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SECTION 6

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6.11 Vegetation Communities and Wetlands

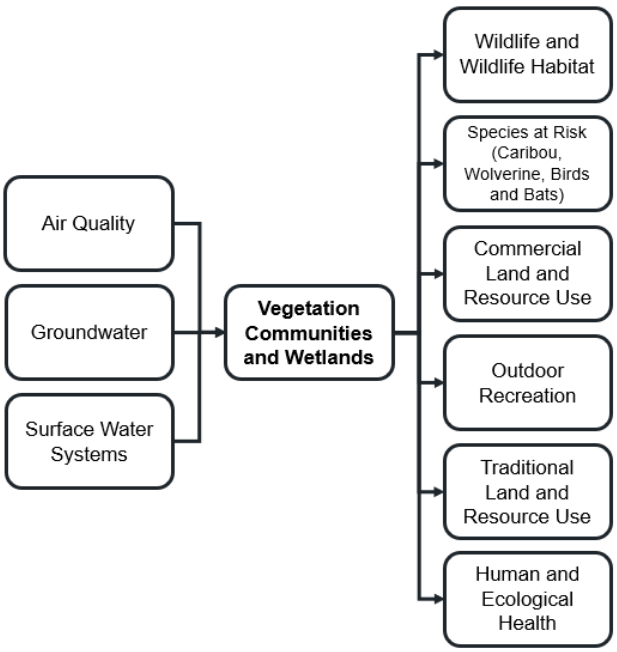
Vegetation communities and wetlands were selected as a VC because vegetation communities and associated terrestrial habitat potentially provide:

- Areas of biological diversity;
- Habitat for locally common species, Significant Wildlife Habitat (SWH) and SAR;
- Corridors or linkages for wildlife movement;
- Supporting function of other ecosystem elements;
- Areas of economic, social, or cultural practice (such as hunting, trapping and gathering); and
- Areas of educational, scientific, or aesthetic interest.

Further, wetlands have a role in supporting biodiversity, traditional use by Indigenous communities, and contributions to ecosystem functions at local and regional landscape scales.

In the absence of mitigation, the potential changes in vegetation communities and wetlands are directly linked to other VCs and informs the following sections:

- **Air Quality (Section 6.2):** the assessment of the potential effects on air quality includes changes in dust deposition during construction and operation of the Project that may affect vegetation communities.
- **Groundwater (Section 6.5):** the assessment of the potential effects on groundwater includes changes in groundwater quantity during construction and operation of the Project that may affect vegetation communities and wetlands.
- **Surface Water Systems (Section 6.6 to Section 6.9):** the assessment of the potential effects on surface water systems includes changes in surface water quantity from altered catchment areas during construction and operation of the Project that may affect vegetation communities and wetlands.



In addition, the assessment of potential changes in vegetation communities and wetlands are also directly linked to other VCs, and informs the analysis of the following sections:

- **Wildlife and Wildlife Habitat (Section 6.12):** the assessment of the potential effects on wildlife and wildlife habitat is informed by the changes in amount and quality of vegetation communities and wetlands during construction of the Project as this may affect wildlife habitat.
- **Species at Risk (Section 6.13 to Section 6.16):** the assessment of the potential effects on species at risk is informed by the changes in the amount and quality of vegetation communities and wetlands during construction of the Project as this may affect habitat for SAR.

- **Commercial Land and Resource Use (Section 6.17):** the assessment of the potential effects on commercial land and resource use is informed by changes in the amount of quality of vegetation communities and wetlands during construction of the Project which may affect habitat used by species that are trapped or commercial activities such as forestry.
- **Outdoor Recreation (Section 6.18):** the assessment of the potential effects on outdoor recreation is informed by changes in the amount and quality of vegetation communities and wetlands during construction and operation of the Project as this may affect habitat used by species that are hunted recreationally or it may affect areas that are used for recreational activities and tourism.
- **Traditional Land and Resource Use (Section 6.21):** the assessment of the potential effects on traditional land and resource use is informed by changes in the amount and quality of during construction of the Project as this may affect plants species that are traditionally harvested Indigenous people or it may affect habitat used by wildlife species that are traditionally hunted or trapped by Indigenous people.
- **Human and Ecological Health (Section 6.24):** the assessment of the potential effects on human and ecological health is informed by changes in the quality of vegetation communities due to the emission of potential contaminants during construction and operation of the Project which may affect the risk to human and ecological health as a result of ingestion of affected vegetation.

The assessment of potential changes on vegetation communities and wetlands from the Project are compared against relevant provincial and federal criteria (Section 6.11.1.4) and existing conditions (Section 6.11.2). The terrestrial resources technical support documentation is included in Appendix P, which includes the Baseline Terrestrial Report (Appendix P-1).

6.11.1 Assessment Approach

The approach to the assessment of potential changes on vegetation communities and wetlands includes a description of the relevant regulatory and policy setting, a description of the input obtained through consultation specific to this VC, the identification of criteria and indicators along with the associated rationale, a description of the spatial and temporal boundaries used for this VC along with a description of the attributes used to determine the significance of any residual, adverse effects. The assessment of potential effects is supported by a description of the existing conditions for the VC (Section 6.11.2), the identification and description of applicable pathways of potential effects on the VC (Section 6.11.3) and a description of applicable mitigation measures for the VC (Section 6.11.4). An outline of the analytical methodology conducted for the assessment and the key assumptions and/or conservative approach is found in Section 6.11.5. With the application of mitigation measures to the potential effects on the VC, the residual effects are then characterized in Section 6.11.6 and the significance of the residual effects is determined in Section 6.11.7.

6.11.1.1 Regulatory and Policy Setting

The effects assessment for vegetation communities and wetlands has been prepared in accordance with the requirements of the federal Environmental Impact Statement (EIS) Guidelines (Appendix B-1 and the provincially approved Amended Terms of Reference (ToR; Appendix B-3). Concordance tables, indicating where EIS Guidelines and ToR requirements have been addressed, are provided in Appendix B-2 and B-5, respectively. Government policies, objectives, standards, or guidelines relevant to the VC are summarized below.

Federal Policy on Wetland Conservation

Federal guidance for wetland conservation is provided by the Federal Policy on Wetland Conservation (EC 1991), which includes the principle of no net loss of wetland function. The federal policy applies to projects occurring on federal lands and waters, projects receiving federal funding, or wetlands of international importance, as determined by the Ramsar Convention (Ramsar Convention Secretariat 2013). Although this policy does not apply to the majority of the Project as it does not meet any of the above criteria, it has been considered in the assessment for the portion of the transmission line that crosses Slate Falls Nation.

There are no federal or provincial plant SAR (Black Ash is not protected under the *Endangered Species Act* (ESA) in the geographic area of the Project).

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

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

Consultation feedback has been addressed through direct responses (in writing and follow up meetings) and in the final EIS/EA, as appropriate. An overview of the key comments that influenced the assessment for vegetation communities and wetlands between the draft and final EIS/EA is provided below.

Baseline Information on Vegetation Communities and Wetlands

The Ministry of Natural Resources (MNR) and Mishkeegogamang Ojibway Nation (MON) commented on the use of Far North Land Cover Classification vegetation data, and MNRF recommended that updated Forest Resource Inventory (FRI) data be used for the vegetation assessments. MON also commented on the adequacy of the sampling strategy for the characterization of vegetation communities. Updated 2021 FRI data has been received from MNRF that has increased the spatial coverage within the regional study area (RSA) for the final EIS/EA. The 2021 FRI data has been used in the Baseline Terrestrial Report (Appendix P-1) and in the assessment of potential effects on vegetation communities and wetlands for the final EIS/EA. Ground truthing vegetation surveys (111 vegetation plots in 2021 and an additional 254 plots in 2022) have been undertaken across the ecosites present in the vegetation community and wetland RSA to further refine local levels of detail per ecosite. Vegetation surveys up to the end of 2022 identified a total of 397 plant species within the RSA.

MNRF requested clarification on the time of year that wetland evaluations were completed. A detailed summary of the methodology and timing of the wetland evaluation has been incorporated into the baseline terrestrial report (Appendix P-1).

Cat Lake First Nation (CLFN) and Lac Seul First Nation (LSFN) requested further information on the methods used to identify plant species, vegetation sample locations including power analysis, and the methodology for conducting wetland evaluations in 2022. Therefore, the number of sample plots for plants, vegetation communities and wetlands were increased in 2021. The methodology for vegetation community sampling is provided in the baseline terrestrial report (Appendix P-1), along the results of the studies carried out in 2021 and 2022. In addition, the methodology used to conduct wetland evaluations is described in Appendix P-1.

Assessment Methodology

The Northwestern Ontario Métis Community (NWOMC) requested clarification on the potential effects due to the temporary construction camp, buildings, and onsite infrastructure as well as commissioning of the process plant. Notably that vegetation within the footprint of the temporary construction camp, buildings, and onsite infrastructure will be removed during the construction phase when site preparation activities occur and will not be revegetated until the decommissioning phase. As a result, this loss of vegetation will extend until the end of the operations phase. The actual construction of these facilities would not result in further effects to vegetation. This has been clarified in Section 6.11.3 .

NWOMC noted that the location of harvest can, in some cases, be as important as the vegetation species. Places are taught and passed down generationally, may have cultural or spiritual significance, or may be a place that contributes to the overall well-being of harvesters out on the land by providing aesthetic appeal. NWOMC noted that the locational element must be considered for plant species which may be removed within the Project Development Area (PDA), including blueberries, chokecherries, cranberries, fiddleheads, Labrador tea, nuts, raspberries, pin cherries, saskatoon berries, wild rice, chaga and mushrooms and the residual effects revisited. FMG has conducted vegetation and wetland surveys in 2011, 2012, 2021 and 2022, and the results are summarized in Baseline Terrestrial Report (Appendix P-1). Input provided by NWOMC through ongoing engagement activities has been included in the assessment of potential effects on vegetation communities and wetlands (Section 6.11) and in the assessment of traditional land and resource use activities such as plant harvesting in the Section 6.21.

NWOMC requested that the loss of wetland communities must be evaluated in relation to Métis rights and what this irreversible loss means for Métis harvesters accessing their territories in the exercise of their rights. NWOMC emphasized the importance of wetland communities. Based on input received from NWOMC during engagement activities, FMG has updated the assessment of effects on wetland communities in Section 6.11 and evaluated the influence of potential groundwater changes on vegetation communities and wetlands during construction and operation of the Project. Opportunities for the creation of functional wetland habitat during closure has also been noted in the closure plan, as described in Section 5.19. Further, the assessment of the effects on traditional land and resource use has been updated in Section 6.21 to note that during closure activities, progressive and final rehabilitation of the mine site area will include a revegetation plan that will incorporate plant species of interest to Indigenous communities, where practical. Further, reclamation efforts carried out during closure will be guided by input from Indigenous communities and land use planning documents. The effect of these changes on Aboriginal and treaty rights is included in the assessment of effects on Indigenous people in Section 6.26.

MNRF requested further rationale on the size of study areas for vegetation surveys, provincially significant wetland and wildlife surveys, noting that distances appear to be arbitrary and not reflect research on zones of impact or home range sizes. Baseline investigation areas have evolved over the period during which field programs have occurred, based on specific valued components being studied, the examination of alternatives, comments received during the preparation of the EIS/EA, and optimizations made to the Project. The relevant baseline investigation areas are defined in the baseline terrestrial report (Appendix P) of the draft EIS/EA. In terms of the study area used for the assessment of potential effects, Section 6.1 provides a description of how these areas are determined. The local study area (LSA) for each valued component (e.g., wetlands and vegetation communities, wildlife) is based on geographic extent of the potential direct and indirect Project effects. The RSA is based on the maximum geographic extent or zone of influence in which the potential effects are assessed and used to provide regional context to the valued component. These have been further refined in the effects assessment for each valued component. The rationale for the RSA for the vegetation communities and wetlands has been updated based on feedback

received from Indigenous communities and government agencies during the review of the draft EIS/EA and is described in Section 6.11.1.3. The RSA is based on the quaternary watershed boundaries, which considers patterns in land cover where assemblages of vegetation and wetlands occur relative to distinct environmental conditions.

MNRF requested further information on the evaluation of impacts, mitigation and residual effects of all feasible road, hydro corridors, and aggregate pit alternatives in the effects assessment, not just the preferred alternative. An assessment of alternative routes has been prepared for the mine access road, transmission line routes and locations for aggregate sources as required by the Federal and Provincial legislation, and in accordance with the Environmental Impact Statement Guidelines (Appendix B-1 for the final EIS/EA) and the approved Amended Terms of Reference (Appendix B-3). The assessment of these Project components is found in Section 4.

MNRF recommended that an indicator for invasive species be included in the assessment of potential effects to vegetation communities and wetlands. Additional consideration of invasive species in the relative abundance and diversity of vegetation community indicator as noted in Section 6.11.1.4. Further, measures to mitigate the introduction of invasive species into the PDA have been included in Section 6.11.4.

MNRF requested clarification on the footprint for the mine access road corridor within the PDA resulting in this corridor width conservatively increasing to 30 metres, which has been updated in Section 5.

CLFN and LSFN requested further information on the anticipated change in groundwater levels due to the Project and the assessment of potential effects on wetlands. An assessment of potential effects on wetlands due to changes in groundwater from the Project is included in Section 6.11.6.2.

Mitigation Measures

MECP requested further detail on the dust management plan to mitigate potential effects to vegetation communities and wetlands. Further details of the dust management plan has been provided in Section 6.2, which includes the application of water spray as needed and supplemented with approved dust suppressants, where required during construction, operation and active closure phases of the Project to mitigate dust emissions from Project roads and mineral stockpiles. The assessment of the effect of dust on vegetation is included in Section 6.11.7.2, using the methodology outlined in Section 6.11.5 and applies the relevant mitigation from the dust management plan in Section 6.11.4.

NWOMC requested clarification on the vegetation plans and that mitigations will be in place to stop the invasion of non-native species. Section 6.11 has been updated to include species used in revegetation plans which will be further refined through life of mine based on their effectiveness in achieving the desired outcome and will include measures to mitigate the spread of invasive species. The development of the vegetation plans will take into consideration input provided by government agencies and Indigenous communities during the EA process. Revegetation trials will be conducted during the life of mine in preparation for closure. These trials will include community input and participation in implementation.

NWOMC noted that plants are an important part of Métis culture and diet, and NWOMC citizens have insight on how plants are used and harvested which could help better target proposed measures. Mitigation measures to be implemented to avoid or minimize the effects of the Project on vegetation communities have been identified in Section 6.11.4. Further, the effect on traditional harvesting of plants is assessed in Section 6.21. Revegetation trials will be conducted during the life of mine in preparation for closure. These trials will include community input and participation in implementation.

MNRF requested further information on the risk of invasive species and mitigation measures to prevent further introductions. An assessment of the potential effects from the Project introducing non-native and invasive plant and wildlife species, has been included and used as the basis for the selection of appropriate mitigation measures in Section 6.11.4 and 6.11.5.

MNRF requested information on rehabilitation measures including a revegetation plan and the associated composition of native vegetation species mixes to be used rehabilitation. Rehabilitation measures will be included in the filed Closure Plan including further information on a preliminary revegetation plan, which will be refined during the operation phase based on an evaluation of soil amendments and seed mixes to maximize the success of the final revegetation program. This has been included in the Conceptual Closure Plan in Section 5.19.

MNRF requested further information on minimizing clearing of vegetation along the mine access road corridor. It is anticipated that between 3 and 10 metres on each side of the mine access road will be cleared of woody vegetation depending on the need to maintain sight lines at corners, with low lying vegetation maintained during construction, operation and active closure of the Project.

Assessment and Characterization of Residual Effects

The Impact Assessment Agency of Canada (IAAC) requested clarification on the definition of wetlands and wetland areas, and a summary of the total area of wetlands displaced by the Project, by wetland type. It has been clarified that wetlands and wetland areas are the same and this definition has been updated in the final EIS/EA. The total area of wetlands displaced by the Project has been updated in Section 6.11.6.3 and Table 6.11-6 by wetland type. Further, IAAC requested a detailed estimate of the area of wetlands and the types of wetlands that will be indirectly altered, including alteration to wetland function, connectivity, and quality, due to the Project. The predicted area of wetlands indirectly altered by the Project has been updated in Section 6.11.6.3 and Table 6.11-7.

NWOMC and MNRF requested the percentage of direct loss of vegetation communities within the LSA rather than the RSA particularly as the vegetation community types within the LSA are referenced in relation to winter moose habitat, etc., which support harvesting. Table 6.11-6 which includes the percent change in the LSA as a result of the Project has been provided. The percent of direct loss within the project development area is compared to the available habitat within the RSA, as this is the appropriate comparison to determine the significance of the residual effect. The table has been updated for the final EIS/EA and includes the percent direct loss for all vegetation community types and ecosite at the LSA, and RSA scale.

Determination of Significance of Residual Effects

IAAC requested clarification on the characterization of specific significance attributes for the change in wetland quantity and quality. As described in Section 6.11.7.3, the residual effect due to the direct loss of wetlands is characterized as partially reversible, as there will be opportunities to recreate wetland habitat during the decommissioning and active closure phase within the PDA, such as the potential aggregate locations. With respect to the residual effect due to the indirect effect on wetlands, the duration of the residual effect is characterized as moderate because it will occur primarily during the operations phase but may also occur during the construction phase and the early parts of the decommissioning phase. The residual effect due to the indirect effect on wetlands is characterized as fully reversibility because groundwater contributions to baseflow generally return to baseline conditions in the final closure phase and dust deposition will be mitigated and cease at the end of the operations and decommissioning phase. The measures carried out during progressive reclamation in operation and final reclamation at closure will support the rehabilitation of wetland vegetation communities, including the inclusion of revegetation trials

during life of mine. Additional information and analysis with respect to groundwater drawdown, dust deposition, and change in wetland form and function has been provided in Section 6.11.7 to support this characterization.

NWOMC requested clarification on the frequency of residual effects on vegetation communities. The assessment of direct effects on vegetation communities conservatively assumes that all vegetation within the PDA will be completely removed during construction, and that these effects will continue until final rehabilitation is complete. As a result, there is no expectation that vegetation communities will be continually impacted throughout operations, once removed during construction. Therefore, the frequency of the residual effects due to direct loss will be once and is low (Level I). However, the frequency of the indirect effects related to the change in the quality and function of vegetation communities and wetlands will occur during operations and be reversible at closure. This has been included Section 6.11.

MON requested further information to support the conclusions related to the assessment of vegetation species of interest to Indigenous communities, including the assumption that mitigation and rehabilitation measures will suffice. Available traditional knowledge has been reviewed to identify species of interest. Substantial additional vegetation field surveys were carried out in 2021 and 2022 and have been used to update the baseline conditions and improve the understanding of natural variability estimates. This has been included in the Baseline Terrestrial Report (Appendix P-1) and summarized in Section 6.11.2. Based on the assessment of potential effects, mitigation measures have been re-evaluated and are included in Section 6.11.4.

Confidence Level in Conclusions

IAAC requested additional details to support the confidence level in the conclusions with respect to effects to wetland vegetation communities. Substantial additional wetland surveys in 2022 were completed and the results of these surveys are provided in the Baseline Terrestrial Report (Appendix P-1) and Section 6.11.2 to support the confidence level in the conclusions. The data from these wetland surveys has been used to update the direct and indirect effects to wetlands including the changes due to groundwater, surface water, noise and dust.

Community Involvement in the Development of Monitoring Programs

NWOMC requested opportunities to be engaged in future monitoring of vegetation communities and wetlands. FMG will offer to form Environment Committee(s) with members of proximate Indigenous communities. The Environment Committee(s) will provide a pathway for continued and constructive, transparent dialogue, interaction and information-sharing between First Mining and the leadership and members of the participating proximate communities regarding potential effects of the Project on the environment, traditional land use, human health and cultural values. It is anticipated that through this mechanism, opportunities to participate in revegetation trials that will occur during operations will be provided. These trials will evaluate such items as soil amendments, seed mixes to maximize the success of the final revegetation program.

6.11.1.3 Spatial and Temporal Boundaries

The PDA is defined as the footprint of the Project including the mine site area, mine site access road and the transmission line corridor, as well as a buffer in order to allow for flexibility for design optimizations during Project permitting. The buffer includes approximately 250 m around the mine site area. The buffer is included within the 40 m wide corridor for the transmission line and within in the 30 m wide corridor for the mine access road. Where the mine access road and transmission line are aligned together, the buffer is included within a 60 m wide corridor.

The spatial boundaries used for the assessment of vegetation communities and wetlands are shown in Figure 6.11-1 and defined as follows:

- **LSA**: The LSA is a 2 km buffer around the mine site area of the PDA and 2 km from the centreline of the mine access road of the PDA, and a 1 km from the centreline of the transmission line. The LSA considers the outer extent to which potential effects are anticipated to occur.
- **RSA:** The RSA is based on the quaternary watershed boundaries, which considers patterns in land cover where assemblages of vegetation and wetlands occur relative to distinct environmental conditions. This RSA is used for all terrestrial VCs except large mammals in the Wildlife and Wildlife habitat VC, Caribou, and Wolverine.

The temporal boundaries for the assessment of vegetation communities and wetlands are defined as:

- **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. Mining of the ore from the open pit will end in Year 10, at which time the pit will begin refilling with water; and
- Decommissioning and Closure Phase:
    - Active Closure: Years 11 and 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).

6.11.1.4 Criteria and Indicators

In undertaking the assessment of effects on vegetation communities and wetlands, the following criteria were used:

- Change in the relative abundance and diversity of plant species and vegetation communities;
- Change in the function, connectivity, and quality; and,
- Change in relative abundance and area of wetland extent.

The specific criteria, measurable indicators and the rationale for the selection of criteria are described in Table 6.11-1. To support the effects assessment, indicators are assessed using professional judgement and experience.

6.11.1.5 Description of Residual Effect Attributes

Residual effects for vegetation communities and wetlands are characterized in terms of the following attributes:

- Magnitude;
- Geographic Extent;
- Duration;
- Frequency; and
- Reversibility.

These attributes along with the rankings are further described in Table 6.11-2.

In addition, the residual effects for vegetation communities and wetlands are characterized according to the ecological context within which the VC is found. This is a qualitative measure of the sensitivity and/or resilience of the VC to potential change. The following ranking is applicable:

- **Level I:** The VC may or may not be sensitive but is capable of supporting the predicted change with typical mitigation measures.
- **Level II:** The VC is sensitive and requires special measures to support the predicted change.
- **Level III:** The VC is sensitive and unable to support the predicted change even with special measures.

As noted in Section 6.1, a residual effect is defined as significant if both of the following criteria are satisfied:

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

Conversely, if a Level I rating is achieved for any of the attributes involving magnitude, extent, duration, frequency or reversibility; or, if a Level I rating is achieved for the ecological contexts, then the residual effect is considered to be not significant.

In the event there is a significant adverse effect, the likelihood of occurrence is further described.

6.11.2 Existing Conditions

A description of the WPbaseline conditions is presented below to characterize the existing conditions for vegetation communities and wetlands and is based on several years of study that has resulted in a comprehensive dataset for this stage of project planning. The existing conditions are used to support the assessment of potential effects from the Project on vegetation communities and wetlands and will support long-term monitoring for the Project. Further baseline information on vegetation communities can be found in the technical support documentation (Appendix P-1) includes baseline data from field investigation conducted on vegetation communities and wetlands.

The Project occurs in an area of the boreal forest in northwest Ontario known as the Northern Coniferous Region (Rowe 1972). Glacial landform patterns are distinct due to complex glacial events and early post-glacial periods. The resulting relief is irregular, with rocky parallel ridges separating poorly drained depressions and innumerable narrow lakes. Common surficial deposits on the uplands are thin in some places and absent in others, where rock barrens of the underlain Precambrian granites and gneisses are exposed. Glaciofluvial and glaciolacustrine deposits are also very common, and the deeper drift of slopes and valleys show hump-ferric podzol profile development, while the less well-drained areas are peat-filled (Sims et al. 1997; Rowe 1972).

In general, the forest ecosystems of northwestern Ontario have a similar set of formative conditions, i.e., elapsed time in soil development and broad climatic gradients. The Northern Coniferous Region is characterized as a region where climatic conditions allow reasonable tree growth and the development of closed forests wherever soil depth is adequate. Black Spruce is the predominant tree, forming stands on the thin soil of the uplands with Jack Pine and in the poorly drained lowlands with Tamarack. Frequent fires favour the spread of Jack Pine and likely encourage the spread of White Birch. Where favourable local soil conditions and climate occur, typically in river valleys and around some lakes, White Spruce, Balsam Fir, Trembling Aspen and Balsam Poplar form mixed stands (Rowe 1972).

In most cases, the climate of northwestern Ontario is microthermal and humid. There are two main climatic gradients, temperature and humidity, that stratify the area. Because of the stratification, the southern half of Ecoregion 3S is defined as the Subhumid Western (Sims et al. 1997). The subhumid is a result of warmer summers (increased average annual temperature) and increased annual precipitation (increased growing season) than the northern portion of Ecoregion 3S. The climatic gradients influence soil developmental processes, which are driven by precipitation and biological activity (Sims et al. 1997).

Studies completed for the Project in 2021 and 2022 documented 30 ecosites and extensive vegetation inventories were completed in the RSA. In September 2023, updated FRI data was provided by the MNRF (Figure 6.11-2 to Figure 6.11-15), allowing increased spatial coverage within the RSA and updated ecosite characterization, including disturbance areas due to commercial forestry and forest fires. The FRI data has been used in the Baseline Terrestrial Report (Appendix P-1) and in the assessment of potential effects on vegetation communities and wetlands. Vegetation surveys to date identified a total of 368 plant species within the RSA. Of the species present, 368 are native to Ontario, with 29 non-native species documented. One SAR was documented; Black Ash was found in the southern extent of the RSA. Five species of plants (including Black Ash) are classified as rare in Ontario (ranked S1, S2, or S3).

From the 2021 FRI data provided, 64 boreal ecosites are mapped (Figure 6.11-2 to Figure 6.11-15). Boreal ecosites are grouped into terrestrial, wetland, and anthropogenic. Terrestrial and anthropogenic ecosites are considered in the assessment of vegetations communities while the wetland ecosites are considered the assessment of wetlands. The footprint of the Project is 1,365 ha, with 670 ha representing the land overprinted by the mine site. However, for the purposes of the EA, a more conservative PDA is used and consists of the mine site area (1,528 ha), the mine access road (184 ha) and the transmission line (294 ha) for a total area of 2,006 ha, of which 296 ha (15%) is open water habitat and the remainder is terrestrial, anthropogenic and wetland ecosites.

6.11.2.1 Upland Vegetation Communities

The upland vegetation communities consist of sparse treed, coniferous treed, deciduous treed, exposed bedrock and anthropogenic land cover types, and makes up 70% of the LSA, 66% of the RSA with 1,393.10 ha within the PDA (Table 6.11-6). The sparse treed community (including ecosites B011, B012, B024, B034, B035, B037 and B040) make up 1.6% of the LSA and 2.1% of the RSA with 1.29 ha within the PDA. This community is relatively rare and occurs where shallow soil limits tree growth. The coniferous treed community (including ecosites B048, B049, B050, B052, B053, B064, B065, B067, B068, B082, B083, B085, B098, B099, B101, B114 and B116) make up 63.8% of the LSA and 60.9% of the RSA, with 1,142.8 ha within the PDA. This community is common throughout the RSA, and is heavily dominated by Black Spruce, Jack Pine, Labrador Tea and blueberries. The deciduous treed community (including ecosites B054, B055, B070, B088, B104 and B119) make up 3.9% of the LSA and 2.3% of the RSA, with 243.9 ha within the PDA. This community includes typical trees such as Trembling Aspen and White Birch. Exposed bedrock communities (including ecosites B158, B161, B162, B164 and B165) make up <0.1% of the LSA and 0.1% of the RSA with 0.08 ha within the PDA. The exposed bedrock community covers only very small areas, with few examples of this habitat discovered during field investigations. Plant species diversity in these habitats is rather low. Species in this community grow where the soil has accumulated and typically include Jack Pine, Paper Birch, Black Spruce blueberries and abundant amounts of lichens and mosses.

Anthropogenic communities consist of sand / gravel / mine tailings (including ecosites B006, B007, B189, B191, B193, B197 and B198), commercial / industrial (ecosite U997), utilities (ecosite U998), and residential (ecosite U999). This community makes up 0.7% of the LSA, 0.22% of the RSA and 4.93 ha are identified in the PDA. Although these communities originate from anthropogenic disturbances, they tend to be highly

variable, with multiple vegetation communities in a small area and extremely diverse, depending on the topography and the nature and history of disturbance. Disturbances such as fire or human activity (logged / clearcut areas, roadsides, infrastructure corridors, and around human settlements) have not been factored in beyond what is provided in the FRI.

6.11.2.2 Wetland Communities

Wetland make up 29.9% of the LSA and 34.2% of the RSA with 352 ha within the PDA (Table 6.11-6). Wetlands cover less area than the adjacent terrestrial communities in the LSA, and RSA. There are no publicly available records (i.e., provincial data sets) of provincially significant wetlands that occur in the investigation area. Fieldwork (DST 2013) acquired baseline data on wetlands, peatlands, and riparian plant communities, and did not identify significant wetlands in the vicinity of the mine site portion of the PDA. Within the RSA, a wetland assessment was completed (Appendix P, informed by the federal wetland ecological functions assessment approach (Hanson et al. 2008)). A total of 5,140 wetlands were identified within the RSA (outside of the PDA and LSA), and of those, 95 were identified as significant (Figure 6.11-16 to Figure 6.11-29). Significant wetlands exhibited similar characteristics in terms of their dominant type, geographical position, size, and complexity. Most significant wetlands were classified as coniferous swamp dominant, making up 98% of the total (93 of 95), however the coniferous swamp wetland ecosites (Table 6.11-6) make up approximately 18% of the LSA and 20% of the RSA.

6.11.2.3 Species of Conservation Concern and SAR

Of the species found to be present in the investigation area, almost all are native to Ontario, although 29 non-native species were documented. Six vegetation species that are considered to be Species of Conservation Concern were documented between 2021 and 2022. These include five species of plants (including Black Ash) and one species of moss which is classified as rare in Ontario (ranked S1, S2 or S3):

- Black Ash (S3);
- Northern Marsh Violet (S2S3);
- Floating Marsh Marigold (S2);
- Alpine Woodsia (S2);
- Nahanni Oak Fern (S3); and
- Red Dung Moss (S2).

Black Ash is the one SAR plant that has been documented (Figure 6.11-3) however, is not currently (and may not be) protected under the ESA (Section 6.11.1.1).

6.11.2.4 Plant Species of Interest to Indigenous People

Available TK / TLU and land use plans have been reviewed to determine species of vegetation of anticipated importance to Indigenous communities.

The Cat Lake – Slate Falls Community Land Use Plan, a joint plan between Cat Lake First Nation and Slate Falls Nation (NDMNRF 2019), notes that various parts of plants, shrubs and trees continue to be used as traditional medicines. The Plan also emphasizes the importance that the people of Cat Lake and Slate Falls emphasize the protection of fish and wildlife habitats and the avoidance of unnecessary disturbance of vegetation and wildlife.

The Cat Lake First Nation Indigenous Knowledge and Use Study (CLFN 2024) for the Project identified various species of plants and medicines used by members in the RSA including Bear Root, Rat Root (weekay), blueberries, mint, jack pinecones, goldenrod, chaga, cedar, joint grass, poplar, spruce, Labrador Tea, Wild Rice (manoomin), and various fungi. Preferred harvesting areas include Birch Lake (near Fox Bay), Springpole Lake (near Johnson's Island), Shabumeni Lake, and the Shabumeni River. It was also noted that a myriad of beaches that line these various waterbodies and watercourses are especially valued for productive plant and medicine harvesting.

The Slate Falls Nation - Health, Socio-economic, Indigenous Knowledge and Land Use Baseline Study (SFN 2024) for the Project identified numerous species used for food such as berries (including blueberries, strawberries, raspberries, blackberries, saskatoon berries, cranberries and pin cherries), Wild Rice, Rat Root, Wild Carrots and bulrush roots. Plant species used for traditional medicines include cedar, pine, Balsam Fir, alder, Labrador Tea, mint, rosehip and Chaga. Other trees and plants used as tools and building material include poplar, spruce, ash, and moss.

The Lac Seul First Nation Indigenous Knowledge and Use Study (LSFN 2024) identified a number of food plant and medicinal plant species harvested throughout the RSA, primarily Wild Rice, cedar, and Weekay (also known as Rat root or Sweet flag). Preferred harvesting areas include the area around Swain Lake and lands north of Lac Seul within the RSA.

Several important plant species are valued for nutrition and ceremony as noted by Wabauskang First Nation, including: Wild Rice, blueberries, raspberries, cherries, juniper, sage, sweet grass, willow, cedar, and tree barks (ArrowBlade Consulting Services 2014).

The NWOMC TK / TLU Study for the Project (Know History 2021) provides locations of plant and natural material harvesting areas along the southern boundary of the RSA. Plants harvested included blueberries, chokecherries, cranberries, fiddleheads, Labrador Tea, nuts, raspberries, pin cherries, Saskatoon berries, Wild Rice, Chaga and mushrooms. Natural materials gathered include wood and bark.

Plant species of interest to various Indigenous communities, identified through TK and TLU studies, as well as land use plans, are listed in Table 6.11-3. The table identifies species recorded in the RSA during baseline surveys, along with their typical habitats.

Based on the above, an analysis of the potential effects from the Project on these plant species has been undertaken and can be found in Section 6.21 (traditional land and resource use) and Section 6.24 (human and ecological health).

6.11.3 Identification of Potential Effect Pathways

The initial step in the assessment process is to identify interactions between the Project and vegetation communities and wetlands that can result in pathways to potential effects. These potential effects may be direct, indirect and/or positive effects, where applicable. Table 6.11-4 includes the potential interactions of the Project with vegetation communities and wetlands, prior to the application of the mitigation measures. The professional judgement of technical experts experienced with mining projects in Ontario and Canada 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 due to a measurable change on vegetation communities and wetlands. These pathways to potential effects are further described below for each phase of the Project, along with the rationale for those interactions excluded from further assessment. Section 6.11.4 and Table 6.11-5 provide a description of the mitigation measures applied to during all phases of the Project. The residual effects, after the application of the

mitigation measures, are then described and further evaluated in Section 6.11.6, using the criteria and indicators identified in Section 6.11.1.4.

Construction Phase

The construction phase of the Project is expected to occur over a three-year period and will include the preparation of the site and the construction of mine infrastructure. The following interactions with the Project result in pathways to potential effects on vegetation communities and wetlands as described below. After mitigation is applied to each pathway, as described in Table 6.11-5, the residual effects are assessed using the criteria identified for each pathway:

- Site preparation activities for the mine site area, including clearing, grubbing, and bulk earthworks, interacts with vegetation communities and wetlands.
    - These activities result in pathways to potential effects on vegetation communities and wetlands due to:
        - the removal of vegetation communities and wetlands. Changes in catchment areas to manage contact water which may indirectly affect vegetation communities and wetlands outside the construction area;
        - changes in dust deposition due to the use of equipment to regrade the construction area may indirectly affect vegetation communities; and,
        - regrading activities that overprint wetland areas which may affect wetlands.
    - The assessment of potential effects on vegetation communities and wetlands includes the change in the relative abundance and diversity of plant species and vegetation communities, the change in the function, connectivity, and quality of these communities and the change in relative abundance and aerial extent of wetlands from these pathways.
- The construction of the mine access road and airstrip, including the development and operation of the aggregate sources, interacts with vegetation communities and wetlands.
    - These activities result in pathways to potential effects due to:
        - the removal of vegetation within the mine access road corridor that may directly affect vegetation communities;
        - changes in dust deposition due to the use of equipment within the construction area may indirectly affect vegetation communities; and,
        - regrading activities that overprint wetland areas which may affect wetlands.
    - The assessment of potential effects on vegetation communities and wetlands includes the change in relative abundance and diversity of plant species and vegetation communities, the change in function, connectivity, and quality of these communities and the change in relative abundance and aerial extent of wetlands from these pathways.
- The construction of the transmission line interacts with vegetation communities. This activity results in a pathway to a potential effect due to the alteration of vegetation communities within the transmission line corridor that may indirectly affect vegetation communities. The assessment of potential effects on vegetation communities includes the change in function, connectivity, and quality of these communities from this pathway.

- The construction of the fish habitat development area, construction of the starter embankments for the CDF, development of the surficial soil stockpile and initiation of stockpiling of ore interacts with vegetation communities and wetlands.
    - These activities result in pathways to potential effects due to:
        - the removal of vegetation within the footprint of these facilities that may directly affect vegetation communities;
        - changes in catchment areas to manage contact water within the footprint of these facilities which may indirectly affect vegetation communities and wetlands outside the construction area;
        - changes in dust deposition due to the use of equipment to construct these facilities may indirectly affect vegetation communities; and,
        - regrading activities within the footprint of these facilities that overprint wetland areas which may affect wetlands.
    - The assessment of potential effects includes the change in the relative abundance and diversity of plant species and vegetation communities, the change in the function, connectivity, and quality of these communities, and the change in relative abundance and aerial extent of wetlands due to these pathways.
- The controlled dewatering of the open pit basin interacts with vegetation communities and wetlands. This activity results in a pathway to potential effects due to changes in groundwater quantities due to water management activities which may indirectly affect vegetation communities and wetlands outside the open pit basin. The assessment of potential effects includes the change in the function, connectivity, and quality of these communities and the change in relative abundance and aerial extent of wetlands from this pathway.
- The establishment and operation of water management and treatment facilities interacts with vegetation communities and wetlands. These activities result in a pathway to potential effects due to changes in catchment areas to manage contact water which may indirectly affect vegetation communities and wetlands outside the construction area. The assessment of potential effects includes the change in the function, connectivity, and quality of these communities and the change in relative abundance and aerial extent of wetlands from this pathway.

The interaction related to the temporary construction camp, buildings, and onsite infrastructure, onsite haul and access roads, central water storage pond as well as the commissioning of the process plant, are not anticipated to have a potential effect once the site preparation activities have been completed and no further disturbance to vegetation communities is required. The installation of the dikes to isolate the mining area, stripping of lakebed sediments and overburden, and development of the open pit will not interact with vegetation communities and wetlands as these activities occur in areas lacking a vegetation community.

There is no plausible interaction between the employment and expenditures activities and vegetation communities and wetlands during any Project phase.

Operations Phase

The operations phase is anticipated over a 10-year period, but the majority of potential effects on vegetation communities and wetlands will occur during the construction phase. The following interactions with the Project result in pathways to potential effects on vegetation communities and wetlands as described below. After mitigation is applied to each pathway, as described in Table 6.11-5, the residual effects are assessed using the criteria identified for each pathway:

- The operation of the open pit interacts with vegetation communities and wetlands. This activity results in a pathway to potential effects on vegetation communities and wetlands due to change in groundwater levels that indirectly affect vegetation communities and wetlands. The assessment of potential effects includes the change in the function, connectivity, and quality of vegetation communities and wetlands from this pathway.
- The management of the overburden stockpile, ore stockpiles and the CDF interacts with vegetation communities. These activities result in a pathway to a potential effect due to the generation of dust which could indirectly affect adjacent vegetation communities. The assessment of potential effects on vegetation communities includes changes in the function, connectivity, and quality of vegetation communities from this pathway.
- The operation and maintenance of Project infrastructure, including the mine access road, airstrip, and transmission line interacts with vegetation communities.
    - These activities result in pathways to a potential effect on vegetation communities due to:
        - the requirement for vegetation management to maintain operations, and this could continue to directly affect vegetation communities; and,
        - the generation of dust which could indirectly affect adjacent vegetation communities.
    - The assessment of potential effects on vegetation communities includes changes in the function, connectivity, and quality of vegetation communities from these pathways.
- The operation and maintenance of the water management and treatment facilities interacts with vegetation communities and wetlands. These activities result in a pathway to potential effects on vegetation communities and wetlands due to the ongoing changes in surface water resulting in an indirect alteration of vegetation communities and wetlands. The assessment of potential effects on the vegetation communities and wetlands includes a change in the function, connectivity, and quality of vegetation communities and wetlands from this pathway.
- Progressive reclamation activities interact with the vegetation community and wetland.
    - These activities result in pathways to potential effects on vegetation communities and wetlands due to:
        - the revegetation of disturbed areas within the mine site area of the PDA that may directly affect vegetation communities;
        - changes in catchment areas to manage contact water which may indirectly affect vegetation communities and wetlands; and,
        - changes in dust deposition due to the use of equipment to regrade the construction area may indirectly affect vegetation communities.

- The assessment of potential effects on vegetation communities and wetlands includes changes in the function, connectivity, and quality of vegetation communities and wetlands from these pathways.

The commissioning and operation of the process plant and the accommodations complex will not interact with vegetation communities and wetlands because the area around these facilities would have been previously altered during the construction phase and assessed for that phase.

Decommissioning and Closure Phase

Activities occurring during these active closure phase, which is expected to occur over a five-year period, are similar to those that occur during the construction phase, and use similar mining equipment but generally on a smaller scale. The following interactions with the Project result in pathways to potential effects on vegetation communities and wetlands as described below. After mitigation is applied to each pathway, as described in Table 6.11-5, the residual effects are assessed using the criteria identified for each pathway:

- Final reclamation activities will include revegetating disturbed areas to provide stable slopes and reduce the potential for erosion. These activities would support the re-establishment of vegetation communities in the PDA through active revegetation efforts and natural processes. These activities result in a pathway to potential effects due to changes in vegetation species from the baseline condition as a result of the development of early successional communities that may not be the same as adjacent vegetation and wetland communities. The assessment of potential effects includes the change in the relative abundance and diversity of plant species and vegetation communities and the change in the function, connectivity, and quality of these communities from these pathways.
- The filling of the open pit with water includes the discontinuation of groundwater management in the open pit starting after Year 10 of operations. Groundwater, precipitation and supplemental water from the north basin of Springpole Lake will be used to fill the open pit in a controlled manner. These activities interact with vegetation communities and wetlands and result in a pathway to potential effects due to the discontinuation of groundwater management for the open pit that will lead to groundwater levels in the PDA returning to pre-disturbance condition, which support vegetation communities and wetlands. The assessment of potential effects includes the change in the function, connectivity, and quality of these communities and the change in relative abundance and aerial extent of wetlands from this pathway.

During decommissioning and closure, the removal of assets, demolition of remaining materials and the disposal of demolition-related wastes are not expected to have an interaction with vegetation communities and wetlands. Beyond closure, the activities will be primarily monitoring, and no effects on vegetation communities and wetlands are expected.

6.11.4 Mitigation Measures

Measures to be implemented to avoid or minimize the effects of the Project on vegetation communities and wetlands include:

- Development of a compact mine site to limit the areal extent of disturbance;
- Co-locate the transmission line, airstrip and mine access road within a shared infrastructure corridor, where feasible;
- During construction and operation, minimize the clearing of vegetation within the mine access road and transmission line corridor to that needed for the construction and safe operation;
- Mechanical vegetation removal practices will be used, when possible;
- Implementation of mitigation measures for potential effects on air quality relevant to vegetation communities and wetlands (Section 6.2.4) including:
    - During construction, operations and active closure, a dust management plan will be implemented to identify potential sources of fugitive dusts, outline mitigation measures that will be employed to control dust generation and detail the inspection and record keeping required to demonstrate that fugitive dusts are being effectively managed.
    - Dust emissions from roads and mineral stockpiles will be controlled through the application of water spray and supplemented by dust suppressants, if required;
    - Site roads will be maintained in good condition, with regular inspections and timely maintenance completed to minimize the silt loading on the roads; and,
    - Vehicle speeds will be limited.
- During construction and operation, implement mitigation measures for potential effects on groundwater relevant to wetlands (Section 6.5.4), including the following:
    - During operation and closure phases, revegetation and encouragement of natural revegetation / recolonization of disturbed areas, will be undertaken as part of progressive and final reclamation to minimize the length of time disturbed areas are exposed to reduce infiltration; and,
    - During the filling of the open pit basin, accelerate the return of groundwater levels to baseline conditions, by transferring water from Springpole Lake in a controlled manner while maintaining lake water levels in Springpole Lake within natural variation;
- During construction, operation and active closure phases, implement the following mitigation measures for wetlands:
    - Conduct construction activities in wetlands during late summer, fall or winter, whenever practical;
    - Salvage topsoil and the upper organic layer when constructing in and adjacent to wetlands;
    - Isolate work areas prior to construction using feasible techniques when working in wetlands during the open water period;
    - Install silt fences prior to construction on approaches to wetlands to prevent erosion and sedimentation, and remove silt fencing once the disturbed areas are stabilized;

- During construction and operation, minimize the removal of woody vegetation within the transmission line corridor to maintain natural cover to adjacent areas. The removal of woody vegetation will be limited to hazard trees and clearing to provide safe construction access and infrastructure needs;
- During construction and operation phases, undertake progressive rehabilitation of mine development areas, in accordance with a filed Closure Plan under the *Mining Act*, amended by the *Building More Mines Act*. The progressive rehabilitation measures for the Project may include:
    - Removal of construction-related facilities and reclamation of disturbed lands, if not required during operations;
    - Rehabilitation of aggregate sources when no longer required for the Project;
    - Initiation of revegetation studies during operations to evaluate soil amendments and seed mixes to maximize the success of the final revegetation program;
    - Implementation of a revegetation plan that preferentially uses local vegetation sources, incorporates plant species of interest to Indigenous communities, and avoids the use of non-native or invasive species; and,
    - Preserving organic material in place where reasonable and/or stockpiling material onsite.
- An invasive species management plan will be implemented during construction, operation and active closure phases to reduce the spread of invasive and non-native species from the Project, and include the following measures:
    - Construction equipment arriving on the Project site will be clean and free of any plant or soil material;
    - Where necessary, establish designated cleaning areas onsite to prevent or limit the spread of invasive and non-native species;
    - Where necessary, store stripped topsoil from the construction of the transmission line corridor in designated locations to avoid the introduction of invasive and non-native species from the existing disturbances due to forestry activities;
    - If required, topsoil stripped in or near areas with identified invasive and non-native species will be managed and stored in designated locations, where practical; and,
    - To limit the introduction of invasive and non-native species, certificates of seed analysis will be requested for seed mixes where available.
- During the active closure phase of the Project, undertake final rehabilitation activities of the mine development areas to create a stable, productive, and naturalized state. The plan includes the rehabilitation of disturbed lands (using commercially available native seed sources) and the establishment of self-sustaining vegetative cover. The closure phase will also include consultation with communities on opportunities for wetland creation; and,
- Vehicular access will be restricted along the mine access road, and the road will be scarified to alleviate surface compaction to aid in vegetative regeneration during the closure phase.

The application of mitigation measures to specific pathways and phases is illustrated in Table 6.11-5. Mitigation measures described in this section are expected to be effective for their intended purposes given their effective implementation at similar projects.

Monitoring programs will be implemented to verify the accuracy of the predicted effects, assess the effectiveness of the implemented mitigation measures and may be further optimized in response to monitoring data. Extensive monitoring programs are in place for the Project with several years of data collection completed. Monitoring for the Project going forward is further described in Section 12 and will be further refined during the permitting phase to incorporate conditions of approvals and permits. Consultation on the monitoring programs is expected to continue through all phases of the Project.

6.11.5 Analytical Methodology

To quantify the direct effects of the removal of vegetation communities and wetlands from the PDA, it was conservatively assumed that all vegetation communities and wetlands will be completely removed in the mine site areas, mine access road areas and transmission line corridor. FRI ecosite mapping was overlaid within the PDA in geographic information system (GIS) tools, and the removal areas were calculated. Previously disturbed areas with non-natural substrates (e.g., roads) were not included in the analysis.

Areas adjacent to the PDA may experience indirect effects as result of a change in function, connectivity and quality due to changes in dust emissions, changes in groundwater levels, changes in surface water catchment conditions due to Project-related ground disturbance and edge effects from increased natural light, increased exposure to wind and potentially from invasive and non-native species. The predicted indirect effects are measured within a zone of influence (ZOI), which is the area between the spatial footprint of an activity and the extent of the activity's effects on the surrounding habitat (Wilson 2016). The ZOI is determined as follows:

- The potential change in dust emissions was determined through predictive air quality modelling for PM_{10} using conservative assumptions for silt content (5.8%) and dust control efficiency measures (85%) during the construction and operation of the mine site area, mine access road and transmission line (Section 6.2). The ZOI was based on the isopleth for PM_{10}, predicted under worst-case scenario (Year 4; Figure 6.11-30 Table 6.11-7).
- The potential change in groundwater levels was determined using predictive groundwater modelling (Section 6.5). The ZOI was based on a two metre groundwater drawdown contour (Figure 6.11-31) that is predicted to emanate radially from the open pit due to the management of groundwater during the operation phase at full build out, and extends towards the nearest boundary conditions (primarily Springpole Lake and Birch Lake).
- The potential change in surface water catchment areas was determined through the development of a receiver water balance (Appendix M-3) as described in Sections 6.6 to 6.9, which estimate monthly flows at representative modelling nodes surrounding the mine site. Changes to average monthly flows for catchments within the LSA during each Project phases were calculated and compared to existing conditions. The ZOI was based on the geographic extent of the material changes to these catchments during the worse case scenario (operations phase).
- The extent of edge effects is defined by the increased exposure to natural light, wind and areas prone to invasive species. Given the variability in microclimate site conditions, the range in affects from light and wind are expected to be less than that of invasive species. Experience with the spread of invasive and non-native vegetation species at other sites in northern Ontario, along with a review of applicable literature indicates that invasive plant cover is greater closest to roads (Gelbard and Harrison 2003; Joly et al. 2011; Pocock and Lawrence 2005). Further, it is noted that maintenance equipment used for work that disturbs the ground may transport seeds (United States Department

of Agriculture 2003). As a result, a ZOI of 50 m from the edge of the PDA is applied to quantify these indirect effects; which is contained within the LSA.

Similar to the direct effects, indirect effects can be conservatively accounted for by overlaying the ZOI on FRI ecosite mapping and calculating the potentially affected area.

To screen for significance, a functional wetland assessment was executed using the methods outlined in the federal wetland ecological functions assessment (Hanson et al. 2008; Appendix P-1, Attachment 5). Criteria considered in the assessment include wetland size, dominant wetland type – rareness, wetland class richness, hydrologic setting, biodiversity, proximity to other wetlands, and proximity to key habitats. The evaluation is based on the functions assessment and ranks wetlands relative to one another. Based on the results, wetlands scoring in the 99% percentile were deemed "Significant", as shown in Table 6.11-8.

6.11.5.1 Assumptions and the Use of the Conservative Approach

The 2021 FRI mapping was used for the purposes of this effects assessment, to support the analyses presented in this assessment, and has been verified through field surveys. It has been conservatively assumed that all vegetation communities and wetlands will be completely removed in the mine site area, mine access road areas, and transmission line corridor. However, in reality, vegetation communities and wetlands will be maintained in specific areas to provide a buffer along waterbodies and mine site infrastructure where necessary. Vegetation communities within the transmission line corridor would be altered from existing conditions, but not completely removed. Further, wetlands within the transmission line corridor would not be removed, as the transmission line infrastructure would typically not be placed below the high-water level of waterbodies and wetlands. These assumptions provide an overestimation of the amount of vegetation communities and wetlands removed. A conservative approach was taken for the area impact assessment. The ZOI overlap considers all terrestrial and wetland vegetation communities that intersect it, without accounting for the area already removed by the PDA. This assumption would provide an overestimation of the amount of vegetation communities and wetlands removed.

Further, it is expected that progressive rehabilitation measures will occur at select locations during construction and operation when disturbance activities have been completed. Nevertheless, to be conservative, the assessment of the effects assumes that final rehabilitation activities will be completed during the closure phase.

6.11.6 Characterization of Potential Residual Effects

Residual effects of the Project on the vegetation communities and wetlands, after the application of mitigation, were subsequently assessed as discussed below.

6.11.6.1 Change in the Relative Abundance and Diversity of Plant Species and Vegetation Communities, including Indigenous Species of Interest

A change in relative abundance and diversity of plant species and vegetation communities, including species of interest to Indigenous communities, species at risk and species of conservation concern may occur during the construction and operation of the Project due to vegetation loss or alteration, fragmentation, competition from invasive and non-native species, and vegetation management. The footprint of the Project is 1,365 ha, with 670 ha representing the land overprinted by the mine site. However, the more conservative PDA was assessed and has an area of 2,006 ha (mine site area 1,527.9 ha, mine access road 183.7 ha and transmission line 294.4 ha). It has been conservatively assumed that all terrestrial and wetland vegetation communities within the PDA will be removed during construction, including 1,388 ha of terrestrial communities and 340 ha of wetland communities. Overall, the change of terrestrial communities in the PDA

represents an 8.63% loss in the LSA and a 0.41% loss in the RSA (Table 6.11-6). Regarding wetland communities, the change is less than a 4.91% decrease in the LSA and 0.19% decrease in the RSA (Table 6.11-6).

The residual effects on vegetation communities are localized to the PDA, and as the vegetation communities are common throughout the LSA and RSA. The RSA is relatively homogenous, as most areas are heavily dominated by similar species in both terrestrial and wetland communities. The ecosites which have the greatest changes are B050 and B052 in the coniferous treed community, B055 in the deciduous treed community, and B146 in the bog and fen wetland community (Table 6.11-6). The removal of B050 in the PDA results in an approximate 15% decrease in the LSA but less than a 1% decrease in the RSA. The removal of B052 in the PDA results in a decrease of approximately 37% in the LSA and 6% in the RSA, which is the largest change in ecosite area in the RSA. The removal of B055 in the PDA results in a decrease of approximately 32% in the LSA and 2% in the RSA. B146 is the only wetland ecosite to experience a change greater than 1% in the RSA (approximately 2% decrease). Although the loss of 2.37 ha of ecosite B146 in the PDA vast amounts of this ecosite occurs in the RSA (approximately 104 ha) outside the Project footprint. The majority of ecosites listed (approximately 63%) occur outside the PDA, and therefore will not be directly impacted by the Project.

No SAR plant species have been documented in the PDA. While Species of Conservation Concern have been found in the PDA (Figure 6.11-4 (c)), the vegetation communities and habitat for these species remains abundant throughout the RSA, and in the areas anticipated to be undisturbed by the Project. Further, species of interest to Indigenous communities have been documented in the PDA during baseline surveys (Figure 6.11-4 (c)), and these species are abundant in the PDA, LSA, and RSA and removal during construction is not anticipated to affect the viability of the species of Indigenous interest.

Although the conservative approach overestimates the change in abundance and diversity of vegetation communities and wetlands, site conditions within the PDA will be altered, and unlikely to fully return to the existing conditions at the location of the CDF, where revegetation efforts will be integrated in the cover design for the facility at closure. The Project will result in a very small incremental change to the landscape and rehabilitation measures will be implemented during the operation and closure phases as outlined in the approved Closure Plan. Revegetation trials will occur during the operations phase to evaluate and optimize the revegetation strategy for closure. During the closure phase, areas within the PDA will be revegetated through active seeding of commercially available native plant species and preparation of the ground surface to promote natural revegetation. There will be opportunities provided to Indigenous communities to refine the list of plant species in the closure phase revegetation plans and to participate in the revegetation trials during life of mine. In areas where species of conservation concern occur, transplanting and salvage of topsoil and upper organic layer may be considered.

Although planned revegetation trials during life of mine will improve the effectiveness of rehabilitation and revegetation efforts, and the controlled refilling of the open pit basin at closure will return groundwater levels to baseline conditions supporting wetlands in the PDA, there will be a residual effect to vegetation communities and wetlands due to a change in abundance.

6.11.6.2 Change in the Function, Connectivity, and Quality

There will be minor and localized changes in the function, connectivity and quality of vegetation communities and wetlands due to indirect effects from dust deposition, changes in groundwater, effects from invasive species, and changes in surface water catchments.

Vehicular traffic at the Project may result in minor increased dust generation and deposition on vegetation communities immediately adjacent to the site roads. Dust can affect photosynthesis, respiration and transpiration in plants and allow the penetration of air pollutants (Farmer 1993). Overall, dust deposition on plants results in some visible stress on individual plants, which can result in a decrease in the plant's productivity. The structure of localized vegetation communities may also be affected by excessive dust. The vegetation communities in the Project site most affected by dust deposition are those located alongside the roads on which mine haul trucks will be travelling. However, a dust management plan using water primarily, and dust suppressants as needed, will be implemented at the start of construction and during operation to limit the effects. Moreover, the predicted worst-case air quality of the mine site was modelled (Section 6.2) and a contour for a dust ZOI was used to estimate worst-case indirect effects. The ZOI is largely contained within the PDA (Figure 6.11-30 and has a potential indirect impact on 7.6% of terrestrial communities and 3.7% of wetland communities in the LSA. This represents 0.36% of the terrestrial communities in the RSA and 0.14% of the wetland communities in the RSA (Table 6.11-7). A conservative approach was taken for the area impact assessment. The ZOI overlap considers all terrestrial and wetland vegetation communities that intersect it, without accounting for the area already removed by the PDA. This assumption would provide an overestimation of the amount of vegetation communities and wetlands removed.

Groundwater drawdown as a result of pit dewatering could affect both the horizontal and vertical connectivity of wetland systems in the mine site area of the PDA. It is expected that the effects of the drawdown are likely to have changes on the wetland communities within the drawdown boundaries. The extent of the impact surrounding the open pit due to the drawdown is estimated to be approximately 580 ha (Figure 6.11-31. During open pit operations, the groundwater drawdown (Figure 6.11-30) will change the water budget available to vegetation communities and wetlands. As a result, there will be change in vegetation communities and wetlands, which makes up 1% of the LSA, and 0.04% in the RSA (Table 6.11-7). However, vegetation communities and wetlands within this footprint will have already been directly removed due to mine site construction.

Once the ore body has been mined open pit operations will cease, and groundwater levels will begin to return to baseline conditions. At the end of the decommissioning phase, the level of traffic will be reduced, and the associated potential effects of dust and deposition will be negligible. The reclamation of disturbed lands and implementation of a revegetation plan, where feasible during operation, and during final reclamation at closure will further support the rehabilitation of vegetation and wetland communities.

Invasive and non-native plant species can displace native vegetation. Areas within LSA may be affected by the spread of these invasive species by new roads, construction equipment and vehicles, or imported fill. Vegetation communities within 30 m of the PDA will be most susceptible to displacement by the introduction of invasive and exotic species. To address the issue of invasive and non-native plant species displacing native vegetation, an invasive species management plan during construction, operation and active closure phases will be implemented.

The catchment area of vegetation communities and wetlands within the LSA will be reduced due to the construction of Project infrastructure. However, these changes in flows are anticipated to be relatively small or negligible (Section 6.6 to 6.9). The direct and indirect changes affecting the quality of vegetation and wetland communities will occur primarily during the construction and operation phases of the Project and be localize to areas of the PDA and immediately adjacent.

With the development of Project infrastructure adjacent to some vegetation communities, edge effects are predicted to occur along the borders of the PDA, including the mine site, the access road, and the transmission line where it does not follow an existing route. This will result in increased light and changes in the microclimate that create conditions for the regrowth of early successional species and other species adapted to disturbance conditions. The edge effects will be reversed at closure with revegetation efforts.

6.11.6.3 Change in the Relative Abundance and Area of Wetland Extent

Minor and localized changes to the relative abundance and area of wetland extent will result from the construction and operation phases of the Project due to the removal of wetland vegetation, the direct loss and / or fragmentation of wetlands. During construction, 340 ha of wetlands within the PDA will be directly removed, which represents less than 0.2% of the wetlands in the RSA (Table 6.11-6). This consists of coniferous swamp (289 ha), thicket swamp (4.7 ha), marsh (4.53 ha), and bog and fen (42.07 ha); all representing less than 0.23% of the RSA each.

Changes in groundwater levels during the operation phase has been modelled (Section 6.5), and the reduction in groundwater levels that affects wetlands is largely confined to the immediate area around the open pit, which is accounted for as a direct loss (Figure 6.11-31). Once groundwater management in the open pit ceases, groundwater levels are predicted to return to pre-development conditions at closure.

Wetlands assessed by the wetland functions assessment were primarily coniferous swamps and make up 16% (19,511 ha) of the total coniferous swamp in the RSA (124,055 ha; Table 6.11-6). However, only 289 ha of coniferous swamp occur within the PDA, which makes up less than 2% of the significant wetlands within the RSA.

During the operation and closure phases, rehabilitation measures will be implemented, as outlined in the approved Closure Plan, to support the reestablishment of native vegetation communities. There may be opportunities to recreate wetland habitat during closure in the potential aggregate locations, enhanced fish habitat area, and the reclaimed central water storage pond (unnamed waterbody L-2), however it is unlikely that wetland communities will be fully reclaimed at closure, and there will be a net loss of wetlands within the PDA, primarily at the location of the CDF.

6.11.7 Significance of Residual Effects

The residual effect on vegetation communities and wetlands is the decrease in relative abundance and diversity of vegetation communities, the change in the function, connectivity and quality of vegetation communities and the change in relative abundance and area of wetland extent.

The Vegetation Communities and Wetlands VC is typical of northern Ontario ecosystems and capable of supporting the predicted residual effects with typical measures, and therefore the ecological and social context is considered low (Level I).

6.11.7.1 Change in the Relative Abundance and Diversity of Plant Species and Vegetation Communities

With the implementation of mitigation, the magnitude of the residual effect due to a decrease in relative abundance and diversity of vegetation communities, including Indigenous species of interest, is considered to be low (Level I) due to the predicted limited change (<1% change) in the RSA. Vegetation communities are common throughout the LSA and RSA, and therefore, removal in the PDA is unlikely to threaten the long-term viability of vegetation communities. As well, the geographic extent of the residual effect is low (Level I), as it is constrained within the PDA. However, the duration of the residual effect is considered to be high (Level III), as the results of final rehabilitation will occur post-closure. In addition, the frequency of the

residual effect is considered to be low (Level I) as it occurs once during construction and is expected to be partially reversible (Level II) as site conditions within the PDA will be permanently altered and following post-closure some areas of the PDA will not be fully revegetated (i.e., CDF dam embankments).

As a result, the adverse residual effect on vegetation communities and wetlands due to a decrease in relative abundance of vegetation communities, including Indigenous species of interest is predicted to be not significant.

6.11.7.2 Change in the Function, Connectivity, and Quality

With the implementation of mitigation measures, the magnitude of the residual effect of the decrease in the quality, connectivity and function of vegetation communities and wetlands is low (Level I) due to the negligible (0.04%) decrease of affected wetlands in the RSA from groundwater drawdown, the negligible effect on terrestrial communities (0.36%) and wetland communities (0.14%) due to changes in air quality, and the minimal change in SWH abundance within the RSA due to the small Project footprint and use of existing routes for linear corridors. The geographic extent of the residual effect is low (Level I), as it is constrained within the PDA and LSA. However, the duration of the residual effect is considered to be high (Level III), as the results of final rehabilitation will occur post-closure. In addition, the frequency of the residual effect is considered to be moderate (Level II) as it occurs intermittently or with a certain degree of regularity during construction and operation. The residual effect is expected to be partially reversible (Level II) as site conditions within the PDA will be permanently altered and some areas of the PDA will not be revegetated (i.e., CDF) until post-closure.

As a result, the adverse residual effect on vegetation communities and wetlands due to a decrease in decrease in the quality, connectivity and function is predicted to be not significant.

6.11.7.3 Change in the Relative Abundance and Area of Wetland Extent

With the implementation of mitigation measures (including reclamation and revegetation), the magnitude of the residual effect from a decrease in relative abundance and area of wetlands is low (Level I) as the predicted decrease in wetlands within the RSA is less than 0.19%. Wetlands are common throughout the LSA and RSA, and therefore, removal within the PDA is not expected to threaten the long-term viability of wetland communities. The geographic extent of the residual effect is low (Level I), as it is confined to the PDA. However, the duration of the residual effect is high (Level III), as the effect is conservatively anticipated to last until post-closure when rehabilitation measures to support the re-establishment of wetland communities are fully implemented. The frequency of the residual effect is low (Level I) as it occurs once during construction but is expected to be partially reversible (Level II) as site conditions within the PDA will be permanently altered and some areas of the PDA will not be revegetated (i.e., CDF) at post-closure.

Wetlands affected by the Project are typical of northern Ontario, and common throughout the RSA. There are no PSWs or unique wetland ecosites with the PDA. As a result, the predicted residual effects can be managed with typical measures, and therefore the ecological context is low (Level I). The likelihood of the residual effect is high as the construction and operation of Project infrastructure will result in effects to wetlands, however the residual effects are likely to be overestimated due to the conservative assumptions used in the modelling. As a result, the adverse residual effect on wetlands due to a decrease in relative abundance and area of wetlands is predicted to be not significant.

6.11.8 Confidence Prediction

The level of confidence in the prediction is high based on the extensive spatial and temporal quality of the baseline information, mapping techniques, ground truthing field work, and use of updated FRI data. The baseline data incorporated representative plant inventories from across the PDA, LSA, and RSA.

The approach to predicting and mitigating effects are based on industry standards and proven methods. The updated baseline data was incorporated into the assessment using GIS-based tools and analysis. Further, the assessment used conservative assumptions as described in Section 6.11.5 to increase the level of confidence that effects would not be underestimated; this includes the assumption that the PDA will be entirely cleared.

6.11.9 References

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Table 6.11-1: Vegetation Communities and Wetlands Criteria, Indicators and Rationale

Criteria	Indicators	Rationale
Change in the relative abundance and diversity of plant species and vegetation communities	• Area of vegetation communities directly altered, in hectares • Relative abundance, and diversity of vegetation communities, measured by count • Relative abundance of plant species of interest to Indigenous people, SAR, and Species of Conservation Concern, measured by count	• A change in the area or relative abundance of specific vegetation communities may indicate changes to plant composition or fragmentation of large tracts of habitat. • A change in species diversity may be a direct loss of rare species or increased presence of invasives and non-natives. • A change in the relative abundance of plant species of interest to Indigenous people, SAR, and Species of Conservation Concern may indicate changes to these species.
Change in the function, connectivity, and quality	• Area of vegetation communities and wetlands indirectly altered, in hectares • Area of vegetation communities and wetlands fragmented by changes, in hectares	• The area of vegetation communities and wetlands which are altered may result in a possible change of function over time. • The area of vegetation communities and wetlands which are fragmented may result in reduced connectivity (hydrological, ecological, etc.). • Together, the changes in function and connectivity may indicate a change in quality.
Change in relative abundance and area of wetland extent	• Relative abundance, of wetland communities, measured by count • Area of wetlands, in hectares	• A change in the area and relative abundance of specific wetland vegetation may indicate changes to plant composition or fragmentation of large tracts of habitat.

Table 6.11-2: Significance Determination Attributes and Rankings for Vegetation Communities and Wetlands

Attribute	Description	Category
Magnitude	A qualitative or quantitative measure to describe the size or degree of the residual effects relative to baseline conditions	**Level I:** Measurable residual effect to the abundance and/or distribution of the vegetation community but would not result in changes to the long-term viability of the vegetation communities. **Level II:** Measurable residual effect on the abundance and/or distribution of the vegetation community but may result in changes to the long-term viability of the vegetation communities. **Level III:** Measurable residual effect on the abundance and/or distribution of the vegetation community, which would likely result in changes to the long-term viability of the vegetation communities.
Geographic Extent	The spatial extent over which the residual effect will take place	**Level I:** Effect is restricted to the LSA. **Level II:** Effect extends beyond the LSA. **Level III:** Effect extends beyond the RSA.
Duration	The time period over which the residual effect will or is expected to occur	**Level I:** Effect occurs over the short term: less than or equal to 3 years. **Level II:** Effect occurs over the medium term: more than three years but less than 20 years. **Level III:** Effect occurs over the long term: greater than 20 years.
Frequency	The rate of occurrence of the residual effect	**Level I:** Effect occurs once, infrequently or not at all. **Level II:** Effect occurs intermittently or with a certain degree of regularity. **Level III:** Effect occurs frequently or continuously.
Reversibility	The extent to which the residual effect can be reversed	**Level I:** Effect is fully reversible. **Level II:** Effect is partially reversible or potentially reversible with difficulty. **Level III:** Effect is not reversible.

Table 6.11-3: Identified Plant Species of Interest to Indigenous communities within the Regional Study Area

Vegetation Species of Interest to Indigenous Communities	Indigenous Community[1]	Habitat
Bear Root (Spreading Dogbane[2])	CLFN	Disturbed areas, woodland edges and openings, wet meadows and hydro corridors
Weekay (Rat Root / Sweet Flag)	CLFN, SFN, LSFN	Shorelines, shallow marshes, slow-moving rivers and lakes
Blueberry	CLFN, SFN, WFN, NWOMC	Open woodlands, conifer, mixed and deciduous forests, swamps, fens, bogs, disturbed areas, roadsides, hydro corridors, thickets and wet meadows
Mint	CLFN, SFN	Shorelines, stream and riverbanks, marshes and wet meadows
Jack Pine	CLFN, SFN	Disturbed areas, rocky outcroppings and conifer forests
Goldenrod	CLFN	Disturbed areas, roadsides, woodland edges and openings, shorelines, wetland edges, fens and thickets.
Chaga	CLFN, SFN, NWOMC	Birch and Poplar trees.
Cedar	CLFN, SFN, LSFN, WFN	Dry to moist forests, swamps, shorelines and wetland edges.
Joint Grass (Bluejoint?)	CLFN	Wetlands, marshes, shorelines, stream and riverbanks, fens, swamps and moist thickets.
Poplar	CLFN, SFN	Dry to moist mixed and deciduous forests, swamps, disturbed sites and roadsides.
Spruce	CLFN, SFN	Dry to moist conifer and mixed forests, swamps, fens, bogs and shorelines.
Labrador Tea	CLFN, SFN, NWOMC	Forests, swamps, thickets, disturbed sites, wetlands, fens, bogs and shorelines.
Wild Rice	CLFN, SFN, LSFN, WFN, NWOMC	Slow-moving rivers, lakes, marshes, ponds and shorelines.
Mushrooms	CLFN, NWOMC	Fresh to moist woodlands, swamps, bogs, on trees and decaying wood.
Strawberry	SFN	Meadows, disturbed areas and open woodlands.
Raspberry / Blackberry	SFN, WFN, NWOMC	Meadows, open woodlands, swamps, thickets, disturbed areas, wetland edges and shorelines.
Saskatoon	SFN, NWOMC	Meadows, open woodlands and forest edges and shorelines.
Cranberry	SFN, NWOMC	Wetlands, fens, bogs, swamps, moist forests and shorelines.
Cherry (Pin and Choke)	SFN, WFN, NWOMC	Disturbed areas, mixed and deciduous forest understories, wetland edges and roadsides.
Wild Carrot	SFN	Disturbed areas, hydro corridors, meadows and roadsides.
Bulrush	SFN	Wetlands, marshes, fens, bogs, edges of streams, slow-moving rivers and lakesides.
Balsam Fir	SFN	Conifer and mixed forests and swamps
Alder	SFN	Conifer, mixed and deciduous forests, swamps, thickets, wetland edges, stream and river-banks, shorelines, disturbed areas, fens and hydro corridors.
Rose	SFN	Fresh to moist forests, swamps, thickets, wetland edges and shorelines.
Ash	SFN	Moist forests, shorelines and swamps
Moss	SFN	Dry to moist forests, swamps, thickets, on trees, wetlands, fens and bogs.
Juniper	WFN	Fens, shorelines, conifer and mixed forests, swamps and woodland clearings.

Table 6.11-3: Identified Plant Species of Interest to Indigenous communities within the Regional Study Area

Vegetation Species of Interest to Indigenous Communities	Indigenous Community[1]	Habitat
Sweet Grass	WFN	Moist meadows, streambanks and wetland edges.
Willow	WFN	Fresh to moist forests, swamps, fens, bogs, shorelines, stream and riverbanks and thickets.
Fiddlehead (Ferns)	NWOMC	Fresh to moist forests, swamps, fens, wetland edges and thickets.

Notes:
[1]Cat Lake First Nation (CLFN), Slate Falls Nation (SFN), Lac Seul First Nation (LSFN), Wabauskang First Nation (WFN), Northwestern Ontario Métis Community (NWOMC)
[2]Kenny, M.B., and W.H. Parker. 2004. Ojibway plant taxonomy at Lac Seul First Nation, Ontario Canada. Journal of Ethnobiology 24(1): 75-91.

Table 6.11-4: Potential Interactions of Project Components on Vegetation Communities and Wetlands

Project Component / Activity	Vegetation Communities	Wetlands
Construction Phase		
Site preparation activities, including clearing, grubbing and bulk earthworks	Yes	Yes
Construction of the mine site access road and airstrip, including the development and operation of aggregate resource areas	Yes	Yes
Development of temporary construction camp and staging areas	Yes	Yes
Construction of the fish habitat development area	Yes	Yes
Construction of the transmission line to the Project site	Yes	Yes
Construction of the onsite haul and access roads	Yes	Yes
Construction of dikes in the north basin of Springpole Lake	-	-
Construction of buildings and onsite infrastructure	Yes	Yes
Construction of the central water storage pond	Yes	Yes
Controlled dewatering of the open pit basin	Yes	Yes
Construction of the starter embankments for the CDF	Yes	Yes
Stripping of lake bed sediment and overburden at the open pit	Yes	Yes
Development of the surficial soil stockpile	Yes	-
Initiation of pit development in rock	Yes	Yes
Initiation of stockpiling of ore	Yes	Yes
Establishment and operation of water management and treatment facilities	Yes	Yes
Commissioning of the process plant	Yes	Yes
Employment and Expenditures	-	-
Operations Phase		
Operation of the process plant	-	-
Operation of open pit mine	Yes	Yes
Management of overburden, mine rock, tailings and ore in designated facilities	Yes	Yes
Operation of water management and treatment facilities	Yes	Yes
Accommodations complex operations	-	-
Operation and maintenance of mine site infrastructure	Yes	Yes
Progressive reclamation activities	Yes	Yes
Employment and Expenditures	-	-
Decommissioning and Closure Phase		
Removal of assets that can be salvaged	-	-
Demolition and recycling and/or disposal of remaining materials	-	-
Removal and disposal of demolition-related wastes in approved facilities	-	-
Reclamation of impacted areas, such as by re-grading, placement of cover, and revegetation	Yes	Yes
Filling the open pit with water	Yes	Yes
Monitoring and maintenance	-	-
Employment and Expenditures	-	-

Note:
(-) The interaction is not expected, and no further assessment is warranted.

Table 6.11-5: Proposed Mitigation Measures for Potential Vegetation Community and Wetland Effects

	Phase			
Pathways to Potential Effect / Criteria	**Con.**	**Op.**	**Cl.**	**Proposed Mitigation Measure**
Change in the relative abundance and diversity of plant species and vegetation communities	•	–	–	Development of a compact mine site to limit the areal extent of disturbance.
	•	–	–	Co-locate the transmission line, airstrip and mine access road within a shared infrastructure corridor, where feasible.
	•	•	–	Minimize the clearing of vegetation within the mine access road and transmission line corridor to that needed for the construction and safe operation.
	•	•	–	Minimize the removal of woody vegetation within the transmission line corridor to maintain natural cover to adjacent areas. The removal of woody vegetation will be limited to hazard trees and clearing to provide safe construction access and infrastructure needs.
	•	•	–	Undertake progressive rehabilitation of mine development areas, in accordance with a filed Closure Plan under the *Mining Act*. The progressive rehabilitation measures for the Project may include: • Removal of construction-related facilities and reclamation of disturbed lands, if not required during operations; • Rehabilitation of aggregate sources when no longer required for the Project; • Implementation of a revegetation plan that preferentially uses local vegetation sources, incorporates plant species of interest to Indigenous communities, and avoids the use of non-native or invasive species; and • Preserving organic material in place where reasonable and/or stockpiling material onsite.
	–	–	•	During the active closure phase of the Project, undertake final rehabilitation activities of the mine development areas to create a stable, productive, and naturalized state. The plan includes the rehabilitation of disturbed lands (using commercially available native seed sources) and the establishment of self-sustaining vegetative cover.
	–	–	•	Vehicular access will be restricted along the mine access road, and the road will be scarified to alleviate surface compaction to aid in vegetative regeneration during the closure phase.

Table 6.11-5: Proposed Mitigation Measures for Potential Vegetation Community and Wetland Effects

	Phase			
Pathways to Potential Effect / Criteria	**Con.**	**Op.**	**Cl.**	**Proposed Mitigation Measure**
Change in the function, connectivity, and quality	●	–	–	Development of a compact mine site to limit the areal extent of disturbance.
	●	–	–	Co-locate the transmission line, airstrip and mine access road within a shared infrastructure corridor, where feasible.
	●	●	●	Mechanical vegetation removal practices will be used, when possible.
	●	●	●	Implement mitigation measures for potential effects on air quality relevant to vegetation communities and wetlands (Section 6.2.4) including: • During construction, operations and active closure, a dust management plan will be implemented to identify potential sources of fugitive dusts, outline mitigation measures that will be employed to control dust generation and detail the inspection and record keeping required to demonstrate that fugitive dusts are being effectively managed. • Dust emissions from roads and mineral stockpiles will be controlled through the application of water spray and supplemented by dust suppressants, if required; • Site roads will be maintained in good condition, with regular inspections and timely maintenance completed to minimize the silt loading on the roads; and, • Vehicle speeds will be limited.
	●	●	–	Implement mitigation measures for potential effects on groundwater relevant to vegetation communities (Section 6.5.4), including the following: • During operation and closure phases, revegetation and encouragement of natural revegetation / recolonization of disturbed areas, will be undertaken as part of progressive and final reclamation to minimize the length of time disturbed areas are exposed to reduce infiltration; and, • During the filling of the open pit basin, accelerate the return of groundwater levels to baseline conditions, by transferring water from Springpole Lake in a controlled manner while maintaining lake water levels in Springpole Lake within natural variation.
	●	●	–	Minimize the clearing of vegetation within the mine access road and transmission line corridor as feasible.
	●	●	–	Minimize the removal of woody vegetation within the transmission line corridor to maintain natural cover to adjacent areas. The removal of woody vegetation will be limited to hazard trees and clearing to provide safe construction access and infrastructure needs.

Table 6.11-5: Proposed Mitigation Measures for Potential Vegetation Community and Wetland Effects

Pathways to Potential Effect / Criteria	Phase			Proposed Mitigation Measure
	Con.	Op.	Cl.	
	•	•	•	An invasive species management plan will be implemented during construction, operation and active closure phases to reduce the spread of invasive and non-native species from the Project, and include the following measures: • Construction equipment arriving on the Project site will be clean and free of any plant or soil material; • Where necessary, establish designated cleaning areas onsite to prevent or limit the spread of invasive and non-native specie; • Where necessary, store stripped topsoil from the construction of the transmission line corridor in designated locations to avoid the introduction of invasive and non-native species from the existing disturbances due to forestry activities; • If required, topsoil stripped in or near areas with identified invasive and non-native species will be managed and stored in designated locations, where practical; and, To limit the introduction of invasive and non-native species, certificates of seed analysis will be requested for seed mixes where available.
	•	•	–	Undertake progressive rehabilitation of mine development areas, in accordance with a filed Closure Plan under the *Mining Act*. The progressive rehabilitation measures for the Project may include: • Removal of construction-related facilities and reclamation of disturbed lands, if not required during operations; • Rehabilitation of aggregate sources when no longer required for the Project; • Implementation of a revegetation plan that preferentially uses local vegetation sources, incorporates plant species of interest to Indigenous communities, and avoids the use of non-native or invasive species; and • Preserving organic material in place where reasonable and/or stockpiling material onsite.
	–	–	•	During the active closure phase of the Project, undertake final rehabilitation activities of the mine development areas to create a stable, productive, and naturalized state. The plan includes the rehabilitation of disturbed lands (using commercially available native seed sources) and the establishment of self-sustaining vegetative cover.
	–	–	•	Vehicular access will be restricted along the mine access road, and the road will be scarified to alleviate surface compaction to aid in vegetative regeneration during the closure phase.

Table 6.11-5: Proposed Mitigation Measures for Potential Vegetation Community and Wetland Effects

	Phase			
Pathways to Potential Effect / Criteria	**Con.**	**Op.**	**Cl.**	**Proposed Mitigation Measure**
Change in relative abundance and area of wetland extent	•	–	–	Development of a compact mine site to limit the footprint of disturbance.
	•	–	–	Co-locate the transmission line, airstrip and mine access road within a shared infrastructure corridor, where feasible.
	•	•	•	Implementation of mitigation measures for potential effects on air quality relevant to vegetation communities and wetlands (Section 6.2.4) including: • During construction, operations and active closure, a dust management plan will be implemented to identify potential sources of fugitive dusts, outline mitigation measures that will be employed to control dust generation and detail the inspection and record keeping required to demonstrate that fugitive dusts are being effectively managed. • Dust emissions from roads and mineral stockpiles will be controlled through the application of water spray and supplemented by dust suppressants, if required; • Site roads will be maintained in good condition, with regular inspections and timely maintenance completed to minimize the silt loading on the roads; and, • Vehicle speeds will be limited.
	•	•	•	Implement mitigation measures for potential effects on groundwater relevant to wetlands (Section 6.5.4), including the following: • During operation and closure phases, revegetation and encouragement of natural revegetation / recolonization of disturbed areas, will be undertaken as part of progressive and final reclamation to minimize the length of time disturbed areas are exposed to reduce infiltration; and, • During the filling of the open pit basin, accelerate the return of groundwater levels to baseline conditions, by transferring water from Springpole Lake in a controlled manner while maintaining lake water levels in Springpole Lake within natural variation.
	•	•	•	During construction, operation and active closure phases, implement the following mitigation measures for wetlands: • Conduct construction activities in wetlands during late summer, fall or winter, whenever practical; • Salvage topsoil and the upper organic layer when constructing in and adjacent to wetlands; • Isolate work areas prior to construction using feasible techniques when working in wetlands during the open water period;

Table 6.11-5: Proposed Mitigation Measures for Potential Vegetation Community and Wetland Effects

Pathways to Potential Effect / Criteria	Phase			Proposed Mitigation Measure
	Con.	Op.	Cl.	
				• Install silt fences prior to construction on approaches to wetlands to prevent erosion and sedimentation, and remove silt fencing once the disturbed areas are stabilized.
	•	•	–	During construction and operation phases, undertake progressive rehabilitation of mine development areas, in accordance with a filed Closure Plan under the *Mining Act*. The progressive rehabilitation measures for the Project may include: • Removal of construction-related facilities and reclamation of disturbed lands, if not required during operations; • Rehabilitation of aggregate sources when no longer required for the Project; • Implementation of a revegetation plan that preferentially uses local vegetation sources, incorporates plant species of interest to Indigenous communities, and avoids the use of non-native or invasive species; and • Preserving organic material in place where reasonable and/or stockpiling material onsite.
	–	–	•	During the active closure phase of the Project, undertake final rehabilitation activities of the mine development areas to create a stable, productive, and naturalized state. The plan includes the rehabilitation of disturbed lands (using commercially available native seed sources) and the establishment of self-sustaining vegetative cover. The closure phase will also include consultation with communities on opportunities for wetland creation.

Note:
Con. = construction; Op. = operations; Cl. = closure; ● = mitigation is applicable; – = mitigation is not applicable.

Table 6.11-6: Summary of Direct Effects on Vegetation and Wetlands Communities

		Ecosite	Baseline Condition (Area, in ha)[1]						Condition during Mine Operations (Area, in ha)[2]				Change in Cover Type[3]	
			PDA	%	LSA	%	RSA	%	LSA	%	RSA	%	LSA	RSA
Terrestrial	Sparse treed	B011	0.00	0.00%	0.00	0.00%	2.77	0.00%	0.00	0.00%	2.77	0.00%	0.00%	0.00%
		B012	1.29	0.07%	306.22	1.32%	4721.61	0.91%	304.93	1.42%	4720.32	0.91%	-0.42%	-0.03%
		B024	0.00	0.00%	6.72	0.03%	6.72	0.00%	6.72	0.03%	6.72	0.00%	0.00%	0.00%
		B034	0.00	0.00%	39.67	0.17%	5720.54	1.10%	39.67	0.18%	5720.54	1.10%	0.00%	0.00%
		B035	0.00	0.00%	0.00	0.00%	555.05	0.11%	0.00	0.00%	555.05	0.11%	0.00%	0.00%
		B037	0.00	0.00%	23.48	0.10%	61.34	0.01%	23.48	0.11%	61.34	0.01%	0.00%	0.00%
		B040	0.00	0.00%	0.00	0.00%	67.16	0.01%	0.00	0.00%	67.16	0.01%	0.00%	0.00%
	Coniferous treed	B048	0.00	0.00%	0.00	0.00%	206.06	0.04%	0.00	0.00%	206.06	0.04%	0.00%	0.00%
		B049	483.23	27.87%	9744.39	42.05%	227209.20	43.74%	9261.16	43.19%	226725.98	43.79%	-4.96%	-0.21%
		B050	478.43	27.60%	3234.36	13.96%	50704.25	9.76%	2755.93	12.85%	50225.82	9.70%	-14.79%	-0.94%
		B052	134.90	7.78%	363.55	1.57%	2094.69	0.40%	228.65	1.07%	1959.79	0.38%	-37.11%	-6.44%
		B053	0.00	0.00%	0.00	0.00%	7.07	0.00%	0.00	0.00%	7.07	0.00%	0.00%	0.00%
		B064	0.00	0.00%	0.00	0.00%	2.24	0.00%	0.00	0.00%	2.24	0.00%	0.00%	0.00%
		B065	40.39	2.33%	896.82	3.87%	27344.02	5.26%	856.44	3.99%	27303.64	5.27%	-4.50%	-0.15%
		B067	0.00	0.00%	0.00	0.00%	73.40	0.01%	0.00	0.00%	73.40	0.01%	0.00%	0.00%
		B068	0.00	0.00%	0.00	0.00%	30.54	0.01%	0.00	0.00%	30.54	0.01%	0.00%	0.00%
		B082	0.00	0.00%	8.99	0.04%	404.06	0.08%	8.99	0.04%	404.06	0.08%	0.00%	0.00%
		B083	0.00	0.00%	0.00	0.00%	269.79	0.05%	0.00	0.00%	269.79	0.05%	0.00%	0.00%
		B085	0.00	0.00%	0.00	0.00%	31.18	0.01%	0.00	0.00%	31.18	0.01%	0.00%	0.00%
		B098	4.72	0.27%	357.76	1.54%	3996.35	0.77%	353.03	1.65%	3991.63	0.77%	-1.32%	-0.12%
		B099	0.37	0.02%	136.36	0.59%	2377.27	0.46%	135.99	0.63%	2376.90	0.46%	-0.27%	-0.02%
		B101	0.77	0.04%	25.29	0.11%	502.20	0.10%	24.52	0.11%	501.43	0.10%	-3.04%	-0.15%
		B114	0.00	0.00%	7.69	0.03%	1165.43	0.22%	7.69	0.04%	1165.43	0.23%	0.00%	0.00%
		B116	0.00	0.00%	0.00	0.00%	73.92	0.01%	0.00	0.00%	73.92	0.01%	0.00%	0.00%
	Deciduous treed (including Mixed Treed)	B054	0.00	0.00%	0.00	0.00%	2.35	0.00%	0.00	0.00%	2.35	0.00%	0.00%	0.00%
		B055	242.86	14.01%	761.46	3.29%	10115.42	1.95%	518.59	2.42%	9872.55	1.91%	-31.89%	-2.40%
		B070	0.00	0.00%	4.20	0.02%	522.79	0.10%	4.20	0.02%	522.79	0.10%	0.00%	0.00%
		B088	0.00	0.00%	0.00	0.00%	173.30	0.03%	0.00	0.00%	173.30	0.03%	0.00%	0.00%
		B104	1.13	0.07%	138.65	0.60%	978.99	0.19%	137.52	0.64%	977.86	0.19%	-0.81%	-0.12%
		B119	0.00	0.00%	0.00	0.00%	254.27	0.05%	0.00	0.00%	254.27	0.05%	0.00%	0.00%
	Bedrock	B158	0.00	0.00%	0.00	0.00%	2.38	0.00%	0.00	0.00%	2.38	0.00%	0.00%	0.00%
		B161	0.00	0.00%	0.00	0.00%	0.37	0.00%	0.00	0.00%	0.37	0.00%	0.00%	0.00%
		B162	0.00	0.00%	0.00	0.00%	5.01	0.00%	0.00	0.00%	5.01	0.00%	0.00%	0.00%
		B164	0.08	0.00%	20.83	0.09%	546.03	0.11%	20.75	0.10%	545.95	0.11%	-0.38%	-0.01%
		B165	0.00	0.00%	0.00	0.00%	16.05	0.00%	0.00	0.00%	16.05	0.00%	0.00%	0.00%
Terrestrial Sub-Total			**1388.16**	**80.08%**	**16076.43**	**69.37%**	**340243.84**	**65%**	**14688.27**	**68.51%**	**338855.67**	**65.45%**	**-8.63%**	**-0.41%**
Wetland	Coniferous swamp	B127	56.21	3.24%	1004.81	4.34%	21580.81	4.15%	948.59	4.42%	21524.60	4.16%	-5.59%	-0.26%
		B128	232.95	13.44%	4093.49	17.66%	101902.02	19.62%	3860.54	18.01%	101669.07	19.64%	-5.69%	-0.23%
		B129	0.00	0.00%	0.00	0.00%	279.38	0.05%	0.00	0.00%	279.38	0.05%	0.00%	0.00%
		B222	0.00	0.00%	0.00	0.00%	171.98	0.03%	0.00	0.00%	171.98	0.03%	0.00%	0.00%
		B223	0.00	0.00%	0.00	0.00%	102.52	0.02%	0.00	0.00%	102.52	0.02%	0.00%	0.00%
		B224	0.00	0.00%	0.00	0.00%	18.43	0.00%	0.00	0.00%	18.43	0.00%	0.00%	0.00%
	Thicket swamp	B135	4.70	0.27%	191.36	0.83%	6688.51	1.29%	186.65	0.87%	6683.80	1.29%	-2.46%	-0.07%

Table 6.11-6: Summary of Direct Effects on Vegetation and Wetlands Communities

		Ecosite	Baseline Condition (Area, in ha)[1]						Condition during Mine Operations (Area, in ha)[2]				Change in Cover Type[3]	
			PDA	%	LSA	%	RSA	%	LSA	%	RSA	%	LSA	RSA
	Marsh	B142	4.53	0.26%	143.54	0.62%	4641.75	0.89%	139.01	0.65%	4637.23	0.90%	-3.15%	-0.10%
		B144	0.00	0.00%	0.00	0.00%	9.33	0.00%	0.00	0.00%	9.33	0.00%	0.00%	0.00%
	Bog and Fen	B126	0.65	0.04%	25.38	0.11%	1333.28	0.26%	24.73	0.12%	1332.63	0.26%	-2.56%	-0.05%
		B136	26.59	1.53%	1104.74	4.77%	26217.35	5.05%	1078.15	5.03%	26190.76	5.06%	-2.41%	-0.10%
		B137	0.00	0.00%	57.01	0.25%	3905.18	0.75%	57.01	0.27%	3905.18	0.75%	-0.01%	0.00%
		B138	0.00	0.00%	0.00	0.00%	98.13	0.02%	0.00	0.00%	98.13	0.02%	0.00%	0.00%
		B139	0.99	0.06%	29.11	0.13%	1243.63	0.24%	28.12	0.13%	1242.63	0.24%	-3.41%	-0.08%
		B140	11.47	0.66%	258.23	1.11%	8830.59	1.70%	246.76	1.15%	8819.12	1.70%	-4.44%	-0.13%
		B141	0.00	0.00%	23.74	0.10%	892.69	0.17%	23.74	0.11%	892.69	0.17%	0.00%	0.00%
		B146	2.37	0.14%	3.33	0.01%	106.33	0.02%	0.97	0.00%	103.97	0.02%	-70.98%	-2.22%
	Deciduous Swamp	B130	0.00	0.00%	0.00	0.00%	33.03	0.01%	0.00	0.00%	33.03	0.01%	0.00%	0.00%
		B133	0.00	0.00%	0.00	0.00%	32.75	0.01%	0.00	0.00%	32.75	0.01%	0.00%	0.00%
Wetland Sub-Total			**340.5**	**19.64%**	**6934.75**	**29.92%**	**178087.71**	**34%**	**6594.28**	**30.76%**	**177747.24**	**34.33%**	**-4.91%**	**-0.19%**
Anthropogenic	Sand / gravel / mine tailings	B006	0.00	0.00%	0.00	0.00%	0.18	0.00%	0.00	0.00%	0.18	0.00%	0.00%	0.00%
		B007	0.00	0.00%	0.00	0.00%	40.83	0.01%	0.00	0.00%	40.83	0.01%	0.00%	0.00%
		B189	0.00	0.00%	0.00	0.00%	0.35	0.00%	0.00	0.00%	0.35	0.00%	0.00%	0.00%
		B191	0.00	0.00%	0.00	0.00%	4.01	0.00%	0.00	0.00%	4.01	0.00%	0.00%	0.00%
		B193	0.00	0.00%	0.00	0.00%	7.99	0.00%	0.00	0.00%	7.99	0.00%	0.00%	0.00%
		B197	0.14	0.01%	3.01	0.01%	585.50	0.11%	2.87	0.01%	585.36	0.11%	-4.67%	-0.02%
		B198	0.00	0.00%	0.00	0.00%	8.30	0.00%	0.00	0.00%	8.30	0.00%	0.00%	0.00%
	Commercial / Industrial Unclassified	U997	1.62	0.09%	1.62	0.01%	80.13	0.02%	0.00	0.00%	78.50	0.02%	-100.00%	-2.03%
	Utilities Unclassified	U998	1.89	0.11%	134.06	0.58%	285.55	0.05%	132.17	0.62%	283.66	0.05%	-1.41%	-0.66%
	Residential Unclassified	U999	1.28	0.07%	24.61	0.11%	128.92	0.02%	23.33	0.11%	127.64	0.02%	-5.21%	-0.99%
Anthropogenic Sub-Total			**4.93**	**0.28%**	**163.30**	**0.70%**	**1141.75**	**0.2%**	**158.37**	**0.74%**	**1136.82**	**0.22%**	**-3.02%**	**-0.43%**
TOTAL			**1,733.56**	**100%**	**23,174.48**	**100.00%**	**519,473.30**	**100%**	**21440.92**	**100%**	**517739.73**	**100%**	**-7.48%**	**-0.33%**

Notes:

1 Refers to the condition prior to mine development.

2 Refers to the conditions after the mine has been developed for operations (i.e., the removal of the PDA footprint in GIS analysis).

3 Change in Cover Type is calculated as =((Condition during Mine Operations – Baseline Condition)/Baseline Condition). In Sub-total rows, Change in Cover Type is not summed but calculated based on the sums of the row.

4 The PDA has an area of 2,006 ha of which 1,713.76 ha are captured in FRI ecosites.

Table 6.11-7: Summary of Potential Indirect Effects on Vegetation Communities and Wetlands

		Ecosite	Baseline Condition (Area, in ha)[1]		Operational Impact (Area, in ha)[2,3]									
			LSA	RSA	Pit Dewatering Drawdown Area	LSA after Drawdown	RSA after Drawdown	LSA % Change	RSA % Change	Air Quality Effects	LSA after Air Effects	RSA after Air Effects	LSA % Change	RSA % Change
Terrestrial	Sparse treed	B011	0.00	2.77	0.00	0.00	2.77	0.00	0.00	0.00	0.00	2.77	0.00%	0.00%
		B012	306.22	4,721.61	0.00	306.22	4,721.61	0.00	0.00	0.00	306.22	4,721.61	0.00%	0.00%
		B024	6.72	6.72	0.00	6.72	6.72	0.00	0.00	0.00	6.72	6.72	0.00%	0.00%
		B034	39.67	5,720.54	0.00	39.67	5,720.54	0.00	0.00	0.00	39.67	5,720.54	0.00%	0.00%
		B035	0.00	555.05	0.00	0.00	555.05	0.00	0.00	0.00	0.00	555.05	0.00%	0.00%
		B037	23.48	61.34	0.00	23.48	61.34	0.00	0.00	0.00	23.48	61.34	0.00%	0.00%
		B040	0.00	67.16	0.00	0.00	67.16	0.00	0.00	0.00	0.00	67.16	0.00%	0.00%
	Coniferous treed	B048	0.00	206.06	0.00	0.00	206.06	0.00	0.00	0.00	0.00	206.06	0.00%	0.00%
		B049	9,744.39	227,209.20	93.56	9,650.83	227,115.64	-0.01	0.00	207.23	9,537.16	227,001.98	-2.13%	-0.09%
		B050	3,234.36	50,704.25	196.45	3,037.90	50,507.80	-0.06	0.00	517.49	2,716.87	50,186.76	-16.00%	-1.02%
		B052	363.55	2,094.69	79.42	284.13	2,015.27	-0.22	-0.04	206.56	156.99	1,888.13	-56.82%	-9.86%
		B053	0.00	7.07	0.00	0.00	7.07	0.00	0.00	0.00	0.00	7.07	0.00%	0.00%
		B064	0.00	2.24	0.00	0.00	2.24	0.00	0.00	0.00	0.00	2.24	0.00%	0.00%
		B065	896.82	27,344.02	17.87	878.96	27,326.16	-0.02	0.00	32.31	864.51	27,311.71	-3.60%	-0.12%
		B067	0.00	73.40	0.00	0.00	73.40	0.00	0.00	0.00	0.00	73.40	0.00%	0.00%
		B068	0.00	30.54	0.00	0.00	30.54	0.00	0.00	0.00	0.00	30.54	0.00%	0.00%
		B082	8.99	404.06	0.00	8.99	404.06	0.00	0.00	0.00	8.99	404.06	0.00%	0.00%
		B083	0.00	269.79	0.00	0.00	269.79	0.00	0.00	0.00	0.00	269.79	0.00%	0.00%
		B085	0.00	31.18	0.00	0.00	31.18	0.00	0.00	0.00	0.00	31.18	0.00%	0.00%
		B098	357.76	3,996.35	0.00	357.76	3,996.35	0.00	0.00	0.00	357.76	3,996.35	0.00%	0.00%
		B099	136.36	2,377.27	0.00	136.36	2,377.27	0.00	0.00	0.00	136.36	2,377.27	0.00%	0.00%
		B101	25.29	502.20	0.00	25.29	502.20	0.00	0.00	0.00	25.29	502.20	0.00%	0.00%
		B114	7.69	1,165.43	0.00	7.69	1,165.43	0.00	0.00	0.00	7.69	1,165.43	0.00%	0.00%
		B116	0.00	73.92	0.00	0.00	73.92	0.00	0.00	0.00	0.00	73.92	0.00%	0.00%
	Deciduous treed (including Mixed Treed)	B054	0.00	2.35	0.00	0.00	2.35	0.00	0.00	0.00	0.00	2.35	0.00%	0.00%
		B055	761.46	10,115.42	111.21	650.24	10,004.20	-0.15	-0.01	261.45	500.00	9,853.96	-34.34%	-2.58%
		B070	4.20	522.79	0.00	4.20	522.79	0.00	0.00	0.00	4.20	522.79	0.00%	0.00%
		B088	0.00	173.30	0.00	0.00	173.30	0.00	0.00	0.00	0.00	173.30	0.00%	0.00%
		B104	138.65	978.99	0.00	138.65	978.99	0.00	0.00	0.00	138.65	978.99	0.00%	0.00%
		B119	0.00	254.27	0.00	0.00	254.27	0.00	0.00	0.00	0.00	254.27	0.00%	0.00%
	Bedrock	B158	0.00	2.38	0.00	0.00	2.38	0.00	0.00	0.00	0.00	2.38	0.00%	0.00%
		B161	0.00	0.37	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.37	0.00%	0.00%
		B162	0.00	5.01	0.00	0.00	5.01	0.00	0.00	0.00	0.00	5.01	0.00%	0.00%
		B164	20.83	546.03	0.00	20.83	546.03	0.00	0.00	0.00	20.83	546.03	0.00%	0.00%
		B165	0.00	16.05	0.00	0.00	16.05	0.00	0.00	0.00	0.00	16.05	0.00%	0.00%
Terrestrial Sub-Total			**16,076.43**	**340,243.84**	**498.51**	**15,577.92**	**339,745.32**	**-0.03**	**0.00**	**1,225.05**	**14,851.38**	**339,018.79**	**-7.62%**	**-0.36%**

Table 6.11-7: Summary of Potential Indirect Effects on Vegetation Communities and Wetlands

		Ecosite	Baseline Condition (Area, in ha)[1]		Operational Impact (Area, in ha)[2,3]									
			LSA	RSA	Pit Dewatering Drawdown Area	LSA after Drawdown	RSA after Drawdown	LSA % Change	RSA % Change	Air Quality Effects	LSA after Air Effects	RSA after Air Effects	LSA % Change	RSA % Change
Wetland	Coniferous swamp	B127	1,004.81	21,580.81	11.19	993.62	21,569.62	-0.01	0.00	34.44	970.37	21,546.37	-3.43%	-0.16%
		B128	4,093.49	101,902.02	60.08	4,033.41	101,841.94	-0.01	0.00	192.74	3,900.76	101,709.29	-4.71%	-0.19%
		B129	0.00	279.38	0.00	0.00	279.38	0.00	0.00	0.00	0.00	279.38	0.00%	0.00%
		B222	0.00	171.98	0.00	0.00	171.98	0.00	0.00	0.00	0.00	171.98	0.00%	0.00%
		B223	0.00	102.52	0.00	0.00	102.52	0.00	0.00	0.00	0.00	102.52	0.00%	0.00%
		B224	0.00	18.43	0.00	0.00	18.43	0.00	0.00	0.00	0.00	18.43	0.00%	0.00%
	Thicket swamp	B135	191.36	6,688.51	0.00	191.36	6,688.51	0.00	0.00	1.46	189.89	6,687.04	-0.77%	-0.02%
	Marsh	B142	143.54	4,641.75	2.02	141.52	4,639.74	-0.01	0.00	6.68	136.86	4,635.07	-4.65%	-0.14%
		B144	0.00	9.33	0.00	0.00	9.33	0.00	0.00	0.00	0.00	9.33	0.00%	0.00%
	Bog and Fen	B126	25.38	1,333.28	0.00	25.38	1,333.28	0.00	0.00	0.00	25.38	1,333.28	0.00%	0.00%
		B136	1,104.74	26,217.35	1.32	1,103.42	26,216.03	0.00	0.00	10.53	1,094.21	26,206.82	-0.95%	-0.04%
		B137	57.01	3,905.18	0.00	57.01	3,905.18	0.00	0.00	0.00	57.01	3,905.18	0.00%	0.00%
		B138	0.00	98.13	0.00	0.00	98.13	0.00	0.00	0.00	0.00	98.13	0.00%	0.00%
		B139	29.11	1,243.63	0.00	29.11	1,243.63	0.00	0.00	0.00	29.11	1,243.63	0.00%	0.00%
		B140	258.23	8,830.59	1.24	256.99	8,829.35	0.00	0.00	9.61	248.62	8,820.98	-3.72%	-0.11%
		B141	23.74	892.69	0.00	23.74	892.69	0.00	0.00	0.00	23.74	892.69	0.00%	0.00%
		B146	3.33	106.33	2.37	0.97	103.97	-0.71	-0.02	2.37	0.97	103.97	-70.98%	-2.22%
	Deciduous Swamp	B130	0.00	33.03	0.00	0.00	33.03	0.00	0.00	0.00	0.00	33.03	0.00%	0.00%
		B133	0.00	32.75	0.00	0.00	32.75	0.00	0.00	0.00	0.00	32.75	0.00%	0.00%
Wetland Sub-Total			**6,934.75**	**178,087.71**	**78.21**	**6,856.53**	**178,009.50**	**-0.01**	**0.00**	**257.83**	**6,676.92**	**177,829.88**	**-3.72%**	**-0.14%**
Anthropogenic	Sand / gravel / mine tailings	B006	0.00	0.18	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.18	0.00%	0.00%
		B007	0.00	40.83	0.00	0.00	40.83	0.00	0.00	0.00	0.00	40.83	0.00%	0.00%
		B189	0.00	0.35	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.35	0.00%	0.00%
		B191	0.00	4.01	0.00	0.00	4.01	0.00	0.00	0.00	0.00	4.01	0.00%	0.00%
		B193	0.00	7.99	0.00	0.00	7.99	0.00	0.00	0.00	0.00	7.99	0.00%	0.00%
		B197	3.01	585.50	0.00	3.01	585.50	0.00	0.00	0.00	3.01	585.50	0.00%	0.00%
		B198	0.00	8.30	0.00	0.00	8.30	0.00	0.00	0.00	0.00	8.30	0.00%	0.00%
	Commercial / Industrial Unclassified	U997	1.62	80.13	1.62	0.00	78.50	-1.00	-0.02	1.62	0.00	78.50	-100.00%	-2.03%
	Utilities Unclassified	U998	134.06	285.55	0.00	134.06	285.55	0.00	0.00	0.00	134.06	285.55	0.00%	0.00%
	Residential Unclassified	U999	24.61	128.92	1.28	23.33	127.64	-0.05	-0.01	2.68	21.93	126.23	-10.91%	-2.08%
Anthropogenic Sub-Total			**163.30**	**1,141.75**	**2.90**	**160.40**	**1,138.85**	**-0.02**	**0.00**	**4.31**	**158.99**	**1,137.44**	**-2.64%**	**-0.38%**
TOTAL			**23,174.48**	**519,473.30**	**579.63**	**22,594.85**	**518,893.67**	**-0.06**	**0.00**	**1,487.18**	**21,687.30**	**517,986.11**	**-6.42%**	**-0.29%**

Notes:
1 Refers to the condition prior to mine construction.
2 Refers to the modelled maximum effects during operation.
3 Change in Cover Type is calculated as =((Condition during Mine Operations – Baseline Condition)/Baseline Condition). In Sub-total rows, Change in Cover Type is not summed but calculated based on the sums of the row.

Table 6.11-8: Summary of Significant Wetlands Impacted by the Project

Wetland ID	Dominant Wetland Type in Wetland Unit	Total Wetland Area (ha)
1948	Coniferous Swamp	6,666.44
2122	Coniferous Swamp	3,211.10
2186	Coniferous Swamp	369.77
3279	Coniferous Swamp	1,160.02
3492	Coniferous Swamp	1,067.38
3500	Coniferous Swamp	703.70
3983	Coniferous Swamp	173.48
4329	Coniferous Swamp	359.20
4488	Coniferous Swamp	4,255.63
4653	Coniferous Swamp	532.42
4728	Coniferous Swamp	100.33
4823	Coniferous Swamp	912.20

480000 500000 520000 540000 560000 580000 600000 620000 640000 660000 680000

5700000 5680000 5660000 5640000 5620000

Carillon Lake
Kapikik Lake
Gitche Lake
Dobie Lake
Zionz Lake
Birch Lake
Springpole Lake
Fawcett Lake
Gull Lake
Wright Lake
Shabumeni Lake
Seagrave Lake
Kezik Lake
Fry Lake
Narrow Lake
Woman Lake
Okanse Lake
Trout Lake
SLATE FALLS NATION
Joyce Lake
Perrigo Lake
Bamaji Lake
Jeanette Lake
Blackstone Lake
Confederation Lake
Lake St. Joseph
Little Trout Lake
Doran Lake
Slate Lake
Whitemud Lake
Otatakan Lake
Miniss Lake
Bruce Lake
Bluffy Lake
De Lesseps Lake
St. Raphael Lake

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LEGEND

- Proposed Mine Feature
- Project Development Area
- Local Study Area for Vegetation Communities and Wetlands
- Regional Study Area for Vegetation Communities and Wetlands
- First Nation Reserve
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- Watercourse
- Waterbody

0 5 10 20 30 40 50 Kilometres

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

Local and Regional Study Areas for Vegetation Communities and Wetlands

PROJECT N°: ONS2104 | **FIGURE: 6.11-1**

SCALE: 1:500,000 | DATE: June 2024

525000 530000 535000 540000 545000 550000 555000 560000

5715000 5710000 5705000 5700000

Mink Lake
Little Shabumeni Lake
Penson Lake
Birch Lake
Keigat Lake

LEGEND

- Proposed Mine Feature
- Local Study Area for Vegetation Communities and Wetlands
- Regional Study Area for Vegetation Communities and Wetlands
- First Nation Reserve
- Existing Road
- Wenesaga Forestry Road
- Existing Transmission Line
- Vegetation Survey Plots (2022)
- Vegetation Survey Plots (June/July 2021)
- Targeted Vegetation Survey Plots (Fall 2021)
- Vegetation Survey Plots (2011 - 2019)

Confirmed Species of Conservation Concern

- Alpine Woodsia (Wood 2021)
- Black Ash (Wood 2021)
- Floating Marsh-marigold (Wood 2021)
- Nahanni Wood Fern (Wood 2021)
- Northern Marsh Violet (Wood 2021)

Vegetation Communites

- Vegetation Community Boundary (labelled with boreal ecosite code)

KEY MAP

a b c d e f g h i j k l m n

20 Km

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan current as of Oct. 30, 2023
- Vegetation communities extracted from FRI data (provided by Domtar 2023, and MNRF 2023)

Datum: NAD83
Projection: UTM Zone 15N

N W E S

0 2.5 5 10 15 20 Kilometres

First Mining Gold

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SPRINGPOLE GOLD PROJECT

Vegetation Communities

PROJECT N°: ONS2104 | **FIGURE: 6.11-2**

SCALE: 1:100,150 | DATE: June 2024

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565000 570000 575000 580000 585000 590000 595000 600000 605000

5715000 5710000 5705000 5700000

Jackpine Lake

LEGEND

- Proposed Mine Feature
- Local Study Area for Vegetation Communities and Wetlands
- Regional Study Area for Vegetation Communities and Wetlands
- First Nation Reserve
- Existing Road
- Wenesaga Forestry Road
- Existing Transmission Line
- Vegetation Survey Plots (2022)
- Vegetation Survey Plots (June/July 2021)
- Targeted Vegetation Survey Plots (Fall 2021)
- Vegetation Survey Plots (2011 - 2019)

Confirmed Species of Conservation Concern

- Alpine Woodsia (Wood 2021)
- Black Ash (Wood 2021)
- Floating Marsh-marigold (Wood 2021)
- Nahanni Wood Fern (Wood 2021)
- Northern Marsh Violet (Wood 2021)

Vegetation Communites

- Vegetation Community Boundary (labelled with boreal ecosite code)

KEY MAP

a b c d e f g h i j k l m n

20 Km

0 2.5 5 10 15 20 Kilometres

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan current as of Oct. 30, 2023
- Vegetation communities extracted from FRI data (provided by Domtar 2023, and MNRF 2023)

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

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SPRINGPOLE GOLD PROJECT

Vegetation Communities

PROJECT N°: ONS2104	**FIGURE: 6.11-3**
SCALE: 1:100,150	DATE: June 2024

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525000 530000 535000 540000 545000 550000 555000 560000

5695000 5690000 5685000 5680000 5675000

Shabumeni Lake
Dole Lake
Springpole Lake
Springpole Lake
Cromarty Lake
Satterly Lake
Superstition Lake
Craydarl Lake
Seagrave Lake
Skingle Lake
Okanse River
Bertha Lake
Springpole Lake

Birch Lake
L-18
L-1
L-19
L-17
L-2
L-3
L-4
L-5
L-6
L-16
1 Km

O:\CA\CAOAK300-OAK\MIS-FS1-Project\F2021\Projects\ONS2104_FMG_Springpole_EIS\11_GIS\E\S\MXD\May2024_Updates\Vege_Community_Series_MapC_3.mxd

LEGEND

- Proposed Mine Feature
- Local Study Area for Vegetation Communities and Wetlands
- Regional Study Area for Vegetation Communities and Wetlands
- First Nation Reserve
- Existing Road
- Wenesaga Forestry Road
- Existing Transmission Line
- Vegetation Survey Plots (2022)
- Vegetation Survey Plots (June/July 2021)
- Targeted Vegetation Survey Plots (Fall 2021)
- Vegetation Survey Plots (2011 - 2019)

Confirmed Species of Conservation Concern

- Alpine Woodsia (Wood 2021)
- Floating Marsh-marigold (Wood 2021)
- Northern Marsh Violet (Wood 2021)

Vegetation Communites

- Vegetation Community Boundary (labelled with boreal ecosite code)

KEY MAP

a b c d e f g h i j k l m n

20 Km

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan current as of Oct. 30, 2023
- Vegetation communities extracted from FRI data (provided by Domtar 2023, and MNRF 2023)

Datum: NAD83
Projection: UTM Zone 15N

0 2.5 5 10 15 20 Kilometres

N W E S

First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

Vegetation Communities

PROJECT N°: ONS2104	**FIGURE: 6.11-4**
SCALE: 1:100,150	DATE: June 2024

565000 570000 575000 580000 585000 590000 595000 600000 605000

5695000 5690000 5685000 5680000 5675000

Durkin Lake

Birch River

Gull Lake

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LEGEND

- Proposed Mine Feature
- Local Study Area for Vegetation Communities and Wetlands
- Regional Study Area for Vegetation Communities and Wetlands
- First Nation Reserve
- Existing Road
- Wenesaga Forestry Road
- Existing Transmission Line
- Vegetation Survey Plots (2022)
- Vegetation Survey Plots (June/July 2021)
- Targeted Vegetation Survey Plots (Fall 2021)
- Vegetation Survey Plots (2011 - 2019)

Confirmed Species of Conservation Concern

- Alpine Woodsia (Wood 2021)
- Black Ash (Wood 2021)
- Floating Marsh-marigold (Wood 2021)
- Nahanni Wood Fern (Wood 2021)
- Northern Marsh Violet (Wood 2021)

Vegetation Communites

- Vegetation Community Boundary (labelled with boreal ecosite code)

0 2.5 5 10 15 20 Kilometres

KEY MAP

a b c d e f g h i j k l m n

20 0 20 Km

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan current as of Oct. 30, 2023
- Vegetation communities extracted from FRI data (provided by Domtar 2023, and MNRF 2023)

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

Vegetation Communities

PROJECT N°: ONS2104	**FIGURE: 6.11-5**
SCALE: 1:100,150	DATE: June 2024