigenous communities has been reviewed to ensure alignment with the valued components (VCs) selected for assessment as shown in Section 6.21. In some cases, the assessment of a VC has been modified to include areas of interest expressed by Indigenous communities such as the inclusion of mental health and well-being in Section 6.19 and Section 6.20. In addition, the description of the existing conditions for each VC, includes a description of Traditional Knowledge and Land and Resource Use that is relevant to the VC, and is considered in the assessment and selection of mitigation and monitoring.

Valued Components

MECP requested clarification of how consultation with government agencies, Indigenous communities and interested persons informed the selection of valued components in accordance with the commitments in the approved amended ToR. During the preparation of the provincial ToR, a preliminary list of VCs was included the draft version of the ToR. As a result of the subsequent engagement during the EA process, two additional VCs were added including: noise and vibration (Section 6.3), and commercial land and resource use (Section 6.17). Through ongoing engagement on the draft EIS/EA, feedback provided by Indigenous communities, government agencies and other stakeholders has been considered in the refinement of the VC list, as described in Section 2. In particular, the Ministry of Citizenship and Multiculturalism (MCM) requested clarification of how a changes in visual aesthetics at remote locations is considered in the

assessment of potential effects on tourism. The assessment of commercial land and resources (Section 6.17) and outdoor recreation (Section 6.18) include an indicator for changes in viewsapes to describe the potential effects on tourism at remote locations. This is supported by a detailed Visual Aesthetics Desktop Baseline Study and Assessment (Appendix U).

MCM requested that the cultural heritage VC acknowledge both built heritage and cultural features. The VC for cultural heritage resources has been renamed built heritage resources and cultural heritage landscapes (Section 6.23) to better reflect the assessment as noted by MCM.

Criteria, Indicators and Data Sources

MECP requested clarification of how the preliminary list of criteria, indicators and data sources in the approved Amended ToR were refined during the EA process, and how each criterion and indicator is considered in the assessment. MECP also requested a final list of the criteria, indicators and data sources be presented in the final EIS/EA. Further, MECP requested clarification on the relationship between the VCs, criteria, indicators and data sources used in the assessment.

During the preparation of the ToR, feedback received through engagement activities with Indigenous communities, government agencies and the public was used in the development of the list of criteria and indicators included in the approved Amended ToR. This list of criteria and indicators was used as the basis for the assessment of the related VCs in the draft EIS/EA. Based on feedback received from Indigenous communities and government agencies during the EA process, the criteria and indicators were refined, where appropriate. MECP identified additional criteria and indicators to be considered in the evaluation of Caribou, and MCM suggested that the cultural heritage VC be characterized as built heritage. Through the review of the draft EIS/EA, feedback received from Indigenous communities, government agencies and the public was considered in finalizing the list of criteria and indicators. For example, a key comment from Indigenous communities was related to mental health and well-being, which resulted in further consideration and inclusion of this in Section 6.19 and 6.20.

It should be noted that the draft EIS/EA used the term “measurable parameters,” which refers to the indicators identified in the approved Amended ToR, and this has been updated in the applicable VC effects assessment sections (Section 6.2 to 6.26). Data sources used include the baseline reports for the VCs that have been prepared for the Project and appended to the final EIS/EA. These baseline reports relied on a combination of field studies, available Traditional Knowledge, various government sources and other relevant sources related to the VC, consistent with the potential sources identified in the approved Amended ToR. A summary of the consultation is included in Section 2, and detailed responses to comments from Indigenous communities and government agencies regarding criteria, indicators and data sources are included in Appendix D-3. Table 6.1-2 includes a final list of criteria, indicators and data sources used for each VC in the EIS/EA. Based on the feedback received on the draft EIS/EA, an updated description of the relationship between VCs, criteria, indicators and data sources used in the assessment is provided in Section 6.1.2.

Spatial Study Areas

Slate Falls Nation requested clarification of the geographic coverage for the preliminary study area used for the environmental assessment. The geographic coverage for the preliminary study area used for the proposed project assessed in the draft EIS/EA did not overlap with the planning area for the Cat Lake / Slate Falls Community Land Use Plan. However, as a result of consultation, the transmission line route has been optimized and is proposed to follow the existing E1C transmission line to the Wataynikaneyap transmission line (Alternative 1 in draft EIS/EA). As a result, the Project Development Area (PDA) and the Local Study Area

(LSA) and Regional Study Area (RSA) for the effects assessment will overlap with the planning area and is considered in the assessment as illustrated in Section 6.21.

MECP requested clarification in the final EIS/EA on the rationales for the study areas chosen for the EA process. During the preparation of the draft EIS/EA, a preliminary study area was broadly defined for the Project to support the overall characterization of the existing surrounding environment for the Project. This preliminary study area (Figure 6.1-1) was further refined during the EA process, and separate study areas were defined for the assessment of potential effects from the Project for each of the biophysical and human environment VCs in the draft EIS/EA (Section 6.1.3). Considering the feedback received on the draft EIS/EA, the rationale for the final LSA and RSA for each VC have been included in Sections 6.2 to 6.26.

Potential Effects

MECP requested clarification on the screening process used for the assessment of potential effects from Project interactions. To provide focus to the assessment of potential effects, the professional judgment of technical experts experienced with mining projects in Ontario as well as input from Indigenous communities, government agencies and the public informed the identification of those interactions that are likely to result in a pathway to a potential effect. The rationale for excluding project interactions from the assessment of particular VCs is provided with the screening and shown in the Project interaction table for each VC. Section 6.1.5 has been updated accordingly.

MECP also requested clarification on the use of the maximum potential effects to predict environmental effects expected to occur during any phase of the Project. The maximum effect refers to the greatest potential effect that may occur on the VC due to the Project and is based on the conservative assumptions and approach used in the effects assessment. By using a conservative approach, effects may be overestimated, but this will provide greater certainty that the actual effects will be less than predicted and will also support flexibility to accommodate minor refinements in the design during detailed engineering. This is a common practice used during the EA phase of a Project. This additional information is included in Section 6.1.5.

MECP requested clarification of whether all Project interactions are considered in the assessment of potential effects to the environment. As a result of Project optimizations, the table of interactions has been reevaluated and updated, as necessary to provide a comprehensive list of potential interactions. For example, it has been clarified that the construction of the mine access road considers the extraction and operation of the aggregate resource areas, the operation of the accommodations complex includes the management of domestic waste, and the operation and maintenance of mine site infrastructure includes the operation of the haul and access roads and other mine infrastructure such as the transmission line. Table 6.1-3 provides a list of Project components and activities during each phase of the Project.

Significance Determination

MECP requested that the characterizations of residual effects use the term attributes, for clarity. The term attributes is used in the final EIS/EA to characterize the residual effects and support the determination of significance, as shown in Table 6.1-4.

Mishkeegogamang Ojibway Nation (MON) requested clarification on the use of the ecological and social context and timing attributes for the determination of significance. The ecological and social context attribute is used to describe the sensitivity of a VC to further changes, and whether typical or special measures are required to managing further effects on sensitive VCs. The characterization of residual effects takes into consideration the ecological and social context for the VC, in determining whether the residual

effects after the application of mitigation is likely to result in a significant adverse effect. The timing attribute is used to describe whether the residual effect on the VC would be influenced by timing, such as occurring during a sensitive period of the year or season for the VC. If the residual effect occurs outside these sensitive periods, there would be a lower likelihood that timing would influence the determination of significance.

MON also requested further information on the process for determining significance and how uncertainty was addressed. The determination of significance is described in Section 6.1.5, and is consistent with the approach described in the approved Amended ToR. Uncertainty is addressed in the assessment of potential effects by include conservative assumptions to minimize the risk that a potential effect is underestimated. A description of the level of confidence in the prediction is provided for each VC, and if there is uncertainty in the prediction, a follow-up program may be developed to assess the prediction or the effectiveness of the mitigation. This additional information is included in Section 6.1.5 of the final EIS/EA.

MON requested clarification on the use of the likelihood attribute and noted that the discussion of the significance determination for each VC should follow a consistent approach. The use of the likelihood attribute is only applied to those residual effects that have been determined to be significant and has been clarified in Section 6.1.5. The discussion of significance for each VC in the final EIS/EA presents the attributes in a consistent order to provide additional clarity.

6.1.2 Methods

The approach used for the effects assessment supported the following objectives:

- Determine the potential direct and indirect Project effects in comparison to baseline (existing background) conditions;
- Apply the appropriate mitigation measures;
- Describe the residual effects; and
- Determine the significance of the residual effects.

The baseline characterization provides information on the features of the biophysical and human environment and their associated interrelationships, as well as the temporal variability within resources. This information is presented to allow characterization of each component being assessed. In describing the environmental components, applicable criteria and indicators used for the assessments are also described. Baseline characterization and the results of consultation and engagement activities have informed the identification of the VCs for the Project. VCs are those aspects of the natural and human environment that are notable or valued. VCs are organized according to the general components of the environment: natural, social, economic, cultural and built environment.

The approach used for the assessment of effects on VCs includes a set of criteria and indicators to evaluate the potential effects that may be caused to the VC. Criteria include a description of the potential effects on the environment, while indicators identify how the potential effects are measured for each criterion. Data sources for the criterion used in the assessment are primarily based on the baseline reports prepared for the draft EIS/EA and updated for the final EIS/EA where appropriate. These reports rely on Project-specific fieldwork, government records, available Traditional Knowledge and Land Use information and other relevant published sources. The approach used in this assessment meets the requirements of the federal EIS guidelines and the provincial approved Amended ToR.

Following the identification of VCs, the approach continues with the identification of potential effects and mitigation measures. Mitigation measures are proposed for each VC as required to eliminate or minimize effects, taking into consideration the magnitude and duration of the potential effects of the Project.

Following the identification of mitigation measures, an analysis is conducted to support the characterization of adverse residual effects (effects that remain after the application of mitigation) using significance attributes. The determination of significance is made on the basis of the attributes.

Residual adverse effects identified for the Project are carried forward into the cumulative effects assessment (Section 7) to determine the potential for overlapping effects with other adjacent projects.

6.1.2.1 Valued Components

VCs are those aspects of the natural and human environment that are notable or valued because of their ecological, scientific, resource, socioeconomic, cultural, health, aesthetic or spiritual importance, and that have a potential to be adversely affected by the Project. The identification of VCs provides focus to the assessment of potential effects on the biophysical and human environment, including the application of avoidance and mitigation measures to reduce or eliminate potential effects. VCs were selected for assessment based on the federal EIS Guidelines and the provincial ToR, comments raised during consultation on the Project, and the potential for interactions between the Project and the biophysical and human environment.

6.1.2.1.1 Determination of Valued Components

A biophysical VC can be a habitat, an environmental feature, an assemblage of plants or animals, a species of plant or animal, or an indicator of environmental and social health. Human environment VCs are defined as components of the human environment that are important in terms of people's values and quality of life. Data from extensive biophysical and human environment baseline studies, including input from consultation, engagement and literature sources, were used to identify VCs for the Project that meet one or more of the following criteria:

- Area of notable biological diversity;
- Significant habitat for locally important species;
- Significant habitat for uncommon or rare species;
- Species at risk (SAR);
- Other notable species or species groups;
- Important corridor linkage for fish and or wildlife movement;
- Sensitive receiving water environment;
- Indicator of environmental health;
- Important component to the function(s) of other ecosystem elements;
- Indigenous cultural significance;
- Economic, social or cultural significance, including as identified through Traditional Knowledge and Land Use information;
- Educational, scientific or aesthetic interest;

- Provincial, federal or international significance;
- Valued by the public and Indigenous communities who will potentially be affected by the Project and are therefore consulted in Project planning and implementation;
- Valued by government agencies as determined through the EA process; and
- Potentially affected by the Project based on the assessed level of interaction.

6.1.2.2 Selection of Valued Components

Biophysical Valued Components

The VCs for this EA process were identified as a result of extensive environmental baseline programs, EIS guidelines and ToR development process, engagement on the Project, and consideration of available Traditional land use information. Biophysical VCs were defined in consideration of the natural environment and the criteria listed above and fit within with the following generalized framework:

- Atmospheric systems;
- Surface water systems;
- Fish and fish habitat; and
- Terrestrial environment.

This framework allows an integration of both physical and biological environmental components of the natural environment, and therefore better accommodates an ecosystem-based approach to the definition and assessment of the VCs. In general, the designation of VCs is focused on habitats, features, and specific-species groups and related system interactions, rather than limiting to an individual species, with the exception of SAR.

Using the above approach, the entire natural environment was assessed. For example, rather than defining hydrology and water quality as distinct VCs, the Springpole Lake system was defined as the VC, with the analysis of the VC including integrated discussions of water flows and water quality.

The following natural environment VCs were selected for assessment in relation to the effects of the Project:

- Air quality;
- Noise and vibration;
- Greenhouse gas emissions;
- Groundwater;
- Birch Lake;
- Springpole Lake, north basin;
- Springpole Lake, southeast arm;
- Local inland waterbodies;
- Fish and fish habitat;
- Vegetation communities and wetlands;
- Wildlife and wildlife habitat;

- Boreal Caribou;
- Wolverine;
- Bats; and
- Birds.

Human Environment Valued Components

Human environment VCs in relation to the effects of the Project are subdivided into four principal categories: social, economic, cultural and built.

Social VCs were selected in consideration of commercial land and resource use, outdoor recreation, traditional use of the land and resources by local Indigenous communities, and human and ecological health. The following VCs were selected:

- Commercial land and resource use;
- Outdoor recreation;
- Indigenous people; and,
- Human and ecological health.

The selection of VCs for the economic environment considered the local and regional economy, labour and business. The following VC was selected:

- Local and regional economy.

VCs within the cultural environment were selected in consideration of cultural heritage and traditional use of the land and resources by local Indigenous communities. The following VCs were selected:

- Traditional land and resource use;
- Archaeological; and,
- Built heritage resources and cultural heritage landscapes.

The built environment VCs were selected in consideration of built heritage and infrastructure valued by local Indigenous communities. The following VC was selected:

- Local and regional infrastructure and services.

For each VC, the criteria and indicators were selected based on professional experience and input received from Indigenous communities, governmental agencies and the public during the EA process. The list of VCs, criteria, indicators and data sources are summarized in Table 6.1-2. These are further described in the applicable VC effects assessment sections (Sections 6.2 to 6.26), along with the rationale for their selection.

6.1.3 Spatial Boundaries

During the preparation of the draft EIS/EA, a preliminary study area was broadly defined for the Project (Figure 6.1-1) to support the overall characterization of the existing environment for the Project. This preliminary study area was further refined during the EA, and separate study areas were defined for the assessment of potential effects for each of the biophysical and human environment VCs. The study areas encompass the environment where effects are expected or likely to occur associated with the facilities and activities of the Project and where effects were studied. Effects on the biophysical environment will generally

occur closer to the Project; whereas human environment effects may occur more broadly. As a result, the areal extent of the potential effects for each VC is different. The study areas form the spatial boundaries for the effects assessment.

The investigation / study areas for the baseline studies are defined in the relevant baseline reports and may differ from the spatial boundaries for the effects assessment as they were defined for data collection purposes. These baseline / investigation study areas have evolved due to refinements as a result of ongoing studies, consultation and continued advancements in Project design.

The Project Development Area (PDA) is the footprint of the Project including the mine site area, mine site access road and the transmission line corridor, as well as a buffer to allow flexibility for design optimizations (Figure 6.1-2). As greater flexibility is required for the mine site area than the infrastructure elements, an approximate buffer of 250 metres (m) is included around the mine site area. The transmission line is within a 40 m wide corridor, the mine access road is within a 30 m wide corridor, and the shared corridor for the transmission line and mine access road is within a 60 m wide corridor.

To address feedback received on the draft EIS/EA, the rationale for the LSA and RSA used for each VC is included in Sections 6.2 to 6.25 of the final EIS/EA.

Two general spatial extents are considered in the assessment of effects for the EIS/EA:

- **Local Study Area (LSA):** extends beyond the PDA and was defined by applying a buffer around the PDA. The size of the LSA is intended to capture potential direct effects from the Project (such as emissions, discharges and habitat loss) and indirect effects resulting from the Project.
- **Regional Study Area (RSA):** encompasses and extends beyond the PDA and LSA. The RSA is used to provide regional context for the VC in the assessment of potential Project effects and the assessment of alternative methods and cumulative effects and is the maximum geographical extent or zone of influence in which potential effects from the Project are assessed.

Specific study areas (LSA and RSA, as applicable) have been established for each VC, as described and shown in the applicable sections of the effects assessment.

6.1.4 Temporal Boundaries

The temporal boundaries for the assessment were defined based on the timing and duration of Project activities and on the nature of the interactions with each VC. The purpose of a temporal boundary is to identify when an environmental effect may occur in relation to specific Project phases and activities. The temporal boundaries for the EIS/EA include the following Project phases:

- **Construction phase:** Years -3 to -1, representing the construction period for the Project.
- **Operations phase:** Years 1 to 10, with the first year potentially representing a partial year as the Project transitions from construction into operations.
- **Decommissioning and closure phase:**
 - Active closure: Years 11 to 15, when final decommissioning and the majority of active reclamation activities are carried out; and
 - Post-closure: Years 16+, corresponding to the post-closure monitoring period and when the filled open pit basin will be reconnected to Springpole Lake.

Effects on the VC are assessed for each Project phase (i.e., construction, operations and closure).

6.1.5 Effects Analysis Methods

For each VC, the analysis of effects is structured for each Project phase according to the following:

- **Assessment approach:** The assessment approach includes a description of the relevant regulatory and policy setting, a description of the input obtained through consultation specific to the VC, the identification of criteria and indicators used to describe and assess the VC, a description of the spatial and temporal boundaries used for the VC, and a description of the attributes used to determine the significance of any residual adverse effects.
- **Existing conditions:** The existing conditions is based on a review of available data sources and the results of the applicable baseline programs. Where Traditional Knowledge is available for the specific VC, it is described and incorporated into the information base used for the assessment. The description of the existing conditions supports the identification of potential effects and provides the relevant data to assess these effects.
- **Pathways to Potential effects:** The interaction between Project components and activities (Table 6.1-3) and the VC may result in one or more pathways to a potential effect on the VC. Project-related effects are identified for a given VC that could reasonably be expected to occur in the absence of mitigation. As not all interactions will have a material effect on each VC, these interactions are screen out on the basis of input received from Indigenous communities, government agencies, the public and technical experts from the Project team. The rationale for why certain Project components and activities will not interact with a VC is explained where required. The potential effects that will be caused or that might reasonably be expected to be caused are further analyzed in the effects assessment for each VC. These potential effects include both direct and indirect effects, as well as negative and positive effects, where applicable.
 - **Mitigation:** Mitigation measures are proposed to prevent, eliminate or reduce negative effects, and include elements inherent in the Project design that are intended to prevent or limit the effect from developing. Mitigation may also include offsetting measures, such as for potential adverse effects on fish habitat and wildlife species at risk, where the provision of alternative habitat can be used to offset adverse effects. If the Project-related effect is positive, the actions that could be taken to enhance the effect are indicated.
- **Analytical Methods:** The analytical methods used to assess the potential residual effects, after the application of mitigation are described. The specific analytical methods and tools used to support the effects assessment may include laboratory tests, mass balance calculations, statistical analysis and various types of predictive technical modelling commonly used in mining EAs. A description of the key assumptions and conservative approaches that would result in a conservative prediction of effects (i.e., an over-estimation of effects) for each VC based on the analytical methods is also provided.
- **Characterization of Potential Residual effects:** The potential residual effects are assessed, after the application of mitigation measures, and those residual effects with a measurable change in the VC based on the analytical method applied are then characterized. For purposes of the EIS/EA, a measurable change is defined as a detectable and quantifiable change when compared to the existing conditions and/or applicable guidelines. Where possible, the spatial and temporal extent of these changes is also described relative to the boundaries established for each VC.
- **Determination of Significance:** The significance of potential adverse residual effects is evaluated on the basis of the characterization of the residual effect using the applicable attributes (listed below). If

there are no predicted residual effects, a significance determination is not completed. The prediction is supported by an assessment of the degree of confidence.

- **Cumulative effects assessment:** Residual effects are carried forward into the cumulative effects assessment and assessed according to the methods described in Section 7.

The effects analysis is carried out using information from the extensive baseline studies and other available sources, well-established technical tools based on other similar projects, input from Indigenous communities, government agencies and the public provided during the development of the ToR, and best professional judgment. Additional information acquired through the EA process is fully considered in the final EIS/EA.

The characterization of residual environmental effects used to evaluate significance include the following attributes:

- **Ecological and social context:** a qualitative measure of the sensitivity and/or resilience of the VC to potential change. This may include unique characteristics of the surrounding area, vulnerable species, VCs with importance to the functioning of the ecosystem or surrounding community, VCs with established targets, or thresholds for disturbance.
- **Magnitude:** a quantitative or qualitative measure of the size or severity of effect for a given key indicator representing the potential effect after mitigation relative to the baseline condition and/or applicable guidelines.
- **Extent:** the geographic area over which an effect is expected to occur.
- **Duration:** the period of time over which an effect is expected to occur.
- **Frequency:** how often an effect is expected to occur within a given time period.
- **Reversibility:** the ability of the effect to be reversed.
- **Timing:** the degree to which the effect is expected to occur during a sensitive period for the VC (applicable only to fish and fish habitat, wildlife and wildlife habitat, and traditional land and resource use VCs).

A set of threshold levels are used to evaluate and define the residual effect for each attribute (Table 6.1-4). The magnitude attribute is VC-specific and defined in the applicable effects assessment section. Three threshold levels are defined (Levels I, II and III), where Level I is indicative of a negligible or low potential to contribute to an overall significant environmental effect, and Level III is indicative of a high potential to contribute to an overall significant environmental effect. Level II represents an intermediate condition.

For an overall residual effect to be defined as significant, bringing together the consideration of each attribute, the overall effect must be such that both of the following criteria are satisfied:

- A Level II or III rating is attained for ecological and/or social context; and
- A Level II or III rating is attained for all of the attributes involving magnitude, extent, duration, reversibility and frequency.

Conversely, if a Level I rating is achieved for any of the attributes involving magnitude, extent, duration, reversibility or frequency or if a Level I rating is achieved for both biophysical environment and human environment contexts (where applicable), then the effect is considered to be not significant.

The rationale for this approach is that a predicted environmental effect is not likely to be significant if it is any of the following:

- Low magnitude and/or extent;
- Short-term duration including residual effects (i.e., the effect itself is of short-term duration); or
- Likely to occur very infrequently (or not at all) with little potential for long-term effects.

Similarly, the effect is not likely to be significant if the effect has low or limited importance to the biophysical or human environment.

In addition, the likelihood or probability of a significant adverse effect occurring is also assessed, although a level is not provided, recognizing that there is some overlap in the concepts of duration, timing, frequency and likelihood.

The level of confidence is described for the significance determination and considers factors such as the certainty of the scientific information, the level of rigour in the modelling and assessment methods, professional judgment, and the effectiveness of proposed mitigation. A follow-up monitoring program may be developed to confirm determinations with higher levels of uncertainty where appropriate (Section 12).

Discussion is provided in the accompanying text relating to the residual effects evaluations to allow the reader to fully understand and appreciate the rationale and professional judgment associated with the significance determinations. The results are tabulated in a standard template for consistency across the VCs.

The effects assessment presented in the remainder of Section 6 addresses the maximum effects expected to occur during any phase of the Project life and is based on the conservative assumptions for each VC. The effects assessment is detailed for each phase of the Project as required by the EIS Guidelines (Appendix B-1). For most VCs, the effects are expected to increase during the construction phase and peak during the operations phase, when the Project footprint and associated levels of environmental disturbance are generally greatest. By using this conservative approach, the effects may be overestimated but will support flexibility to accommodate design optimizations during detailed engineering.

Site preparation and construction of the surface infrastructure to start mining and processing activities is approximately three years. Most physical activities during the Project construction phase and associated effects are focused on site preparation activities, dike construction and dewatering of a portion of the north basin of Springpole Lake, establishment of the starter embankments for the co-disposal facility (CDF), construction of buildings and infrastructure (on site and off site) and development and operation of water management and treatment facilities.

The operations phase is expected to end in Year 10. Towards the end of this period, the surficial soils stockpile will be at maximum height and extent, and the CDF embankments will have been fully constructed. Discharges from the effluent treatment plant will be at maximum during the operations phase. Air, noise and vibration emissions will peak earlier in the operations phase and be reduced once mining ceases.

Similarly, during active closure and post-closure, environmental effects will diminish as the site is reclaimed.

Table 6.1-1: Description of Baseline Conditions

Environmental Component	Section of EIS/EA	Baseline Report
Natural Environment		
Air Quality	Section 6.2.2	Appendix G-1
Noise and Vibration	Section 6.3.2	Appendix H-1 and Appendix H-2
Greenhouse Gases	Section 6.4.2	Appendix I-1
Groundwater quality and quantity	Section 6.5.2	Appendix L-1
Birch Lake water quality and quantity	Section 6.6.2	Appendix M-1 and Appendix N-1
Springpole Lake water quality and quantity	Section 6.7.2 and Section 6.8.2	Appendix M-1 and Appendix N-1
Local Inland Waterbodies water quality and quantity	Section 6.9.2	Appendix M-1 and Appendix N-1
Fish and Fish Habitat	Section 6.10.2	Appendix O-1, Appendix O-2, Appendix O-3
Vegetation Communities and Wetlands	Section 6.11.2	Appendix P-1 and Appendix P-2
Wildlife and Wildlife Habitat	Section 6.12.2	Appendix P-1 and Appendix P-2
Boreal Caribou	Section 6.13.2	Appendix P-1 and Appendix P-2
Wolverine	Section 6.14.2	Appendix P-1 and Appendix P-2
Bats	Section 6.15.2	Appendix P-1 and Appendix P-2
Species at Risk Birds	Section 6.16.2	Appendix P-1 and Appendix P-2
Social Environment		
Commercial Land and Resource Use	Section 6.17.2	Appendix Q-1
Outdoor Recreation	Section 6.18.2	Appendix Q-1
Local and Regional Infrastructure and Services	Section 6.20.2	Appendix Q-1
Indigenous people	Section 6.26.2	Appendix Q-1
Human and Ecological Health		Appendix R
Economic Environment		
Local and Regional Economy	Section 6.19.2	Appendix Q-1 and Appendix Q-2
Cultural Environment		
Traditional Land and Resource Use	Section 6.21.2	Appendix Q-1
Archaeology	Section 6.22.2	Appendix S-1, Appendix S-2, Appendix S-3 and Appendix S-4
Built Heritage Resources and Cultural Heritage Landscapes	Section 6.23.2	Appendix S-5, Appendix S-6, Appendix S-7, Appendix S-8, Appendix S-9, Appendix S-10 and Appendix S-11
Built Environment		
Local and Regional Infrastructure and Services	Section 6.20.2	Appendix Q-1

Table 6.1-2: Final List of Valued Components, Criteria, Indicators and Data Sources

Valued Component	Criteria	Indicator	Data Source
Natural Environment			
Air Quality	<ul style="list-style-type: none"> Change in criteria air contaminants Change in metals Change in volatile organic compounds Change in polycyclic aromatic hydrocarbons Change in other Contaminants 	<ul style="list-style-type: none"> Average 24-hour concentration Average annual concentration 	<ul style="list-style-type: none"> Air Quality Baseline Report (Appendix G-2), including a summary of relevant weather station data and other government sources Non-confidential Traditional Knowledge A description of the existing regional air quality in Section 3 A description of the existing air quality to support the effects assessment in Section 6.2
Noise and Vibration	<ul style="list-style-type: none"> Change in noise levels 	<ul style="list-style-type: none"> Daytime (07:00 – 19:00) 1-hour equivalent sound level ($L_{Aeq-1hr}$) Evening (19:00 – 23:00) $L_{Aeq-1hr}$ Nighttime (23:00 – 07:00) $L_{Aeq-1hr}$ Day-night sound level (L_{dn}) Change in percent highly annoyed (%HA) 	<ul style="list-style-type: none"> Noise and Vibration Baseline Reports (Appendices H-1 and H-2) Non-confidential Traditional Knowledge Blasting Impact Assessment Report (Appendix H-4) A description of the existing regional acoustic environment in Section 3 A description of the existing acoustic environment to support the effects assessment in Section 6.3
	<ul style="list-style-type: none"> Change in vibration levels 	<ul style="list-style-type: none"> Air overpressure peak pressure level (L_{peak}) Water-overpressure peak pressure level (P_{peak}) Ground-borne vibration (PPV) 	
Greenhouse Gases	<ul style="list-style-type: none"> Change in greenhouse gas emissions 	<ul style="list-style-type: none"> Carbon dioxide equivalent (CO_{2e}) 	<ul style="list-style-type: none"> Greenhouse Gas Assessment (Appendix I), including a summary of government sources Non-confidential Traditional Knowledge A description of greenhouse gases to support the effects assessment in Section 6.4
Groundwater	<ul style="list-style-type: none"> Change in groundwater quantity 	<ul style="list-style-type: none"> Flow volumes at groundwater discharge locations 	<ul style="list-style-type: none"> Hydrogeology Baseline Report (Appendix L-1), including a summary of relevant government sources and guidance

Valued Component	Criteria	Indicator	Data Source
	<ul style="list-style-type: none"> Change in groundwater quality 	<ul style="list-style-type: none"> Concentrations of dissolved metals 	<ul style="list-style-type: none"> Non-confidential Traditional Knowledge A description of the existing regional groundwater in Section 3 A description of the existing groundwater to support the effects assessment in Section 6.5
Birch Lake System	<ul style="list-style-type: none"> Change in water quantity 	<ul style="list-style-type: none"> Surface water levels Catchment area Flow 	<ul style="list-style-type: none"> Surface Water Quality Baseline Report (Appendix N-1), including a summary of relevant government sources Non-confidential Traditional Knowledge Hydrology Baseline Report (Appendix M-1), including a summary of relevant government sources A description of the existing regional surface water quality and quantity conditions in Section 3 A description of the existing surface water quality and quantity conditions to support the effects assessment in Sections 6.6 to 6.9
Springpole Lake, North Basin System			
Springpole Lake, Southeast Arm System	<ul style="list-style-type: none"> Change in water quality 	<ul style="list-style-type: none"> Concentration of total and dissolved metals Concentration of nutrients and anions Concentration of cyanide 	
Local Inland Waterbodies System			
Fish and Fish Habitat	<ul style="list-style-type: none"> Change in fish habitat 	<ul style="list-style-type: none"> Areal extents of fish habitat Change in surface water levels Change in drainage areas 	<ul style="list-style-type: none"> Aquatic Resources Baseline Reports (Appendices O-1 to O-4), including a summary of relevant government sources Non-confidential Traditional Knowledge A description of the existing regional aquatic resource conditions in Section 3 A description of the existing aquatic resource conditions to support the effects assessment in Section 6.10
	<ul style="list-style-type: none"> Change in fish communities 	<ul style="list-style-type: none"> Change in relative abundance of fish species Change in fish community structure 	
	<ul style="list-style-type: none"> Change in fish health 	<ul style="list-style-type: none"> Change in water quality 	
Vegetation Communities and Wetlands	<ul style="list-style-type: none"> Change in the relative abundance and diversity of plant species and vegetation communities 	<ul style="list-style-type: none"> Area of vegetation communities directly altered Relative abundance and diversity of vegetation communities Relative abundance of plant species of interest to Indigenous people, SAR and species of conservation concern 	<ul style="list-style-type: none"> Terrestrial Resources Baseline Reports (Appendices P-1 to P-3), including a summary of relevant government sources and non-confidential Traditional Knowledge A description of the existing regional vegetation and wetland community conditions in Section 3



Valued Component	Criteria	Indicator	Data Source
	<ul style="list-style-type: none"> Change in the function, connectivity, and quality 	<ul style="list-style-type: none"> Area of vegetation communities and wetlands indirectly altered Area of vegetation communities and wetlands fragmented by changes 	<ul style="list-style-type: none"> A description of the existing vegetation and wetland community conditions to support the effects assessment in Section 6.11
	<ul style="list-style-type: none"> Change in relative abundance and area of wetland extent 	<ul style="list-style-type: none"> Relative abundance, of wetland communities, Area of wetlands 	
Wildlife and Wildlife Habitat	<ul style="list-style-type: none"> Change in relative abundance of habitat 	<ul style="list-style-type: none"> Area and relative abundance of habitat (Habitat mapping as described) 	<ul style="list-style-type: none"> Terrestrial Resources Baseline Reports (Appendices P-1 to P-3), including a summary of relevant government sources and non-confidential traditional knowledge A description of the existing regional wildlife conditions in Section 3 A description of the existing wildlife conditions to support the effects assessment in Section 6.12
	<ul style="list-style-type: none"> Change in the function, connectivity and quality of habitat 	<ul style="list-style-type: none"> Area indirectly altered (Habitat mapping in the LSA will be used to determine the indirect effects on wildlife habitat) Change in form and function of Confirmed Significant Wildlife Habitat 	
	<ul style="list-style-type: none"> Change in the risk of mortality 	<ul style="list-style-type: none"> Qualitative risk of mortality Vegetation removal outside of sensitive timing windows 	
	<ul style="list-style-type: none"> Change in bird density 	<ul style="list-style-type: none"> Density models for select species from avian point count survey data and the percent change in individuals 	

Valued Component	Criteria	Indicator	Data Source
Boreal Caribou	<ul style="list-style-type: none"> Direct habitat changes 	<ul style="list-style-type: none"> Changes in relative amounts of Category 1, 2 and 3 from direct and indirect disturbance Areas of MECP General Habitat Description (GHD) Category 1, 2 and 3 habitats directly lost in PDA Numbers of MECP GHD Category 1 Areas fragmented by the PDA and within 10 km of the PDA Areas of Predicted Use directly lost in the PDA Alignment with Existing or Proposed Disturbance 	<ul style="list-style-type: none"> Terrestrial Resources Baseline Reports (Appendices P-1 to P-3), including a summary of relevant government sources and non-confidential Traditional Knowledge A description of the existing regional SAR conditions in Section 3 A description of the existing SAR conditions to support the effects assessment in Section 6.13
	<ul style="list-style-type: none"> Indirect habitat changes 	<ul style="list-style-type: none"> Areas of MECP GHD Category 1, 2, and 3 within 500 m buffer of PDA Areas of Predicted Use within 500 m buffer of PDA Changes in the relative amounts of predicted use areas in the Churchill Range Spatial extent of predicted sensory disturbance Habitat Amount and Arrangement Spatial distribution and abundance of movement corridors 	
	<ul style="list-style-type: none"> Change in range condition 	<ul style="list-style-type: none"> Cumulative disturbance at the Churchill Range Scale using both the federal and provincial disturbance models 	
	<ul style="list-style-type: none"> Change in population demography 	<ul style="list-style-type: none"> Altered mortality rates from Predators Altered risk of incidental mortality from anthropogenic impacts Changes in population abundance and seasonal distribution 	

Valued Component	Criteria	Indicator	Data Source
		<ul style="list-style-type: none"> Altered population vital rates (calf recruitment, probability of persistence, survival rates, lambda (λ), herd composition (age and sex)) 	
	<ul style="list-style-type: none"> Change in community via predator – prey dynamics 	<ul style="list-style-type: none"> Changes in the distribution and abundance of early successional habitat Changes in the distribution and abundance of Moose Changes in the distribution and abundance of Predators (Wolves and/or Black Bears) Altered indirect mortality rates resulting from apparent competition effects and/or from parasite burdening 	
Wolverine	<ul style="list-style-type: none"> Change in habitat availability and effectiveness Change in function, connectivity and quality of habitat Change in the risk of mortality 	<ul style="list-style-type: none"> Amount of Wolverine habitat directly affected. Amount of high and moderate habitat directly and indirectly affected or altered for Wolverine. Number of formally defined SAR residences (i.e., dens) directly or indirectly affected. Habitat loss resulting from reduced habitat effectiveness, assessed qualitatively. 	<ul style="list-style-type: none"> Terrestrial Resources Baseline Reports (Appendices P-1 to P-3), including a summary of relevant government sources and non-confidential Traditional Knowledge A description of the existing regional SAR conditions in Section 3 A description of the existing SAR conditions to support the effects assessment in Section 6.14
	<ul style="list-style-type: none"> Change in movement 	<ul style="list-style-type: none"> Qualitative assessment of effects of habitat change and sensory disturbance on Wolverine movement. 	
	<ul style="list-style-type: none"> Change in mortality risk 	<ul style="list-style-type: none"> Qualitative risk of mortality 	

Valued Component	Criteria	Indicator	Data Source
Bats	<ul style="list-style-type: none"> Change in habitat 	<ul style="list-style-type: none"> Area and relative abundance of habitat Removal of hibernacula 	<ul style="list-style-type: none"> Terrestrial Resources Baseline Reports (Appendices P-1 to P-3), including a summary of relevant government sources and non-confidential Traditional Knowledge A description of the existing regional SAR conditions in Section 3 A description of the existing SAR conditions to support the effects assessment in Section 6.15
	<ul style="list-style-type: none"> Change in the function, connectivity, and quality of habitat 	<ul style="list-style-type: none"> Area indirectly altered 	
	<ul style="list-style-type: none"> Change in the risk of mortality 	<ul style="list-style-type: none"> Qualitative risk of mortality 	
Birds	<ul style="list-style-type: none"> Change in relative abundance of habitat 	<ul style="list-style-type: none"> Area and relative abundance of habitat For Eastern Whip-poor-will, if forest cover will be reduced to less than 25% in the RSA 	<ul style="list-style-type: none"> Terrestrial Resources Baseline Reports (Appendices P-1 to P-3), including a summary of relevant government sources and non-confidential Traditional Knowledge A description of the existing regional SAR conditions in Section 3 A description of the existing SAR conditions to support the effects assessment in Section 6.16
	<ul style="list-style-type: none"> Change in the function, connectivity, and quality of habitat 	<ul style="list-style-type: none"> Area indirectly altered, in ha For Eastern Whip-poor-will, if forest cover will be reduced to less than 25% in the RSA 	
	<ul style="list-style-type: none"> Change in the risk of mortality 	<ul style="list-style-type: none"> Qualitative risk of mortality Vegetation removal outside of sensitive timing windows 	
Social Environment			
Commercial Land and Resource Use	<ul style="list-style-type: none"> Change in forestry resources 	<ul style="list-style-type: none"> Quantity of merchantable forest areas removed 	<ul style="list-style-type: none"> Socioeconomic Baseline Report (Appendix Q-1), including a summary of relevant government sources Non-confidential Traditional Knowledge A description of the existing regional socioeconomic conditions in Section 3 A description of the existing socioeconomic conditions to support the effects assessment in Section 6.17
	<ul style="list-style-type: none"> Change to trapping ability and experience 	<ul style="list-style-type: none"> Area of traplines overlapped by PDA, LSA and RSA Extent or scale of sensory disturbances (noise, light) Change in access to traplines 	
	<ul style="list-style-type: none"> Change in commercial bait harvesting 	<ul style="list-style-type: none"> Area of bait harvesting areas overlapped by the PDA, LSA and RSA Extent or scale of sensory disturbances (noise, light) 	

Valued Component	Criteria	Indicator	Data Source
		<ul style="list-style-type: none"> • Change in access to bait harvest areas 	
	<ul style="list-style-type: none"> • Change at outfitter camps 	<ul style="list-style-type: none"> • Number of outfitter camps with altered viewscapes • Extent or scale of sensory disturbances (noise, light) • Change in access to outfitter camps 	
	<ul style="list-style-type: none"> • Change in aggregate resources 	<ul style="list-style-type: none"> • Change in commercial availability of aggregate 	
	<ul style="list-style-type: none"> • Change in access to mineral claims 	<ul style="list-style-type: none"> • Number of mineral claims overlapped by LSA and RSA • Change in access by mineral exploration companies 	
Outdoor Recreation	<ul style="list-style-type: none"> • Change in recreational fishing 	<ul style="list-style-type: none"> • Area of fish habitat lost / altered • Change in the availability of the resource • Area affected by sensory disturbances • Change in viewscapes • Access to areas of recreational fishing 	<ul style="list-style-type: none"> • Socioeconomic Baseline Report (Appendix Q-1), including a summary of relevant government sources • Non-confidential Traditional Knowledge • A description of the existing regional socioeconomic conditions in Section 3 • A description of the existing socioeconomic conditions to support the effects assessment in Section 6.18
	<ul style="list-style-type: none"> • Change in recreational hunting 	<ul style="list-style-type: none"> • Area of wildlife habitat lost / altered • Change in the availability of the resource • Area affected by sensory disturbances • Change in viewscapes 	
	<ul style="list-style-type: none"> • Change in recreation areas 	<ul style="list-style-type: none"> • Area of land or water with altered access to recreational areas • Area affected by sensory disturbances • Change in viewscapes 	



Valued Component	Criteria	Indicator	Data Source
	<ul style="list-style-type: none"> Change in navigation 	<ul style="list-style-type: none"> Length of navigation routes removed Number of portage routes removed Area of navigable waters removed 	
Human and Ecological Health	<ul style="list-style-type: none"> Change in human health 	<ul style="list-style-type: none"> Change in air quality Chemicals of Potential Concern (COPC) Change in surface water quality COPC Change in soil quality COPC Change in country foods quality (fish, vegetation, wild game) COPC 	<ul style="list-style-type: none"> Surface Water Quality Baseline Report (Appendix N-1), including a summary of relevant government sources Aquatic Resources Baseline Reports (Appendices O-1 to O-4), including a summary of relevant government sources Baseline Terrestrial Resources Reports (Appendices P-1 to P-3), including a summary of relevant government sources Non-confidential Traditional Knowledge Baseline Air Quality Report (Appendix G-3), including a summary of relevant government sources
	<ul style="list-style-type: none"> Change in ecological health 	<ul style="list-style-type: none"> Change in air quality COPC Change in surface water quality COPC Change in soil quality COPC Change in country foods quality (fish, vegetation, wild game) COPC 	
Indigenous people	<ul style="list-style-type: none"> Change in Indigenous Health Conditions 	<ul style="list-style-type: none"> Potential changes in air quality Potential changes in current and future availability and quality of country foods Potential changes in noise exposure and effects of vibration from blasting Potential changes in water quality (drinking, recreational and cultural uses) 	<ul style="list-style-type: none"> Traditional Knowledge and Traditional Land Use Studies and information A description of the existing regional traditional land use activity conditions in Section 3 A description of the existing traditional land use activity conditions to support the effects assessment in Section 6.21 Human and Ecological Health Risk Assessment (Appendix R-1)
	<ul style="list-style-type: none"> Change in Indigenous Socio-economic Conditions 	<ul style="list-style-type: none"> The use of navigable waters (including any water used for Indigenous transport) Forestry and logging operations Commercial fishing, hunting, trapping, and gathering activities Commercial outfitters 	



Valued Component	Criteria	Indicator	Data Source
		<ul style="list-style-type: none"> • Recreational use • Food security • Income inequity • Changes at the community level that affect socio-economic conditions for Indigenous peoples as result of increased population, economic activity, cost of living, among other factors • Non-commercial / trade economy 	
	<ul style="list-style-type: none"> • Change in Indigenous Physical and Cultural Heritage 	<ul style="list-style-type: none"> • The loss or destruction of physical and cultural heritage • Changes to the cultural value or importance associated with physical and cultural heritage • Changes to access to physical and cultural heritage • Changes to sacred, ceremonial or culturally important places, objects, or things • Changes to visual aesthetics over the life of the Project 	
	<ul style="list-style-type: none"> • Change in Current Use of Lands and Resources for Traditional Purposes 	<ul style="list-style-type: none"> • Resources used, such as changes to the quantity, quality, and availability of resources and habitat, as well as to the sufficiency of resources required to conduct an activity or practice, including perception of effects, avoidance, and consideration of the seasonal round • Access to areas and resources without difficulty or additional cost used to conduct an activity or practice, as well as the opening up 	



Valued Component	Criteria	Indicator	Data Source
		<p>of areas to non-Indigenous populations for access and use, and consideration of preferred areas, timing of harvest, and options of traveling there in preferred manner</p> <ul style="list-style-type: none"> • Experience by Indigenous peoples, including changes that affect the spiritual and cultural experiences of the activity or practice, as well as sense of place and wellbeing, and the applicability and transmission of Indigenous knowledge, laws, customs and traditions 	
Economic Environment			
Local and Regional Economy	<ul style="list-style-type: none"> • Change in employment levels in municipalities 	<ul style="list-style-type: none"> • Project-generated employment numbers • Home communities of Project employees 	<ul style="list-style-type: none"> • Socioeconomic Baseline Report (Appendix Q-1), including a summary of relevant government sources • Economic Modelling Report (Appendix Q-2) • A description of the existing regional socioeconomic conditions in Section 3 • A description of the existing socioeconomic conditions to support the effects assessment in Section 6.19
	<ul style="list-style-type: none"> • Change in labour income 	<ul style="list-style-type: none"> • Project-generated income 	
	<ul style="list-style-type: none"> • Change in business opportunities 	<ul style="list-style-type: none"> • Contracts with local businesses from the Project 	
	<ul style="list-style-type: none"> • Change in business income 	<ul style="list-style-type: none"> • Dollars paid to local businesses from the Project 	
	<ul style="list-style-type: none"> • Change in demand for training 	<ul style="list-style-type: none"> • Enrollment in Project-relevant training 	
	<ul style="list-style-type: none"> • Change in government revenues 	<ul style="list-style-type: none"> • Taxes and fees paid from the Project 	
Cultural Environment			
Traditional Land and Resource Use	<ul style="list-style-type: none"> • Change in availability, access to and experience related to traditional terrestrial wildlife harvesting (hunting and trapping) 	<ul style="list-style-type: none"> • Quantity of direct habitat lost • Quality of experience in area due to change in sensory disturbances and viewscapes • Quality of harvested wildlife 	<ul style="list-style-type: none"> • Traditional Knowledge and Traditional Land Use Studies and information • A description of the existing regional traditional land use activity conditions in Section 3

Valued Component	Criteria	Indicator	Data Source
	<ul style="list-style-type: none"> Change in availability, access to and experience related to traditional aquatic wildlife harvesting (fishing) 	<ul style="list-style-type: none"> Quality of access to land Quantity of direct habitat lost Quality of experience in area due to change in sensory disturbances and viewscapes Quality of harvested fish Quality of access to land 	<ul style="list-style-type: none"> A description of the existing traditional land use activity conditions to support the effects assessment in Section 6.21
	<ul style="list-style-type: none"> Change in availability, access to and experience related to traditional plant (food and medicinal) harvesting 	<ul style="list-style-type: none"> Quantity of direct habitat lost Quality of experience in area due to change in sensory disturbances and viewscapes Quality of harvested plants Quality of access to land 	
	<ul style="list-style-type: none"> Change in availability, access to and experience related to traditional habitation and cultural and spiritual sites / areas 	<ul style="list-style-type: none"> Quantity of areas lost Quality of experience in area due to change in sensory disturbances and viewscapes Quality of access to land 	
Archaeology	<ul style="list-style-type: none"> Presence of archaeological resources 	<ul style="list-style-type: none"> Number of registered archaeological sites or areas of archaeological potential in the PDA and LSA 	
	<ul style="list-style-type: none"> Potential for the disturbance / impacts of unassessed or documented archaeological resources 	<ul style="list-style-type: none"> Alteration, loss or removal of archaeological resources from original context during construction, operations or decommissioning and closure 	<ul style="list-style-type: none"> Stage 1 and 2 Archaeological Assessment Reports (Appendices S-1, S-2, S-3, and S-7), including a summary of relevant government sources Non-confidential Traditional Knowledge A description of the existing regional socioeconomic conditions in Section 3 A description of the existing archaeological conditions to support the effects assessment in Section 6.22

Valued Component	Criteria	Indicator	Data Source
Built Heritage Resources and Cultural Heritage Landscapes	<ul style="list-style-type: none"> • Presence of buildings or landscape features 40 years or older 	<ul style="list-style-type: none"> • Number of known or potential built heritage resources or cultural heritage landscapes in the PDA and LSA 	<ul style="list-style-type: none"> • Cultural Heritage Evaluation Reports (Appendices S-4, S-5 and S-6), including a summary of relevant government sources • A description of the existing regional built heritage conditions in Section 3 • Non-confidential Traditional Knowledge • A description of the existing built heritage conditions to support the effects assessment in Section 6.23
	<ul style="list-style-type: none"> • Alteration or destruction of built heritage resources or cultural heritage landscapes 	<ul style="list-style-type: none"> • Changes in the quality, quantity or access to built heritage resources or cultural heritage landscapes 	
Built Environment			
Local and Regional Infrastructure and Services	<ul style="list-style-type: none"> • Change in the demand for educational services 	<ul style="list-style-type: none"> • Enrollment in local elementary, secondary and post-secondary schools / training institutions 	<ul style="list-style-type: none"> • Socioeconomic Baseline Report (Appendix Q-1), including a summary of relevant government sources • A description of the existing regional socioeconomic conditions in Section 3 • A description of the existing socioeconomic conditions to support the effects assessment in Section 6.20
	<ul style="list-style-type: none"> • Change in the demand for housing 	<ul style="list-style-type: none"> • Housing inventory and availability 	
	<ul style="list-style-type: none"> • Change in demand for emergency services, municipal services and infrastructure 	<ul style="list-style-type: none"> • Community population levels • Utilization of emergency response and health facilities and services • Utilization rate of municipal services and infrastructure (electricity, water, wastewater and solid waste systems) 	
	<ul style="list-style-type: none"> • Change in demand for municipal and provincial community resources 	<ul style="list-style-type: none"> • Utilization rates on community resources (recreation services, health services, childcare services) 	
	<ul style="list-style-type: none"> • Change in the demands on transportation networks 	<ul style="list-style-type: none"> • Road traffic volumes • Passenger / cargo volumes for air flights 	

Table 6.1-3: Project Interactions

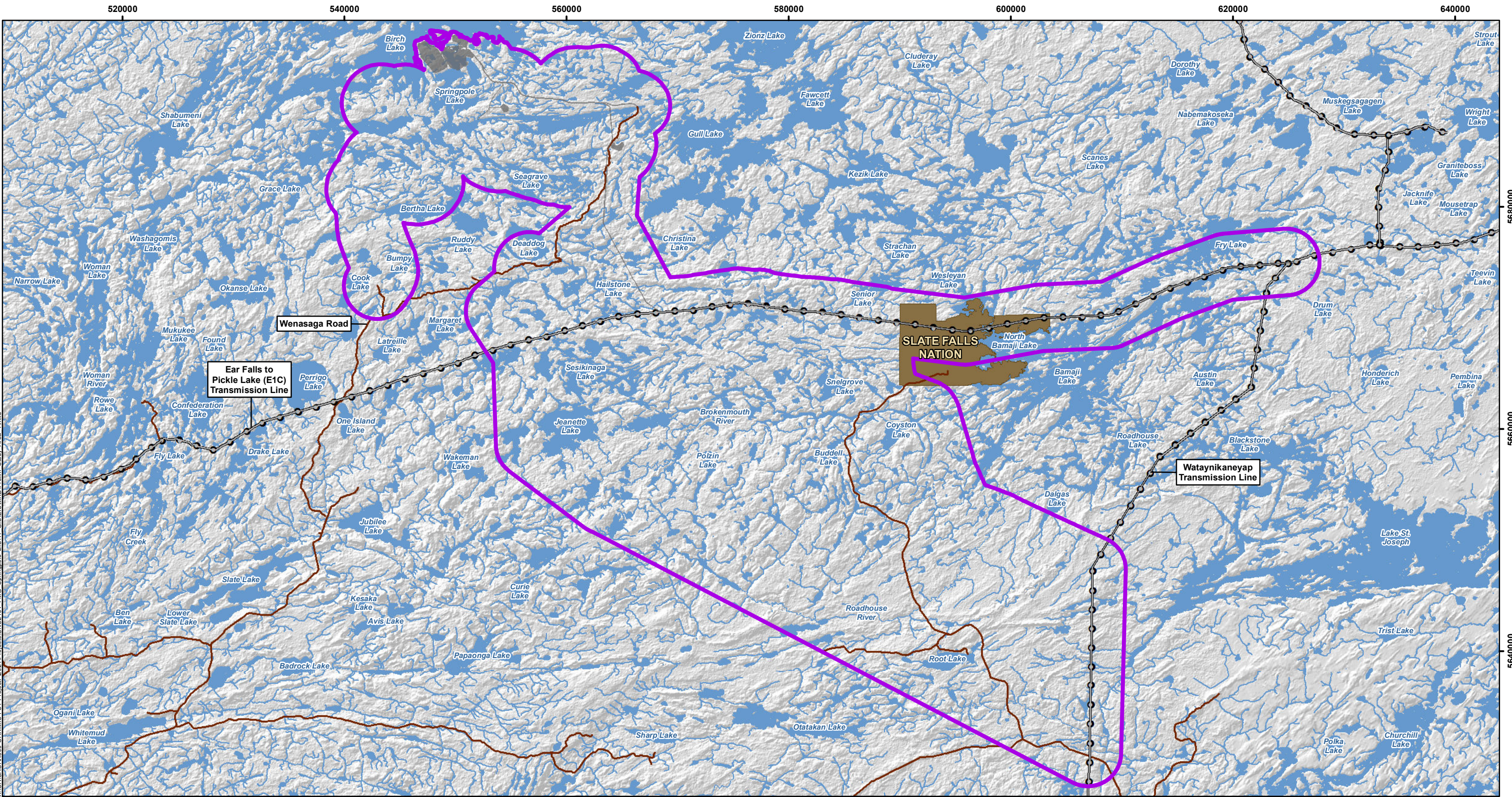
Project Component / Activity	Description of Project Component / Activity
Construction Phase	
Site preparation activities including clearing, grubbing and bulk earthworks	Site preparation activities in the mine site area of the PDA. Includes clearing of vegetation, grubbing (i.e., removing roots and stumps), and movement of organics, soil and overburden to support the subsequent construction of mine infrastructure, including the fish habitat development area, onsite haul and access roads, buildings and onsite infrastructure, central water storage pond (CWSP), CDF, surficial soil stockpile and ore stockpiles.
Construction of the mine access road and airstrip, including the development and operation of aggregate resource areas	Site preparation and construction of the 18-km mine access road, the co-located airstrip, two potential aggregate resource extraction areas and the treated effluent pipeline. Site preparation activities include the clearing of vegetation, grubbing and movement of soil and overburden. Construction involves using heavy equipment, the excavation and operation of the aggregate resource areas and the installation of the treated effluent pipeline.
Development of temporary construction camp and staging areas	Construction of a temporary construction camp at or near the mine site, and temporary camps to support the transmission line corridor where necessary. Staging areas could be established within the mine site area to support site construction, and along or near the transmission line corridor where needed.
Construction of the fish habitat development area	Construction of the fish habitat development area includes the use of explosives to support the excavation and removal of bedrock to develop the offsetting measures for fish habitat, but excludes the initial site preparation that would occur for the mine site area. Rock from the fish habitat development area will be loaded and transported for use in the construction of mine site infrastructure.
Construction of the transmission line to the Project site	Construction of the 230-kilovolt (kV) transmission line generally during frozen ground conditions. Associated activities include preparation of access to the corridor, clearing of woody vegetation and establishment of access within the corridor and construction of the transmission line, using light vehicles and heavy equipment.
Construction of the onsite haul and access roads	Construction of onsite haul and access roads, excluding the mine access road. Activities include the development of road surfaces, and installation of watercourse crossings and cross drainages, but excludes the initial site preparation that would occur for the mine site area.
Construction of the dikes in the north basin of Springpole Lake	Installation of two dikes to isolate a portion of the north basin of Springpole Lake. Activities include site preparation along the shoreline of Springpole Lake, the isolation of the in-water construction area, and the construction of the dikes using haul trucks and construction equipment. It excludes the construction of access roads and the excavation of construction material.
Construction of buildings and onsite infrastructure	Construction of the process plant, accommodation complex, warehouses and other buildings and onsite infrastructure not otherwise identified. Associated activities include the construction of the buildings but exclude the initial site preparation that would occur for the mine site area.
Construction of the CWSP	Development of the CWSP, including the removal of fish and dewatering as needed to support the construction of the pond, excluding the initial site preparation that would occur for the mine site area.

Project Component / Activity	Description of Project Component / Activity
Controlled dewatering of the open pit basin	Occurs once the dikes have been completed. It involves the removal and transfer of fish, and subsequent dewatering from the isolated portion of the north basin of Springpole Lake. Through ongoing water quality monitoring, clean water will be discharged downstream to Springpole Lake, whereas sediment-laden waters will be discharged to a settling pond for treatment prior to discharge.
Construction of the starter embankments for the CDF	Preparation of the foundation as needed and the construction of the initial starter embankments of the CDF using mine rock and/or aggregate with heavy equipment including the excavation of quarry material used for construction of the embankments. This component excludes site preparation activities, and the construction of access / haul roads.
Stripping of lake bed sediment and overburden at the open pit	Occurs after the isolated portion of the north basin of Springpole Lake has been dewatered. It includes the stripping of lake bed sediment and overburden from the footprint of the open pit using heavy equipment. It also includes the stockpiling of lake bed sediment within the dewatered basins or surficial soil stockpile as applicable.
Development of the surficial soil stockpile	Development of the surficial soil stockpile includes the transportation of surficial soil to the stockpile using haul trucks and contouring / managing the stockpile using construction equipment. It excludes site preparation activities and the establishment of water management and treatment facilities surrounding the stockpile, such as ditches and sumps.
Initiation of pit development in rock	Preparation of the open pit area for blasting and the removal of mine rock and ore. It includes the initial groundwater management involving pumps, the blasting of rock, and the use of haul trucks and construction equipment within the pit outline.
Initiation of stockpiling of ore	Initial development of the ore stockpiles during the construction phase, includes the transportation and stockpiling of the ore using heavy equipment. It excludes site preparation activities and the establishment of water management facilities surrounding the stockpile such as ditches and sumps.
Establishment and operation of water management and treatment facilities	Establishment and operation of the integrated water management system and treatment facilities for mine site infrastructure including the CDF, ore stockpiles, surficial soil stockpile and processing area. This activity will occur in parallel with site preparation activities, potentially as temporary facilities, and continue until the mine site infrastructure is fully constructed for operations. It includes the installation of contact water management ponds, ditches, sumps and use of pumping equipment and pipelines to manage site water around the mine site. The operation of the CWSP, sewage treatment plant and effluent treatment plant during the construction phase are included in this activity.
Employment and expenditures	Employment of individuals and expenditures related to procurement and contracting for the construction phase of the Project.
Commissioning of the process plant	Commissioning of the process plant, including limited processing of ore.
Operations Phase	
Operation of the process plant	Operation of the process plant, including the processing of ore.
Operation of open pit mine	Operation of the open pit mine, including in-pit blasting, the removal of overburden, mine rock and ore with haul trucks and construction equipment, ongoing groundwater management and the management of minewater.

Project Component / Activity	Description of Project Component / Activity
Management of overburden, mine rock, tailings and ore in designated facilities	Ongoing management of the surficial soil stockpile, the ongoing development of the ore stockpiles and the operation of the CDF for mine rock and tailings. It includes the use of haul trucks for the transportation of ore and mine rock from the open pit, the transportation of mine rock in the north cell using construction equipment, the deposition of thickened tailings in the north cell of the CDF, the deposition of slurry tailings in the south cell of the CDF and periodic raising of the CDF embankments.
Operation of water management and treatment facilities	Operation of the integrated water management system for the mine site, including the operation of the collection ditches and sumps around the CDF, ore stockpiles, surficial soil stockpile, process plant and other areas, as well as the operation of the freshwater pipeline, CWSP, sewage treatment plant and effluent treatment plant.
Accommodations complex operations	Operation of the onsite accommodations complex and includes the management of domestic waste.
Operation and maintenance of mine site infrastructure	Ongoing operation and maintenance of mine infrastructure such as haul roads, onsite access roads, mine access road, airstrip, transmission line, buildings, fuel farms, process plant and other mine infrastructure.
Progressive reclamation activities	Progressive reclamation within the mine site area including the stabilization and rehabilitation of inactive disturbed areas, as well as revegetation, where practical.
Employment and expenditures	Employment of individuals to support the operation of the Project, and expenditures related to procurement and contracting for the operations phase of the Project.
Decommissioning and Closure Phase	
Removal of assets that can be salvaged	Removal of assets that may have value, through the dismantling and transportation off site.
Demolition and recycling and/or disposal of remaining materials	Demolition of mine site facilities and infrastructure, and transportation for recycling off site.
Removal and disposal of demolition-related wastes in approved facilities	Remaining site facilities / equipment / infrastructure will be dismantled and transported to an offsite waste disposal facility.
Reclamation of impacted areas, such as by regrading, placement of cover, and revegetation	Stabilization and rehabilitation of disturbed areas, as well as revegetation (active or passive). It includes, but is not limited to, the final reclamation of the CDF, ore stockpile area and the mine site area.
Filling of the open pit basin with water	Refilling of the open pit basin during the closure phase with water from Springpole Lake, over a period of 3 to 5 years. Once the water meets all regulatory requirements, the basin will be reconnected with Springpole Lake.
Monitoring and maintenance	Periodic monitoring of environmental media within the PDA and LSA during active closure and post-closure, as well as monitoring of remaining onsite structural facilities such as the CDF.
Employment and expenditures	Employment of individuals to support the decommissioning and closure of the Project, and expenditures related to procurement and contracting for the decommissioning and closure phase of the Project.

Table 6.1-4: Environmental Assessment Attributes

Attributes	Description	Level I	Level II	Level III
Ecological and Social Context	A qualitative measure of the sensitivity and/or resilience of the VC to potential change, based on professional judgment and/or consultation	The VC may or may not be sensitive and is capable of supporting the predicted change with typical mitigation measures	The VC is sensitive and requires special measures to support the predicted change	The VC is sensitive and unable to support the predicted change even with special measures
Magnitude	A qualitative or quantitative measure to describe the size or degree of the residual effects relative to baseline conditions	VC-specific and defined in applicable VC effects assessment section	VC-specific and defined in applicable VC effects assessment section	VC-specific and defined in applicable VC effects assessment section
Extent	The spatial extent over which the residual effect will take place	Effect is restricted to the LSA	Effect extends beyond the LSA	Effect extends beyond the RSA
Duration	The time period over which the residual effect will or is expected to occur	Effect occurs over the short term: less than or equal to 3 years	Effect occurs over the medium term: more than 3 years but less than or equal to 20 years	Effect occurs over the long term: greater than 20 years
Frequency	The rate of occurrence of the residual effect	Effect occurs once, infrequently or not at all	Effect occurs intermittently or with a certain degree of regularity	Effect occurs frequently or continuously
Reversibility	The extent to which the residual effect can be reversed	Effect is fully reversible	Effect is partially reversible or potentially reversible with difficulty	Effect is not reversible
Timing	A measure of whether the residual effect occurs during a sensitive period of the year	Effects do not occur during a sensitive period; or related effects are fully mitigated	Effects occur during a sensitive period, and related effects are partially mitigated	Effects occur during a sensitive period; or related effects cannot be mitigated



LEGEND

- Proposed Mine Feature
- Preliminary Study Area
- Existing Road
- Existing Transmission Line
- First Nation Reserve
- Watercourse
- Waterbody

NOTES:

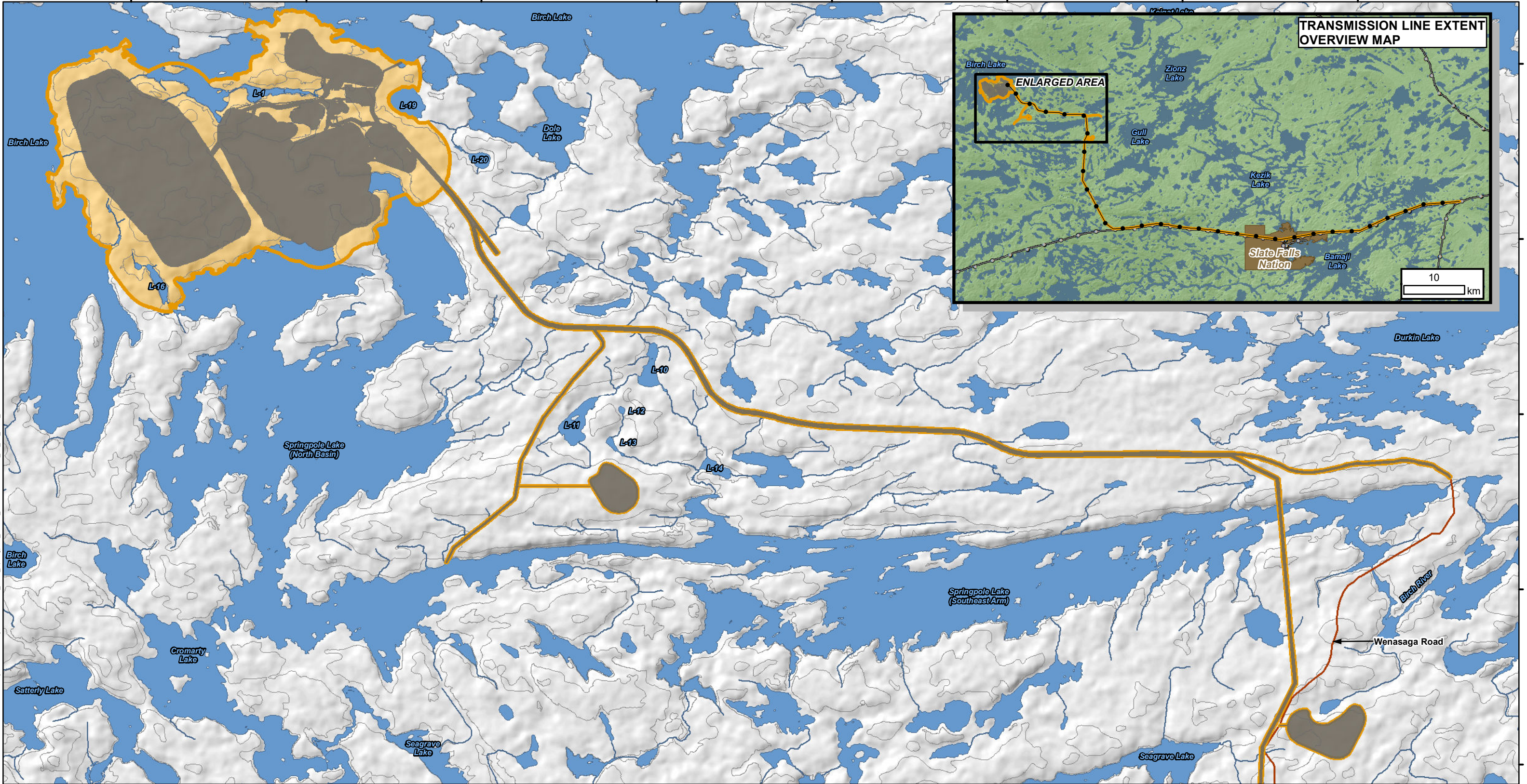
- Topographic information extracted from LIO, MNR.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.
- 230 kV transmission line provided by First Mining Gold, April 2024.

Datum: NAD83
Projection: UTM Zone 15N

	<p>FIRST MINING GOLD</p> <p>SPRINGPOLE GOLD PROJECT</p> <p>Preliminary Study Area</p>	
<p>0 5 10 20 30 40 50 Kilometres</p>		<p>PROJECT N°: ONS2104 FIGURE: 6.1-1</p> <p>SCALE: 1:325,000 DATE: October 2024</p>

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- LEGEND**
- Project Development Area
 - Proposed Mine Feature
 - Existing Road
 - Watercourse
 - Waterbody
 - Existing Transmission Line
 - Contour (10 m intervals)

NOTES:
 - Topographic information extracted from LIO, MNR.
 - Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1, 26 June 2023 and modified by WSP July 2023.
 - 230 kV transmission line provided by First Mining Gold, April 2024.



SPRINGPOLE GOLD PROJECT

Project Development Area

Datum: NAD83
 Projection: UTM Zone 15N



PROJECT N°: ONS2104

FIGURE: 6.1-2

SCALE: 1:52,000

DATE: October 2024



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