

TMI_870-WL(2)-01

Unique Identifier	Agency IR #	Annex	Agency / Group / Stakeholder	Cross Reference / Comment / Information Request / Response	
TMI_870-WL(2)-01	WL(2)-01	1	CEA Agency	Reference to EIS Guidelines:	Part 2, Section 9.1.2
				Reference to EIS / Appendix	Sections 5.9.2.1 - 5.9.2.4, Table 5.9.1; Appendix G; Section 9.1.2, Table 9.5, Figures 9.4 - 9.7; Appendix R Executive Summary, Section 2.2
				Cross-reference to Round 1 IRs	TMI_145-WL(1)-02, TMI_147-WL(1)-04, TMI_162-WL(1)-19, TMI_542-AC(1)-216
				<p>Context and Rationale:</p> <p>Ecosites</p> <ul style="list-style-type: none"> • The Agency requested a figure and summary table depicting the Project footprint components and ecosites. • However, the following issues were identified: <ul style="list-style-type: none"> ○ Figure 2a and 2b in TMI_145-WL(1)-02 includes white polygons which are not defined in the legend and appear to be used for both disturbed areas as well as undisturbed areas adjacent to Lola Lake. ○ Table 3 in TMI_145-WL(1)-02 does not include all wetland types identified in Appendix S. For example, WLD4, described as a wetland complex including swamp and marsh areas (Appendix S_Figure Vegetation Communities_Wetland – WLD4), will be overprinted by the Open Pit and Waste Rock Storage Area (as depicted in Figure 3.0-1A), however marsh wetlands were not in the table. ○ The summary tables and figures present ecosite numbers, however the Agency requested that the ecosite summary tables and figures include ecosite names and codes. ○ The monochromatic colour scheme used in the figures does not allow the reader to determine which ecosites are impacted. <p>Habitat Classes</p> <ul style="list-style-type: none"> • The habitat classes provided in Table 1 of TMI_145-WL(1)-02 are too general to be applied to wildlife habitat used by migratory birds, species of interest to Indigenous groups or SAR. Specifically: <ul style="list-style-type: none"> ○ Upland includes a range but not exhaustive list of upland ecosites. This is misleading and does not correspond with general wildlife habitat associations; ○ Deciduous includes mixed wood forests such as ES23. Implementing a mixed wood habitat category is recommended for better understanding of effects to SAR and migratory birds with mixed wood habits such as the Canada warbler; and 	

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				<p>○ Wetland includes all wetland ecosites, however wildlife use of habitat is often restricted to select wetland types (e.g., the habitat for yellow rail, a SAR and migratory bird, is restricted to marshes). Clearly defining the Project ecosites and habitat classes is necessary to understand the effect of the Project on habitat for species at risk (SAR), migratory birds and species of interest to Indigenous groups. This information is also required to validate whether the baseline wildlife survey effort is appropriate in determining project effects.</p> <p><u>Specific Question / Request for Information:</u></p> <p>A. Revise ecosite mapping to ensure it is complete within the local study area (LSA). B. Provide an updated ecosite summary table that includes the Project footprint, regional study area (RSA) and LSA. Provide both the ecosite codes and names, and summarize using broader habitat classes, such as:</p> <p style="padding-left: 40px;">Habitat Type: Upland Habitat Class:</p> <ul style="list-style-type: none"> ○ Coniferous ○ Deciduous ○ Mixed wood ○ Shrubland ○ Grassland ○ Barren <p style="padding-left: 40px;">Habitat Type: Wetland Habitat Class:</p> <ul style="list-style-type: none"> ○ Marsh ○ Swamp ○ Fen ○ Bog <p style="padding-left: 40px;">Open Water Disturbed</p> <p>C. Update IR#1 TMI_145-WL(1)-02_Table 3 to include ecosite codes and names, and all project components (including underground workings, disturbed “interstitial” areas, effluent discharge infrastructure and firebreaks). Include a summary table that presents the project components and habitat classes.</p>

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				<p>D. Revise Figure 2b from IR#1 TMI_145-WL(1)-02 to include the Project footprint. Use the updated habitat classes instead of ecosites, and ensure the colour scheme is distinct.</p> <p>E. Revise Table 1 of TMI_147 WL(1)-05 to include the Project footprint, the ecosite codes and names, and subtotals to summarize the values using the suggested habitat classes.</p> <p>F. Present the baseline wildlife (including breeding birds) and vegetation survey information using the revised habitat classes. Amend the following tables:</p> <ul style="list-style-type: none"> o Appendix R Tables 4.2 and 4.3; o Tables in response to IR#1, TMI_147 WL(1)-05; and o Response in IR#1, TMI_162 WL(1)-19 Tables 5 and 10 <p>G. Using the information presented above, justify how the wildlife and vegetation survey efforts appropriately characterize the direct effects of the project within the Project footprint and the indirect effects of the project within the LSA, relative to the RSA.</p> <p>H. Update wildlife habitat and vegetation summaries where appropriate based on the updated habitat classes.</p> <p>I. Provide estimates of the total number of individuals of each migratory bird that will be affected by the project relative to the LSA and RSA.</p> <p>J. Update all VC effect assessment summaries based on the revised Project footprint and where appropriate on the updated ecosite mapping, habitat classes and number of individuals of each species of migratory bird that will be affected.</p> <p><u>K. Where appropriate, review and revise the proposed mitigation measures and follow-up program associated with the updated valued component effect assessment.</u></p> <p><u>DRAFT Response:</u></p> <p><u>Part A:</u> Ecosite mapping was revised for the RSA and LSA in TMI_870-WL(2)-01_Figure_1a and TMI_870-WL(2)-01_Figure_1b, respectively, which supersede the previously submitted TMI_145-WL(1)-02_Figure 2a and 2b. The new mapping uses Forest Resource Inventory landcover data from Land Information Ontario. The new mapping presents provincial ecosite classifications rather than the NWO Ecosite classifications presented in the original figures.</p> <p><u>Part B:</u> Ecosite areas, identified by both codes and names, were summarized across the three study areas (RSA, LSA and Operation Area), as presented in TMI_870-WL(2)-01_Table_1a. Likewise, habitat class areas were summarized in TMI_870-WL(2)-01_Table_1b. Ecosite and Habitat Class relationships have been presented in TMI_870-WL(2)-01_Table-2. Please note, that “Swamp” wetland habitat was subdivided into “Swamp – Coniferous” and “Swamp – Deciduous” following the guidance of ECCC (correspondence has been included in TMI_870-WL(2)-01_Appendix_A).</p>

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				<p><u>Part C:</u> An updated table summarizing the habitat loss contributed by the various Project elements has been presented in TMI_870-WL(2)-01_Table_3.</p> <p><u>Part D:</u> A new figure has been created to illustrate Habitat Classes and the Operation Area within the LSA (TMI_870-WL(2)-01_Figure 2). Corresponding habitat area summaries can be found in TMI_870-WL(2)-01_Table_1b.</p> <p><u>Part E:</u> Vegetation survey locations were summarized by Ecosite and Survey Area using the updated mapping in TMI_870-WL(2)-01_Table 4a, and by Habitat Class and Survey Area in TMI_870-WL(2)-01_Table 4b. This information was presented in two tables rather than a single table for clarity. Please note that ecosite is more ecologically relevant for assessing vegetation communities; habitat classifications were only used to assess wildlife. Please refer to the response to Question G for further discussion of these summary tables.</p> <p><u>Part F:</u> Appendix R Table 4.2 is unchanged with the changes in habitat classification. However, updated versions of Appendix R Tables 4.3 and 4.4 have been presented in TMI_870-WL(2)-01_Table 5a and 5b, respectively. TMI_870-WL(2)-01_Table_4a and TMI_870-WL(2)-01_Table_4b supersede the table include in the response for TMI_147- WL(1)-05. Additionally, TMI_870-WL(2)-01_Table 5b supersedes TMI_162 WL(1)-19 Tables 5 and TMI_870-WL(2)-01_Table 1b supersedes TMI_162 WL(1)-19 Tables 10.</p> <p><u>Part G:</u> Breeding Birds Breeding bird survey areas by habitat class have been presented in TMI_870-WL(2)-01_Table_6; a deficiency in surveyed Swamp – Coniferous and Fen habitat was identified. However, given that the request for updated habitat classifications was communicated on June 8th, the ecosite-habitat classification correlations were finalized on June 15, the need for additional surveys was communicated on June 29th, and the breeding bird survey window closed on July 7th, it was not reasonably feasible to mobilize and conduct the necessary bird surveys using the specified methodology during the 2018 field season. Further, Treasury Metals would have been unable to attain a permit to work in Lola Lake Nature Reserve within this window. Through discussions with ECCC, it was decided that any perceived deficiencies in sampling effort can be addressed through the construction-operations phase monitoring program in lieu of conducting further baseline surveys (correspondence has been included in TMI_870-WL(2)-01_Appendix_A).</p> <p>Vegetation The initial vegetation surveys were planned and executed to reflect the original ecosite mapping (i.e., NWO Ecosite classifications), which is coarser than the provincial ecosite classifications that were used to develop the updated habitat categories. As such, the existing surveys no longer capture all ecosites within the LSA. There were difficulties transitioning the existing survey locations, as the provincial ecosite landcover data now indicates that a disproportional number of surveys were conducted in disturbed areas (Ecosite B197) and some survey locations now appear as</p>

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				<p>though they were conducted in open water, both of which are incorrect. Ecosite code were assigned to survey locations appearing within open water where reasonable inferences could be made, or they were omitted from the summary table (i.e., TMI_870-WL(2)-01_Table 4a and 4b).</p> <p>These are artefacts of updating the ecosite mapping 7 years after the initiation of baseline data collection, and not a reflection of the quality of the work. Treasury Metals is confident that the existing vegetation surveys adequately captures the natural variation of the Boreal forest, which is relatively simple and homogenous in the Project area.</p> <p><u>Part H:</u> Breeding bird summaries have been updated in TMI_870-WL(2)-01_Table 5a and 5b and TMI_870-WL(2)-01_Table_6 (see parts F and G of this response). Vegetation summaries have been updated in TMI_870-WL(2)-01_Table 4a and 4b.</p> <p><u>Part I:</u> Projected densities by habitat type were calculated for all species observed through the breeding bird surveys. These densities were then used to determine how many individuals of each species are expected to be displaced by the development of the Operations Area. This information is summarized in TMI_870-WL(2)-01_Table_7. Please note that, although TMI_870-WL(2)-01_Table 7 indicates that 12 Barn Swallows will be displaced by the Project, no potential nesting habitat (i.e., existing buildings and anthropogenic structures) are going to be removed as a result of the Project. This value simply reflects the number of Barn Swallows that are expected to forage within the Operations Area, and are likely to continue doing so during the life of the Project. Likewise, the development will not remove potential Bald Eagle nesting habitat, as reflected in the previously submitted response to TMI_153-WL(1)-10.</p> <p><u>Part J:</u> The changes to habitat mapping do not change the effects assessment presented in the revised EIS.</p> <p><u>Part K:</u> No changes are necessary to the mitigation measures/monitoring plan presented in the revised EIS.</p> <p>References: Government of Ontario. Land Information Ontario. https://www.ontario.ca/page/land-information-ontario</p> <hr/> <p>Agency Comment on Draft Response:</p> <p>TMI #: The Agency has reviewed TMI_870-WL(2)-01_Figure_1a and TMI_870-WL(2)-01_Figure_1b, and has three comments.</p> <p>A1. The Agency notes that these figures present an “Operations Area.” TMI_871-WL(2)-02_Figure 2b shows an “Operations Area” and a separate “Project Footprint.” As presented in TMI_913-REC-01, the Agency requests the proponent create a “Project Study Area” that includes all project components within the boundary, including but not limited to the following:</p>

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				<ul style="list-style-type: none"> • effluent discharge infrastructure; • process water pipeline; • fire breaks (if applicable); • diversion channel for Blackwater Creek Tributary 2; • withdrawal pond infrastructure; and • Project roads and parking lots. <p>Clearly defining the “Project Study Area” is necessary to understand its effect on habitat for species at risk (SAR), migratory birds and species of interest to Indigenous groups, as well as the current use of lands and resources for traditional purposes. Installation and maintenance of proposed and existing Project components may have an effect on the aforementioned wildlife habitat (e.g., clearing of vegetation adjacent to roads may impact migratory bird nesting habitat, maintenance of culverts may alter the hydrology of habitat for SAR, installation of pipelines may impact habitat for species of interest to Indigenous groups).</p> <p>A2. The Agency requests confirmation from the proponent that the Forest Resource Inventory land cover data from Land Information Ontario ecosite classifications were updated within the revised Project Study Area (TMI_870_WI(2)-01A) based on field survey data.</p> <p>A3. The Agency has reviewed TMI_871-WL(2)-02_Figure_1 for TMI_871-WL(2)-02. The Agency requests confirmation that the Groundwater ZOI has been updated based on updated groundwater modelling (if applicable) and wetland mapping. The Agency requests the proponent include the full extent of the Groundwater ZOI within the LSA, given this will include the potential extent of indirect Project effects on the adjacent terrestrial environment.</p> <p>B, C, D, E, F. The Agency has reviewed TMI_870-WL(2)-01_Table_1, TMI_870-WL(2)-01_Table_1b, TMI_870-WL(2)-01_Table_2, TMI_870-WL(2)-01_Table_3, and TMI_870-WL(2)-01_Figure 2, TMI_870-WL(2)-01_Table 4a, TMI_870-WL(2)-01_Table 4b, TMI_870-WL(2)-01_Table 5 (referred to by the proponent as TMI_870-WL(2)-01_Table 5a) and TMI_870-WL(2)-01_Table 5b. Table 1a and Table 1b state the Operations Area is 309.6 hectares. TMI_870-WL(2)-01_Table_3 has a total area of 319.28 hectares for all Project components.</p> <p>Update TMI_870-WL(2)-01_Table_1a, TMI_870-WL(2)-01_Table_1b, TMI_870-WL(2)-01_Table_3, TMI_870-WL(2)-01_Figure 2, TMI_870-WL(2)-01_Table 4a, TMI_870-WL(2)-01_Table 4b, and TMI_870-WL(2)-01_Table 5 to include all Project components within the “Project Study Area” [as discussed in TMI_870-WL(2)-01(A1)] and an updated LSA to include the updated Groundwater ZOI [as discussed in TMI_870-WL(2)-01(A1)].</p> <p>Confirm ecosite classifications presented in TMI_870-WL(2)-01_Table_1a, TMI_870-WL(2)-01_Table_1b and TMI_870-WL(2)-01_Table_3, TMI_870-WL(2)-01_Figure 2, TMI_870-WL(2)-01_Table 4a, TMI_870-WL(2)-01_Table</p>

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				<p>4b, TMI_870-WL(2)-01_Table 5, and TMI_870-WL(2)-01_Table 5b were updated as necessary based on field survey data [as discussed in TMI_870-WL(2)-01(A2)].</p> <p>Refer to WL(2)-01E regarding updates to TMI_870-WL(2)-01_Table 4a and TMI_870-WL(2)-01_Table 4b. Refer to WL(2)-01B regarding updates to TMI_870-WL(2)-01_Table 1b.</p> <p>G. The Agency has reviewed TMI_870-WL(2)-01_Table_6 and the “Goliath Gold Project Follow-up Program Addendum” (FUP Addendum) and has four comments.</p> <p>G1. Based on the response to WL(2)-01G, the Agency understands that the proponent has not updated the provincial ecosite land cover data based on field survey data: “There were difficulties transitioning the existing survey locations, as the provincial ecosite land cover data now indicates that a disproportional number of surveys were conducted in disturbed areas (Ecosite B197) and some survey locations now appear as though they were conducted in open water, both of which are incorrect. Ecosite code were assigned to survey locations appearing within open water where reasonable inferences could be made, or they were omitted from the summary table (i.e., TMI_870-WL(2)-01_Table 4a and 4b).”</p> <p>The Agency requests the proponent update the ecosite and habitat mapping as necessary within the project study area based on field data [as discussed in TMI_870-WL(2)-01(A2)]. In the absence of field data, recent aerial photography or satellite imagery may be used to confirm ecosite/habitat classifications.</p> <p>G2. The FUP Addendum states that “songbird monitoring will occur within Lola Lake wetland as per the discussions with Environment Canada. WLD7 and WLD5 will be monitored as reference sites.” EIS Chapter 6.15.4.2 states “WLD5 at the headwater of Blackwater Creek Tributary 5 sits above a granular deposit, and is susceptible to drawdown. For the purposes of this assessment, the whole of WLD5 will be considered affected.”</p> <p>The Agency requests the proponent choose alternate wetlands outside of the Groundwater ZOI as reference sites.</p> <p>G3. The proponent has stated that “any perceived deficiencies in sampling effort can be addressed through the construction-operations phase monitoring program in lieu of conducting further baseline surveys.”</p> <p>The Agency requests that a monitoring program is initiated in the spring of 2018, prior to the construction-operations phase, and a description of the program is provided, including:</p> <ul style="list-style-type: none"> • number of survey locations within each ecosite/habitat; • approximate location of surveys; • frequency of monitoring program; • duration of monitoring program; • proposed follow-up if migratory birds and species at risk are identified; and

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				<ul style="list-style-type: none"> proposed follow-up if predicted effects to habitat for migratory birds, species at risk, and species of interest to Indigenous groups are exceeded. <p>G4. Update TMI_870-WL(2)-01_Table_6 to include columns for the PSA and RSA area and %.</p> <p>Confirm habitat classifications presented in TMI_870-WL(2)-01_Table_6 were updated based on field survey data as necessary [as discussed in TMI_870- WL(2)-01(A2)].</p> <p>Provide a description of the proposed monitoring program initiated in the spring of 2019, prior to the construction-operations phase, to address data deficiencies including:</p> <ul style="list-style-type: none"> number of survey locations within each ecosite/habitat; approximate location of surveys; location of reference sites (outside of the Groundwater ZOI); frequency of monitoring program; duration of monitoring program; and proposed follow-up if migratory birds and species at risk are identified within. proposed follow-up if predicted effects to habitat for migratory birds, species at risk, and species of interest to Indigenous groups are exceeded. <p>Update TMI_870-WL(2)-01_Table_6 to include columns for the PSA and RSA area and %.</p> <p>H. The Agency has reviewed TMI_870-WL(2)-01_Table 4a and 4b, TMI_870-WL(2)-01_Table 5a and 5b, and TMI_870-WL(2)-01_Table_6. The Agency had requested the proponent update wildlife habitat summaries, not limited to breeding birds. The Agency requests area summaries for each valued component, including migratory bird species at risk, species at risk and species of use to Indigenous groups, based on suitable nesting and foraging habitat.</p> <p>Provide updated vegetation and wildlife summaries. The Agency has provided the suggested summary tables in an excel file in an attached file.</p> <p>I. The Agency has reviewed TMI_870-WL(2)-01_Table_7. The proponent has calculated the project bird density within the Operations Area for all bird species. The Agency requests the proponent calculate the projected density of each migratory bird in the PSA, LSA and RSA in order to calculate the relative effect of the Project on migratory bird populations.</p> <p>I2. The draft response to TMI_870-WL(2)-011 states that no potential barn swallow nesting habitat will be removed, however EIS Section 6 states: "Barn Swallows have been observed in the buildings at the tree nursery as well as in some out buildings at a residence within the Project area. A concerted effort was made to close all doors and windows of the buildings at the tree nursery, which eliminated nesting opportunities for Barn Swallows. Barn Swallows are known to nest in human-built structures such as barns, sheds and the overhangs of houses. They will also nest in</p>

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				<p>culverts and under bridges, as well as natural rock faces. The residence and associated outbuildings will be removed as part of the site preparation and construction phase of the project. The removal of these buildings will displace approximately 3 to 5 breeding pairs of Barn Swallow."</p> <p>MNRF has indicated that they will require the proponent to create or enhance Barn Swallow habitat, including constructing Barn Swallow nesting habitat to compensate for the loss of Barn Swallow nesting sites, that would meet the requirements of Ontario's Endangered Species Act (2007), administered by the Ontario Ministry of Natural Resources and Forestry, and the proposed Recovery Strategies developed under the federal Species at Risk Act.</p> <p>Provide estimates of the total number of individuals (using breeding bird density calculations) of each migratory bird within the PSA, LSA and RSA, as well as the number of each migratory bird that may be indirectly affected by Project activities including noise, light and dust.</p> <p>See TMI_876_WL(2)-07 for further questions regarding Barn Swallow nesting habitat mitigation and monitoring.</p> <p>J. The Agency requests the proponent consider the effect of the updated direct and indirect habitat loss on each VC (as documented in the provided excel table [WL(2)-01H]) relative to the LSA and RSA, as well as the change in abundance of migratory birds including species at risk.</p> <p>Update the effects assessment based on the updated direct and indirect habitat loss on each VC (as documented in the provided excel table [WL(2)- 01H]) relative to the LSA and RSA, as well as the change in abundance of migratory birds including species at risk.</p> <p>K. Based on the revised response to WL(2)-01, where appropriate, review and revise the proposed mitigation measures and follow-up program associated with the updated valued component effect assessment.</p> <p><u>Specific Response to Agency Comments on DRAFT Response:</u></p> <p>A1) Treasury Metals has introduced a new spatial area referred to as the Project Study Area (PSA). As discussed with the Agency on October 12th, 2018, the PSA defines an area that encloses the physical footprint and impact of the Project (see TMI_870-WL(2)-01-Figure_2). This area has been incorporated into analyses and summaries pertaining to all the biological disciplines (wildlife, migratory birds and wetlands and vegetation).</p> <p>A2) Treasury Metals confirms that the most up-to-date FRI data has been used for the current habitat mapping (including for the PSA), and ecosite classification have been ground-truthed in conjunction with the 2018 wetland surveys; field observations confirmed ecosite classifications in all cases.</p>

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				<p>A3) At the request of the Agency, the LSA has been expanded to include the full groundwater zone of influence (ZOI) for each of the biological disciplines (i.e., wildlife and wildlife habitat, migratory birds, fish and fish habitat and wetlands and vegetation). As such, LSA area, habitat and ecosite summaries have been updated where applicable. This expanded LSA used for these biological disciplines is shown in TMI_871-WL(2)-02_Figure_1.</p> <p>B, C, D, E and F) As described in the response to Part A, the disturbance footprint of the Project (Project Study Area or PSA) is calculated to be to be 334.26 ha. This area includes all identifiable Project components, as well as the “interstitial areas”. All of the areas within the PSA are assumed to be impacted, which includes those areas identified as “interstitial areas”. These “interstitial areas” correspond with roadways, pipelines, and constructed features such as impoundment dams, ditches and berms. Treasury Metals would also like to confirm that extensive ecosite mapping has been conducted throughout the course of the Goliath Gold Project field studies, and field observations have been used to confirm the updated ecosite classifications.</p> <p>G1) The most up-to-date FRI data has been used for the current habitat mapping, and ecosite classifications have been ground-truthed in conjunction with the 2018 wetland surveys; field observations confirmed ecosite classifications in all cases. We are confident in our ecosite mapping.</p> <p>G2) The Agency’s request to choose an alternative reference site for monitoring wetlands has been incorporated into the Goliath Gold Project Follow-up Program Addendum. The revised EIS (April 2018) identified WLD5 as the reference site; however, this has been changed in the Goliath Gold Project Follow-up Program Addendum to use alternative wetlands located outside of the zone of influence (ZOI).</p> <p>G3) A monitoring program intended to contribute to the baseline data collection will be initiated in spring of 2019, as requested. Please refer to the Goliath Gold Project Preliminary Environmental Monitoring Addendum for the details request by the Agency.</p> <p>G4) TMI_870-WL(2)-01_Table_6 has been updated to included columns for the PSA, RSA area and %. Treasury Metals confirms that the most up-to-date FRI data has been used for the current habitat mapping, and ecosite classifications have been ground-truthed in conjunction with the 2018 wetland surveys; field observations confirmed ecosite classifications in all cases. We are confident in our ecosite mapping. A monitoring program intended to contribute to the baseline data collection will be initiated in the spring of 2019 and will address all of the data deficiencies identified. Please refer to TMI_873-WL(2)-04 for a full discussion of monitoring programs. All songbird analyses and summaries have been updated to reflect the new LSA and PSA boundaries. Please refer to the Goliath Gold Project Preliminary Environmental Monitoring Addendum for further details on the baseline data collection for the spring of 2019.</p>

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				<p>H) Treasury Metals has completed the four tables sent by the Agency to include wildlife habitat summaries as well as for breeding birds. Please refer to TMI_870-WL(2)-01_Table_1 for vegetation, TMI_871-WL(2)-02_Table_4 for wetlands, TMI_870-WL(2)-01_Table_8 for migratory birds, TMI_952-WL(2)-07_Table_2 for Species at Risk, TMI_952-WL(2)-07_Table_4 for species/communities of interest to Indigenous groups, and TMI_870-WL(2)-01_Table_9, TMI_870-WL(2)-01_Table_10 and TMI_870-WL(2)-01_Table_11 for all terrestrial biology VCs presented in the revised EIS.</p> <p>I) The density and number of individuals have been calculated for all migratory bird species in the three study areas (PSA, LSA and RSA) and is provided in TMI_870-WL(2)-01_Table_8.</p> <p>I2. The Agency's comments are well-received. There will be a loss of Barn Swallow habitat as a result of Project activities, which will be offset by constructing new Barn Swallow habitat. The effects to Barn Swallow from the Project and the proposed offsetting is discussed in TMI_952-WL(2)-07.</p> <p>J) An updated effects assessment has been completed to include the updated LSA and the PSA using the tables provided by the Agency. This assessment includes:</p> <ul style="list-style-type: none"> • Vegetation community summaries are presented in TMI_870-WL(2)-01_Table_1, and the vegetation survey summary has been presented in TMI_870-WL(2)-01_Table_4. • Songbird communities summaries have been presented in TMI_870-WL(2)-01_Table_5 through TMI_870-WL(2)-01_Table_8. • Species at Risk habitat summaries have been presented in TMI_952-WL(2)-07_Table_2 (not attached this IR). • Wetland habitat summaries have been presented in TMI_871-WL(2)-02_Table_3 (not attached to this IR). • A summary of VCs important to Indigenous groups has been included in TMI_952-WL(2)-07_Table_4. <p>K) There is no need to update the mitigation measures based on the responses to Parts A through J. All of the mitigation measures presented in Section 11 of the revised EIS (April 2018) will effectively minimize potential Project effects on wildlife. Follow-up monitoring programs are discussed in TMI_873-WL(2)-04.</p> <p>Revised Response:</p> <p>Part A: Ecosite mapping was revised for the RSA and LSA in TMI_870-WL(2)-01_Figure_1a and TMI_870 WL(2) 01_Figure_1b, respectively, which supersede the previously submitted TMI_145-WL(1)-02_Figure 2a and 2b. The</p>

new mapping uses Forest Resource Inventory landcover data from Land Information Ontario. The new mapping presents provincial ecosite classifications rather than the NWO Ecosite classifications presented in the original figures.

Part B: Ecosite areas, identified by both codes and names, were summarized across the three study areas (RSA, LSA and PSA), as presented in TMI_870-WL(2)-01_Table_1a. Likewise, habitat class areas were summarized in TMI_870-WL(2)-01_Table_1b. Ecosite and Habitat Class relationships have been presented in TMI_870-WL(2)-01_Table_2. Please note, that “Swamp” wetland habitat was subdivided into “Swamp – Coniferous” and “Swamp – Deciduous” following the guidance of ECCC (correspondence has been included in TMI_870-WL(2)-01_Appendix_1).

Part C: An updated table summarizing the habitat loss within the PSA contributed by the various Project elements has been presented in TMI_870-WL(2)-01_Table_3.

Part D: A new figure has been created to illustrate Habitat Classes within the PSA and LSA using a distinct colour scheme (TMI_870-WL(2)-01_Figure_2). Corresponding habitat area summaries can be found in TMI_870-WL(2)-01_Table_1b.

Part E: Vegetation survey locations were summarized by Ecosite and Survey Area (PSA, LSA and RSA) using the updated mapping in TMI_870-WL(2)-01_Table_4a, and by Habitat Class and Survey Area in TMI_870-WL(2)-01_Table_4b. This information was presented in two tables rather than a single table for clarity. Please note that ecosite is more ecologically relevant for assessing vegetation communities; habitat classifications were only used to assess wildlife. Refer to the response to Part G for further discussion of these summary tables. Please also note that TMI_870-WL(2)-01_Table_4a and TMI_870-WL(2)-01_Table_4b supersede the table include in the response for TMI_147- WL(1)-05.

Part F: Appendix R Table 4.2 is unchanged with the changes in habitat classification. However, updated versions of Appendix R Tables 4.3 and 4.4 have been presented in TMI_870-WL(2)-01_Table_5a and 5b, respectively. Please note, only migratory bird species listed under the Migratory Birds Convention Act (Government of Canada 1994) were included in the updated songbird summary tables.

Additionally, TMI_870-WL(2)-01_Table_5b supersedes TMI_162 WL(1)-19 Tables 5 and TMI_870-WL(2)-01_Table_1b supersedes TMI_162 WL(1)-19 Tables 10.

Part G:

Vegetation

The initial vegetation surveys were planned and executed to reflect the original ecosite mapping (i.e., NWO Ecosite classifications), which is coarser than the provincial ecosite classifications that were used to develop the updated habitat categories. As such, the existing surveys no longer capture all ecosites within the LSA (TMI_870-WL(2)-01_Table_4). There were difficulties transitioning the existing survey locations, as the provincial ecosite landcover data now indicates that a disproportional number of surveys were conducted in disturbed areas (Ecosite B197) and some survey locations now appear as though they were conducted in open water. Adjustments were made to using

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				<p>field observations, satellite imagery and FRI data as a guide. These were artefacts of updating the ecosite mapping with FRI data from LIO, and not a reflection of the quality of the work. Treasury Metals is confident and it is the professional opinion of their independent consultants that the existing vegetation surveys adequately captures the natural variation of the Boreal forest, which is relatively simple and homogenous in the Project. TMI is confident and it is the professional opinion of their independent consultants that the updated ecosite and habitat mapping for the PSA, LSA and RSA is correct.</p> <p>Wildlife and SAR</p> <p>Extensive work has been conducted to identify the species likely to occur within the PSA and LSA, and the habitats present in both study areas. All applicable MNRF-approved survey protocols have been employed targeting these species/communities over 7 field seasons. Updated effects assessments for wildlife, SAR and VCs of interest to Indigenous groups have been provided in TMI_870-WL(2)-01_Table_9, TMI_952-WL(2)-07_Table_2, TMI_952-WL(2)-07_Table_4, respectively. Treasury Metals is confident and it is the professional opinion of their independent consultants that all wildlife species, except for migratory birds (discussed below), have been sufficiently surveyed.</p> <p>Migratory Birds</p> <p>Breeding bird survey areas by habitat class have been presented in TMI_870-WL(2)-01_Table_6 for the PSA, LSA and RSA; a clear deficiency in surveyed Fen habitat was identified. However, given that the request for updated habitat classifications was communicated on June 8th, the ecosite-habitat classification correlations were finalized on June 15, the need for additional surveys was communicated on June 29th, and the breeding bird survey window closed on July 7th, it was not reasonably feasible to mobilize and conduct the necessary bird surveys using the specified methodology during the 2018 field season. Further, Treasury Metals would have been unable to attain a permit to work in Lola Lake Nature Reserve within this window, with the clear majority of Fen habitat within the LSA falling within the park. Through discussions with ECCC, it was decided that any perceived deficiencies in sampling effort can be addressed through the construction-operations phase monitoring program in lieu of conducting further baseline surveys (correspondence has been included in TMI_870-WL(2)-01_Appendix_A). Please refer to TMI_873-WL(2)-04 for a discussion of monitoring programs.</p> <p><u>Part H:</u> Treasury Metals has completed the tables sent by the Agency to include wildlife habitat summaries as well as for breeding birds. Please refer to TMI_870-WL(2)-01_Table_1 and TMI_870-WL(2)-01_Table_4 for vegetation, TMI_871-WL(2)-02_Table_3 for wetlands, TMI_870-WL(2)-01_Tables 5-8 for migratory birds, TMI_952-WL(2)-07_Table_2 for Species at Risk, TMI_952-WL(2)-07_Table_4 for species/communities of interest to Indigenous groups, and TMI_870-WL(2)-01_Table_9, TMI_870-WL(2)-01_Table_10 and TMI_870-WL(2)-01_Table_11 for all terrestrial biology VCs presented in the revised EIS.</p> <p><u>Part I:</u> Projected densities by habitat type were calculated for all migratory bird species (Government of Canada 1994) observed through the breeding bird surveys TMI_870-WL(2)-01_Table_7. These densities were then used to</p>

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				<p>determine how many individuals of each species are expected to be displaced by direct and indirect project impacts (TMI_870-WL(2)-01_Table_8). Please note that, although TMI_870-WL(2)-01_Table_7 indicates that 12 Barn Swallows will be displaced by the Project, only 1 building (representing potential nesting habitat) is scheduled for demolition under the revised EIS, which is unlikely to result in the displacement of 12 individuals. This value simply reflects the number of Barn Swallows that are expected to forage within the PSA, and are likely to continue doing so during the life of the Project. Likewise, the development will not remove potential Bald Eagle nesting habitat, as reflected in TMI_952-WL(2)-07.</p> <p>Please refer to TMI_952-WL(2)-07 for a detailed discussion of Species at Risk.</p> <p><u>Part J:</u> An updated effects assessment has been completed to include the updated LSA and the PSA using the tables provided by the Agency. This assessment includes:</p> <ul style="list-style-type: none"> • Vegetation community summaries are presented in TMI_870-WL(2)-01_Table_1, and the vegetation survey summary has been presented in TMI_870-WL(2)-01_Table_4. • Songbird communities summaries have been presented in TMI_870-WL(2)-01_Table_4 through TMI_870-WL(2)-01_Table_8. • Species at Risk habitat summaries have been presented in TMI_952-WL(2)-07_Table_2 (not attached to this IR). • Wetland habitat summaries have been presented in TMI_871-WL(2)-02_Table_3 (not attached to this IR). • A summary of VCs important to Indigenous groups has been included in TMI_952-WL(2)-07_Table_4. <p><u>Part K:</u> There is no need to update the mitigation measures or the follow-up program based on the responses to Parts A through J.</p> <p>References: Government of Canada. 1994. Migratory Bird Convention Act. https://www.canada.ca/en/environment-climate-change/services/migratory-birds-legal-protection/convention-act.html Government of Ontario. Land Information Ontario. https://www.ontario.ca/page/land-information-ontario</p> <p><u>Agency Comments on Revised Response</u></p> <p>B. The Agency has reviewed TMI_870-WL(2)-01_Table_1a, TMI_870-WL(2)-01_Table_1b, TMI_870-WL(2)-02_Table_4. The Agency has two comments:</p> <ul style="list-style-type: none"> • Note (5) states “Following the end of mining, dewatering activities will cease and the open pit will be allowed to fill with water. The west basin will be shallow (i.e., 2 to 3 m) and half of the area is expected to form marsh habitat”. Wetlands are defined by the Canadian Wetland Classification System and the Ontario Wetland Evaluation System

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				<p>as being less than two meters deep. The Agency recommends classifying the west basin of the open pit as “open water” instead of “marsh.” Considering the open pit will have been stripped of all organic and mineral soil and the minimum projected depth is 2 m or greater, it is unlikely that the area will form marsh habitat without intervention.</p> <ul style="list-style-type: none"> ○ The west basin should therefore either be characterized as open water habitat or a rehabilitation plan should be provided to support the conclusion that it will form marsh habitat. ● TMI_870-WL(2)-01_Table 1b and TMI_870-WL(2)-02_Table_4 states 1.3 ha of fen will be irreversibly changed post-abandonment, however only 0.8 ha occur within the PSA. <ul style="list-style-type: none"> ○ Confirm that irreversible habitat change post-abandonment for fens will occur within the LSA. <p>C. The Agency has reviewed TMI_870-WL(2)-01_Table 3 and has two comments:</p> <ul style="list-style-type: none"> ● TMI_870-WL(2)-01_Table 3 states that 6.09 ha of marsh will be lost by project components, however TMI_870-WL(2)-01_Table 1b states 5.14 ha of marsh will be lost by project components. <ul style="list-style-type: none"> ○ Confirm the area of marsh that will be removed by project components. ● TMI_870-WL(2)-01_Table 3 states that 3.04 ha of open water will be lost by project components, however TMI_870-WL(2)-01_Table 1b states 3.99 ha of open water will be lost by project components. <ul style="list-style-type: none"> ○ Confirm the area of open water that will be removed by project components.. <p>H. The Agency has reviewed TMI_870-WL(2)-01_Table_1b (see TMI_870-WL(2)-01_B for questions). Note that in the response the proponent refers to this table as TMI_870-WL(2)-01_Table_1.</p> <p>The Agency has reviewed TMI_870-WL(2)-02_Table_4 (see TMI_870-WL(2)-01_B for questions).</p> <p>The Agency has reviewed TMI_870-WL(2)-01_Table_8. The title “displacement of songbird individuals”, should be changed to “displacement of migratory bird individuals” and the list should be limited to migratory birds (migratory birds do not include eagles, grouse and owls).</p> <ul style="list-style-type: none"> ○ Update TMI_870-WL(2)-01_Table_8 title to: displacement of migratory bird individuals, and restrict the table to migratory birds. <p>The Agency has reviewed TMI_952-WL(2)-07_Table_2 and has the following comments:</p> <ul style="list-style-type: none"> ● Snapping turtle “habitat area rehabilitated post-abandonment” includes the area of the west basin of the open pit lake. <ul style="list-style-type: none"> ○ The Agency recommends classifying the west basin of the open pit lake as “open water” instead of “marsh” (see TMI_870-WL(2)-01_B), in calculating impacts to snapping turtle habitat. ● The table states that there are 3 human structures in the PSA, however only 1 (outside the PSA) will be removed. <ul style="list-style-type: none"> ○ The Agency requests further clarity on the number of barn swallow and chimney swift nesting structures that will be lost within the PSA and LSA. The effects to barn swallow should be accurately assessed. Please identify/describe the 3 human structures that will be retained within the PSA, and provide a rationale why 1 structure within the LSA that will need to be removed. ● The table does not provide barn swallow and chimney swift foraging habitat area summaries.

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				<ul style="list-style-type: none"> ○ The Agency requests an assessment of barn swallow and chimney swift foraging habitat. ● It appears that the description of American Badger habitat was overwritten by the Yellow Rail habitat. <ul style="list-style-type: none"> ○ Update the American Badger habitat description. ● Northern Myotis and Little Brown Myotis habitat is described as “forested areas where hibernacula and roosting habitat is abundant; maternal roosts – cavities in large-diameter snags at a moderate state of decay, or buildings”. The “habitat area rehabilitated post-abandonment” is estimated at 16.71 hectares. The rehabilitation of the Project Study Area will not provide “large-diameter snags” for several decades. <ul style="list-style-type: none"> ○ Update the “habitat area rehabilitated post-abandonment” for Northern and Little Brown Myotis given that large-diameter snags will not be available post-abandonment. ● Wolverine habitat is described as “undisturbed, contiguous mature coniferous forest”. The “habitat area rehabilitated post-abandonment” is estimated at 20.69 hectares. The rehabilitation of the Project Study Area will not provide “undisturbed, contiguous mature coniferous forest” for several decades. <ul style="list-style-type: none"> ○ Update the “habitat area rehabilitated post-abandonment” for wolverine given that undisturbed, contiguous mature coniferous forest will not be available post-abandonment. <p>The Agency has reviewed TMI_952-WL(2)-07_Table_4 and has the following questions:</p> <ul style="list-style-type: none"> ● Confirm the discrepancy in moose habitat in the PSA (84 ha) and direct habitat loss (78 ha) is due to the construction of the fish habitat offsetting plan. <ul style="list-style-type: none"> ○ Please describe how moose habitat loss was calculated in the PSA and LSA. ● There is 37.4 ha of land available for “forestry” post-abandonment (only 9 years after Project closure). <ul style="list-style-type: none"> ○ Please describe how the rehabilitated area will be available for forestry 9 years after Project closure. <p>The Agency has reviewed TMI_870-WL(2)-01_Table_9 and TMI_870-WL(2)-01_Table_10, and has the following question:</p> <ul style="list-style-type: none"> ● TMI_870-WL(2)-01_Table_9 states that 40.54 ha of “wetland bird” habitat will be lost in the PSA. <ul style="list-style-type: none"> ○ Revise the assessment of habitat loss for “wetland birds” considering waterfowl use open water. <p>The Agency has reviewed TMI_870-WL(2)-01_Table_11 and has the following question:</p> <ul style="list-style-type: none"> ● The proponent has estimated that 21 ha of coniferous forest, 17 ha of deciduous forest and 185.98 ha of successional areas will be rehabilitated post-abandonment. The Agency recommends nine years after Project closure, the rehabilitation of the Project will be limited to successional areas, as the trees will be at a maximum, nine years old. <ul style="list-style-type: none"> ○ Update the upland forest area summaries given areas that has been cleared within in the PSA should be considered successional habitat if the regeneration is less than 20 years old. <p>J. The Agency has reviewed TMI_870-WL(2)-01_Table_1b (see above [TMI_870-WL(2)-01_B for questions). Note that in the response the proponent refers to this table as TMI_870-WL(2)-01_Table_1.</p> <p>The Agency has reviewed TMI_870-WL(2)-01_Table_4a and TMI_870-WL(2)-01_Table_4b. Note that in the response the proponent refers to this table as TMI_870-WL(2)-01_Table_4.</p>

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				<p>The Agency has reviewed TMI_870-WL(2)-01_Table 5a and TMI_870-WL(2)-01_Table 5b., TMI_870-WL(2)-01_Table_6, TMI_870-WL(2)-01_Table_7 and TMI_870-WL(2)-01_Table_8. The Agency requests that for TMI_870-WL(2)-01_Table_7 and TMI_870-WL(2)-01_Table_8, the list should be limited to migratory birds (migratory birds do not include eagles, grouse and owls).</p> <p><u>Update TMI_870-WL(2)-01 Table 7 and TMI_870-WL(2)-01 Table 8, restricting the assessment to migratory birds.</u></p> <p><u>Specific Comment to the Agency</u></p> <p>B)</p> <ul style="list-style-type: none"> Treasury Metals will rehabilitate the shore of the west pit basin to marsh habitat (representing roughly 50% of the west pit basin) by placing organic material from the overburden stockpile and planting riparian and marsh vegetation to accelerate marsh formation. A detailed rehabilitation plans will be developed in consultation with government agencies and Indigenous communities as partial fulfillment of the formal closure plan. The formal closure plan process will begin following completion of the EA process. TMI_870-WL(2)-01_Table_1b and TMI_870-WL(2)-02_Table_4 are correct in stating that 1.3 ha of fen will be irreversibly changed post-closure. There is fen habitat associated with Blackwater Creek Tributary 2 which is partially overprinted by the TSF (0.8 ha), and partially isolated from flow between upstream portion of the diversion channel and the TSF (0.5 ha). This 0.5 ha of isolated fen habitat occurs within the LSA, but outside of the PSA. Flow will not be restored to the isolated fen habitat, so irreversible habitat change is expected. <p>C)</p> <ul style="list-style-type: none"> The area of marsh that will be removed by Project components presented in TMI_870-WL(2)-01_Table_3 has been corrected to 5.14 ha. The area of open water that will be removed by Project components presented in TMI_870-WL(2)-01_Table_3 has been corrected to 3.99 ha. <p>H)</p> <ul style="list-style-type: none"> The reference to TMI_870-WL(2)-01_Table_1b has been corrected in the final response. The title of TMI_870-WL(2)-01_Table_8 was changed following the Agency's instructions to "Displacement of Migratory Bird Individuals" and non-migratory birds have been removed from the table (i.e., eagles, grouse and owls).

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				<p>TMI_952-WL(2)-07_Table_2</p> <ul style="list-style-type: none"> • Please refer to the response to Section B (above) regarding marsh habitat in the west pit basin. Both open water and marsh habitat were considered as potential Snapping Turtle habitat, so the total predicted habitat area will be the same. • The PSA was designed to include all existing anthropogenic features associated with the Project, including the 3 buildings at the former MNRF Tree Nursery: an office building and two large warehouse structures. These structures will be preserved throughout the life of the Project. However, there is also a residence (currently unoccupied) located to the south of the PSA off of Tree Nursery Road that will be removed. The residence will be removed to eliminate potential liability to Treasury Metals. As a result, this residence would no longer represents a sensitive receptor for environmental assessment purposes. • An assessment of Barn Swallow and Chimney Swift foraging habitat has been incorporated into TMI_952-WL(2)-07_Table_2. • The American Badger habitat description is correct. The comma at the end of the Yellow Rail habitat description (located immediately above that of American Badger) has been removed to eliminate confusion. • The post-abandonment / post-closure phase of the Project is defined as the time following the active closure of the site and does not have a finite end or duration. Therefore, the statement that 16.71 ha of Northern Myotis/Little Brown Myotis habitat will be reestablished in the post-abandonment phase is correct, although the reviewer is correct in pointing out that it will take several decades for this habitat to become available. To reflect that the habitat will not be available for several decades following post-abandonment, TMI_952-WL(2)-07-Table_2 has been updated to show that large-diameter snags will not rehabilitate immediately in the post-closure phase. The area rehabilitated post-abandonment has therefore been changed from 16.71 to 0 in TMI_952-WL(2)-07_Table_2. • The post-abandonment / post-closure phase of the Project is defined as the time following the active closure of the site and does not have a finite end or duration. Therefore, the statement that 20.69 ha of Wolverine habitat will be reestablished in the post-abandonment phase is correct, although the reviewer is correct in pointing out that it will take several decades for this habitat to become available. To reflect that the habitat will not be available for several decades following post-abandonment, TMI_952-WL(2)-07-Table_2 has been updated to show that undisturbed, contiguous mature coniferous forest will not rehabilitate immediately in the post-closure phase. The area rehabilitated post-abandonment has therefore been changed from 16.71 to 0 in TMI_952-WL(2)-07_Table_2. <p>TMI_952-WL(2)-07_Table_4</p> <ul style="list-style-type: none"> • Moose habitat loss in the PSA, LSA and RSA was defined using the Ontario Landscape Tool. 84 ha of moose habitat will be lost in the PSA due to overprinting by the Project, however 6 ha of moose habitat will be constructed in the form of the fish compensation ponds for a total of 78 ha of moose habitat removed. • The post-abandonment / post-closure phase of the Project is defined as the time following the active closure of the site and does not have a finite end or duration. Therefore, the statement that 37.40 ha will be

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				<p>available for forestry in the post-closure is correct; however, it likely will not be available at the beginning of the post-closure phase. Once the land is returned to the Crown, 37.40 ha of the PSA will be reestablished as merchantable forest and could be harvested by the forestry resource rights holder once the forest has matured.</p> <p>TMI_870-WL(2)-01_Table_9 and TMI_870-WL(2)-01_Table_10</p> <ul style="list-style-type: none"> Wetland bird habitat areas have been updated to include open water <p>TMI_870-WL(2)-01_Table_11</p> <ul style="list-style-type: none"> As part of closure activities, Treasury Metals plans to revegetate 21 ha of coniferous forest, 17 ha of deciduous forest and 185.98 ha of successional areas. The post-abandonment / post-closure phase of the Project is defined as the time following the active closure of the site and does not have a finite end or duration. Therefore, although the coniferous forest and deciduous forest will not be fully established at the beginning of the post-closure phase, these areas will eventually establish as coniferous forest and deciduous forest a number of years into the post-closure phase and will remain in perpetuity. The cycle of timber harvesting and planting new trees follows the cycle of the forestry industry and is therefore not considered different from current conditions. <p>J)</p> <ul style="list-style-type: none"> TMI_870-WL(2)-01_Table_7 and TMI_870-WL(2)-01_Table_8 have been updated as requested to only show migratory birds. <p>FINAL Response:</p> <p><u>Part A:</u> Ecosite mapping was revised for the RSA and LSA in TMI_870-WL(2)-01_Figure_1a and TMI_870 WL(2) 01_Figure_1b, respectively, which supersede the previously submitted TMI_145-WL(1)-02_Figure 2a and 2b. The new mapping uses Forest Resource Inventory landcover data from Land Information Ontario. The new mapping presents provincial ecosite classifications rather than the NWO Ecosite classifications presented in the original figures. Treasury Metals will rehabilitate the shore of the west pit basin to marsh habitat (representing roughly 50% of the west pit basin) by placing organic material from the overburden stockpile and planting riparian and marsh vegetation to accelerate marsh formation. A detailed rehabilitation plans will be developed in consultation with government agencies and Indigenous communities as partial fulfillment of the formal closure plan. The formal closure plan process will begin following completion of the EA process.</p> <p><u>Part B:</u> Ecosite areas, identified by both codes and names, were summarized across the three study areas (RSA, LSA and PSA), as presented in TMI_870-WL(2)-01_Table_1a. Likewise, habitat class areas were summarized in TMI_870-WL(2)-01_Table_1b. Ecosite and Habitat Class relationships have been presented in TMI_870-WL(2)-</p>

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				<p>01_Table_2. Please note, that “Swamp” wetland habitat was subdivided into “Swamp – Coniferous” and “Swamp – Deciduous” following the guidance of ECCC (correspondence has been included in TMI_870-WL(2)-01_Appendix_1).</p> <p><u>Part C:</u> An updated table summarizing the habitat loss within the PSA contributed by the various Project elements has been presented in TMI_870-WL(2)-01_Table_3.</p> <p><u>Part D:</u> A new figure has been created to illustrate Habitat Classes within the PSA and LSA using a distinct colour scheme (TMI_870-WL(2)-01_Figure_2). Corresponding habitat area summaries can be found in TMI_870-WL(2)-01_Table_1b.</p> <p><u>Part E:</u> Vegetation survey locations were summarized by Ecosite and Survey Area (PSA, LSA and RSA) using the updated mapping in TMI_870-WL(2)-01_Table_4a, and by Habitat Class and Survey Area in TMI_870-WL(2)-01_Table_4b. This information was presented in two tables rather than a single table for clarity. Please note that ecosite is more ecologically relevant for assessing vegetation communities; habitat classifications were only used to assess wildlife. Refer to the response to Past G for further discussion of these summary tables. Please also note that TMI_870-WL(2)-01_Table_4a and TMI_870-WL(2)-01_Table_4b supersede the table include in the response for TMI_147- WL(1)-05.</p> <p><u>Part F:</u> Appendix R Table 4.2 is unchanged with the changes in habitat classification. However, updated versions of Appendix R Tables 4.3 and 4.4 have been presented in TMI_870-WL(2)-01_Table_5a and 5b, respectively. Please note, only migratory bird species listed under the Migratory Birds Convention Act (Government of Canada 1994) were included in the updated migratory bird summary tables.</p> <p>Additionally, TMI_870-WL(2)-01_Table_5b supersedes TMI_162 WL(1)-19 Tables 5 and TMI_870-WL(2)-01_Table_1b supersedes TMI_162 WL(1)-19 Tables 10.</p> <p><u>Part G:</u> Vegetation The initial vegetation surveys were planned and executed to reflect the original ecosite mapping (i.e., NWO Ecosite classifications), which is coarser than the provincial ecosite classifications that were used to develop the updated habitat categories. As such, the existing surveys no longer capture all ecosites within the LSA (TMI_870-WL(2)-01_Table_4). There were difficulties transitioning the existing survey locations, as the provincial ecosite landcover data now indicates that a disproportional number of surveys were conducted in disturbed areas (Ecosite B197) and some survey locations now appear as though they were conducted in open water. Adjustments were made to using field observations, satellite imagery and FRI data as a guide. These were artefacts of updating the ecosite mapping with FRI data from LIO, and not a reflection of the quality of the work. Treasury Metals is confident and it is the professional opinion of their independent consultants that the existing vegetation surveys adequately captures the natural variation of the Boreal forest, which is relatively simple and homogenous in the Project. TMI is confident and it</p>

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				<p>is the professional opinion of their independent consultants that the updated ecosite and habitat mapping for the PSA, LSA and RSA is correct.</p> <p>Wildlife and SAR</p> <p>Extensive work has been conducted to identify the species likely to occur within the PSA and LSA, and the habitats present in both study areas. All applicable MNRF-approved survey protocols have been employed targeting these species/communities over 7 field seasons. Updated effects assessments for wildlife, SAR and VCs of interest to Indigenous groups have been provided in TMI_870-WL(2)-01_Table_9, TMI_952-WL(2)-07_Table_2, TMI_952-WL(2)-07_Table_4, respectively. Treasury Metals is confident and it is the professional opinion of their independent consultants that all wildlife species, except for migratory birds (discussed below), have been sufficiently surveyed.</p> <p>Migratory Birds</p> <p>Breeding bird survey areas by habitat class have been presented in TMI_870-WL(2)-01_Table_6 for the PSA, LSA and RSA; a clear deficiency in surveyed Fen habitat was identified. However, given that the request for updated habitat classifications was communicated on June 8th, the ecosite-habitat classification correlations were finalized on June 15, the need for additional surveys was communicated on June 29th, and the breeding bird survey window closed on July 7th, it was not reasonably feasible to mobilize and conduct the necessary bird surveys using the specified methodology during the 2018 field season. Further, Treasury Metals would have been unable to attain a permit to work in Lola Lake Nature Reserve within this window, with the clear majority of Fen habitat within the LSA falling within the park. Through discussions with ECCC, it was decided that any perceived deficiencies in sampling effort can be addressed through the construction-operations phase monitoring program in lieu of conducting further baseline surveys (correspondence has been included in TMI_870-WL(2)-01_Appendix_A). Please refer to TMI_873-WL(2)-04 for a discussion of monitoring programs.</p> <p><u>Part H:</u> Treasury Metals has completed the tables sent by the Agency to include wildlife habitat summaries as well as for breeding birds. Please refer to TMI_870-WL(2)-01_Table_1b and TMI_870-WL(2)-01_Table_4 for vegetation, TMI_871-WL(2)-02_Table_3 for wetlands, TMI_870-WL(2)-01_Tables 5-8 for migratory birds, TMI_952-WL(2)-07_Table_2 for Species at Risk, TMI_952-WL(2)-07_Table_4 for species/communities of interest to Indigenous groups, and TMI_870-WL(2)-01_Table_9, TMI_870-WL(2)-01_Table_10 and TMI_870-WL(2)-01_Table_11 for all terrestrial biology VCs presented in the revised EIS.</p> <p><u>Part I:</u> Projected densities by habitat type were calculated for all migratory bird species (Government of Canada 1994) observed through the breeding bird surveys TMI_870-WL(2)-01_Table_7. These densities were then used to determine how many individuals of each species are expected to be displaced by direct and indirect project impacts (TMI_870-WL(2)-01_Table_8). Please note that, although TMI_870-WL(2)-01_Table_7 indicates that 12 Barn Swallows will be displaced by the Project, only 1 building (representing potential nesting habitat) is scheduled for demolition under the revised EIS, which is unlikely to result in the displacement of 12 individuals. This value simply</p>

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				<p>reflects the number of Barn Swallows that are expected to forage within the PSA, and are likely to continue doing so during the life of the Project. Likewise, the development will not remove potential Bald Eagle nesting habitat, as reflected in TMI_952-WL(2)-07.</p> <p>Please refer to TMI_952-WL(2)-07 for a detailed discussion of Species at Risk.</p> <p><u>Part J:</u> An updated effects assessment has been completed to include the updated LSA and the PSA using the tables provided by the Agency. This assessment includes:</p> <ul style="list-style-type: none"> • Vegetation community summaries are presented in TMI_870-WL(2)-01_Table 1, and the vegetation survey summary has been presented in TMI_870-WL(2)-01_Table_4. • Migratory bird communities summaries have been presented in TMI_870-WL(2)-01_Table_4 through TMI_870-WL(2)-01_Table_8. • Species at Risk habitat summaries have been presented in TMI_952-WL(2)-07_Table_2 (not attached to this IR). • Wetland habitat summaries have been presented in TMI_871-WL(2)-02_Table 3 (not attached to this IR). • A summary of VCs important to Indigenous groups has been included in TMI_952-WL(2)-07_Table_4. <p><u>Part K:</u> There is no need to update the mitigation measures or the follow-up program based on the responses to Parts A through J.</p> <p>References: Government of Canada. 1994. Migratory Bird Convention Act. https://www.canada.ca/en/environment-climate-change/services/migratory-birds-legal-protection/convention-act.html Government of Ontario. Land Information Ontario. https://www.ontario.ca/page/land-information-ontario</p>

TMI_871-WL(2)-02

Unique Identifier	Agency IR #	Annex	Agency / Group / Stakeholder	Cross Reference / Comment / Information Request / Response	
TMI_871-WL(2)-02	WL(2)-02	1	CEA Agency	Reference to EIS Guidelines:	Part 2, Section 9.1.2
				Reference to EIS / Appendix	Sections 5.9.2.4, 5.9.3, 6.2.1.13, 6.4.1.13, 9.1.2, 9.2.2.3 Appendix R, Figure 3.1, Appendix S, Figure 2.1, Appendix G, Appendix S Section 2.2
				Cross-reference to Round 1 IRs	TMI_88-WL(1)-03, TMI_105-WL(1)-07, TMI_146-RG(1)-17, TMI_787-AC(1)-368, TMI_794-AC(1)-375
				<p><u>Context and Rationale:</u></p> <ul style="list-style-type: none"> Clearly defining the project study area (PSA), the Project Site and wetlands that may be impacted by Project activities is necessary to understand the effect of the Project footprint on the habitat for species at risk (SAR), migratory birds and species of interest to Indigenous groups. The Agency previously requested baseline surveys for all wetlands within the local study area (LSA) as well as the Zone Of Influence (ZOI) for groundwater drawdown. Appendix S indicates that 11 wetlands were surveyed within the PSA, LSA and the regional study area (RSA), all of which were considered fish habitat. However, Figure 6.15.4.1-1 indicates that at least 27 additional wetlands (three in the “development footprint” and 24 in the LSA) were not assessed or included in the potential effects assessment for wetlands. For example, boreal wetlands (potential Rusty Blackbird habitat) presented in Figure 3 of TMI_153-WL(1)-10 differs from wetland boundaries presented in Figures 3.0-1A, 5.9.3.2-1, 6.1.4.10-1, 6.15.4.1-1, 6.15.5.1-1, 6.15.4.2-1 of the revised EIs, Figure 1 of TMI_42_MW(1)-04, Figure 1 of TMI_146-WL(1)-03, and Figure 1 of FMI_125-FH(1)-04. Furthermore, a review of the satellite imagery associated with a few of the assessed wetlands provided in Appendix S indicates that wetland delineations do not capture the entire wetland complex. For example, wetland boundaries depicted in the following figures did not capture wetland extents to the northwest: Wetland WLD4 (PSA), Wetland – WLD6 (LSA), Wetland – WLD8 (LSA), and Wetland – WLD9 (PSA/LSA). The proponent provided a summary of wetland ecosites in Table 1 of Treasury’s response to IR#1 TMI_146_WL(1)-03; however this table cannot be interpreted, as the parameters within it are not defined (e.g. Project footprint, Ecosite, %, wetlands). Finally, EIS Section 6.15.4.2 states that “most wetlands within the LSA are underlain with clay and tills making them resistant to water table drawdown.” However, an assessment of effects to wetland habitat from alterations to surface water and indirect effects associated with alterations to groundwater hydrology (such as reduced surface water input) has not been provided. These alterations include: <ul style="list-style-type: none"> the proposed diversion channel; 	

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				<ul style="list-style-type: none"> ○ the loss of WLD5, the headwater of a Black Water Creek Tributary; ○ Thunder Lake and Wabigoon Lake water levels; ○ Thunder Lake Tributary 2 and Tributary 3 flow; and ○ Hoffstrom’s Bay Tributary flow. <ul style="list-style-type: none"> ● For example, direct and indirect alterations to Blackwater Creek have the potential to affect WLD6, a wetland that supports a population of wild rice, a species of interest to Indigenous groups. As stated in EIS Section 5.12.1.3, wild rice is a sensitive plant and does not tolerate changes in water level or water quality during its growth cycle. ● As discussed in EIS Sections 6.12, 6.14 and 6.15, wetlands are important habitat for many wildlife species including moose, beaver and wild rice (species of interest to Indigenous groups), birds (including migratory birds), little brown myotis and northern myotis (SAR), amphibians and reptiles (snapping turtle [SAR]), and fish. They may also provide key hydrological functions such as groundwater recharge and water quality improvement. ● This information is required to validate the number and area of wetlands within and adjacent to the Project which may have resulted in an underestimation of the effect of the Project on the wildlife that use these wetlands. Furthermore, the underestimation of wetland habitat may influence the design of wildlife surveys thereby having a direct impact on the predicted effects on wildlife. <p><u>Specific Question / Request for Information:</u></p> <p>A. Review and update wetland mapping within the Project Study Area (PSA), Local Study Area (LSA) and Zone of Influence (ZOI). Review satellite imagery in the Project footprint, LSA and ZOI to update desktop mapping for wetlands.</p> <p>B. Based on the results of the revised desktop wetland mapping, revise the field survey summaries to ensure all habitat within the PSA, LSA and RSA are adequately assessed.</p> <p>C. If the revised field survey habitat summaries identify gaps in coverage, additional baseline survey information may be needed to assess the effects of Project activities within the PSA, LSA and ZOI. Compare the location of the historic field surveys with the “new” wetland areas to determine areas where survey coverage is inadequate. Additional field surveys for the following valued components (VCs) may be necessary for:</p> <ul style="list-style-type: none"> ○ Fish and fish habitat; ○ Migratory birds (Breeding bird surveys should occur between May 28 and July 7); ○ Species of interest to Indigenous groups (flora and fauna); ○ Wetlands; and ○ Species at Risk.

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				<p>D. Provide updated figures of (a) all wetlands within the LSA and (b) all wetlands within the PSA. Include the following information in each figure:</p> <ul style="list-style-type: none"> ○ PSA; ○ LSA (where appropriate); ○ Project footprint; ○ Wetland name; ○ Wetland boundary; ○ Impacted wetlands; and ○ Shading by wetland type (marsh, swamp, fen, bog). Ensure colour scheme is distinct and defined. <p>E. Provide an updated summary table for all wetlands (including wetlands that were not surveyed) within the LSA.</p> <p>F. Revise the effects assessment and the determination of significance of the residual effects on VCs impacted by the loss of wetland habitat caused by project activities, while taking into account:</p> <ul style="list-style-type: none"> ○ Revised wetland mapping; ○ Updated groundwater modelling (including effects on Lola Lake Provincial Nature Reserve and Aaron Provincial Park); ○ Proposed diversion channel; ○ Loss of WLD5; ○ Changes to Thunder Lake and Wabigoon Lake water levels; ○ Changes to Thunder Lake Tributary 2 and Tributary 3 flow; ○ Changes to Hoffstrom’s Bay Tributary flow; and ○ Updated modelled effluent concentrations. <p>Include a reassessment of the following effects:</p> <ul style="list-style-type: none"> ○ Direct wetland habitat loss due to site preparation, construction, operation and closure phases; ○ Functional loss of wetland habitat due to Project effects including: <ul style="list-style-type: none"> ● groundwater drawdown within the Zone of Influence (ZOI); ● surface water withdrawals (including wetlands up and downstream of withdrawal ponds); ● surface water discharge (including wetlands downstream of discharge location); ● alterations to hydrology and catchment areas due to Project Site (including wetland downstream of Project Site); and

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				<ul style="list-style-type: none"> alterations in wetland water quality due to Project activities including effluent discharge, removal of upstream wetlands and alterations to surface water and groundwater flow rates. <p>Updated VCs could include migratory birds, species at risk and species of interest to Indigenous groups with wetland habitat (e.g., rusty blackbird, yellowrail, waterfowl, little brown myotis, northern myotis, snapping turtle, moose, beaver and wild rice).</p> <p>G. As required, review and revise the proposed mitigation measures and follow-up programs associated with updates to the determination of significance.</p> <p><u>DRAFT Response:</u></p> <p><u>Part A.</u> To clarify, the term Project Study Area (PSA) has not been used as part of the environmental assessment for the Goliath Gold Project. The reviewer is most likely referring to the Operations Area. The wetland mapping has been updated for the Operations Area, the Local Study Area (LSA) and the groundwater zone of influence (ZOI), as illustrated in TMI_871-WL(2)-02_Figure_1. Rather than relying on satellite imagery and Land Information Ontario (LIO) groundcover data (as used in the initial assessment), the updated mapping relied primarily on the updated Forest Resource Inventory groundcover habitat classifications to identify wetland areas (please refer to TMI_870-WL(2)-01). This data set is the most extensive and comprehensive available to Treasury Metals.</p> <p><u>Part B.</u> The Agency previously identified four wetlands (or portions of wetlands) they wished incorporated into the wetland survey and mapping. A further 2 wetlands that partially overlap with the operations area were also identified as survey candidates.</p> <p><u>Part C.</u> Additional field surveys were conducted June 19-20, 2018. An updated illustration of surveyed wetlands has been presented in TMI_871-WL(2)-02_Figure_2. A detailed summary of the surveyed wetlands has been presented in TMI_871-WL(2)-02_Table_1. Overall, Marsh and Swamp wetlands (both Coniferous and Deciduous) are adequately surveyed, but Fen wetlands are largely under-represented across the LSA (TMI_871-WL(2)-02_Table_2). All Fen habitat overlapping with the Operations Area have been surveyed (WLD12). The vast majority of Fen habitat within the LSA is associated with a portion of the Lola Lake wetland complex in the north-east. This area is upstream of all Project effects and occurs outside of the Groundwater ZOI.</p> <p><u>Part D.</u> Updated figures illustrating wetlands within the LSA and Operations Area have been prepared as requested, TMI_871-WL(2)-02_Figure 2a and TMI_871-WL(2)-02_Figure 2b, respectively.</p> <p><u>Part E.</u> A summary of all wetland habitat within the LSA and Operations Area has been presented in TMI_871-WL(2)-02_Table 3.</p>

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				<p><u>Part F.</u> Although the habitat categories have been updated (see TMI_870-WL(2)-01) and additional wetlands have been surveyed (see response to part C), the conclusions of the effects assessment presented in the revised EIS remain unchanged. All wetland ecosites were accounted for in the initial effects assessment.</p> <p><u>Part G.</u> The proposed mitigation methods and monitoring programs are based on the conclusions of the effects assessment presented in the revised EIS and remain unchanged with the update of the habitat categories.</p> <p><u>Agency Comment on Draft Response:</u></p> <p>A. The Agency has reviewed the response to WL(2)-02A including TMI_871-WL(2)-02_Figure_1 and has four comments:</p> <p>A1. See discussion regarding “Project Study Area” in WL(2)-01A1.</p> <p>A2. As discussed in TMI_870-WL(2)-01(A1), the Agency has reviewed TMI_871-WL(2)-02_Figure_1. The Agency requests confirmation that the Groundwater ZOI has been updated based on updated groundwater modelling (if applicable) and wetland mapping. The Agency requests the proponent include the full extent of the Groundwater ZOI within the LSA, given this will include the potential extent of indirect Project effects on the adjacent terrestrial environment.</p> <p>A3. The Agency requests confirmation that the Forest Resource Inventory wetland mapping was updated based on field survey data. See discussion in WL(2)-01(A2).</p> <p>A4. TMI_871-WL(2)-02_Figure_1 is missing wetland connection between WLD3 and WLD4. Update TMI_871-WL(2)-02_Figure_1 to include all Project components within the “Project Study Area” [as discussed in TMI_870-WL(2)-01(A1)]. Confirm the Groundwater ZOI has been updated based on updated groundwater modelling and wetland mapping. Update the terrestrial LSA to include the Groundwater ZOI [as discussed in TMI_870-WL(2)-01(A1)]. Confirm wetland classifications were updated based on field survey data as necessary [as discussed in TMI_870-WL(2)-01(A2)]. Ensure TMI_871-WL(2)-02_Figure_1 includes all wetlands within the LSA.</p> <p>C. The Agency has reviewed TMI_871-WL(2)-02_Figure_2, TMI_871-WL(2)-02_Table_1 and TMI_871-WL(2)-02_Table_2. Update TMI_871-WL(2)-02_Figure_2 to include all Project components within the “Project Study Area” [as discussed in TMI_870-WL(2)-01(A1)] and the updated LSA [as discussed in TMI_870-WL(2)-01(A1)]</p> <p>D. The Agency has reviewed TMI_871-WL(2)-02_Figure 2a and TMI_871-WL(2)-02_Figure 2b and have three comments.</p>

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				<p>D1. Several wetlands displayed in TMI_871-WL(2)-02_Figure 2a and TMI_871-WL(2)-02_Figure 2b are not shaded according to the wetland categories displayed in the legend. It appears that they have been shaded using the "surveyed wetland" shading from TMI_871-WL(1)-02_Figure_2.</p> <p>D2. Wetland WLD13a is not shown on the figure.</p> <p>D3. The figures present the "impacted" wetlands within the LSA. These appear to be predominantly restricted to direct impacts associated with vegetation removal. The Agency requests the proponent consider direct and indirect effects of the Project on wetlands within the PSA and LSA, as described in the context and rationale for TMI_871_WL(2)-02. Specifically, "an assessment of effects to wetland habitat from alterations to surface water and indirect effects associated with alterations to groundwater hydrology (such as reduced surface water input) has not been provided. These alterations include:</p> <ul style="list-style-type: none"> • the proposed diversion channel; • the loss of WLD5; • the headwater of Black Water Creek Tributary; • Thunder Lake and Wabigoon Lake water levels; • Thunder Lake Tributary 2 and Tributary 3 flow; and • Hoffstrom's Bay Tributary flow." <p>The FUP addendum states "the upstream portion of Blackwater Creek Tributary 1 will be enclosed within the operations area and, [...], will drained [...] during either the site preparation and construction, or the operations phases of the Project. [...]. Further, the removal of the upstream portion of Blackwater Creek Tributary 1 and associated drainage area, means that the portion of Blackwater Creek Tributary 1 that is immediately downstream from the operations area is expected to be dry and, therefore, it is not expected to contain fish."</p> <p>The Agency requests the proponent review and provide rationale for including or not including the following wetlands as "impacted" in TMI_871-WL(2)- 02_Figure 2a and TMI_871-WL(2)-02_Figure 2b:</p> <ul style="list-style-type: none"> • a coniferous swamp in the northwest corner of the operations area: occurs within the Operations Area and Project Footprint. • the wetland connecting WLD3 and WLD4: the majority of the catchment area will be removed; the hydrology of the wetland will be disrupted by the removal of WLD4 and WLD4b; a portion of the wetland occurs within the Operations Area. • the entirety of WLD5: a portion of WLD5 has not been included in the "impacted" boundary. • fen north of WLD12: located within Groundwater ZOI and north of diversion channel. • an open water component at the southern end of WLD2: occurs within the Operations Area and Project Footprint.

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				<p>• wetlands adjacent to the PSA that may be impacted by dust, changing water levels and flow.</p> <p>Update TMI_871-WL(2)-02_Figure 2a and TMI_871-WL(2)-02_Figure 2b to include all Project components within the "Project Study Area" [as discussed in TMI_870-WL(2)-01(A1)] and the updated LSA [as discussed in TMI_870-WL(2)-01(A1)]</p> <p>Ensure wetlands presented in TMI_871-WL(2)-02_Figure 2a and TMI_871-WL(2)-02_Figure 2b are shaded using wetland shading presented in the legend.</p> <p>Update TMI_871-WL(2)-02_Figure 2a to include all wetlands within the LSA including WLD13a. Reassess wetlands within the updated LSA to determine direct and indirect "impacted" wetlands.</p> <p>E. The Agency has reviewed TMI_871-WL(2)- 02_Table 3. As requested in TMI_870-WL(2)-01H, update the vegetation summary table provided using the PSA [TMI_870-WL(2)-01(A1)], updated LSA [TMI_870-WL(2)-01(A1)] and "impacted" wetland assessment [TMI_871-WL(2)-02D].</p> <p>F. The Agency has reviewed the response to TMI_871-WL(2)-02F. The Agency requests the proponent consider the updated groundwater modelling and LSA in the assessment of effects on wetlands.</p> <p>Revise the effects assessment and the determination of significance of the residual effects on VCs impacted by the loss of wetland habitat caused by project activities, while taking into account the updated Groundwater ZOI and LSA [TMI_870-WL(2)-01(A1)].</p> <p>G. The Agency will refer to the response to TMI_873-WL(2)-04 regarding a monitoring plan for effects to wetland habitat.</p> <p><u>Specific Response to Agency Comments:</u></p> <p>A1. The LSA has been updated to include the full groundwater zone of influence (ZOI), and all wetland figures and summary tables have been updated to include all Project components defined as the PSA.</p> <p>A2. The extent of the groundwater ZOI reflects the updated groundwater modelling to address the Round 2 information requests; however, the did not change from what was presented in the revised EIS (April 2018). The LSA has been expanded to include the extent of the groundwater ZOI in order to capture all of the potential Project related effects to wetlands.</p> <p>A3. Treasury Metals confirms that the most up-to-date FRI data has been used for the current habitat mapping, and ecosite classifications have been ground-truthed in conjunction with the 2018 wetland surveys; field observations confirmed ecosite classifications in all cases. We are confident in our ecosite mapping.</p> <p>A4. The wetland between WLD3 and WLD4 has been added to all wetland figures and is included in the assessment of Project effects to wetlands.</p>

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				<p>C. TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b, along with the associated tables have been updated to include all the Project components within the PSA. All of the areas within the PSA are assumed to be impacted, which includes those areas identified as “interstitial areas”. These “interstitial areas” correspond with roadways, pipelines, and constructed features such as impoundment dams, ditches and berms.</p> <p>D) The wetland assessment, figures and tables were updated to reflect the new LSA (including the ZOI) and the PSA (see response to TMI_870-WL(2)-01).</p> <p>D1. The wetland categories in the legends of TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b have been updated with the appropriate categories shown in the figures.</p> <p>D2. WLD13a has been added to TMI_871-WL(2)-02_Figure_2b.</p> <p>D3. The direct and indirect effects to wetlands are included on TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b. A rationale for the inclusion or exclusion of the specific effects identified by the reviewer is provided below in Table 1.</p> <table border="1"> <thead> <tr> <th colspan="2">Table 1: Rationale for Inclusion or Exclusion of Direct or Indirect Effects to Wetlands Identified by the Agency</th> </tr> <tr> <th>Direct or Indirect Effect Identified by the Agency</th> <th>Rationale for Inclusion or Exclusion to the Wetland Effects Assessment</th> </tr> </thead> <tbody> <tr> <td>The proposed diversion channel</td> <td>The proposed diversion channel is included in the effects assessment shown on TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b as a direct effect to the wetlands east of the TSF.</td> </tr> <tr> <td>The loss of WLD5</td> <td>WLD5 is included in the effects assessment shown on TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b as an indirect effect. WLD5 is underlain by a kame deposit (granular material) within part of the ZOI where drawdown is relatively limited (2 m) and likely within observable seasonal variation. This wetland has been conservatively assumed to be affected by groundwater drawdown and may experience up to 50% reduction to wetland extent during the operations, closure and a period of post-closure while groundwater recovers to near pre-development levels. WLD5 is expected to fully recover once the groundwater has recovered to near pre-development levels in the post-closure phase. As discussed in the Goliath Gold Project Follow-up Program Addendum, WLD5 along with the other wetlands that are</td> </tr> </tbody> </table>	Table 1: Rationale for Inclusion or Exclusion of Direct or Indirect Effects to Wetlands Identified by the Agency		Direct or Indirect Effect Identified by the Agency	Rationale for Inclusion or Exclusion to the Wetland Effects Assessment	The proposed diversion channel	The proposed diversion channel is included in the effects assessment shown on TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b as a direct effect to the wetlands east of the TSF.	The loss of WLD5	WLD5 is included in the effects assessment shown on TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b as an indirect effect. WLD5 is underlain by a kame deposit (granular material) within part of the ZOI where drawdown is relatively limited (2 m) and likely within observable seasonal variation. This wetland has been conservatively assumed to be affected by groundwater drawdown and may experience up to 50% reduction to wetland extent during the operations, closure and a period of post-closure while groundwater recovers to near pre-development levels. WLD5 is expected to fully recover once the groundwater has recovered to near pre-development levels in the post-closure phase. As discussed in the Goliath Gold Project Follow-up Program Addendum, WLD5 along with the other wetlands that are
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				<p>underlain by the same deposit will be monitored to verify the prediction of no more than 50% reduction to the wetland extent. If the wetlands within the same deposit are observed to have a loss of greater than 50%, these wetlands will be offset by constructing new wetlands within the Treasury Metals property to ensure that the total loss of wetlands from the Project is below 3 % of the total wetlands within the LSA.</p> <p>To clarify, 50% of WLD5 has been conservatively assumed to be lost as a result of the Project during the operations, closure and a portion of post-closure while the groundwater recovers to near pre-development levels.</p>
				<p>The headwaters of Blackwater Creek Tributary</p> <p>These wetlands have not been considered affected as a result of the Project as they are underlain by fine silt and clay material that effectively isolates them from the groundwater drawdown.</p>
				<p>Thunder Lake and Wabigoon Lake water levels</p> <p>Wetlands along the shores of Thunder Lake and Wabigoon Lake will not be affected as a result of changes in water levels from Project activities. Changes in water levels to these lakes as a result of Project activities was shown to be negligible. Additionally, water levels in Thunder Lake and Wabigoon Lake are controlled by dams located in Aaron Lake Park and Dryden, respectively.</p>
				<p>Thunder Lake Tributary 2 and Tributary 3 flow</p> <p>The changes in flows to Thunder Lake Tributaries 2 and 3 are predicted to experience up to a 1.7 % reduction as a result of Project activities, which is within the natural range of flow variability in these 2 tributaries. The riparian wetlands along the tributaries are not expected to be affected as a result of this small change in flow. The wetlands along Thunder Lake Tributaries 2 and 3 are therefore not considered to be affected.</p>
				<p>Hoffstrom's Bay Tributary flow</p> <p>The changes in flows to Hoffstrom's Bay Tributary is predicted to experience up to a 7.8 % reduction, which is within the natural range of flow variability in the tributary. The riparian wetlands along this tributary are not expected to be affected as a result of this small change in flow. The wetland along Hoffstrom's Bay Tributary was therefore not considered to be affected.</p>

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				Coniferous swamp in the northwest corner of the operations area	The coniferous swamp that overlaps the PSA in the northwest corner of the operations area has been included in the updated effects assessment as being directly affected by the Project. The portions of this wetland that occur outside of the PSA are assumed to not be affected by Project effects.
				Open water component at the southern end of WLD2	The entirety of WLD2 (including the open water component at the southern end of the wetland) is included in the effects assessment as being directly affect by the Project.
				Wetland connecting WLD3 and WLD4	The wetland between WLD3 and WLD4 (along Blackwater Creek Tributary 1) is included in the effects assessment shown on TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b as an indirect effect due to flow loss in Blackwater Creek Tributary 1. This wetland is anticipated to be entirely lost during the site preparation and construction, operations and closure phases of the Project and will be reestablished in the post-closure phase once the pit lake fills and water overflows into Blackwater Creek Tributary 1.
				The entirety of WLD5	<p>WLD5 is included in the effects assessment shown on TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b as an indirect effect. WLD5 is underlain by a kame deposit (granular material) within part of the ZOI where drawdown is relatively limited (2 m) and likely within observable seasonal variation. This wetland has been conservatively assumed to be affected by groundwater drawdown and may experience up to 50% reduction to wetland extent during the operations, closure and a period of post-closure while groundwater recovers to near pre-development levels. WLD5 is expected to fully recover once the groundwater has recovered to near pre-development levels in the post-closure phase.</p> <p>As discussed in the Goliath Gold Project Follow-up Program Addendum, WLD5 along with the other wetlands that are underlain by the kame deposit will be monitored to verify the prediction of no more than 50% reduction to the wetland extent. If the wetlands within the kame deposit are observed to have a loss of greater than 50%, these wetlands will be offset by constructing new wetlands within the Treasury Metals property</p>

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				<p>to ensure that the total loss of wetlands from the Project is below 3 % of the total wetlands within the LSA.</p> <p>To clarify, 50% of WLD5 has been conservatively assumed to be lost as a result of the Project during the operations, closure and a portion of post-closure while the groundwater recovers to near pre-development levels.</p>
				<p>Fen north of WLD12 within ZOI</p> <p>The fen just north of WLD12 is in an area underlain by fine silt and clay material within the drawdown ZOI and is considered to be effectively isolated by the drawdown effects from the Project. Fen wetlands are partially defined by an inflow of nutrient rich water (minerotrophic) that helps to characterize the vegetation community and structure within it. This minerotrophic influence in fens can be from groundwater interactions with nutrient rich bedrock or overlying sediments. Due to the fine silt and clay layer underlying the fen, it is likely that the minerotrophic influence into the fen is not from the underlying bedrock, but from nutrient rich soils adjacent to the fen. Therefore, it is anticipated that the extent of this fen and vegetation communities within it will not be affected as a result of the Project.</p>
				<p>Wetlands adjacent to the PSA that may be impacted by dust, changing water levels and flow</p> <p>Changes in Flows - The changes in water levels to an extent that would affect wetlands have been included in the updated wetlands assessment, as discussed above. These wetlands include the wetland between WLD3 and WLD4 along the lower reaches of Blackwater Creek Tributary 1, and WLD15 and part of WLD16 along the lower reaches of Blackwater Creek Tributary 2.</p> <p>Dust – A figure showing the extent of dust outside of the PSA is provide on TMI_871-WL(2)-02_Figure_3. As shown in this figure, the only wetland areas that overlap with the dust effects are those already impacted by the Project. No additional dust impacts were identified on the wetlands surrounding the Project. Therefore, there are no anticipated affects to wetlands as a result of dust from the Project</p>

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				<p>TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b now show all of the Project components as defined by the PSA and the appropriate shading has been used within the figure and legend. The effects to wetlands shown in the figures has also been categorized by direct and indirect effects.</p> <p>E) The vegetation area and impact summary tables have been updated as requested using the newly defined PSA, the updated LSA to include the ZOI, and the impacted wetlands from indirect Project effects.</p> <p>F) The wetland effects assessment has been updated to reflect the expanded LSA, as requested. The groundwater model was updated as part of the responses to the Round 2 information requests; however, the update did not result in a change to the ZOI and therefore does not change the wetlands effects assessment. A revised effects assessment, including a revised determination of significance, has been provided in TMI_871-WL(2)-02_Table_4, TMI_871-WL(2)-02_Table_5 and TMI_871-WL(2)-02_Table_6. For clarity, Treasury Metals has assessed the VCs presented in the revised EIS (April 2018) using the same template provided by the Agency. Although the PSA and LSA have changed, the conclusions of the updated effects assessment are similar to those presented in the revised EIS.</p> <p>It is important to note that 24.16 ha of marsh habitat loss as a result of the Project will be offset by the construction of the fish compensation / offsetting ponds, the formation of the pit lake in the post-closure phase and the creation of marsh habitat in Collection Ponds 2a and 2b on either side of Blackwater Creek Tributary 1 This wetland offsetting habitat is shown in TMI_871-WL(2)-02_Table_4.</p> <p>G) The Agency is directed to the response to TMI_873-WL(2)-04 for details on the wetland follow-up program.</p> <p><u>FINAL RESPONSE</u></p> <p><u>Part A.</u> The wetland mapping has been updated for the Project Study Area (PSA) and the Local Study Area (LSA; which now includes the full groundwater ZOI), as illustrated in TMI_871-WL(2)-02_Figure_1. Rather than relying on satellite imagery and Land Information Ontario (LIO) groundcover data (as used in the initial assessment), the updated mapping relied primarily on the updated Forest Resource Inventory (FRI) groundcover habitat classifications to identify wetland areas (please refer to TMI_870-WL(2)-01). This data set is the most extensive and comprehensive available to Treasury Metals. In June of 2018, additional wetland surveys were completed within the LSA. During this time, some ecosites were ground-truthed using the FRI groundcover habitat classifications, and all field observations confirmed the existing FRI classifications. As such, it is the professional opinion of Treasury Metals' independent consultants that the comprehensive dataset is representative of the actual conditions in the field.</p> <p><u>Part B.</u> The Agency previously identified four wetlands (or portions of wetlands) they wished incorporated into the wetland survey and mapping. These wetlands (WLD12, WLD13a, WLD13b and WLD14) were surveyed in June of 2018 and are shown in TMI_871-WL(2)-02_Figure_2.</p>

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				<p><u>Part C.</u> Additional field surveys were conducted June 19-20, 2018. An updated illustration of surveyed wetlands has been presented in TMI_871-WL(2)-02_Figure_2. A detailed summary of the surveyed wetlands has been presented in TMI_871-WL(2)-02_Table_2. Overall, Marsh and Swamp wetlands (both Coniferous and Deciduous) are adequately surveyed, but Fen wetlands are largely under-represented within the PSA (TMI_871-WL(2)-02_Table_2 and TMI_871-WL(2)-02_Table_3). All Fen habitat overlapping with the PSA have been surveyed (WLD12) A further 1.43 ha of fen habitat are expected to be indirectly impacted through changes to groundwater in the LSA. However, the vast majority of Fen habitat within the LSA is associated with a portion of the Lola Lake wetland complex in the north-east. This area is upstream of all Project effects and occurs outside of the Groundwater ZOI. Therefore, Treasury Metals and its consultants are of the opinion that the existing surveys are sufficient to describe conditions for fish and fish habitat, Species at Risk and species of interest to Indigenous groups and as such no additional surveys are required. Additional surveys for migratory birds will be conducted in spring 2019, as discussed in TMI_870-WL(2)-01 and TMI_873-WL(2)-04.</p> <p><u>Part D.</u> Updated figures illustrating wetlands within the LSA and PSA have been prepared as requested, TMI_871-WL(2)-02_Figure 2a and TMI_871-WL(2)-02_Figure 2b, respectively. A rationale for the inclusion or exclusion of the specific wetlands identified by the Agency into the wetlands effects assessment has been provided as Table 1 below.</p> <table border="1"> <thead> <tr> <th colspan="2">Table 1: Rationale for Inclusion or Exclusion of Direct or Indirect Effects to Wetlands Identified by the Agency</th> </tr> <tr> <th>Direct or Indirect Effect Identified by the Agency</th> <th>Rationale for Inclusion or Exclusion to the Wetland Effects Assessment</th> </tr> </thead> <tbody> <tr> <td>The proposed diversion channel</td> <td>The proposed diversion channel is included in the effects assessment shown on TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b as a direct effect to the wetlands east of the TSF.</td> </tr> <tr> <td>The loss of WLD5</td> <td>WLD5 is included in the effects assessment shown on TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b as an indirect effect. WLD5 is underlain by a kame deposit (granular material) within part of the ZOI where drawdown is relatively limited (2 m) and likely within observable seasonal variation. This wetland has been conservatively assumed to be affected by groundwater drawdown and may experience up to 50% reduction to wetland extent during the operations, closure and a period of post-closure while groundwater recovers to near pre-development levels. WLD5 is expected to fully recover once the</td> </tr> </tbody> </table>	Table 1: Rationale for Inclusion or Exclusion of Direct or Indirect Effects to Wetlands Identified by the Agency		Direct or Indirect Effect Identified by the Agency	Rationale for Inclusion or Exclusion to the Wetland Effects Assessment	The proposed diversion channel	The proposed diversion channel is included in the effects assessment shown on TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b as a direct effect to the wetlands east of the TSF.	The loss of WLD5	WLD5 is included in the effects assessment shown on TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b as an indirect effect. WLD5 is underlain by a kame deposit (granular material) within part of the ZOI where drawdown is relatively limited (2 m) and likely within observable seasonal variation. This wetland has been conservatively assumed to be affected by groundwater drawdown and may experience up to 50% reduction to wetland extent during the operations, closure and a period of post-closure while groundwater recovers to near pre-development levels. WLD5 is expected to fully recover once the
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					<p>groundwater has recovered to near pre-development levels in the post-closure phase.</p> <p>As discussed in the Goliath Gold Project Follow-up Program Addendum, WLD5 along with the other wetlands that are underlain by the kame deposit will be monitored to verify the prediction of no more than 50% reduction to the wetland extent. If the wetlands within the kame deposit are observed to have a loss of greater than 50%, these wetlands will be offset by constructing new wetlands within the Treasury Metals property to ensure that the total loss of wetlands from the Project is below 3 % of the total wetlands within the LSA.</p> <p>To clarify, 50% of WLD5 has been conservatively assumed to be lost as a result of the Project during the operations, closure and a portion of post-closure while the groundwater recovers to near pre-development levels.</p>
				The headwaters of Blackwater Creek Tributary	These wetlands have not been considered affected as a result of the Project as they are underlain by fine silt and clay material that effectively isolates them from the groundwater drawdown.
				Thunder Lake and Wabigoon Lake water levels	Wetlands along the shores of Thunder Lake and Wabigoon Lake will not be affected as a result of changes in water levels from Project activities. Changes in water levels to these lakes as a result of Project activities was shown to be negligible. Additionally, water levels in Thunder Lake and Wabigoon Lake are controlled by dams located in Aaron Lake Park and Dryden, respectively.
				Thunder Lake Tributary 2 and Tributary 3 flow	The changes in flows to Thunder Lake Tributaries 2 and 3 are predicted to experience up to a 1.7 % reduction as a result of Project activities, which is within the natural range of flow variability in these 2 tributaries. The riparian wetlands along the tributaries are not expected to be affected as a result of this small change in flow. The wetlands along Thunder Lake Tributaries 2 and 3 are therefore not considered to be affected.
				Hoffstrom's Bay Tributary flow	The changes in flows to Hoffstrom's Bay Tributary is predicted to experience up to a 7.8 % reduction, which is within the natural range of flow variability in the tributary. The riparian wetlands along this tributary are not expected to be affected as a result of

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				<p>Coniferous swamp in the northwest corner of the operations area</p> <p>The coniferous swamp that overlaps the PSA in the northwest corner of the operations area has been included in the updated effects assessment as being directly affected by the Project. The portions of this wetland that occur outside of the PSA are assumed to not be affected by Project effects.</p>
				<p>Open water component at the southern end of WLD2</p> <p>The entirety of WLD2 (including the open water component at the southern end of the wetland) is included in the effects assessment as being directly affect by the Project.</p>
				<p>Wetland connecting WLD3 and WLD4</p> <p>The wetland between WLD3 and WLD4 (along Blackwater Creek Tributary 1) is included in the effects assessment shown on TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b as an indirect effect due to flow loss in Blackwater Creek Tributary 1. This wetland is anticipated to be entirely lost during the site preparation and construction, operations and closure phases of the Project and will be reestablished in the post-closure phase once the pit lake fills and water overflows into Blackwater Creek Tributary 1.</p>
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				<p>Fen north of WLD12 within ZOI</p> <p>The fen just north of WLD12 is in an area underlain by fine silt and clay material within the drawdown ZOI and is considered to be effectively isolated by the drawdown effects from the Project. Fen wetlands are partially defined by an inflow of nutrient rich water (minerotrophic) that helps to characterize the vegetation community and structure within it. This minerotrophic influence in fens can be from groundwater interactions with nutrient rich bedrock or overlying sediments. Due to the fine silt and clay layer underlying the fen, it is likely that the minerotrophic influence into the fen is not from the underlying bedrock, but from nutrient rich soils adjacent to the fen. Therefore, it is anticipated that the extent of this fen and vegetation communities within it will not be affected as a result of the Project.</p>
				<p>Wetlands adjacent to the PSA that may be impacted by dust, changing water levels and flow</p> <p>Changes in Flows - The changes in water levels to an extent that would affect wetlands have been included in the updated wetlands assessment, as discussed above. These wetlands include the wetland between WLD3 and WLD4 along the lower reaches of Blackwater Creek Tributary 1, and WLD15 and part of WLD16 along the lower reaches of Blackwater Creek Tributary 2.</p> <p>Dust – A figure showing the extent of dust outside of the PSA is provide on TMI_871-WL(2)-02_Figure_3. As shown in this figure, the only wetland areas that overlap with the dust effects are those already impacted by the Project. No additional dust impacts were identified on the wetlands surrounding the Project. Therefore, there are no anticipated affects to wetlands as a result of dust from the Project</p>

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				<p><u>Part E.</u> A summary of all vegetation habitat within the PSA, LSA and RSA has been presented in TMI_870-WL(2)-01_Table_2.</p> <p><u>Part F.</u> The effects assessment has been updated to reflect the new PSA and LSA boundaries using both the VCs and tables provided by the Agency for wetland types (TMI_871-WL(2)-02_Table_4) and for the VCs affected by wetlands used in the EIS (TMI_871-WL(2)-02_Table_5). The groundwater model was updated as part of the responses to the Round 2 information requests; however, the update did not result in a change to the ZOI and therefore does not change the wetlands effects assessment. For clarity, Treasury Metals has assessed the VCs presented in the revised EIS (April 2018) using the same template provided by the Agency. Although the PSA and LSA have changed, the conclusions of the updated effects assessment are similar to those presented in the revised EIS.</p> <p>It is important to note that 24.16 ha of marsh habitat loss as a result of the Project will be offset by the construction of the fish compensation / offsetting ponds, the formation of the pit lake in the post-closure phase and the creation of marsh habitat in Collection Ponds 2a and 2b on either side of Blackwater Creek Tributary 1. This wetland offsetting habitat is shown in TMI_871-WL(2)-02_Table_4.</p> <p>An updated determination of significance to reflect the updated PSA and LSA has been provided for the VCs presented in the EIS related to wetlands (TMI_871-WL(2)-04_Table_6). None of the criteria for assessing significance has changed from what was presented in the revised EIS (April 2018) and the reviewer is directed to Section 8.1 of the revised EIS for the methodology for assigning significance. As shown in TMI_871-WL(2)-04-Table_6, with an updated effects assessment to reflect the new PSA and LSA boundaries, there are no significant adverse effects as a result of the Project.</p> <p><u>Part G.</u> The reviewer is directed to the response to TMI_873-WL(2)-04 regarding a monitoring plan for effects to wetland habitat.</p> <p><u>Agency Comment on Revised Response:</u></p> <p>A1. The Agency has reviewed the response to WL(2)-02A1.</p> <p>A2. The Agency has reviewed the response to WL(2)-02A2.</p> <p>A3. The Agency has reviewed the response to WL(2)-02A3.</p> <p>A4. The Agency has reviewed the response to WL(2)-02A4.</p> <p>C. The Agency has reviewed TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b.</p>

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				<p>D. The Agency has reviewed the response to WL(2)-02D.</p> <p>D1. The Agency has reviewed TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b.</p> <p>D2. The Agency has reviewed TMI_871-WL(2)-02_Figure_2b.</p> <p>D3. The Agency has reviewed TMI_871-WL(2)-02_Figure_2a and TMI_871-WL(2)-02_Figure_2b, and Table 1: Rationale for Inclusion or Exclusion of Direct or Indirect Effects to Wetland Identified by the Agency.</p> <p>E. The Agency has reviewed the response to WL(2)-02E.</p> <p>F. The Agency has reviewed TMI_871-WL(2)-02_Table 4 (see TMI_870-WL(2)-01_B for questions regarding classification of rehabilitated west basin of the pit lake).</p> <p>The Agency has reviewed TMI_871-WL(2)-02_Table 5 (see TMI_870-WL(2)-01_H for questions).</p> <p>The Agency has reviewed TMI_871-WL(2)-02_Table 6.</p> <p>G. The Agency has reviewed the response to TMI_873-WL(2)-04.</p> <hr/> <p><u>Specific Comment to the Agency</u></p> <p>Not required. No additional information was requested.</p> <hr/> <p><u>Final Response</u></p> <p>None required. Agency accepted revised response as complete.</p>

TMI_872-WL(2)-03

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TMI_872-WL(2)-03	WL(2)-03	1	CEA Agency	Reference to EIS Guidelines:	Part 2, Section 9.1.2
				Reference to EIS / Appendix	Sections 3.7, 6.12, 6.13, 6.21, 6.23, 10.0, 13.0
				Cross-reference to Round 1 IRs	TMI_148-WL(1)-05, TMI_450-AC(1)-124
				<p><u>Context and Rationale:</u></p> <ul style="list-style-type: none"> In WL(1)-05, The Agency requested an assessment of the potential risk to wildlife that may have access the tailings storage facility (TSF) and clarification regarding mitigation to exclude wildlife from the TSF. Response TMI_148_WL(1)05 states that with the use of fencing will exclude wildlife receptors likely to access the TSF, with the exception of migratory birds, flying species at risk (birds and bats), and waterfowl of interest by Indigenous groups . However, the potential effect from contact or ingestion of water from the TSF is not discussed in Section 6.0 (Effects Assessment) for migratory birds, waterfowl of interest to Indigenous groups or flying species at risk. In the IR response, the proponent indicated that “the potential risk to wildlife as a result of exposure to water in the TSF is intrinsically low” due to the “the revised design features [...] (i.e. fencing, cyanide treatment, TSF cover at closure)” and the short term risk of birds ingesting TSF supernatant water. However, the Agency noticed discrepancies in the proposed TSF water quality within the revised EIS and IR responses. In the response to WL(1)-05, the proposed concentration range for cyanide in the TSF is 10-50 mg/L (ppm), whereas the response to AC(1)-124 states that “recovery and destruction of cyanide will reduce the concentration to less than 1 mg/L.” In addition, the response to AC(1)-409 states “effluent entering the TSF will effectively meet the MMER requirements for releases to the environment.” In the response to WL(1)-05, it was assumed that concentrations of 10-50 mg/L would not pose a risk to birds because they would not ingest all of their drinking water from the TSF. However, reports show that there may be effects on birds at cyanide concentrations below 50 mg/L (Eisler and Wiemeyer, 2004; Dzombak et al., 2005). In addition, while the response to WL(1)-05 focuses on cyanide other contaminants including heavy metals may be accessible for uptake by wildlife and result in lethal or sublethal effects. <p><u>References</u></p> <ul style="list-style-type: none"> Eisler, R., and S.N. Wiemeyer. 2004. Cyanide Hazards to Plants and Animals from Gold Mining and Related Water Issues. Rev. Environ. Contam. Toxicol. 183:21-54. Dzombak, D.A., Ghosh, R.S., and G.M. Wong-Chong. Cyanide in Water: Chemistry, Risk, and Management. Taylor & Francis Group. 2005. 	

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				<p><u>Specific Question / Request for Information:</u></p> <p>A. Clarify the anticipated water quality concentrations for the TSF.</p> <p>B. Review and revise the potential effects to wildlife including migratory birds, flying species at risk (birds and bats), species of interest to Indigenous groups, and consumption of wildlife by Indigenous communities that could access the TSF taking into consideration the response to Question A and the information in the context.</p> <p>C. Describe additional mitigation measures to prevent adverse effects from water in the TSF on wildlife including migratory birds, flying species at risk (birds and bats), and species of interest to Indigenous groups taking the response from Question B into consideration.</p> <p>D. In the follow-up program, include a specific monitoring activity to identify if migratory birds are accessing the TSF. If monitoring identifies use by migratory birds, contingency measures including additional deterrents such as visual and noise disturbances should be implemented. Include this monitoring activity in the response to EA(2)-01.</p> <p><u>DRAFT Response:</u></p> <p><u>Part A:</u></p> <p>The reviewers are referred to Section 3 (Project Description) of the revised EIS (April 2018) for a fulsome description of the Project operations and process, as well as the qualities of effluent discharged from the process plant to the tailings storage facility (TSF). A description of these discharges are presented in Section 3.8.8 of the revised EIS (April 2018), and the cyanide treatment process is described in Section 3.8.7.</p> <p>Following the standard carbon-in-leach (CIL) process used to extract gold from the ore, the process water containing cyanide will be reused to the extent possible, and then treated using the INCO/SO₂ cyanide destruction process (which is widely used in the mining industry). Following the INCO/SO₂ process, tailings directed to the TSF will meet the 1 mg/L total cyanide effluent discharge limit set out in the federal Metal Mining Effluent Regulations (MMER). The water covering the TSF will be recycled and used in the processing plant, and excess water that cannot be recycled will be treated in the effluent treatment plant and ultimately discharge to Blackwater Creek. There may be times when the INCO/SO₂ process does not reach 100% efficiency or the INCO/SO₂ process is temporarily not in operation, the concentration of Weak Acid Dissociable (WAD) cyanide in the tailings going to the TSF could be in the range of 10 to 50 mg/L. This in no way implies the concentration of the supernatant water would be this high as these instances would only be temporary, and the small volume of tailings releases with elevated cyanide concentrations (in the range of 10 to 50 mg/L) would be rapidly diluted with the large volume supernatant water in the TSF. Average cyanide concentrations in the supernatant water will in the range of <1 mg/L is still expected in the TSF. It is important to note that the TSF is intended to never reach 50 mg/L. The value of 50 mg/L referred to by the reviewer is referring to periodic releases of effluent to the TSF, not the concentration that is expected within the entire TSF.</p> <p>Treasury Metals will strive to maintain an average target total cyanide concentration within the TSF of 1 mg/L over the long-term basis. In addition, contingency measures, such as hydrogen peroxide treatment to the TSF supernatant water, and incorporation of hydrogen peroxide into the effluent treatment process will be considered as part of the sewage Environmental Compliance Approval (ECA) process with the Ministry of the Environment and Climate Change</p>

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				<p>(MOECC). By design, the cyanide treatment circuit will destroy cyanide to a level acceptable for direct discharge to the environment and reduce the environmental safety requirements placed on the TSF. Within the TSF, the free cyanide concentration is expected to be in the range of 0.2025 mg/L, which corresponds with 1 mg/L of total cyanide in the TSF.</p> <p>The anticipated supernatant water quality within the TSF is as outlined in Table 3.8.8-1 of the revised EIS (April 2018). As discussed above, the relatively small volumes of tailings releases to the TSF with elevated cyanide concentrations (in the range of 10 to 50 mg/L) due to those rare occasions when the INCO/SO₂ process does not reach 100% efficiency or the INCO/SO₂ process is temporarily not in operation would not affect the overall concentrations of cyanide within the TSF, which Treasury Metals will strive to maintain at an average target total cyanide concentration within the TSF of 1 mg/L over the long-term basis.</p> <p>As described in Section 3 of the EIS (April 2018), the predicted TSF supernatant water chemistry coming from the detoxification circuit was modelled using the PHREEQC1 model, using results presented in literature (Devuyst et al., 1988; Devuyst et al., 1989) for comparable free milling gold circuits, and only the worst-case maximum predicted value was provided.</p> <p>The assessment of the effects of concentrations of chemicals in source media on human health was performed using a two-step qualitative and quantitative approach. First, contaminants of concern (COCs) were selected via a qualitative screening process where predicted chemical EPCs were compared to their generic health-based Canadian or Ontario criteria/guideline/standard. Where a COC was selected based on an exceedance of its respective qualitative screening criteria, a quantitative assessment was considered. For both the human health risk assessment (HHRA) and ecological risk assessment (ERA), a supplemental screening was completed as part of their respective Problem Formulation steps, using component values specific to each human or ecological receptor, provided by the Ontario Ministry of Environment, Conservation and Parks (MECP, formally the Ontario Ministry of Environment and Climate Change (MOECC)). Chemical concentrations that did not exceed their respective MECP human health or ecological component value were qualitatively considered to present a negligible amount of potential risk for that particular receptor/pathway combination. For concentrations that exceed their respective human health or ecological component value or for which a component value for that pathway was unavailable, they were carried forward for a quantitative assessment of potential risk.</p> <p>The anticipated water quality concentrations for the TSF are provided in Table 3.5.3.5-2 in the HHERA (August 2018). Table 3.5.3.5-2 in the HHERA (August 2018) provided the EPCs of chemicals in the TSF supernatant water and compared the predicted concentrations to risk-based water quality criteria protective of human and ecological receptors. As stated above, the predicted concentrations in the TSF represent a worse-case scenario.</p> <p style="text-align: center;">Table 3.5.3.5-2: Exposure Point Concentration of Metals in TSF Supernatant Water</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Criteria (PWQO/ CWQG or MAC)</th> <th>Predicted Tailings Supernatant</th> </tr> </thead> <tbody> <tr> <td>Aluminum</td> <td>0.075</td> <td>0.199</td> </tr> <tr> <td>Antimony</td> <td>0.006</td> <td>0.002</td> </tr> </tbody> </table>	Parameter	Criteria (PWQO/ CWQG or MAC)	Predicted Tailings Supernatant	Aluminum	0.075	0.199	Antimony	0.006	0.002
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				Arsenic	0.01	0.018
				Barium	—	0.012
				Beryllium	0.011	0.0005
				Bismuth	—	0.0005
				Boron	0.2	0.02
				Cadmium	0.002	0.002
				Calcium	—	7.15
				Carbonate	—	15.88
				Chromium	0.0089	0.0001
				Chloride	120	0.78
				Cobalt	0.0009	0.004
				Copper	0.005	0.018
				Cyanide	0.005	<1**
				Iron	0.3	0.358
				Lead	0.005	0.082
				Lithium	—	0.024
				Magnesium	—	1.44
				Manganese	—	0.063
				Mercury	0.0002	0.0018
				Methyl Mercury	0.00004	0.0018
				Molybdenum	0.04	0.001
				Nickel	0.025	0.021
				Nitrate (as N)	13	7.07
				Phosphorus	0.03	0.06
				Potassium	—	1.78
				Selenium	0.1	0.0005
				Silicon	—	0.099
				Silver	0.0001	0.00005
				Sodium	—	1.16
				Strontium	—	0.032
				Sulphates	—	68.67
				Sulphur	—	22.94
				Thallium	0.0003	0.642
				Tin	—	0.0005
				Titanium	—	0.003
				Uranium	0.005	0.005

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				<table border="1"> <tr> <td>Vanadium</td> <td>0.006</td> <td>0.004</td> </tr> <tr> <td>Zinc</td> <td>0.03</td> <td>0.04</td> </tr> </table> <p>NOTES:</p> <p>Units All units in mg/L</p> <table border="1"> <tr> <td>BOLD & SHADED</td> <td>Concentration exceeds criteria, parameter carried forward as COC in HHERA</td> </tr> <tr> <td>BOLD & SHADED</td> <td>Concentration exceeds criteria, however criteria set based on criteria other than human or ecological health. Parameter is not carried forward as COC in HHERA.</td> </tr> </table> <p>The EPCs of aluminum, antimony, cobalt, copper, cyanide, lead, mercury, assumed methyl mercury, thallium and zinc in TSF supernatant water exceeded their respective screening criteria and are considered COCs requiring assessment as part of the HHERA (August 2018).</p> <p>Two parameters, iron and phosphorus, exceeded their respective surface water quality standard in TSF supernatant water, however, are not carried forward as COCs in the HHERA based on the following rationale:</p> <ul style="list-style-type: none"> • Phosphorus: Phosphorus is an essential macronutrient for plant growth and is ubiquitous in the environment. However, at elevated levels phosphorus can lead to the proliferation of algae blooms and the eutrophication of waterways. The primary concern of phosphorus is eutrophication rather than chemical specific toxicity and as such no risk-based soil standards or guidelines are available. It is not considered a COC to human or ecological receptors, and is subsequently not carried forward for further assessment. • Iron: Iron is naturally occurring via erosion and weathering of rocks and minerals. The concentration of iron in the watersheds surrounding the Goliath Gold Project is naturally above the screening criteria. The surface water quality guidelines for iron are set based on aesthetic criteria (i.e., taste and staining of drinking water) rather than protection of human or ecological receptors. It is not considered a COC to human or ecological receptors, and is subsequently not carried forward for further assessment. <p><u>PART B:</u></p> <p>The revised effects of the Project on human health and ecological receptors via exposure to the TSF supernatant water is provided in the 2018 HHERA Report provided in support of the Round 2 Information Request process.</p> <p>The potential effects to wildlife via exposure to the TSF supernatant water was performed in Ecological Risk Assessment (ERA) provided as Section 5 of the 2018 HHERA using valued ecological components (VECs). When selecting VECs, it is important to consider general characteristics of the Study Areas, land use characteristics, local and regional habitat surveys, species inventory, species that are at risk (i.e., referring to <i>Species at Risk Act (SARA)</i>) and/or information from local experts and Residents (including members of Indigenous communities). Based on the results of the baseline biological data collection performed by KBM (and others) and provided to Treasury Metals for use in the EIS (April 2018), VECs that are located in reasonably close proximity to the Project include: terrestrial</p>	Vanadium	0.006	0.004	Zinc	0.03	0.04	BOLD & SHADED	Concentration exceeds criteria, parameter carried forward as COC in HHERA	BOLD & SHADED	Concentration exceeds criteria, however criteria set based on criteria other than human or ecological health. Parameter is not carried forward as COC in HHERA.
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				<p>plants, soil invertebrates, mammals, birds, amphibians and reptiles. Aquatic receptors were also considered. The potential effects to human receptors who may consume wildlife exposure to the TSF supernatant water was performed in the Human Health Risk Assessment provided as Section 4 of the 2018 HHERA. The concentrations of chemicals from environmental and Project specific media (i.e. TSF supernatant water) in country foods were quantified in Section 3.6 of the HHERA. The species selected in the assessment were based on traditional knowledge and information regarding current use of lands and resources for traditional purposes shared with Treasury Metals during ongoing engagement activities. For safety purposes, access to Study Area No. 1 the Operations Area (i.e. the TSF supernatant water) will be restricted to only employees of Treasury Metals during the active phases of the Project (i.e., Site Preparation and Construction, Operations, and Closure) and no country foods will be harvested from the Operations Area during these Project Phases. Country foods harvesting may resume at Study Area No. 1 the Operations Area during the Post-Closure phase of the Project, however there is no longer TSF supernatant water following closure of the Project, therefore this is not considered an operable pathway of exposure. Although restricting access to human receptors within the Operations Area is a reasonable administrative control for public safety, restricting access to mobile animals such as birds (e.g., grouse and duck) and small mammals (e.g., rabbit) may not be feasible or 100% effective. Thus, these ecological receptors (and country food items) may be exposed to Project-specific media within the Operations Area and then consumed either by larger predatory species or human receptors off-site. Therefore, an assumption was made that 5% of the country foods consumed by human receptors in Study Areas No. 2 and 3 may come from the Operations Area during the Site Preparation and Construction, Operations, and Closure phases of the Project. Sample calculations are provided in Appendix II - Supplemental Information for the HHRA of Country Foods for the Goliath Gold Project to the 2018 HHERA Report.</p> <p>Uptake of chemicals from all media, including the TSF supernatant water were modelled into the following human and ecological receptor food groups:</p> <ul style="list-style-type: none"> • Invertebrates <ul style="list-style-type: none"> ○ Soil invertebrate • Plants <ul style="list-style-type: none"> ○ Forage; ○ Root Vegetables; ○ Berries (assumed to include raspberry- <i>Rubus strigosus</i>, blueberry-<i>Vaccinium angustifolium</i>, and/or strawberry <i>Fragaria virginiana</i>); ○ Macrophytes including Wild Rice (<i>Zizania palustris</i>); and ○ Medicinal Plants including Labrador Tea (<i>Ledum groenlandicum</i>). • Meat (Wild Game) <ul style="list-style-type: none"> ○ Moose (<i>Acles acles</i>); ○ Ruffed Grouse (<i>Bonasa umbellus</i>); ○ Mallard Duck (<i>Anas platyrhynchos</i>); and

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				<ul style="list-style-type: none"> ○ Snowshoe Hare (<i>Lepus americanus</i>). ● Fish <ul style="list-style-type: none"> ○ Measured fish (Walleye- <i>Sander vitreus</i> and Sauger- <i>Sander canadensis</i>); and ○ Modelled fish (assumed to be Walleye- <i>Sander vitreus</i> and Sauger- <i>Sander canadensis</i>). <p><u>PART C:</u></p> <p>As described in Section 5 of the HHERA, additional risk management measures including fencing, and bird deterrent flags will serve as mitigation measures to effectively reduce exposure of wildlife to the TSF supernatant water. With the implementation of these risk management measures and the quality of the TSF supernatant water, an adverse impact on birds and mammals from exposure to TSF supernatant water is not anticipated. There were no potential effects identified for plants or aquatic receptors via exposure to the TSF supernatant water, as exposure of these ecological receptors to the TSF supernatant water, given the quality, is not a viable operable pathway of exposure. No potential risk was identified to human receptors via ingestion of country foods exposed to the TSF supernatant water as a result of the Project. Therefore, there was no need for risk management measures to serve as a mitigation measure for the Project. Potential risk was identified to a Project Worker who may be exposed to TSF supernatant water via direct dermal contact or incidental ingestion during routine maintenance work. An occupational health and safety plan including additional requirements for personal protective equipment (long sleeves, face shield, gloves etc.) will serve as an appropriate risk management measure or mitigation measure.</p> <p>No residual adverse effects were identified to human health or ecological receptors in the 2018 HHERA Report.</p> <p><u>PART D:</u></p> <p>A number of Round 2 Information Requests asked that the Follow-Up Program submitted as Section 13 of the EIS (April 2018) be revised. The Goliath Gold Follow-Up Addendum has been provided in support of the Round 2 Information Request Process and delivers a comprehensive and consolidated answer to all Round 2 Information Requests related to the Follow-Up Programs including those related to verifying the predictions with respect to the ecological risk assessment. The expectation is that if on-going monitoring in support of the Follow-Up Programs identifies that the mitigation measures to reduce exposure of wildlife to the TSF are not effective, and multiple lines of evidence support that there is potential risk to ecological receptors (as defined by current federal Ecological Risk Assessment guidance), then additional contingency measures may need to be considered.</p> <p>References:</p> <ul style="list-style-type: none"> ● Devuyt, E.A., B.R. Conrad, and G. Robbins. 1988. Commercial performance of Inco's SO₂-air cyanide removal process. Pages 87-88 in Proceedings Randol Gold Conference. Golden, CO: Randol International Ltd.

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				<ul style="list-style-type: none"> • Devuyst, E.A., B.R. Conrad, G. Robbins, and R. Vergunst. 1989. INCO SO₂-Air Cyanide Removal Process Update. Pages 353-356 in Proceedings World Gold '89. • Government of Canada, Federal Contaminated Sites Action Plan (FCSAP). 2012. Ecological Risk Assessment Guidance. March 2012. • Government of Canada, Federal Contaminated Sites Action Plan (FCSAP). 2010. Ecological Risk Assessment Guidance: Module 1: toxicity test selection and interpretation. March 2010. • Government of Canada, Federal Contaminated Sites Action Plan (FCSAP). 2010. Ecological Risk Assessment Guidance: Module 2: selection or development of site-specific toxicity reference values. March 2010. • Government of Canada, Federal Contaminated Sites Action Plan (FCSAP). 2012. Ecological Risk Assessment Guidance: Module 3: standardization of wildlife receptor characteristics. March 2012. • Health Canada (HC). 2018. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Country Foods. Dated June 2018. <p><u>Agency Comment on Draft Response:</u></p> <p>C. The Agency has reviewed the response to TMI_872-WL(2)-03. The proponent has committed to implemented fencing, bird deterrent flags to reduce exposure of wildlife to TSF supernatant water.</p> <p>D. The Agency has reviewed the response and the FUP addendum.</p> <p>The FUP addendum states “with respect to confirming the effectiveness of the risk management measures (mitigation measures) to reduce wildlife exposure to the TSF supernatant water, wildlife monitoring surveys may be completed. The surveys may include monitoring of the type of species visiting the TSF, frequency of exposure per day, and length of exposure.”</p> <p>The Agency requests the proponent refrain from use of the word “may” and commit to monitoring open water components of the Project Study Area, in order to confirm the predictions that (a) migratory birds, species at risk, and species of use to Indigenous groups will not be affected by accessing open water components of the project study area, and (b) mitigation measures (including fencing and flagging) is effective. The Agency recommends monitoring open water components of the project study area during all project phases until the rehabilitation of the facilities are complete and in compliance with the Certified Closure Plan. If wildlife is observed accessing the open water components of the Project Study Area, the proponent will implement additional mitigation measures, as required.</p> <p>Update the FUP addendum with confirmation that all open water components of the project study area, including the TSF and onsite pond will be monitored for use by wildlife during all project phases until rehabilitation of the facilities are complete and in compliance with the Certified Closure Plan.</p>

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				<p><u>Specific Response to Agency Comments:</u></p> <p>The text in the Goliath Gold Follow-Up Addendum for Wildlife and Wildlife Habitat, Human Health, Geochemistry and Surface Water Quality have been revised to more clearly reflect the intention of Treasury Metals to monitor the quality of water in the onsite features (relative to Project phase) to ensure that migratory birds, species at risk, and species of use to Indigenous groups will not be affected or that mitigation measures are effective. Treasury Metals has committed that environmental monitoring Environmental monitoring will be conducted in accordance with standard practice and regulatory requirements, including any site –specific environmental approvals would include in compliance with a Certified Closure Plan (Cmt_024). This includes but is not limited to, monitoring the water quality in the open water features. As described in Table 2 herein, the predicted concentrations of chemicals in the open water features of the project are not sufficiently high to pose risk to risk to migratory birds, species at risk, and mammal and bird species of use to Indigenous groups.</p> <p>To support Part D of this information request, a refined ecological toxicity assessment has been completed to evaluate the potential risk to mammals and birds who may access the open water features of the Project including the TSF, and minewater pond during operations, and the pit lake during the post-closure phase. Predicted chemical concentrations in the mine water pond, TSF, and pit lake are compared to ecotoxicity reference values for mammals and birds from literature. For conservatism, the no observable effect level (NOEL) was selected over the lowest observable effect level (LOEL). The values presented in the table are the lower NOEL for either birds or mammals. According the current regulatory ecological risk assessment guidance, a NOEL is typically only employed when assessing potential risk to species at risk (SAR) which require additional protection at the individual level versus the population level. The results of the refined toxicity assessment presented in Table D1 indicate that the predicted chemical concentrations in all open water features are below levels expected to pose risk to mammals or bird, with the exception of cyanide in the TSF. The predicted cyanide concentration of < 1 mg/L exceeds the NOEL (0.16 mg/L) for SAR birds, however not the LOEL of (1.6 mg/L) protective of all other bird (and mammal) species. Recall from Part A of this response that the predicted cyanide concentration in the TSF is a worst-case scenario based on one data point and is therefore an overly conservative estimate. Barn Swallows are the only bird SAR listed as threatened or endangered observed in the local study area for which the NOEL would be appropriate, and nesting sites have not been observed in the existing infrastructure since 2016 as Treasury Metals has made concerted efforts to restrict access to many of the outbuildings on the property. Given, that measures are already in place by Treasury Metals to protect barn swallows, and the results presented in Table 2 suggest that there is no potential risk to all other mammals and birds via exposure to open water Project features, no additional risk management or mitigation measures are required at this time.</p> <p>In the event that the follow-up program for geochemistry described in the Goliath Gold Follow-Up Addendum determines that the concentration of cyanide in the TSF during operations is much higher than the predicted value of < 1 mg/L, than additional contingency measures such as bird deterrent flag would be considered for the protection of Barn Swallows. As described in the Follow-up Addendum, Treasury Metals has submitted an Information Gathering Form and an Alternatives Assessment Form for Barn Swallow, which is currently being review by the Dryden district OMNRF. It is anticipated that an Overall Benefit Permit will be required if some of the structures are dismantled within</p>

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				<p>the footprint which have previously hosted nesting Barn Swallow. Mandatory monitoring and follow-up reporting will be a condition of the Overall Benefit Permit.</p> <p style="text-align: center;">Table 2. Refined Ecological Toxicity Assessment for Mammals and Birds</p> <table border="1"> <thead> <tr> <th rowspan="2">Parameter</th> <th colspan="3">Predicted Concentration in Open Water Project Feature (mg/L/ppm)</th> <th rowspan="2">No Observable Effect Level for the Protection of Mammals / Birds (ppm) ¹</th> <th rowspan="2">Ecological Toxicity Reference Value Source</th> </tr> <tr> <th>Predicted Mine Water Pond</th> <th>Predicted Pit Lake</th> <th>Predicted Tailings Supernatant (mg/L or ppm)</th> </tr> </thead> <tbody> <tr> <td>Aluminum</td> <td>23.35550823</td> <td>0.2735</td> <td>0.199</td> <td>450</td> <td>Los Alamos National Laboratory</td> </tr> <tr> <td>Ammonia (unionized)</td> <td>1.202632474</td> <td>0.003631407</td> <td>0.228</td> <td>—</td> <td>—</td> </tr> <tr> <td>Ammonia (total)</td> <td>31.64822301</td> <td>0.095563351</td> <td>6</td> <td>—</td> <td>—</td> </tr> <tr> <td>Antimony</td> <td>0.000958696</td> <td>0.001132857</td> <td>0.002</td> <td>1470</td> <td>MECP</td> </tr> <tr> <td>Arsenic</td> <td>0.011898774</td> <td>0.001422975</td> <td>0.018</td> <td>333</td> <td>MECP</td> </tr> <tr> <td>Barium</td> <td>0.031456854</td> <td>—</td> <td>0.012</td> <td>672</td> <td>MECP</td> </tr> <tr> <td>Beryllium</td> <td>0.002607453</td> <td>0.001034601</td> <td>0.0005</td> <td>776</td> <td>MECP</td> </tr> <tr> <td>Bismuth</td> <td>0.001627591</td> <td>—</td> <td>0.0005</td> <td>—</td> <td>—</td> </tr> <tr> <td>Boron</td> <td>0.101833915</td> <td>0.051487505</td> <td>0.02</td> <td>115</td> <td>MECP</td> </tr> <tr> <td>Cadmium</td> <td>0.00203497</td> <td>9.37416E-05</td> <td>0.002</td> <td>1.9</td> <td>MECP</td> </tr> <tr> <td>Calcium</td> <td>43.14484489</td> <td>—</td> <td>7.15</td> <td>—</td> <td>—</td> </tr> <tr> <td>Carbonate</td> <td>15.88</td> <td>—</td> <td>15.88</td> <td>—</td> <td>—</td> </tr> <tr> <td>Chromium</td> <td>0.001959249</td> <td>0.000968497</td> <td>0.0001</td> <td>161</td> <td>MECP</td> </tr> <tr> <td>Chloride</td> <td>16.03781075</td> <td>—</td> <td>0.78</td> <td>230</td> <td>Los Alamos National Laboratory</td> </tr> <tr> <td>Cobalt</td> <td>0.206522455</td> <td>0.0009</td> <td>0.004</td> <td>180</td> <td>MECP</td> </tr> <tr> <td>Copper</td> <td>0.076914085</td> <td>0.003885798</td> <td>0.018</td> <td>3060</td> <td>MECP</td> </tr> <tr> <td>Cyanide</td> <td>0.003488829</td> <td>0.002072804</td> <td><1**</td> <td>0.16 (1.6) ^{2,3}</td> <td>Los Alamos National Laboratory</td> </tr> <tr> <td>Iron</td> <td>72.83139034</td> <td>1.495</td> <td>0.358</td> <td>—</td> <td>—</td> </tr> <tr> <td>Lead</td> <td>0.058576655</td> <td>0.002912402</td> <td>0.082</td> <td>32</td> <td>MECP</td> </tr> <tr> <td>Lithium</td> <td>0.080373573</td> <td>—</td> <td>0.024</td> <td>153.6</td> <td>Sample et al., 1996</td> </tr> <tr> <td>Magnesium</td> <td>9.253753794</td> <td>—</td> <td>1.44</td> <td>—</td> <td>—</td> </tr> </tbody> </table>	Parameter	Predicted Concentration in Open Water Project Feature (mg/L/ppm)			No Observable Effect Level for the Protection of Mammals / Birds (ppm) ¹	Ecological Toxicity Reference Value Source	Predicted Mine Water Pond	Predicted Pit Lake	Predicted Tailings Supernatant (mg/L or ppm)	Aluminum	23.35550823	0.2735	0.199	450	Los Alamos National Laboratory	Ammonia (unionized)	1.202632474	0.003631407	0.228	—	—	Ammonia (total)	31.64822301	0.095563351	6	—	—	Antimony	0.000958696	0.001132857	0.002	1470	MECP	Arsenic	0.011898774	0.001422975	0.018	333	MECP	Barium	0.031456854	—	0.012	672	MECP	Beryllium	0.002607453	0.001034601	0.0005	776	MECP	Bismuth	0.001627591	—	0.0005	—	—	Boron	0.101833915	0.051487505	0.02	115	MECP	Cadmium	0.00203497	9.37416E-05	0.002	1.9	MECP	Calcium	43.14484489	—	7.15	—	—	Carbonate	15.88	—	15.88	—	—	Chromium	0.001959249	0.000968497	0.0001	161	MECP	Chloride	16.03781075	—	0.78	230	Los Alamos National Laboratory	Cobalt	0.206522455	0.0009	0.004	180	MECP	Copper	0.076914085	0.003885798	0.018	3060	MECP	Cyanide	0.003488829	0.002072804	<1**	0.16 (1.6) ^{2,3}	Los Alamos National Laboratory	Iron	72.83139034	1.495	0.358	—	—	Lead	0.058576655	0.002912402	0.082	32	MECP	Lithium	0.080373573	—	0.024	153.6	Sample et al., 1996	Magnesium	9.253753794	—	1.44	—	—
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				Manganese	0.264411508	—	0.063	377	Sample et al., 1996
				Mercury	4.05761E-05	0.00002	0.0018	20	MECP
				Methyl Mercury	4.05761E-07	0.0000002	0.000018	0.034	MECP
				Molybdenum	0.001539177	0.001009293	0.001	74	MECP
				Nickel	1.569545817	0.025	0.021	5430	MECP
				Nitrate	0.100988237	0.066745946	7.07	2719	Sample et al., 1996
				Phosphorus	0.033439311	0.0304	0.06	—	—
				Potassium	3.259294274	—	1.78	—	—
				Selenium	0.00218106	0.000955146	0.0005	5.5	MECP
				Silicon	6.907871421	—	0.099	—	—
				Silver	0.000148161	9.95605E-05	0.00005	4500	Los Alamos National Laboratory
				Sodium	8.053680117	—	1.16	—	—
				Strontium	0.085422207	—	0.032	1127	Sample et al., 1996
				Sulphates	22.25349884	20	68.67	—	—
				Sulphur	22.94	—	22.94	—	—
				Thallium	0.001065505	0.0003	0.642	47	MECP
				Tin	0.001709083	—	0.0005	29.2	Sample et al., 1996
				Titanium	0.011741183	—	0.003	70	Los Alamos National Laboratory
				Uranium	0.035549481	0.005	0.005	33	MECP
				Vanadium	0.002893586	0.00104014	0.004	18	MECP
				Zinc	0.931078937	0.03	0.04	337	MECP
				<p>Notes:</p> <ul style="list-style-type: none"> — no data. Parameter not modelled or insufficient toxicity data available for mammals and birds to drive a toxicity reference value 1 No observable effect level selected as the lowest of birds or mammals from the applicable toxicity reference value data source 2 Exceeds NOEL for birds, however does not exceed NOEL for mammals 3 Does not exceed Lowest Observable Effect Level for Birds of 1.6 mg/L 					
				<p>Revised Response:</p> <p>Part A:</p>					

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				<p>The reviewers are referred to Section 3 (Project Description) of the revised EIS (April 2018) for a fulsome description of the Project operations and process, as well as the qualities of effluent discharged from the process plant to the tailings storage facility (TSF). A description of these discharges are presented in Section 3.8.8 of the revised EIS (April 2018), and the cyanide treatment process is described in Section 3.8.7.</p> <p>Following the standard carbon-in-leach (CIL) process used to extract gold from the ore, the process water containing cyanide will be reused to the extent possible, and then treated using the INCO/SO₂ cyanide destruction process (which is widely used in the mining industry). Following the INCO/SO₂ process, tailings directed to the TSF will meet the 1 mg/L total cyanide effluent discharge limit set out in the federal Metal Mining Effluent Regulations (MMER). The water covering the TSF will be recycled and used in the processing plant, and excess water that cannot be recycled will be treated in the effluent treatment plant and ultimately discharge to Blackwater Creek. There may be times when the INCO/SO₂ process does not reach 100% efficiency or the INCO/SO₂ process is temporarily not in operation, the concentration of Weak Acid Dissociable (WAD) cyanide in the tailings going to the TSF could be in the range of 10 to 50 mg/L. This in no way implies the concentration of the supernatant water would be this high as these instances would only be temporary, and the small volume of tailings releases with elevated cyanide concentrations (in the range of 10 to 50 mg/L) would be rapidly diluted with the large volume supernatant water in the TSF. Average cyanide concentrations in the supernatant water will in the range of <1 mg/L is still expected in the TSF. It is important to note that the TSF is intended to never reach 50 mg/L. The value of 50 mg/L referred to by the reviewer is referring to periodic releases of effluent to the TSF, not the concentration that is expected within the entire TSF.</p> <p>Treasury Metals will strive to maintain an average target total cyanide concentration within the TSF of 1 mg/L over the long-term basis. In addition, contingency measures, such as hydrogen peroxide treatment to the TSF supernatant water, and incorporation of hydrogen peroxide into the effluent treatment process will be considered as part of the sewage Environmental Compliance Approval (ECA) process with the Ministry of the Environment and Climate Change (MOECC). By design, the cyanide treatment circuit will destroy cyanide to a level acceptable for direct discharge to the environment and reduce the environmental safety requirements placed on the TSF. Within the TSF, the free cyanide concentration is expected to be in the range of 0.2025 mg/L, which corresponds with 1 mg/L of total cyanide in the TSF.</p> <p>The anticipated supernatant water quality within the TSF is as outlined in Table 3.8.8-1 of the revised EIS (April 2018). As discussed above, the relatively small volumes of tailings releases to the TSF with elevated cyanide concentrations (in the range of 10 to 50 mg/L) due to those rare occasions when the INCO/SO₂ process does not reach 100% efficiency or the INCO/SO₂ process is temporarily not in operation would not affect the overall concentrations of cyanide within the TSF, which Treasury Metals will strive to maintain at an average target total cyanide concentration within the TSF of 1 mg/L over the long-term basis.</p> <p>As described in Section 3 of the EIS (April 2018), the predicted TSF supernatant water chemistry coming from the detoxification circuit was modelled using the PHREEQCI model, using results presented in literature (Devuyst et al., 1988; Devuyst et al., 1989) for comparable free milling gold circuits, and only the worst-case maximum predicted value was provided.</p> <p>The assessment of the effects of concentrations of chemicals in source media on human health was performed using a two-step qualitative and quantitative approach. First, contaminants of concern (COCs) were selected via a</p>

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				<p>qualitative screening process where predicted chemical EPCs were compared to their generic health-based Canadian or Ontario criteria/guideline/standard. Where a COC was selected based on an exceedance of its respective qualitative screening criteria, a quantitative assessment was considered. For both the human health risk assessment (HHRA) and ecological risk assessment (ERA), a supplemental screening was completed as part of their respective Problem Formulation steps, using component values specific to each human or ecological receptor, provided by the Ontario Ministry of Environment, Conservation and Parks (MECP, formally the Ontario Ministry of Environment and Climate Change (MOECC)). Chemical concentrations that did not exceed their respective MECP human health or ecological component value were qualitatively considered to present a negligible amount of potential risk for that particular receptor/pathway combination. For concentrations that exceed their respective human health or ecological component value or for which a component value for that pathway was unavailable, they were carried forward for a quantitative assessment of potential risk.</p> <p>The anticipated water quality concentrations for the TSF are provided in Table 1 (Table 3.5.3.5-2 in the 2018 HHERA Report) herein. Table 1 provides the exposure point concentrations (EPCs) of chemicals in the TSF supernatant water and compared the predicted concentrations to risk-based water quality criteria protective of human and ecological receptors. As stated above, the predicted concentrations in the TSF represent a worse-case scenario.</p> <p style="text-align: center;">Table 1 (Table 3.5.3.5-2 of HHERA): Exposure Point Concentration of Metals in TSF Supernatant Water</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Criteria (PWQO/ CWQG or MAC) (mg/L)</th> <th>Predicted Tailings Supernatant Water Quality (mg/L)</th> </tr> </thead> <tbody> <tr><td>Aluminum</td><td>0.075</td><td>0.199</td></tr> <tr><td>Antimony</td><td>0.006</td><td>0.002</td></tr> <tr><td>Arsenic</td><td>0.01</td><td>0.018</td></tr> <tr><td>Barium</td><td>—</td><td>0.012</td></tr> <tr><td>Beryllium</td><td>0.011</td><td>0.0005</td></tr> <tr><td>Bismuth</td><td>—</td><td>0.0005</td></tr> <tr><td>Boron</td><td>0.2</td><td>0.02</td></tr> <tr><td>Cadmium</td><td>0.002</td><td>0.002</td></tr> <tr><td>Calcium</td><td>—</td><td>7.15</td></tr> <tr><td>Carbonate</td><td>—</td><td>15.88</td></tr> <tr><td>Chromium</td><td>0.0089</td><td>0.0001</td></tr> <tr><td>Chloride</td><td>120</td><td>0.78</td></tr> <tr><td>Cobalt</td><td>0.0009</td><td>0.004</td></tr> <tr><td>Copper</td><td>0.005</td><td>0.018</td></tr> <tr><td>Cyanide</td><td>0.005</td><td><1**</td></tr> <tr><td>Iron</td><td>0.3</td><td>0.358</td></tr> <tr><td>Lead</td><td>0.005</td><td>0.082</td></tr> <tr><td>Lithium</td><td>—</td><td>0.024</td></tr> <tr><td>Magnesium</td><td>—</td><td>1.44</td></tr> <tr><td>Manganese</td><td>—</td><td>0.063</td></tr> <tr><td>Mercury</td><td>0.0002</td><td>0.0018</td></tr> <tr><td>Methyl Mercury</td><td>0.00004</td><td>0.0018</td></tr> </tbody> </table>	Parameter	Criteria (PWQO/ CWQG or MAC) (mg/L)	Predicted Tailings Supernatant Water Quality (mg/L)	Aluminum	0.075	0.199	Antimony	0.006	0.002	Arsenic	0.01	0.018	Barium	—	0.012	Beryllium	0.011	0.0005	Bismuth	—	0.0005	Boron	0.2	0.02	Cadmium	0.002	0.002	Calcium	—	7.15	Carbonate	—	15.88	Chromium	0.0089	0.0001	Chloride	120	0.78	Cobalt	0.0009	0.004	Copper	0.005	0.018	Cyanide	0.005	<1**	Iron	0.3	0.358	Lead	0.005	0.082	Lithium	—	0.024	Magnesium	—	1.44	Manganese	—	0.063	Mercury	0.0002	0.0018	Methyl Mercury	0.00004	0.0018
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				<table border="1"> <tr><td>Molybdenum</td><td>0.04</td><td>0.001</td></tr> <tr><td>Nickel</td><td>0.025</td><td>0.021</td></tr> <tr><td>Nitrate (as N)</td><td>13</td><td>7.07</td></tr> <tr><td>Phosphorus</td><td>0.03</td><td>0.06</td></tr> <tr><td>Potassium</td><td>—</td><td>1.78</td></tr> <tr><td>Selenium</td><td>0.1</td><td>0.0005</td></tr> <tr><td>Silicon</td><td>—</td><td>0.099</td></tr> <tr><td>Silver</td><td>0.0001</td><td>0.00005</td></tr> <tr><td>Sodium</td><td>—</td><td>1.16</td></tr> <tr><td>Strontium</td><td>—</td><td>0.032</td></tr> <tr><td>Sulphates</td><td>—</td><td>68.67</td></tr> <tr><td>Sulphur</td><td>—</td><td>22.94</td></tr> <tr><td>Thallium</td><td>0.0003</td><td>0.642</td></tr> <tr><td>Tin</td><td>—</td><td>0.0005</td></tr> <tr><td>Titanium</td><td>—</td><td>0.003</td></tr> <tr><td>Uranium</td><td>0.005</td><td>0.005</td></tr> <tr><td>Vanadium</td><td>0.006</td><td>0.004</td></tr> <tr><td>Zinc</td><td>0.03</td><td>0.04</td></tr> </table> <p>NOTES:</p> <table border="0"> <tr> <td>Units</td> <td>All units in mg/L</td> </tr> <tr> <td>BOLD & SHADED</td> <td>Concentration exceeds criteria, parameter carried forward as COC in HHERA</td> </tr> <tr> <td>BOLD & SHADED</td> <td>Concentration exceeds criteria, however criteria set based on criteria other than human or ecological health. Parameter is not carried forward as COC in HHERA.</td> </tr> </table> <p>Two parameters, iron and phosphorus, exceeded their respective surface water quality standard in TSF supernatant water, however, are not carried forward as COCs in the HHERA based on the following rationale:</p> <ul style="list-style-type: none"> • Phosphorus: Phosphorus is an essential macronutrient for plant growth and is ubiquitous in the environment. However, at elevated levels phosphorus can lead to the proliferation of algae blooms and the eutrophication of waterways. The primary concern of phosphorus is eutrophication rather than chemical specific toxicity and as such no risk-based soil standards or guidelines are available. It is not considered a COC to human or ecological receptors, and is subsequently not carried forward for further assessment. • Iron: Iron is naturally occurring via erosion and weathering of rocks and minerals. The concentration of iron in the watersheds surrounding the Goliath Gold Project is naturally above the screening criteria. The surface water quality guidelines for iron are set based on aesthetic criteria (i.e., taste and staining of drinking water) rather than protection of human or ecological receptors. It is not considered a COC to human or ecological receptors, and is subsequently not carried forward for further assessment. <p><u>PART B:</u></p> <p>The revised effects of the Project on human health and ecological receptors via exposure to the TSF supernatant water is provided in the 2018 HHERA Report provided in support of the Round 2 Information Request process. A revised ecological risk assessment of potential effects to wildlife including to migratory birds, flying species at risk</p>	Molybdenum	0.04	0.001	Nickel	0.025	0.021	Nitrate (as N)	13	7.07	Phosphorus	0.03	0.06	Potassium	—	1.78	Selenium	0.1	0.0005	Silicon	—	0.099	Silver	0.0001	0.00005	Sodium	—	1.16	Strontium	—	0.032	Sulphates	—	68.67	Sulphur	—	22.94	Thallium	0.0003	0.642	Tin	—	0.0005	Titanium	—	0.003	Uranium	0.005	0.005	Vanadium	0.006	0.004	Zinc	0.03	0.04	Units	All units in mg/L	BOLD & SHADED	Concentration exceeds criteria, parameter carried forward as COC in HHERA	BOLD & SHADED	Concentration exceeds criteria, however criteria set based on criteria other than human or ecological health. Parameter is not carried forward as COC in HHERA.
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				<p>(birds and bats), and species of interest to Indigenous group was completed as part of the ecological risk assessment in Section 5 of the HHERA. The potential risk to human receptors who may be exposed to chemicals in the TSF via the ingestion of country foods, was assessed as part of the human health risk assessment in Section 4 of the 2018 HHERA Report. Recall from Part A of this response, that the available predicted TSF supernatant water quality used as an exposure point concentration in both the ERA and HHRA represented a maximum worst-case scenario based on modelling. Therefore, the current predicted TSF supernatant water quality is likely to result in an overestimate of potential risk.</p> <p>Potential Risk to Wildlife</p> <p>The predicted concentrations of chemicals in the open water features of the project are not sufficiently high to pose risk to migratory birds, species at risk, and mammal and bird species of use to Indigenous groups. A refined ecological toxicity assessment was completed to evaluate the potential risk to mammals and birds who may access the open water features of the Project including the TSF, and minewater pond during operations, and the pit lake during the post-closure phase. The information provided herein is also incorporated into the 2018 HHERA Report. Predicted chemical concentrations in the mine water pond, TSF, and pit lake are compared to ecotoxicity reference values for mammals and birds from literature. For conservatism, the no observable effect level (NOEL) was selected over the lowest observable effect level (LOEL). The values presented in the table are the lower NOEL for either birds or mammals. According to the current regulatory ecological risk assessment guidance, a NOEL is typically only employed when assessing potential risk to species at risk (SAR) which require additional protection at the individual level versus the population level. The results of the refined toxicity assessment presented in Table 2 indicate that the predicted chemical concentrations in all open water features are below levels expected to pose risk to mammals or bird, with the exception of cyanide in the TSF. The predicted cyanide concentration of < 1 mg/L exceeds the NOEL (0.16 mg/L) for SAR birds, however not the LOEL of (1.6 mg/L) protective of all other bird (and mammal) species. Barn Swallows are the only bird SAR listed as threatened or endangered observed in the local study area for which the NOEL would be appropriate, and nesting sites have not been observed in the existing infrastructure since 2016 as Treasury Metals has made concerted efforts to restrict access to many of the outbuildings on the property. Given, that measures are already in place by Treasury Metals to protect barn swallows, and the results presented in Table D1 suggest that there is no potential risk to all other mammals and birds via exposure to open water Project features, no additional risk management or mitigation measures are required at this time.</p> <p style="text-align: center;">Table 2. Refined Ecological Toxicity Assessment for Mammals and Birds</p> <table border="1"> <thead> <tr> <th rowspan="2">Parameter</th> <th colspan="3">Predicted Concentration in Open Water Project Feature (mg/L/ppm)</th> <th rowspan="2">No Observable Effect Level for the Protection of Mammals / Birds (ppm) ¹</th> <th rowspan="2">Ecological Toxicity Reference Value Source</th> </tr> <tr> <th>Predicted Mine Water Pond</th> <th>Predicted Pit Lake</th> <th>Predicted Tailings</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Parameter	Predicted Concentration in Open Water Project Feature (mg/L/ppm)			No Observable Effect Level for the Protection of Mammals / Birds (ppm) ¹	Ecological Toxicity Reference Value Source	Predicted Mine Water Pond	Predicted Pit Lake	Predicted Tailings						
Parameter	Predicted Concentration in Open Water Project Feature (mg/L/ppm)			No Observable Effect Level for the Protection of Mammals / Birds (ppm) ¹		Ecological Toxicity Reference Value Source													
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							Supernatant (mg/L or ppm)		
				Aluminum	23.35550823	0.2735	0.199	450	Los Alamos National Laboratory
				Ammonia (unionized)	1.202632474	0.003631407	0.228	—	—
				Ammonia (total)	31.64822301	0.095563351	6	—	—
				Antimony	0.000958696	0.001132857	0.002	1470	MECP
				Arsenic	0.011898774	0.001422975	0.018	333	MECP
				Barium	0.031456854	—	0.012	672	MECP
				Beryllium	0.002607453	0.001034601	0.0005	776	MECP
				Bismuth	0.001627591	—	0.0005	—	—
				Boron	0.101833915	0.051487505	0.02	115	MECP
				Cadmium	0.00203497	9.37416E-05	0.002	1.9	MECP
				Calcium	43.14484489	—	7.15	—	—
				Carbonate	15.88	—	15.88	—	—
				Chromium	0.001959249	0.000968497	0.0001	161	MECP
				Chloride	16.03781075	—	0.78	230	Los Alamos National Laboratory
				Cobalt	0.206522455	0.0009	0.004	180	MECP
				Copper	0.076914085	0.003885798	0.018	3060	MECP
				Cyanide	0.003488829	0.002072804	<1**	0.16 (1.6) ^{2,3}	Los Alamos National Laboratory
				Iron	72.83139034	1.495	0.358	—	—
				Lead	0.058576655	0.002912402	0.082	32	MECP
				Lithium	0.080373573	—	0.024	153.6	Sample et al., 1996
				Magnesium	9.253753794	—	1.44	—	—
				Manganese	0.264411508	—	0.063	377	Sample et al., 1996
				Mercury	4.05761E-05	0.00002	0.0018	20	MECP
				Methyl Mercury	4.05761E-07	0.0000002	0.000018	0.034	MECP
				Molybdenum	0.001539177	0.001009293	0.001	74	MECP
				Nickel	1.569545817	0.025	0.021	5430	MECP
				Nitrate	0.100988237	0.066745946	7.07	2719	Sample et al., 1996

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				Phosphorus	0.033439311	0.0304	0.06	—	—	
				Potassium	3.259294274	—	1.78	—	—	
				Selenium	0.00218106	0.000955146	0.0005	5.5	MECP	
				Silicon	6.907871421	—	0.099	—	—	
				Silver	0.000148161	9.95605E-05	0.00005	4500	Los Alamos National Laboratory	
				Sodium	8.053680117	—	1.16	—	—	
				Strontium	0.085422207	—	0.032	1127	Sample et al., 1996	
				Sulphates	22.25349884	20	68.67	—	—	
				Sulphur	22.94	—	22.94	—	—	
				Thallium	0.001065505	0.0003	0.642	47	MECP	
				Tin	0.001709083	—	0.0005	29.2	Sample et al., 1996	
				Titanium	0.011741183	—	0.003	70	Los Alamos National Laboratory	
				Uranium	0.035549481	0.005	0.005	33	MECP	
				Vanadium	0.002893586	0.00104014	0.004	18	MECP	
				Zinc	0.931078937	0.03	0.04	337	MECP	
				<p>Notes:</p> <ul style="list-style-type: none"> — no data. Parameter not modelled or insufficient toxicity data available for mammals and birds to drive a toxicity reference value 1 No observable effect level selected as the lowest of birds or mammals from the applicable toxicity reference value data source 2 Exceeds NOEL for birds, however does not exceed NOEL for mammals 3 Does not exceed Lowest Observable Effect Level for Birds of 1.6 mg/L <p>In the event that the follow-up program for geochemistry described in the Goliath Gold Follow-Up Addendum determines that the concentration of cyanide in the TSF during operations is much higher than the predicted value of < 1 mg/L, then additional contingency measures such as bird deterrent flag would be considered for the protection of Barn Swallows. As described in the Follow-up Addendum, Treasury Metals has submitted an Information Gathering Form and an Alternatives Assessment Form for Barn Swallow, which is currently being review by the Dryden district OMNRF. It is anticipated that an Overall Benefit Permit will be required if some of the structures are dismantled within the footprint which have previously hosted nesting Barn Swallow. Mandatory monitoring and follow-up reporting will be a condition of the Overall Benefit Permit.</p> <p>Potential Risk to Indigenous Groups who Consume Wildlife</p> <p>The potential effects to human receptors who may consume wildlife exposure to the TSF supernatant water was performed in the Human Health Risk Assessment provided as Section 4 of the 2018 HHERA. The concentrations of chemicals from environmental and Project specific media (i.e. TSF supernatant water) in country foods were</p>						

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				<p>quantified in Section 3.6 of the HHERA. The species selected in the assessment were based on traditional knowledge and information regarding current use of lands and resources for traditional purposes shared with Treasury Metals during ongoing engagement activities. For safety purposes, access to Study Area No. 1 the Operations Area (i.e. the TSF supernatant water) will be restricted to only employees of Treasury Metals during the active phases of the Project (i.e., Site Preparation and Construction, Operations, and Closure) and no country foods will be harvested from the Operations Area during these Project Phases. Country foods harvesting may resume at Study Area No. 1 the Operations Area during the Post-Closure phase of the Project, however there is no longer TSF supernatant water following closure of the Project, therefore this is not considered an operable pathway of exposure. Although restricting access to human receptors within the Operations Area is a reasonable administrative control for public safety, restricting access to mobile animals such as birds (e.g., grouse and duck) and small mammals (e.g., rabbit) may not be feasible or 100% effective. Thus, these ecological receptors (and country food items) may be exposed to Project-specific media within the Operations Area and then consumed either by larger predatory species or human receptors off-site. Given the small amount of habitat available, an assumption was made that 5% of the country foods consumed by human receptors in Study Areas No. 2 and 3 may come from the Operations Area during the Site Preparation and Construction, Operations, and Closure phases of the Project (i.e. conservatively assumes that 5% of country foods live 100% of their lives within the operations area). Sample calculations are provided in Appendix II - Supplemental Information for the HHRA of Country Foods for the Goliath Gold Project to the 2018 HHERA Report.</p> <p>Uptake of chemicals from all media, including the TSF supernatant water were modelled into the following human and ecological receptor food groups:</p> <ul style="list-style-type: none"> • Invertebrates <ul style="list-style-type: none"> ○ Soil invertebrate • Plants <ul style="list-style-type: none"> ○ Forage; ○ Root Vegetables; ○ Berries (assumed to include raspberry- <i>Rubus strigosus</i>, blueberry-<i>Vaccinium angustifolium</i>, and/or strawberry <i>Fragaria virginiana</i>); ○ Macrophytes including Wild Rice (<i>Zizania palustris</i>); and ○ Medicinal Plants including Labrador Tea (<i>Ledum groenlandicum</i>). • Meat (Wild Game) <ul style="list-style-type: none"> ○ Moose (<i>Acles acles</i>); ○ Ruffed Grouse (<i>Bonasa umbellus</i>); ○ Mallard Duck (<i>Anas platyrhynchos</i>); and ○ Snowshoe Hare (<i>Lepus americanus</i>). • Fish

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				<ul style="list-style-type: none"> ○ Measured fish (Walleye- <i>Sander vitreus</i> and Sauger- <i>Sander canadensis</i>); and ○ Modelled fish (assumed to be Walleye- <i>Sander vitreus</i> and Sauger- <i>Sander canadensis</i>). <p><u>PART C:</u> As described in Section 5 of the HHERA, water quality will be monitored to determine if additional risk management or mitigation measures are required to deter migratory birds, species at risk, and species of use to Indigenous groups from accessing the onsite open water features (e.g. TSF during operations and pit lake during post-closure). The results of the wildlife toxicity assessment completed as part of the ecological risk assessment (Section 5 of the HHERA Report) indicated that the water quality of all open water components will not be degraded to an extent that would pose acute lethality or population effects to wildlife including birds or SAR. As such, it is unlikely that additional mitigation measures would be required. However, if water quality was degraded beyond the predicted levels, then additional mitigation measures such as fencing, and bird deterrent flags would serve as mitigation measures to effectively reduce exposure of wildlife to the TSF supernatant water. A monitoring program would also be instituted where the frequency and duration of wildlife exposure to the onsite open water features would occur to measure the effectiveness of the implemented mitigation measures.</p> <p><u>PART D:</u> The text in the Goliath Gold Follow-Up Addendum for Wildlife and Wildlife Habitat, Human Health, Geochemistry and Surface Water Quality have been revised to more clearly reflect the intention of Treasury Metals to monitor the quality of water in the onsite features (relative to Project phase) to ensure that migratory birds, species at risk, and species of use to Indigenous groups will not be affected or that mitigation measures are effective. The Goliath Gold Follow Up Addendum supersedes Section 13 of the revised EIS (April 2018). Treasury Metals has committed that environmental monitoring Environmental monitoring will be conducted in accordance with standard practice and regulatory requirements, including any site –specific environmental approvals would include in compliance with a Certified Closure Plan (Cmt_024). This includes but is not limited to, monitoring the water quality in the open water features. As described in Table 2 herein, the predicted concentrations of chemicals in the open water features of the project are not sufficiently high to pose risk to risk to migratory birds, species at risk, and mammal and bird species of use to Indigenous groups. In addition, the quality of the of wildlife for consumption by Indigenous communities is also not anticipated to change significantly from baseline, as a result of wildlife exposure to open water components of the Project. Therefore, no mitigation measures are required, and subsequently a follow-up program is not required to confirm the effectiveness.</p> <p>In the event that the follow-up program for geochemistry described in the Goliath Gold Follow-Up Addendum determines that the concentration of cyanide in the TSF during operations is much higher than the predicted value of < 1 mg/L, than additional contingency measures such as bird deterrent flag would be considered for the protection of Barn Swallows. As described in the Follow-up Addendum, Treasury Metals has submitted an Information Gathering Form and an Alternatives Assessment Form for Barn Swallow, which is currently being review by the Dryden district OMNRF. It is anticipated that an Overall Benefit Permit will be required if some of the structures are dismantled within</p>

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				<p>the footprint which have previously hosted nesting Barn Swallow. Mandatory monitoring and follow-up reporting will be a condition of the Overall Benefit Permit. A detailed description regarding the Follow-Up Monitoring Program for Barn Swallows has also been provided as part of the Round 2 response process as described in the Goliath Gold Follow-Up Addendum.</p> <p>References:</p> <ul style="list-style-type: none"> • Devuyst, E.A., B.R. Conrad, and G. Robbins. 1988. Commercial performance of Inco's SO₂-air cyanide removal process. Pages 87-88 in Proceedings Randol Gold Conference. Golden, CO: Randol International Ltd. • Devuyst, E.A., B.R. Conrad, G. Robbins, and R. Vergunst. 1989. INCO SO₂-Air Cyanide Removal Process Update. Pages 353-356 in Proceedings World Gold '89. • Government of Canada, Federal Contaminated Sites Action Plan (FCSAP). 2012. Ecological Risk Assessment Guidance. March 2012. • Government of Canada, Federal Contaminated Sites Action Plan (FCSAP). 2010. Ecological Risk Assessment Guidance: Module 1: toxicity test selection and interpretation. March 2010. • Government of Canada, Federal Contaminated Sites Action Plan (FCSAP). 2010. Ecological Risk Assessment Guidance: Module 2: selection or development of site-specific toxicity reference values. March 2010. • Government of Canada, Federal Contaminated Sites Action Plan (FCSAP). 2012. Ecological Risk Assessment Guidance: Module 3: standardization of wildlife receptor characteristics. March 2012. • Health Canada (HC). 2018. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Country Foods. Dated June 2018. <p><u>Agency Comment on Revised Response</u></p> <p>D. The Agency has reviewed the <i>Summary of Follow-up Addendum and Preliminary Monitoring Addendum Changes for Wildlife and Wildlife Habitat</i>. The Agency acknowledges the proponent's statement: "predicted chemical concentrations in all open water features are below levels expected to pose risk to mammals or bird, with the exception of cyanide in the TSF" and "the predicted cyanide concentration of 1 mg/L exceeds the NOEL (0.16 mg/L) for SAR birds."</p> <p>Comment-Given the presence of potential habitat for avian species at risk within the local study area as shown in TMI_952-WL(2)-07_Table_2, there is the possibility for avian species at risk to be exposed to cyanide within the TSF. The Agency acknowledges the proponent's statement that "the predicted cyanide concentration in the TSF is a worst-case scenario," however the Agency will require monitoring of the TSF for migratory birds, and if migratory birds are observed using the TSF, the implementation of deterrents. The</p>

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				<p>rationale, for this m to mitigate harm or mortality to migratory birds, including avian species at risk. The program would include measures to determine of the effectiveness of any deterrents.</p> <p><u>Comment to Agency Comment</u></p> <p>As part of the draft review process, Treasury Metals issued a Draft Goliath Gold Project Follow Up Addendum, and will issue a Final Goliath Gold Project Follow Up Addendum once all of the information requests have been reviewed by the Agency and comments provided to Treasury Metals. Treasury Metals highlights, that as per the Revised Draft Response, Treasury Metals has already stated that they have a monitoring program in place for barn swallows (the only migratory bird SAR predicted at the site for which may experience potential risk via exposure to the TSF) and that they will monitor water quality in the open water features including the TSF to ensure adequate protection is provided to human and ecological receptors, and they will implement risk management/ contingency measures if required (such as bird deterrents). These statements are provided in the Final Goliath Gold Project Follow Up Addendum as per the Revised Draft IR response.</p> <p>It is important to highlight that the cyanide concentration currently predicted in the TSF is less than 1 mg/L, thus it may actually be less than 0.16 mg/L which is protective of SAR. In addition to monitoring barn swallows (for which Treasury Metals already has submitted an Information Gathering Form and an Alternatives Assessment Form for Barn Swallow, which is currently being review by the Dryden district OMNRF), the geochemistry of the TSF supernatant water including the cyanide concentration must also be confirmed. In the event the cyanide concentration is greater than the NOAEL for birds of 0.16 mg/L based on the results of the geochemistry follow up program, and the barn swallow / migratory bird monitoring program indicates that the barn swallows are frequently using the TSF and there is a risk of them experiencing harm and mortality, then Treasury Metals will implement further contingency measures which could include bird deterrents flags or other effective measures and will monitor the success of these risk management/contingency measures.</p> <p>Treasury Metals understands the rationale provided by the Agency that the objective is to ensure no harm or mortality to migratory birds, which is why Treasury Metals is committed to ensuring that the health of all wildlife, including migratory birds and species at risk has been appropriately assessed in the revised EIS (April 2018), Round 2 information requests, and ecological risk assessment, and a comprehensive follow up and monitoring programs designed to verify the predictions and effectiveness of mitigation measures (if required) have been described.</p> <p><u>FINAL Response:</u></p> <p><u>Part A:</u></p> <p>The reviewers are referred to Section 3 (Project Description) of the revised EIS (April 2018) for a fulsome description of the Project operations and process, as well as the qualities of effluent discharged from the process plant to the tailings storage facility (TSF). A description of these discharges are presented in Section 3.8.8 of the revised EIS (April 2018), and the cyanide treatment process is described in Section 3.8.7.</p> <p>Following the standard carbon-in-leach (CIL) process used to extract gold from the ore, the process water containing cyanide will be reused to the extent possible, and then treated using the INCO/SO₂ cyanide destruction process</p>

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				<p>(which is widely used in the mining industry). Following the INCO/SO₂ process, tailings directed to the TSF will meet the 1 mg/L total cyanide effluent discharge limit set out in the federal Metal and Diamond Mining Effluent Regulations (MDMER). The water covering the TSF will be recycled and used in the processing plant, and excess water that cannot be recycled will be treated in the effluent treatment plant and ultimately discharge to Blackwater Creek. There may be times when the INCO/SO₂ process does not reach 100% efficiency or the INCO/SO₂ process is temporarily not in operation, the concentration of Weak Acid Dissociable (WAD) cyanide in the tailings going to the TSF could be in the range of 10 to 50 mg/L. This in no way implies the concentration of the supernatant water would be this high as these instances would only be temporary, and the small volume of tailings releases with elevated cyanide concentrations (in the range of 10 to 50 mg/L) would be rapidly diluted with the large volume supernatant water in the TSF. Average cyanide concentrations in the supernatant water will in the range of less than (<) 1 mg/L is still expected in the TSF. It is important to note that the TSF is intended to never reach 50 mg/L. The value of 50 mg/L referred to by the reviewer is referring to periodic releases of effluent to the TSF, not the concentration that is expected within the entire TSF.</p> <p>Treasury Metals will strive to maintain an average target total cyanide concentration within the TSF of < 1 mg/L over the long-term basis. In addition, contingency measures, such as hydrogen peroxide treatment to the TSF supernatant water, and incorporation of hydrogen peroxide into the effluent treatment process will be considered as part of the sewage Environmental Compliance Approval (ECA) process with the Ministry of the Environment and Climate Change (MOECC). By design, the cyanide treatment circuit will destroy cyanide to a level acceptable for direct discharge to the environment and reduce the environmental safety requirements placed on the TSF. Within the TSF, the free cyanide concentration is expected to be in the range of 0.2025 mg/L, which corresponds with 1 mg/L of total cyanide in the TSF.</p> <p>The anticipated supernatant water quality within the TSF is as outlined in Table 3.8.8-1 of the revised EIS (April 2018). As discussed above, the relatively small volumes of tailings releases to the TSF with elevated cyanide concentrations (in the range of 10 to 50 mg/L) due to those rare occasions when the INCO/SO₂ process does not reach 100% efficiency or the INCO/SO₂ process is temporarily not in operation would not affect the overall concentrations of cyanide within the TSF, which Treasury Metals will strive to maintain at an average target total cyanide concentration within the TSF of 1 mg/L over the long-term basis.</p> <p>As described in Section 3 of the EIS (April 2018), the predicted TSF supernatant water chemistry coming from the detoxification circuit was modelled using the PHREEQC1 model, using results presented in literature (Devuyst et al., 1988; Devuyst et al., 1989) for comparable free milling gold circuits, and only the worst-case maximum predicted value was provided.</p> <p>The assessment of the effects of concentrations of chemicals in source media on human health was performed using a two-step qualitative and quantitative approach. First, contaminants of concern (COCs) were selected via a qualitative screening process where predicted chemical EPCs were compared to their generic health-based Canadian or Ontario criteria/guideline/standard. Where a COC was selected based on an exceedance of its respective qualitative screening criteria, a quantitative assessment was considered. For both the human health risk assessment (HHRA) and ecological risk assessment (ERA), a supplemental screening was completed as part of their respective Problem Formulation steps, using component values specific to each human or ecological receptor, provided by the</p>

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				<p>Ontario Ministry of Environment, Conservation and Parks (MECP, formally the Ontario Ministry of Environment and Climate Change (MOECC)). Chemical concentrations that did not exceed their respective MECP human health or ecological component value were qualitatively considered to present a negligible amount of potential risk for that particular receptor/pathway combination. For concentrations that exceed their respective human health or ecological component value or for which a component value for that pathway was unavailable, they were carried forward for a quantitative assessment of potential risk.</p> <p>The anticipated water quality concentrations for the TSF are provided in Table 1 (Table 3.5.3.5-2 in the 2018 HHERA Report) herein. Table 1 provides the exposure point concentrations (EPCs) of chemicals in the TSF supernatant water and compared the predicted concentrations to risk-based water quality criteria protective of human and ecological receptors. As stated above, the predicted concentrations in the TSF represent a worse-case scenario.</p> <p>Table 1 (Table 3.5.3.5-2 of HHERA): Exposure Point Concentration of Metals in TSF Supernatant Water</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Criteria (PWQO/ CWQG or MAC) (mg/L)</th> <th>Predicted Tailings Supernatant Water Quality (mg/L)</th> </tr> </thead> <tbody> <tr><td>Aluminum</td><td>0.075</td><td>0.199</td></tr> <tr><td>Antimony</td><td>0.006</td><td>0.002</td></tr> <tr><td>Arsenic</td><td>0.01</td><td>0.018</td></tr> <tr><td>Barium</td><td>—</td><td>0.012</td></tr> <tr><td>Beryllium</td><td>0.011</td><td>0.0005</td></tr> <tr><td>Bismuth</td><td>—</td><td>0.0005</td></tr> <tr><td>Boron</td><td>0.2</td><td>0.02</td></tr> <tr><td>Cadmium</td><td>0.002</td><td>0.002</td></tr> <tr><td>Calcium</td><td>—</td><td>7.15</td></tr> <tr><td>Carbonate</td><td>—</td><td>15.88</td></tr> <tr><td>Chromium</td><td>0.0089</td><td>0.0001</td></tr> <tr><td>Chloride</td><td>120</td><td>0.78</td></tr> <tr><td>Cobalt</td><td>0.0009</td><td>0.004</td></tr> <tr><td>Copper</td><td>0.005</td><td>0.018</td></tr> <tr><td>Cyanide</td><td>0.005</td><td><1**</td></tr> <tr><td>Iron</td><td>0.3</td><td>0.358</td></tr> <tr><td>Lead</td><td>0.005</td><td>0.082</td></tr> <tr><td>Lithium</td><td>—</td><td>0.024</td></tr> <tr><td>Magnesium</td><td>—</td><td>1.44</td></tr> <tr><td>Manganese</td><td>—</td><td>0.063</td></tr> <tr><td>Mercury</td><td>0.0002</td><td>0.0018</td></tr> <tr><td>Methyl Mercury</td><td>0.00004</td><td>0.0018</td></tr> <tr><td>Molybdenum</td><td>0.04</td><td>0.001</td></tr> <tr><td>Nickel</td><td>0.025</td><td>0.021</td></tr> <tr><td>Nitrate (as N)</td><td>13</td><td>7.07</td></tr> <tr><td>Phosphorus</td><td>0.03</td><td>0.06</td></tr> <tr><td>Potassium</td><td>—</td><td>1.78</td></tr> <tr><td>Selenium</td><td>0.1</td><td>0.0005</td></tr> </tbody> </table>	Parameter	Criteria (PWQO/ CWQG or MAC) (mg/L)	Predicted Tailings Supernatant Water Quality (mg/L)	Aluminum	0.075	0.199	Antimony	0.006	0.002	Arsenic	0.01	0.018	Barium	—	0.012	Beryllium	0.011	0.0005	Bismuth	—	0.0005	Boron	0.2	0.02	Cadmium	0.002	0.002	Calcium	—	7.15	Carbonate	—	15.88	Chromium	0.0089	0.0001	Chloride	120	0.78	Cobalt	0.0009	0.004	Copper	0.005	0.018	Cyanide	0.005	<1**	Iron	0.3	0.358	Lead	0.005	0.082	Lithium	—	0.024	Magnesium	—	1.44	Manganese	—	0.063	Mercury	0.0002	0.0018	Methyl Mercury	0.00004	0.0018	Molybdenum	0.04	0.001	Nickel	0.025	0.021	Nitrate (as N)	13	7.07	Phosphorus	0.03	0.06	Potassium	—	1.78	Selenium	0.1	0.0005
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				<p>on modelling. Therefore, the current predicted TSF supernatant water quality is likely to result in an overestimate of potential risk.</p> <p>Potential Risk to Wildlife</p> <p>The predicted concentrations of chemicals in the open water features of the project are not sufficiently high to pose risk to migratory birds, species at risk, and mammal and bird species of use to Indigenous groups. A refined ecological toxicity assessment was completed to evaluate the potential risk to mammals and birds who may access the open water features of the Project including the TSF, and minewater pond during operations, and the pit lake during the post-closure phase. The information provided herein is also incorporated into the 2018 HHERA Report. Predicted chemical concentrations in the mine water pond, TSF, and pit lake are compared to ecotoxicity reference values for mammals and birds from literature. For conservatism, the no observable effect level (NOEL) was selected over the lowest observable effect level (LOEL). The values presented in the table are the lower NOEL for either birds or mammals. According the current regulatory ecological risk assessment guidance, a NOEL is typically only employed when assessing potential risk to species at risk (SAR) which require additional protection at the individual level versus the population level. The results of the refined toxicity assessment presented in Table 2 indicate that the predicted chemical concentrations in all open water features are below levels expected to pose risk to mammals or bird, with the exception of cyanide in the TSF. The predicted cyanide concentration of < 1 mg/L exceeds the NOEL (0.16 mg/L) for SAR birds, however not the LOEL of (1.6 mg/L) protective of all other bird (and mammal) species. It is important to highlight that the cyanide concentration currently predicted in the TSF is less than 1 mg/L, thus it may actually be less than 0.16 mg/L. The follow up geochemistry program, as [provided in the Goliath Gold Follow Up Program will be relied upon to confirm the concentration of cyanide in the TSF supernatant water.</p> <p>Barn Swallows are the only bird SAR listed as threatened or endangered observed in the local study area for which the NOEL would be appropriate, and nesting sites have not been observed in the existing infrastructure since 2016 as Treasury Metals has made concerted efforts to restrict access to many of the outbuildings on the property. Measures are already in place by Treasury Metals to protect barn swallows, and the results presented in Table D1 suggest that there is no potential risk to all other mammals and birds via exposure to open water Project features, no additional risk management or mitigation measures are required at this time. As described in the Final Goliath Gold Project Follow-up Addendum, Treasury Metals has submitted an Information Gathering Form and an Alternatives Assessment Form for Barn Swallow, which is currently being review by the Dryden district OMNRF. It is anticipated that an Overall Benefit Permit will be required if some of the structures are dismantled within the footprint which have previously hosted nesting Barn Swallow. Mandatory monitoring and follow-up reporting will be a condition of the Overall Benefit Permit.</p> <p style="text-align: center;">Table 2. Refined Ecological Toxicity Assessment for Mammals and Birds</p> <table border="1"> <thead> <tr> <th rowspan="2">Parameter</th> <th colspan="3">Predicted Concentration in Open Water Project Feature (mg/L/ppm)</th> <th rowspan="2">No Observable Effect Level for the Protection of Mammals / Birds (ppm) ¹</th> <th rowspan="2">Ecological Toxicity Reference Value Source</th> </tr> <tr> <th>Predicted Mine Water Pond</th> <th>Predicted Pit Lake</th> <th>Predicted Tailings</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Parameter	Predicted Concentration in Open Water Project Feature (mg/L/ppm)			No Observable Effect Level for the Protection of Mammals / Birds (ppm) ¹	Ecological Toxicity Reference Value Source	Predicted Mine Water Pond	Predicted Pit Lake	Predicted Tailings						
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							Supernatant (mg/L or ppm)			
				Aluminum	23.35550823	0.2735	0.199	450	Los Alamos National Laboratory	
				Ammonia (unionized)	1.202632474	0.003631407	0.228	—	—	
				Ammonia (total)	31.64822301	0.095563351	6	—	—	
				Antimony	0.000958696	0.001132857	0.002	1470	MECP	
				Arsenic	0.011898774	0.001422975	0.018	333	MECP	
				Barium	0.031456854	—	0.012	672	MECP	
				Beryllium	0.002607453	0.001034601	0.0005	776	MECP	
				Bismuth	0.001627591	—	0.0005	—	—	
				Boron	0.101833915	0.051487505	0.02	115	MECP	
				Cadmium	0.00203497	9.37416E-05	0.002	1.9	MECP	
				Calcium	43.14484489	—	7.15	—	—	
				Carbonate	15.88	—	15.88	—	—	
				Chromium	0.001959249	0.000968497	0.0001	161	MECP	
				Chloride	16.03781075	—	0.78	230	Los Alamos National Laboratory	
				Cobalt	0.206522455	0.0009	0.004	180	MECP	
				Copper	0.076914085	0.003885798	0.018	3060	MECP	
				Cyanide	0.003488829	0.002072804	<1**	0.16 (1.6) ^{2,3}	Los Alamos National Laboratory	
				Iron	72.83139034	1.495	0.358	—	—	
				Lead	0.058576655	0.002912402	0.082	32	MECP	
				Lithium	0.080373573	—	0.024	153.6	Sample et al., 1996	
				Magnesium	9.253753794	—	1.44	—	—	
				Manganese	0.264411508	—	0.063	377	Sample et al., 1996	
				Mercury	4.05761E-05	0.00002	0.0018	20	MECP	
				Methyl Mercury	4.05761E-07	0.0000002	0.000018	0.034	MECP	
				Molybdenum	0.001539177	0.001009293	0.001	74	MECP	
				Nickel	1.569545817	0.025	0.021	5430	MECP	
				Nitrate	0.100988237	0.066745946	7.07	2719	Sample et al., 1996	

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				Phosphorus	0.033439311	0.0304	0.06	—	—	
				Potassium	3.259294274	—	1.78	—	—	
				Selenium	0.00218106	0.000955146	0.0005	5.5	MECP	
				Silicon	6.907871421	—	0.099	—	—	
				Silver	0.000148161	9.95605E-05	0.00005	4500	Los Alamos National Laboratory	
				Sodium	8.053680117	—	1.16	—	—	
				Strontium	0.085422207	—	0.032	1127	Sample et al., 1996	
				Sulphates	22.25349884	20	68.67	—	—	
				Sulphur	22.94	—	22.94	—	—	
				Thallium	0.001065505	0.0003	0.642	47	MECP	
				Tin	0.001709083	—	0.0005	29.2	Sample et al., 1996	
				Titanium	0.011741183	—	0.003	70	Los Alamos National Laboratory	
				Uranium	0.035549481	0.005	0.005	33	MECP	
				Vanadium	0.002893586	0.00104014	0.004	18	MECP	
				Zinc	0.931078937	0.03	0.04	337	MECP	
				<p>Notes:</p> <ul style="list-style-type: none"> — no data. Parameter not modelled or insufficient toxicity data available for mammals and birds to drive a toxicity reference value 1 No observable effect level selected as the lowest of birds or mammals from the applicable toxicity reference value data source 2 Exceeds NOEL for birds, however does not exceed NOEL for mammals 3 Does not exceed Lowest Observable Effect Level for Birds of 1.6 mg/L <p>In the event that the follow-up program for geochemistry described in the Final Goliath Gold Follow-Up Addendum determines that the concentration of cyanide in the TSF during operations are higher than 0.16 mg/L (protective of SAR), and the barn swallow/migratory bird monitoring program indicates that the barn swallows are frequently using the TSF and there is a risk of them experiencing harm and mortality, then Treasury Metals will implement further contingency measures which could include bird deterrents flags or other effective measures and will monitor the success of these risk management/contingency measures. Treasury Metals understands the rationale provided by the Agency that the objective is to ensure no harm or mortality to migratory birds, which is why Treasury Metals is committed to ensuring that the health of all wildlife, including migratory birds and species at risk has been appropriately assessed in the revised EIS (April 2018), Round 2 information requests, and ecological risk assessment, and a comprehensive follow up and monitoring programs designed to verify the predictions and effectiveness of mitigation measures (if required) have been described.</p> <p>Potential Risk to Indigenous Groups who Consume Wildlife</p>						

Unique Identifier	Agency IR #	Annex	Agency / Group / Stakeholder	Cross Reference / Comment / Information Request / Response
				<p>The potential effects to human receptors who may consume wildlife exposure to the TSF supernatant water was performed in the Human Health Risk Assessment provided as Section 4 of the 2018 HHERA. The concentrations of chemicals from environmental and Project specific media (i.e. TSF supernatant water) in country foods were quantified in Section 3.6 of the HHERA. The species selected in the assessment were based on traditional knowledge and information regarding current use of lands and resources for traditional purposes shared with Treasury Metals during ongoing engagement activities. For safety purposes, access to Study Area No. 1 the Operations Area (i.e. the TSF supernatant water) will be restricted to only employees of Treasury Metals during the active phases of the Project (i.e., Site Preparation and Construction, Operations, and Closure) and no country foods will be harvested from the Operations Area during these Project Phases. Country foods harvesting may resume at Study Area No. 1 the Operations Area during the Post-Closure phase of the Project, however there is no longer TSF supernatant water following closure of the Project, therefore this is not considered an operable pathway of exposure. Although restricting access to human receptors within the Operations Area is a reasonable administrative control for public safety, restricting access to mobile animals such as birds (e.g., grouse and duck) and small mammals (e.g., rabbit) may not be feasible or 100% effective. Thus, these ecological receptors (and country food items) may be exposed to Project-specific media within the Operations Area and then consumed either by larger predatory species or human receptors off-site. Given the small amount of habitat available, an assumption was made that 5% of the country foods consumed by human receptors in Study Areas No. 2 and 3 may come from the Operations Area during the Site Preparation and Construction, Operations, and Closure phases of the Project (i.e. conservatively assumes that 5% of country foods live 100% of their lives within the operations area). Sample calculations are provided in Appendix II - Supplemental Information for the HHRA of Country Foods for the Goliath Gold Project to the 2018 HHERA Report.</p> <p>Uptake of chemicals from all media, including the TSF supernatant water were modelled into the following human and ecological receptor food groups:</p> <ul style="list-style-type: none"> • Invertebrates <ul style="list-style-type: none"> ○ Soil invertebrate • Plants <ul style="list-style-type: none"> ○ Forage; ○ Root Vegetables; ○ Berries (assumed to include raspberry- <i>Rubus strigosus</i>, blueberry-<i>Vaccinium angustifolium</i>, and/or strawberry <i>Fragaria virginiana</i>); ○ Macrophytes including Wild Rice (<i>Zizania palustris</i>); and ○ Medicinal Plants including Labrador Tea (<i>Ledum groenlandicum</i>). • Meat (Wild Game) <ul style="list-style-type: none"> ○ Moose (<i>Acles acles</i>); ○ Ruffed Grouse (<i>Bonasa umbellus</i>); ○ Mallard Duck (<i>Anas platyrhynchos</i>); and

Unique Identifier	Agency IR #	Annex	Agency / Group / Stakeholder	Cross Reference / Comment / Information Request / Response
				<ul style="list-style-type: none"> ○ Snowshoe Hare (<i>Lepus americanus</i>). ● Fish <ul style="list-style-type: none"> ○ Measured fish (Walleye- <i>Sander vitreus</i> and Sauger- <i>Sander canadensis</i>); and ○ Modelled fish (assumed to be Walleye- <i>Sander vitreus</i> and Sauger- <i>Sander canadensis</i>). <p>Potential risk to Indigenous communities via the consumption of country foods was determined to be essentially negligible. A follow up program for country foods has been provided in the Final Goliath Gold Project Follow Up Addendum.</p> <p><u>PART C:</u></p> <p>As described in Section 5 of the HHERA, water quality will be monitored to determine if additional risk management or mitigation measures are required to deter migratory birds, species at risk, and species of use to Indigenous groups from accessing the onsite open water features (e.g. TSF during operations and pit lake during post-closure). The results of the wildlife toxicity assessment completed as part of the ecological risk assessment (Section 5 of the HHERA Report) indicated that the water quality of all open water components will not be degraded to an extent that would pose acute lethality or population effects to wildlife including birds or SAR. As such, it is unlikely that additional mitigation measures would be required. However, if water quality was degraded beyond the predicted levels, then additional mitigation measures such as fencing, and bird deterrent flags would serve as mitigation measures to effectively reduce exposure of wildlife to the TSF supernatant water. A monitoring program would also be instituted where the frequency and duration of wildlife exposure to the onsite open water features would occur to measure the effectiveness of the implemented mitigation measures.</p> <p><u>PART D:</u></p> <p>The text in the Goliath Gold Follow-Up Addendum for Wildlife and Wildlife Habitat, Human Health, Geochemistry and Surface Water Quality have been revised to more clearly reflect the intention of Treasury Metals to monitor the quality of water in the onsite features (relative to Project phase) to ensure that migratory birds, species at risk, and species of use to Indigenous groups will not be affected or that mitigation measures are effective. The Goliath Gold Follow Up Addendum supersedes Section 13 of the revised EIS (April 2018). Treasury Metals has committed that environmental monitoring Environmental monitoring will be conducted in accordance with standard practice and regulatory requirements, including any site –specific environmental approvals would include in compliance with a Certified Closure Plan (Cmt_024). This includes but is not limited to, monitoring the water quality in the open water features. As described in Table 2 herein, the predicted concentrations of chemicals in the open water features of the project are not sufficiently high to pose risk to risk to migratory birds, species at risk, and mammal and bird species of use to Indigenous groups. In addition, the quality of the of wildlife for consumption by Indigenous communities is also not anticipated to change significantly from baseline, as a result of wildlife exposure to open water components of the Project. Therefore, no mitigation measures are required, and subsequently a follow-up program is not required to confirm the effectiveness.</p>

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				<p>In the event that the follow-up program for geochemistry described in the Goliath Gold Follow-Up Addendum determines that the concentration of cyanide in the TSF during operations is much higher than the predicted value of 0.16 mg/L (protective of migratory birds that are also SAR e.g. barn swallows), then additional contingency measures such as bird deterrent flag would be considered for the protection of these species. As described in the Follow-up Addendum, Treasury Metals has submitted an Information Gathering Form and an Alternatives Assessment Form for Barn Swallow, which is currently being review by the Dryden district OMNRF. It is anticipated that an Overall Benefit Permit will be required if some of the structures are dismantled within the footprint which have previously hosted nesting Barn Swallow. Mandatory monitoring and follow-up reporting will be a condition of the Overall Benefit Permit. A detailed description regarding the Follow-Up Monitoring Program for Barn Swallows has also been provided as part of the Round 2 response process as described in the Goliath Gold Project Follow-Up Addendum.</p> <p>References:</p> <ul style="list-style-type: none"> • Devuyst, E.A., B.R. Conrad, and G. Robbins. 1988. Commercial performance of Inco's SO₂-air cyanide removal process. Pages 87-88 in Proceedings Randol Gold Conference. Golden, CO: Randol International Ltd. • Devuyst, E.A., B.R. Conrad, G. Robbins, and R. Vergunst. 1989. INCO SO₂-Air Cyanide Removal Process Update. Pages 353-356 in Proceedings World Gold '89. • Government of Canada, Federal Contaminated Sites Action Plan (FCSAP). 2012. Ecological Risk Assessment Guidance. March 2012. • Government of Canada, Federal Contaminated Sites Action Plan (FCSAP). 2010. Ecological Risk Assessment Guidance: Module 1: toxicity test selection and interpretation. March 2010. • Government of Canada, Federal Contaminated Sites Action Plan (FCSAP). 2010. Ecological Risk Assessment Guidance: Module 2: selection or development of site-specific toxicity reference values. March 2010. • Government of Canada, Federal Contaminated Sites Action Plan (FCSAP). 2012. Ecological Risk Assessment Guidance: Module 3: standardization of wildlife receptor characteristics. March 2012. • Health Canada (HC). 2018. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Country Foods. Dated June 2018.

TMI_873-WL(2)-04

Unique Identifier	Agency IR #	Annex	Agency / Group / Stakeholder	Cross Reference / Comment / Information Request / Response	
TMI_873-WL(2)-04	WL(2)-04	1	CEA Agency	Reference to EIS Guidelines:	Part 2, Section 9.1.2
				Reference to EIS / Appendix	Section 10
				Cross-reference to Round 1 IRs	TMI_152-WL(1)-09
				<p>Context and Rationale:</p> <ul style="list-style-type: none"> The proposed effluent discharge location appears to be located within wetland WLD3, a swamp/marsh complex. It is upstream of WLD6, a marsh where wild rice, a species of interest to Indigenous groups has been identified. These wetland types are considered habitat for migratory birds and species at risk (SAR), including Canada Warbler (SAR and migratory bird), least bittern (SAR, and migratory bird), rusty blackbird (SAR, and migratory bird), yellow rail (SAR, and migratory bird) and snapping turtle (SAR), as well as species of interest to Indigenous groups including moose, wild rice and waterfowl. Section 10 of the revised EIS includes the following mitigation measures associated with effluent discharge in the revised EIS: <ul style="list-style-type: none"> Mitigation 057 states that “On-site storage facilities will allow for the effective management of water, reducing the need for discharges, especially during periods when conditions are not suitable. Onsite storage facilities will allow for the effective management of water, reducing the amount for water taken from adjacent watercourses. [Mit_057].” Mitigation 035 states “All final effluent discharge points will have control structures to immediately cease discharge if and when necessary [Cmt_035]” The Agency notes as well, that Table 13.22-1 in Section 13 of the revised EIS states that wetland water level and flora monitoring will occur within the drawdown zone. Wetlands are sensitive to changes in surface and groundwater hydrology and alterations to the soil and vegetation within their catchment area in addition to changes in surface water quality. Additional information on the mitigation measures to protect the wetlands surrounding the effluent release point is required to understand the potential effect of effluent discharge on wetlands and possible resulting impacts to wild rice, as well as to wildlife such as migratory birds, SAR, and species of interest to Indigenous groups. 	

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				<p><u>Specific Question / Request for Information:</u></p> <p>A. Provide details on the monitoring programs that will be used to assess the effectiveness of the mitigation measures in reducing the effects of effluent discharge on wetlands, and conditions that would trigger the reduction or termination of effluent discharge.</p> <p>Include:</p> <ul style="list-style-type: none"> ○ wetland water level and flora composition monitoring locations; ○ monitoring conditions that would trigger the reduction or termination of effluent discharge release. <p>B. Consider additional wetlands that may be identified as a result of revised wetland mapping [WL(2)-03] that may be affected by alterations to the flow of Blackwater Creek.</p> <p><u>DRAFT Response:</u></p> <p>A. Sections 13.15.3.1 and 13.15.3.2 of the revised EIS (April 2018) describe the follow-up monitoring program for wetlands and vegetation potentially affected by the Project. Wetland monitoring described in Section 13.15.3 of the revised EIS includes;</p> <ul style="list-style-type: none"> • Wetland extent mapping will be carried out to determine the wetland extent within the LSA, and the 2 m groundwater drawdown zone; • Wetland monitoring will be conducted to ensure no impacts to wetland water levels inside the drawdown zone is occurring; and • Wetland floral surveys will be conducted to verify that wetland species diversity is maintained. <p>As shown in Figure TMI_873-WL(2)-04, WLD3, WLD 13a, WLD 10, and WLD 6 will be monitored to ensure no loss of area occurs, and floral and faunal communities remain consistent with surrounding wetlands. In addition, songbird monitoring will occur within Lola Lake wetland as per the discussions with Environment Canada. WLD 7 and WLD 5 will also be monitored as reference sites. The exact locations for monitoring will vary depending on the attribute being monitored, but will likely follow previous survey locations for consistency. Additionally, as part of the Round 2 information requests, Treasury Metals has amended the follow-up program to incorporate any of the Agency’s feedback from the revised EIS (April 2018). This amendment to the follow-up program has been provided with the submission of the Round 2 information requests and titled “The Goliath Gold Project Follow-up Program”. In this addendum report, a map is provided that shows the water level monitoring locations and vegetation composition monitoring locations in wetlands potentially affected by the Project.</p> <p>It is recognized that there are wetlands along Blackwater Creek within the area of the planned Project effluent discharge point. As Project effluent discharged into Blackwater Creek will either meet PWQO or be less than background, the water quality of the effluent is not predicted to negatively affect wetlands within the creek. The wetland WLD3, located on Blackwater Creek, will be monitored for vegetation community changes to ensure that this prediction is accurate. If there are statistically significant changes to the vegetation communities in this wetland, further mitigation and avoidance measures will be developed with input from the Ministry of Natural Resources and</p>

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				<p>Forestry (MNRF) in addition to continued engagement with Indigenous communities. An example of a potential mitigation measures could include discharging small quantities of effluent consistently as opposed to larger quantities periodically.</p> <p>B. After the assessment completed for wetlands identified in TMI_871-WL(2)-02, there are no additional wetlands that would be affected by alterations to the flow of Blackwater Creek. As part of the follow-up program described in The Goliath Gold Project Follow-up Program, wetlands downstream of the effluent discharge point on Blackwater Creek (WLD3) will be monitored for changes in wetland extent, changes in water levels and changes in wetland flora to confirm that changes to flow from the Project are not causing any adverse effects. If there are statistically significant changes to the vegetation communities in this wetland, further mitigation and avoidance measures will be developed with input from the MNRF in addition to continued engagement with Indigenous communities.</p> <p><u>Agency Comment on Draft Response:</u></p> <p>A. The Agency, ECCC and MNRF has reviewed the response and the FUP addendum and has the following comments:</p> <p>A1. The FUP addendum states that the wetland extent mapping and wetland floral surveys will “be conducted every 5 years beginning just prior to the start of operations”.</p> <p>Given the project time frame (2 years for construction, 12 years for operations, 9 years for decommissioning and abandonment), a monitoring program that occurs every five years will not collect sufficient data to accurately assess whether a potential change is significant. The Agency recommends monitoring is conducted more frequently, in consultation with ECCC, MNRF, MECP (for monitoring within the Lola Lake Reserve) and Indigenous groups.</p> <p>A2. The response states “WLD3, WLD13a, WLD10 and WLD6 will be monitored to ensure no loss of area occurs, and floral and faunal communities remain consistent with surrounding wetlands.”</p> <p>The Agency requests the proponent consider monitoring the following additional locations to verify the prediction that the project will not have a significant residual effect on wetland habitat:</p> <ul style="list-style-type: none"> - the Lola Lake Reserve, upstream of the Project; -WLD14 downstream of the irrigation ponds; and -WLD12 upstream of the proposed diversion channel. <p>A3. As stated in WL(2)-01G, the FUP Addendum states that “WLD7 and WLD5 will be monitored as reference sites.” EIS Chapter 6.15.4.2 states “WLD5 at the headwater of Blackwater Creek Tributary 5 sits above a granular deposit, and is susceptible to drawdown. For the purposes of this assessment, the whole of WLD5 will be considered affected.”</p> <p>The Agency requests the proponent chose alternate wetlands outside of the Groundwater ZOI as reference sites.</p> <p>A4. MNRF has reviewed the response and “does not believe that damage to Lola Park wetlands, due to dewatering the mine, can be mitigated or fixed.” They request additional information regarding the monitoring program and mitigation measures that would be implemented to ensure effects to the Lola Lake Reserve are avoided.</p>

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				<p>In order to prepare a follow-up monitoring program for wetlands and vegetation potentially affected by the Project, CEAA requests a meeting with the proponent, ECCC and MNRF to develop a wetland monitoring program and mitigation measures that would accurately assess potential effects to wetlands within the LSA and RSA (including the Lola Lake Reserve).</p> <p>This includes updating the frequency of wetland monitoring to ensure adequate data is collected to accurately assess whether a potential change is significant, and updating the location of wetland monitoring to verify the prediction that the project will not have a significant residual effect on wetland habitat.</p> <p>B. The Agency has reviewed the response and requests the proponent classify WLD3 as an impacted wetland given:</p> <ul style="list-style-type: none"> • the removal of WLD4 and WLD4b; • significant reduction in the catchment area with the construction of the PSA; • alteration to surface and groundwater hydrology; and • effluent discharge. <p>The Agency supports the development of a wetland monitoring program for WLD3 in consultation with MNRF and Indigenous communities.</p> <p><u>Specific Response to Agency Comments:</u></p> <p>A1) FUP monitoring will be conducted on a 3-year schedule, beginning shortly before the start of operation (as discussed with the Agency)</p> <p>A2) WLD12, WLD14 and wetlands within the Lola Lake reserve will be incorporated into the FUP. Access to Lola Lake reserve will be determined through discussions with MNRF prior to the commencement of the program.</p> <p>A3) WLD5 will be monitored as an impacted site. Reference sites will include WLD7, WLD9 and Lola Lake Reserve as per TMI_873-WL(2)-04_Figure_1.</p> <p>A4) The comment is well-received. Treasury Metals will coordinate with the Agency, ECCC and MNRF to develop a wetland monitoring program and mitigation measures that would accurately assess potential effects to wetlands within the LSA and RSA (including the Lola Lake Reserve). A meeting with the Agency, ECCC and MNRF will take place prior to the start of site preparation and construction.</p> <p>B) Treasury Metals acknowledge that WLD3 will be affected by the Project. However, not all of WLD3 will be impacted. The removal of the upstream portions of Blackwater Creek Tributary 1 (including WLD4 and WLD4b), and the enclosure of 95% of the catchment of Blackwater Creek Tributary 1 will result in the impact (loss) of the section of WLD3 that runs along Blackwater Creek Tributary 1, upstream of Blackwater Creek. These impacts will occur during the site preparation and construction phase and continue through the closure phase. The flow through WLD3 will return once the open pit has filled with water in the post-closure phase and the wetland is expected to reestablish. The inclusion of this portion of WLD3 has been included in the effects assessment to wetlands presented in TMI_871-WL(2)-02. Although a portion of WLD3 is located downstream of the effluent discharge location, Treasury Metals have committed to treat the effluent to meet PWQO for the protection of aquatic life, or background if background is higher than the PWQO. Therefore, there would be no degradation in the water quality downstream of the effluent discharge</p>

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				<p>location in WLD3. The effects on WLD3 will be monitored as part of the Follow-up Program to verify these predictions. The proposed wetlands Follow-up Program is provided in the Goliath Gold Project Follow-up Program Addendum and will be finalized following discussion with the Agency, ECCC and MNRF.</p> <p>Revised Response:</p> <p>A. The Goliath Gold Project Follow-up Program Addendum has been created to respond to the Round 2 information requests and supersedes Section 13 of the revised EIS. Wetland monitoring described in the Goliath Gold Project Follow-up Program Addendum includes:</p> <ul style="list-style-type: none"> • Wetland extent mapping every three years to determine the ongoing wetland extent within the LSA, and the 2 m groundwater drawdown zone; • Wetland monitoring (water levels) conducted at a minimum of quarterly including at local reference locations (outside of the zone of influence [ZOI]) to verify the predicted effects of the Project on water levels in wetlands inside the drawdown zone; • Wetland floral and faunal surveys will be conducted every three years to verify that wetland species diversity is maintained within the LSA. <p>As shown in TMI_873-WL(2)-04_Figure 1 (also provided as Figure 13.15.3-1 in the Goliath Gold Project Follow-up Program Addendum), WLD3, WLD5, WLD10, WLD12 (upstream of the diversion channel), WLD13a, WLD14 (downstream of the irrigation ponds), WLD17 and WLD18 will be monitored to verify the predictions of the revised EIS (April 2018). Reference sites that are located outside of the extent of Project ZOI (i.e., WLD1, WLD9) will also be monitored to determine natural fluctuations in water levels so as to help distinguish changes that are related to mining activities.</p> <p>Treasury Metals recognize the importance of the Lola Lake Reserve, which is located upstream of the Project, and outside the predicted zone of influence (ZOI). As such, no effects are predicted to occur within the Lola Lake Reserve as a result of the Project. The Goliath Gold Project Follow-up Program Addendum also identifies several sites within the Lola Lake Reserve that will be monitored. The exact locations of these sites are to be determined in discussion with the Agency, ECCC and MNRF, and will be used to confirm that the Project effects do not extend into the Lola Lake Reserve.</p> <p>The specific monitoring locations within each wetland will depend on access and the attribute being monitored and will be determined prior to the start of site preparation and construction. At the request of the Agency, ECCC and MNRF, Treasury Metals will coordinate with these government agencies to further develop and finalize a wetland monitoring program and mitigation measures that would accurately assess potential effects to wetlands within the LSA and RSA (including the Lola Lake Reserve). This detailed plan will be developed and submitted to these government agencies for comment, prior to the start of the site preparation and construction phase.</p> <p>It is recognized that there are wetlands along Blackwater Creek within the area of the planned Project effluent discharge point. As Project effluent discharged into Blackwater Creek will either meet PWQO or be less than background, the water quality of the effluent is not predicted to negatively affect wetlands within the creek. The wetland WLD3, located on Blackwater Creek, will be monitored for vegetation community changes to ensure that this</p>

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				<p>prediction is accurate. If there are statistically significant changes to the vegetation communities in this wetland, further mitigation and avoidance measures will be developed with input from the Agency, ECCC and MNRF in addition to continued engagement with Indigenous communities. An example of a potential mitigation measures could be development of compensatory habitat or include discharging smaller quantities of effluent over a longer period, rather than larger quantities less frequently.</p> <p>B. Treasury Metals acknowledge that WLD3 will be affected by the Project. However, not all of WLD3 will be impacted. The removal of the upstream portions of Blackwater Creek Tributary 1 (including WLD4 and WLD4b), and the enclosure of 95% of the catchment of Blackwater Creek Tributary 1 will result in the impact (loss) of the section of WLD3 that runs along Blackwater Creek Tributary 1, upstream of Blackwater Creek. These impacts will occur during the site preparation and construction phase, and continue through the closure phase The flow through WLD3 will return once the open pit has filled with water in the post-closure phase and the wetland is expected to reestablish. The inclusion of this portion of WLD3 has been included in the effects assessment to wetlands presented in TMI_871-WL(2)-02. Although a portion of WLD3 is located downstream of the effluent discharge location, Treasury Metals have committed to treat the effluent to meet PWQO for the protection of aquatic life, or background if background is higher than the PWQO. Therefore, there would be no degradation in the water quality downstream of the effluent discharge location in WLD3. The effects on WLD3 will be monitored as part of the Follow-up Program to verify these predictions. A comparison will be made to local reference locations, to assess whether identified changes are related to the Project or due to natural variations. The proposed wetlands Follow-up Program is provided in the Goliath Gold Project Follow-up Program Addendum and will be finalized following discussion with the Agency, ECCC and MNRF.</p> <p><u>Agency Comment on Revised Response</u></p> <p>A1. The Agency has reviewed the response to TMI_873_WL(2)-04A1 and will recommend the development of a wetland monitoring program in consultation with ECCC, MNRF, MECP and Indigenous groups.</p> <p>The Agency has the following comments regarding the proposed wetland monitoring program:</p> <ul style="list-style-type: none"> ○ The response states “wetland monitoring (water levels) conducted at a minimum of quarterly.” In order to gather meaningful hydrologic data, continuous monitoring of water levels in “reference” and “impacted” wetlands is recommended, as part of a wetland monitoring program developed in consultation with relevant government authorities and Indigenous groups. <p><u>Specific Comment to the Agency</u></p> <ul style="list-style-type: none"> • Wetland monitoring (water level) will incorporate the use of data loggers to provide continuous data throughout the monitoring program. Loggers will be programmed to record water level once every 24-hrs at a minimum. Data will be downloaded on a schedule based on logger battery life, to be determined.

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				<p>FINAL Response:</p> <p>A. The Goliath Gold Project Follow-up Program Addendum has been created to respond to the Round 2 information requests and supersedes Section 13 of the revised EIS. Wetland monitoring described in the Goliath Gold Project Follow-up Program Addendum includes:</p> <ul style="list-style-type: none"> • Wetland extent mapping every three years to determine the ongoing wetland extent within the LSA, and the 2 m groundwater drawdown zone; • Wetland monitoring (water levels) conducted continuously using data loggers, including at local reference locations (outside of the zone of influence [ZOI]) to verify the predicted effects of the Project on water levels in wetlands inside the drawdown zone; • Wetland floral and faunal surveys will be conducted every three years to verify that wetland species diversity is maintained within the LSA. <p>As shown in TMI_873-WL(2)-04_Figure 1 (also provided as Figure 13.15.3-1 in the Goliath Gold Project Follow-up Program Addendum), WLD3, WLD5, WLD10, WLD12 (upstream of the diversion channel), WLD13a, WLD14 (downstream of the irrigation ponds), WLD17 and WLD18 will be monitored to verify the predictions of the revised EIS (April 2018). Reference sites that are located outside of the extent of Project ZOI (i.e., WLD1, WLD9) will also be monitored to determine natural fluctuations in water levels so as to help distinguish changes that are related to mining activities.</p> <p>Treasury Metals recognize the importance of the Lola Lake Reserve, which is located upstream of the Project, and outside the predicted zone of influence (ZOI). As such, no effects are predicted to occur within the Lola Lake Nature Reserve as a result of the Project. The Goliath Gold Project Follow-up Program Addendum also identifies several sites within the Lola Lake Nature Reserve that will be monitored. The exact locations of these sites are to be determined in discussion with the Agency, ECCC and MNRF, and will be used to confirm that the Project effects do not extend into the Lola Lake Reserve.</p> <p>The specific monitoring locations within each wetland will depend on access and the attribute being monitored and will be determined prior to the start of site preparation and construction. At the request of the Agency, ECCC and MNRF, Treasury Metals will coordinate with these government agencies to further develop and finalize a wetland monitoring program and mitigation measures that would accurately assess potential effects to wetlands within the LSA and RSA (including the Lola Lake Reserve). This detailed plan will be developed and submitted to these government agencies for comment, prior to the start of the site preparation and construction phase.</p> <p>It is recognized that there are wetlands along Blackwater Creek within the area of the planned Project effluent discharge point. As Project effluent discharged into Blackwater Creek will either meet PWQO or be less than background, the water quality of the effluent is not predicted to negatively affect wetlands within the creek. The wetland WLD3, located on Blackwater Creek, will be monitored for vegetation community changes to ensure that this prediction is accurate. If there are statistically significant changes to the vegetation communities in this wetland, further mitigation and avoidance measures will be developed with input from the Agency, ECCC and MNRF in addition to continued engagement with Indigenous communities. An example of a potential mitigation measures could</p>

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				<p>be development of compensatory habitat or include discharging smaller quantities of effluent over a longer period, rather than larger quantities less frequently.</p> <p>B. Treasury Metals acknowledge that WLD3 will be affected by the Project. However, not all of WLD3 will be impacted. The removal of the upstream portions of Blackwater Creek Tributary 1 (including WLD4 and WLD4b), and the enclosure of 95% of the catchment of Blackwater Creek Tributary 1 will result in the impact (loss) of the section of WLD3 that runs along Blackwater Creek Tributary 1, upstream of Blackwater Creek. These impacts will occur during the site preparation and construction phase, and continue through the closure phase. The flow through WLD3 will return once the open pit has filled with water in the post-closure phase and the wetland is expected to reestablish. The inclusion of this portion of WLD3 has been included in the effects assessment to wetlands presented in TMI_871-WL(2)-02. Although a portion of WLD3 is located downstream of the effluent discharge location, Treasury Metals have committed to treat the effluent to meet PWQO for the protection of aquatic life, or background if background is higher than the PWQO. Therefore, there would be no degradation in the water quality downstream of the effluent discharge location in WLD3. The effects on WLD3 will be monitored as part of the Follow-up Program to verify these predictions. A comparison will be made to local reference locations, to assess whether identified changes are related to the Project or due to natural variations. The proposed wetlands Follow-up Program is provided in the Goliath Gold Project Follow-up Program Addendum and will be finalized following discussion with the Agency, ECCC and MNRF.</p>

TMI_874-WL(2)-05

Unique Identifier	Agency IR #	Annex	Agency / Group / Stakeholder	Cross Reference / Comment / Information Request / Response	
TMI_874-WL(2)-05	WL(2)-05	1	CEA Agency	Reference to EIS Guidelines:	Part 2, Sections 7.1.1, 9.1.2
				Reference to EIS / Appendix	Section 6.1.3.11
				Cross-reference to Round 1 IRs	TMI_153-WL(1)-10
				<p>Context and Rationale:</p> <ul style="list-style-type: none"> In IR# WL(1)-10, the Agency requested the proponent revise the assessment of potential effects of the Project on species at risk, including snapping turtle (listed as special concern under Schedule 1 of the Species at Risk Act and by COSEWIC). In response TMI_153, the proponent indicated that snapping turtles “are not expected to occur in the Project area” and they were not observed during field surveys. However, the Ontario Ministry of Natural Resources and Forestry (MNR) states that the Ontario Reptile and Amphibian Atlas indicates that there are records of recent snapping turtle nesting sites in the Town of Wabigoon and Aaron Park (https://ontarionature.org/oraa/maps/). Figure 5.11.2-4: Potential Snapping Turtle Habitat Within the LSA [local study area] does not clearly identify potential habitat for the snapping turtle. 	
<p>Specific Question / Request for Information:</p> <p>A. Provide a figure illustrating potential habitat for snapping turtle and potential habitat loss data summary.</p> <p>B. Provide an effects assessment for snapping turtle. Provide the indicators used to assess potential project effects. Use an impact matrix to describe the potential effects, including species at risk (SAR) habitats, for each project phase.</p> <p>C. Describe the mitigation measures to address the potential effects to snapping turtle, ensuring that the measures are consistent with applicable recovery strategies and management plans.</p> <p>D. Describe the residual effects on snapping turtle and their habitat and the significance of those residual effects, based on the Agency’s methodology for assessing significance (including the criteria of magnitude, geographic extent, timing, duration, frequency, reversibility, and ecological and social context).</p> <p>E. Describe the monitoring program for snapping turtle, including objectives and any monitoring measures that will be implemented, to verify presence of snapping turtles, effectiveness of mitigation measures.</p>					
<p>DRAFT Response:</p> <p>The response to TMI_153-WL(1)-10 made no assertion regarding the likelihood of Snapping Turtles occurring within the Project area, but rather included detailed information on their natural history, life history, regional importance,</p>					

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				<p>potential project effects (presented as an impact matrix), suggested mitigation measures, and expected residual effects.</p> <p>Section 6.1.3.11 of the revised EIS contains the following statement regarding Snapping Turtles: “Extensive aquatic, wetland and terrestrial surveys were conducted in the LSA, all of which failed to detect Snapping Turtles (<i>Chelydra serpentina</i>; listed as Special Concern in Ontario). The nearest reported occurrences roughly 40 km west of Dryden, representing the northern-most extent of this species’ global range. As a result, it was concluded that the exclusion from the list of VCs and associated indicators is justified.</p> <p>Although Snapping Turtles are not expected to occur in the Project area and species of “Special Concern” are not afforded additional protection in Ontario, Snapping Turtles have been identified in the Wildlife Management Plan (Section 12.9 of the revised EIS) because of the presence of potential nesting habitat and the relative proximity of historical sightings.</p> <p>We acknowledge that the observations from the Ontario Reptile and Amphibian Atlas were not included in the initial assessment, and thank the Agency for bringing this to our attention. However, these additional observations do not alter the conclusions from the effects assessment presented in the revised EIS.</p> <p><u>Part A:</u> A detailed description of Snapping Turtle life history and natural history is presented in TMI_874-WL(2)-05_Table_1a, and their regional importance to the Project area in TMI_874-WL(2)-05_Table_1b. For the purposes of habitat mapping, all surface water features within the LSA are considered potential Snapping Turtle habitat, as illustrated in TMI_874-WL(2)-05_Figure_1. Potential habitat loss is summarized in TMI_874-WL(2)-05_Table_2.</p> <p><u>Part B:</u> An impact matrix presenting potential Project effects on Snapping Turtle is presented in TMI_874-WL(2)-05_Table_1c. Potential Snapping Turtle habitat loss is summarized by Project phase in TMI_874-WL(2)-05_Table_2, and illustrated in TMI_874-WL(2)-05_Figure_1.</p> <p><u>Part C:</u> Mitigation measures to address potential Project effects on Snapping Turtle are presented in TMI_874-WL(2)-05_Table_1d.</p> <p><u>Part D:</u> Residual effects for Snapping Turtle are discussed in TMI_874-WL(2)-05_Table_1e.</p> <p><u>Part E:</u> Presently, there are no documented observations of Snapping Turtles within the LSA, although the “recent” observation from the Ontario Reptile and Amphibian Atlas were nearby. However, Snapping Turtles are listed as “Special Concern” in Ontario, however as such are not afforded additional protection beyond the standard environmental protection regulations. Monitoring for Snapping Turtles will be conducted passively through the course</p>

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				<p>of other monitoring activities (e.g., wildlife, wetlands and ground water); no targeted monitoring will be undertaken for this species.</p> <p><u>Agency Comment on Draft Response:</u></p> <p>A. The Agency has reviewed the response to TMI_874-WL(2)-05, TMI_874-WL(2)-05_Figure_1, TMI_874-WL(2)-05_Table_1a, TMI_874-WL(2)-05_Table_1b and TMI_874-WL(2)-05_Table_2. TMI_874-WL(2)-05 and TMI_874-WL(2)-05_Figure_1 indicate that Snapping Turtle habitat is restricted to watercourses and waterbodies, however Table_874-WL(2)-05_Table_1a states that Snapping Turtle hibernacula habitat includes wetland habitat (e.g., “marshy areas”). Under Section 79 of the Species at Risk Act, the proponent is required to identify potential adverse effects on all listed wildlife species, including species of “Special Concern” and its critical habitat; and if the project is carried out, ensure that measures are taken to avoid or lessen those adverse effects and to monitor them, and ensure that such measures are consistent with any applicable recovery strategy and action plans.</p> <p>Update TMI_874-WL(2)-05_Figure_1 to include all Snapping Turtle Habitat, as well as the updated “Project Study Area” [as discussed in TMI_870-WL(2)-01(A1)] and the updated LSA [as discussed in TMI_870-WL(2)-01(A1)]</p> <p>Update the TMI_870-WL(2)-01H summary table for valued components to include all Snapping Turtle habitat.</p> <p>C. The Agency has reviewed TMI_874-WL(2)-05_Table_1d. The Agency requests the proponent provide the maximum speed limit on roads within the PSA.</p> <p>Provide the maximum speed limit on roads within the PSA.</p> <p>E. The Agency has reviewed the response to TMI_874-WL(2)-05 and the FUP addendum. Snapping turtles including their habitat have the potential to be impacted by activities such as the construction of the diversion channel, associated with other federal decisions [5(2) effects]. The Agency requests the proponent develop and implement a follow-up program measures to verify the prediction of Snapping Turtle use of the PSA during construction and operation in consultation with Indigenous groups, ECCC and MNRF. If Snapping Turtles are observed in the PSA, the Agency requests the proponent implement measures such as relocation and exclusion fences, to prevent Snapping Turtles from accessing active Project components.</p> <p>Describe the monitoring program for snapping turtle, including objectives and any monitoring measures that will be implemented, to verify presence of snapping turtles, effectiveness of mitigation measures.</p> <p><u>Specific Response to Agency Comments:</u></p> <p>A) The tables and figures have been updated to reflect the new PSA and LSA boundaries, as requested. Marsh wetlands have been included in the effects assessment as potential habitat for Snapping Turtle hibernacula. TMI_874-WL(2)-05_Table 1d has been added to the response to show the potential habitat loss accounting for</p>

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				<p>Snapping Turtle and indicates a maximum loss totaling 8.85 ha during the operations phase (a combination of direct and indirect effects).</p> <p>The construction of the fish compensation/offsetting ponds during the site preparation and construction phase, conversion of Collection Pond 2a and 2b to marsh habitat in to post-closure phase and development of marsh habitat within the pit lake during the post-closure phase will provide 6 ha of potential Snapping Turtle habitat to partially offset the 8.85 ha of habitat loss. Additionally, once the open pit has filled in the post-closure phase, the pit lake is anticipated to provide additional suitable Snapping Turtle habitat. In the long-term, once the pit lake is established, there will be a net gain of 15.43 ha of Snapping Turtle habitat.</p> <p>C) Posted equipment speed limits will be adhered to on the Project site. Speed limits on operations roads are expected to be 30 km/hr. Speed limits on established non-operation roads, such as the existing Tree Nursery Road, will likely be maintained at current levels, generally 80 km/hr with some sections at 30 km/hr, or will be reduced further where deemed necessary to help avoid equipment, passenger vehicle, and wildlife interactions (including with Snapping Turtles, should they be present).</p> <p>During site preparation and construction, active construction areas will be controlled by similar limitations, to help mitigate risk of collisions with wildlife in active construction areas.</p> <p>E) A Snapping Turtle education and monitoring plan will be prepared in consultation with MNRF and Indigenous Stakeholders prior to being distributed to all Project personnel during the site preparation and construction, operations and closure phases of the Project. This will help personnel on site identify Snapping Turtles, if present. A monitoring program has been proposed by Treasury Metals that involves site personnel reporting to the Environmental Manager if a Snapping Turtle is observed on site. A qualified person will then trap and relocate the Snapping Turtle from the Project area, if required.</p> <p><u>REVISED RESPONSE:</u></p> <p>Section 6.1.3.11 of the revised EIS contains the following statement regarding Snapping Turtles: “Extensive aquatic, wetland and terrestrial surveys were conducted in the LSA, all of which failed to detect Snapping Turtles (Chelydra serpentine; listed as Special Concern in Ontario). The nearest reported occurrence roughly 40 km west of Dryden, representing the northern-most extent of this species’ global range. As a result, it was concluded that the exclusion from the list of VCs and associated indicators is justified.”</p> <p>Although Snapping Turtles as a species of “Special Concern” are not afforded additional protection in Ontario and are not expected to occur in the Project area, Treasury Metals has included Snapping Turtles in the Wildlife Management Plan (Section 12.9 of the revised EIS) because of the presence of potential nesting habitat and the relative proximity of historical sightings. The Agency has also identified that Under Section 79 of the Species at Risk Act, Treasury Metals is required to identify potential adverse effects on all listed wildlife species, including species of “Special Concern” and its critical habitat, as well ensure that measures are taken to avoid or lessen those adverse effects and to monitor them. To accommodate this request, Treasury Metals has completed an effects assessment for Snapping Turtles including a detail habitat loss accounting for all of the potential Snapping Turtle habitat lost as a result of the Project (Tables 1a to 1f). The effects assessment indicates that there are no anticipated residual adverse effects to</p>

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				<p>Snapping Turtles with the implementation of mitigation measures identified in TMI_874-WL(2)-05_Table_1e and Project activities will result in a net gain of Snapping Turtle habitat with the construction of the fish compensation / offsetting ponds and the pit lake.</p> <p>We acknowledge that the observations from the Ontario Reptile and Amphibian Atlas were not included in the initial assessment, and thank the Agency for bringing this to our attention. However, these additional observations do not alter the conclusions from the effects assessment presented in the revised EIS.</p> <p><u>Part A:</u> A detailed description of Snapping Turtle life history and natural history is presented in TMI_874-WL(2)-05_Table_1a, and their regional importance to the Project area in TMI_874-WL(2)-05_Table_1b. For the purposes of habitat mapping, all surface waterbodies within the LSA are considered potential Snapping Turtle habitat, as illustrated in TMI_874-WL(2)-05_Figure_1. Snapping Turtle hibernacula tend to be under cover in streams that flow continuously through winter, wedged beneath submerged logs and covered in silt along lakeshores, or buried deep in anoxic mud / under floating mats of vegetation in marshy areas. This hibernacula habitat is all associated with open water and marsh wetlands and has been accounted for in the effects assessment to Snapping Turtles provided in TMI_874-WL(2)-05_Table_1a to TMI_874-WL(2)-05_Table_1f. Potential Snapping Turtle habitat loss is illustrated in TMI_874-WL(2)-05_Figure_2 and summarized in TMI_874-WL(2)-05_Table_2. TMI_874-WL(2)-05_Table_1d shows the potential habitat loss accounting for Snapping Turtle and indicates a maximum loss totaling 8.85 ha during the operations phase (a combination of direct and indirect effects).</p> <p>The construction of the fish compensation/offsetting ponds during the site preparation and construction phase, conversion of Collection Pond 2a and 2b to marsh habitat in to post-closure phase and development of marsh habitat within the pit lake during the post-closure phase will provide 6 ha of potential Snapping Turtle habitat to partially offset the 8.85 ha of habitat loss. Additionally, once the open pit has filled in the post-closure phase, the pit lake is anticipated to provide additional suitable Snapping Turtle habitat. In the long-term, once the pit lake is established, there will be a net gain of 15.43 ha of Snapping Turtle habitat.</p> <p><u>Part B:</u> An impact matrix presenting potential Project effects on Snapping Turtle is presented in TMI_874-WL(2)-05_Table_1c with a detailed accounting of Snapping Turtle habitat loss provided in TMI_874-WL(2)-05_Table_1d. Mitigation measures in place to reduce or eliminated the predicted effects to Snapping Turtles are presented in TMI_874-WL(2)-05_Table_1e and the residual adverse effects once these mitigation measure have been implemented is provided in TMI_874-WL(2)-05_Table_1f. Potential Snapping Turtle habitat loss is summarized by Project phase in TMI_874-WL(2)-05_Table_2, and illustrated in TMI_874-WL(2)-05_Figure_1.</p> <p>As shown in the effects assessment, there are no anticipated residual adverse effects to Snapping Turtles and Project activities will result in a net surplus of Snapping Turtle habitat with the construction of the fish compensation / offsetting ponds and the development of the pit lake.</p> <p><u>Part C:</u> Mitigation measures to address potential Project effects on Snapping Turtle are presented in TMI_874-WL(2)-05_Table_1e. One of the main mitigation measures to prevent vehicle collisions with Snapping Turtle</p>

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				<p>(should they be present) and other wildlife is the implementation of a maximum speed limit. For the safety of individuals, equipment and wildlife, posted equipment speed limits will be adhered to on the Project site. Speed limits on operations roads are expected to be 30 km/hr. Speed limits on established non-operation roads, such as the existing Tree Nursery Road, will be maintained at current levels or reduced to 30 km/hr to mitigate the risk of collisions between equipment, passenger vehicles and wildlife (including Snapping Turtles if present).</p> <p>During site preparation and construction, active construction areas will be controlled by similar limitations, which will allow for identification of obstructions or wildlife such as turtles and deer and help to mitigate risk of collisions in active construction areas. Additional safety measures will be put in place should collisions occur, which could include reduced speed limits, additional signage, lighting or traffic barriers.</p> <p><u>Part D:</u> There will be no residual effects on potential Snapping Turtle habitat, as stated in TMI_874-WL(2)-05_Table_1f. The Project area will experience a net gain of 15.43 ha of potential Snapping Turtle habitat, through the construction of the compensation / offsetting ponds, and the development of the pit lake.</p> <p><u>Part E:</u> Presently, there are no documented observations of Snapping Turtles within the LSA, although the “recent” observation from the Ontario Reptile and Amphibian Atlas were a few kilometres way at Aaron Provincial Park. Snapping Turtles are listed as “Special Concern” in Ontario, and as such are not afforded additional protection beyond the standard environmental protection regulations. Monitoring for Snapping Turtles will be conducted through the course of other monitoring activities (e.g., wildlife, wetlands and ground water). A Snapping Turtle education and monitoring plan will be prepared in consultation with MNRF and Indigenous Stakeholders prior to being distributed to all Project personnel during the site preparation and construction, operations and closure phases of the Project. This will help personnel on site identify Snapping Turtles, if present. A monitoring program has been proposed by Treasury Metals that involves site personnel reporting to the Environmental Manager if a Snapping Turtle is observed on site. A qualified person will then trap and translocate the Snapping Turtle from the Project area, if required.</p> <p><u>Agency Comment on Draft Response</u></p> <p>A. The Agency has reviewed the response to TMI_874_WL(2)-05A.</p> <p>C. The Agency has reviewed the response to TMI_874_WL(2)-05C.</p> <p>E. The Agency has reviewed the response to TMI_874_WL(2)-05E. The Agency will recommend the proponent implement a follow-up program to verify the prediction of Snapping Turtle use of the PSA during construction and operations, including mitigation measures in consultation with Indigenous groups, ECCC and MNRF.</p>

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				<p><u>FINAL RESPONSE</u></p> <p>Agency accepted Revised Response as Final.</p>

TMI_875-WL(2)-06

Unique Identifier	Agency IR #	Annex	Agency / Group / Stakeholder	Cross Reference / Comment / Information Request / Response
TMI_875-WL(2)-06	WL(2)-06	1	CEA Agency	<p>Reference to EIS Guidelines:</p> <p>Part 2, Section 9.1.2</p>
				<p>Reference to EIS / Appendix</p> <p>Section 6.3</p>
				<p>Cross-reference to Round 1 IRs</p>
				<p><u>Context and Rationale:</u></p> <ul style="list-style-type: none"> • Section 6.3.3 states: <ul style="list-style-type: none"> ○ “The pit lake will be monitored as it is filling to determine whether batch treatment will be required to ensure the water meets PWQO, or background if background levels exceed the PWQO, prior to the discharge from the pit lake to a tributary of Blackwater Creek [Mit_024].” ○ “Once the pit lake is fully flooded, it is expected that the monitoring of the water quality in the pit lake will continue for a period of time to determine whether additional batch treatment may be required to ensure the water released from the pit lake meets effluent release limits. [Mit_124].” • The Agency understands that at closure, mitigation measures to address water quality issues in the pit lake will be implemented if required. However, should it be determined that water quality does not meet the PWQO, it is unclear what measures will be in place to ensure pit lake water quality does not cause adverse effects to wildlife, including migratory birds, species at risk and species of use to Indigenous groups (e.g., waterfowl, moose).

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				<p><u>Specific Question / Request for Information:</u></p> <p>A. Describe the measures that will be put in place at closure to restrict access for wildlife, in the event that monitoring data indicates that surface water quality in the pit lake exceeds the PWQO or background conditions if background levels exceed the PWQO.</p> <p>B. In the event that no such measures are put in place, describe the potential adverse effects of exposure to contaminated pit lake water to wildlife, including migratory birds, species at risk and species of use to Indigenous groups (e.g., waterfowl, moose).</p> <hr/> <p><u>DRAFT Response:</u></p> <p><u>Part A:</u></p> <p>As stated in the revised EIS (April 2018), the pit lake will be monitored as it is filling to determine whether batch treatment will be required to ensure the water meets PWQO, or background if background levels exceed the PWQO, prior to the discharge from the pit lake to a tributary of Blackwater Creek. Batch treatment has been successfully applied in situations similar to the Project to reduce the concentrations to a point where they would be suitable for discharge and would not present a concern to wildlife that may access the pit lake following closure. The treatment of the pit lake during filling was identified in the revised EIS (April 2018) as mitigation reference number Mit_024.</p> <p>In the event that monitoring data indicates that surface water quality in the pit lake exceeds the PWQO, or background conditions if background levels exceed the PWQO, additional applications of batch treatment by Treasury Metals would be required. Treasury Metals fully realize that discharges from the pit lake to the receiving environment would first require them to obtain an Environmental Compliance Approval (ECA) from the Ontario Ministry of Environment, Conservation and Parks. Obtaining an ECA would require Treasury Metals to demonstrate that the water they plan to discharge is suitable for release to the environment.</p> <p>Based on past experience on similar mining developments, there is no compelling evidence to suggest that, with appropriate application of batch treatments of the pit lake, that the water quality would not meet the PWQO, or background if the background levels are greater than the PWQO. Therefore, no additional mitigation measures beyond additional batch treatments would be required, as with the planned batch treatment mitigation will be able to achieve and maintain the pit lake water quality at a level where the PWQO will be maintained, and thus there is no need to restrict access to wildlife.</p> <p>In the unlikely event the batch treatment is not successful and PWQO is not met, additional mitigation or risk management measures for the protection of human health and ecological receptors (including but not limited to wildlife) may be considered. These additional risk management/mitigation measures to restrict access (i.e. exposure) to the pit-lake may potentially include fencing and will evaluate in conjunction to consultation with regulators further mitigation measures. The effectiveness of these risk management/mitigation measures may be monitored and site-specific receptor characteristics with respect to frequency of exposure (i.e. number of time per day an ecological receptor visits the pit lake) determined. As detailed in Section 7 of the 2018 HHERA Report, as part of a Follow—Up and Monitoring program to verify the predictions made in the HHERA, consideration may also be given to performing tissue sampling for a small proportion of the population to calculate site-specific chemical uptake factors. Finally, as</p>

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				<p>detailed by the Government of Canada in their Federal Contaminated Sites Action Plan guidance for completing an ERA, a weight of evidence approach may be considered to the assessment of potential risk to ecological receptors. The weight-of-evidence approach would dictate that population surveys and community profiles be considered in addition to the calculation of chemical exposure and associated potential risk. Together, the site-specific exposure values with risk management/ mitigation measures in place may be used to revise the HHERA, and if required, calculate site-specific risk -based target levels for water quality in the pit-lake. The development of site-specific target levels for pit-lake water would be performed following Health Canada's 2010 guidance entitled "<i>Part V: Guidance on Human Health Detailed Quantitative Risk Assessment For Chemicals (DQRA_{CHEM})</i>" and the Canadian Council of Ministers of Environment (CCME) 1996 guidance entitled "<i>A protocol for the derivation of Environmental and Human Health Soil Quality Guidelines</i>", using the most-up to date toxicity reference values for plants, invertebrates, mammals, birds, and human receptors considered.</p> <p>Part B</p> <p>To support the Round 2 Information Requests, a Human Health and Ecological Risk Assessment (HHERA) for the Goliath Gold Project was performed using the most up-to-date risk assessment and environmental assessment guidance available. The HHERA Report (August 2018), was provided with the Round 2 Information Requests and superseded the SLRA previously submitted. The 2018 HHERA specifically assessed the potential effects on human health and ecological receptors via exposure to chemicals in environmental and Project-specific media. As per current provincial and federal risk assessment guidance, the assessment of potential risk should be completed without risk management measures in place. Thus, the 2018 HHERA including the human health risk assessment, country foods assessment, and ecological risk assessment was completed in the absence of any mitigation measure. Concentrations of chemicals in environmental media (including air, soil, and surface water) and Project-specific media (including waste rock, tailings storage facility (TSF) supernatant water, and pit-lake water) were measured or modelled during baseline studies completed in support of the other technical disciplines associated with the EIS. The results of the 2018 HHERA indicated that there were no residual adverse effects predicted to human health or ecological receptors as a result of the Project, including via exposure to surface water or pit-lake water following closure of the Project (i.e., during Post-Closure).</p> <p>As stated in the revised EIS (April 2018), the pit lake will be monitored as it is filling to determine whether batch treatment will be required to ensure the water meets PWQO, or background if background levels exceed the PWQO, prior to the discharge from the pit lake to a tributary of Blackwater Creek. In the unlikely event the batch treatment is not successful and PWQO is not met, a revised HHERA may be completed that includes the development of site-specific risk-based targets or additional mitigation or risk management measures may be considered. As stated in Part A, these additional mitigation measures may include fencing or noise/visual deterrents and the effectiveness of the mitigation may also be monitored and used in additional ERA or adjustment of site-specific water quality target levels for the pit-lake.</p> <p>The 2018 HHERA specifically assessed the effects of exposure to wildlife to the water quality prediction made for the pit-lake. The following ecological receptors were considered for exposure to pit-lake water during the Post-Closure phase of the Project in the ERA provided as Section 5 of the 2018 HHERA: Plants, Invertebrates, Mammals, Birds, Amphibians and Reptiles, and Aquatic Receptors. Potential risk to Plants, Invertebrates, Amphibians and Reptiles,</p>

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				<p>and Aquatic Receptors was not identified during the qualitative screening process, however a qualitative discussion of aquatic receptors potentially introduced to the pit-lake following post-closure was provided. The following list of mammals and birds were considered in the ERA:</p> <ul style="list-style-type: none"> • Meadow Vole • Moose • Common Shrew • Little Brown Myotis • Red Fox • Deer Mouse • Short tailed weasel • Ruffed Grouse • Mallard Duck • Barn Swallow • Red-tailed Hawk • Bald Eagle • American Robin • Snowshoe Hare <p>Little Brown Myotis (Bat) and Barn-swallows were appropriately assessed as a species at risk based on the data collected as part of the terrestrial baseline studies presented in Section 5 of the revised EIS (April 2018) and as summarized in Section 5.3 of the 2018 HHERA Report. All species considered were chosen with consideration given to the information shared with Treasury Metals during ongoing engagement activities.</p> <p>Pit-lake water quality is predicted to meet PQWO and therefore no mitigation measures are required. As discussed in the response to Part A, Treasury Metals has stated that the pit lake will be monitored as it is filling to determine whether batch treatment will be required to ensure the water meets PWQO, or background if background levels exceed the PWQO, prior to the discharge from the pit lake to a tributary of Blackwater Creek. This is provided as mitigation reference number Mit_024. The 2018 HHERA did not identify potential risk to mammals and birds via exposure to pit-lake water.</p> <p>While aquatic receptors would not be anticipated in the pit-lake, over time there is the possibility that aquatic biota may be introduced during the Post-Closure phase of the Project without knowledge of the introduction by Treasury Metals. This was evaluated qualitatively within the ERA. During engagement activities and the Round 1 and 2 Information Request process, members of Indigenous communities have expressed particular interest in mercury and methyl mercury concentrations in the water courses and the potential effects on fish, therefore this was provided special consideration in the 2018 HHERA. The predicted concentration of mercury in the pit-lake is predicted at concentrations well below the PWQO (applied for screening purposes) as well as the Ontario Aquatic Protection Value (used for supplemental screening of contaminants of concern to aquatic organisms including fish). Therefore,</p>

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				<p>no potential risk is anticipated to aquatic receptors via inorganic mercury in the pit lake. However, in the HHERA the conservative assumption was made that the methyl-mercury concentration in the environment would equal 100% of the mercury concentration, therefore the pit-lake water had an estimated (assumed) methyl mercury concentration greater than the aquatic protective value. This is an overly conservative assumption as stoichiometry and the fundamentals of chemical mass balance dictate that this 1:1 ratio of inorganic mercury: methyl-mercury is not possible. The biotransformation of mercury to methyl-mercury is a process dependent on environmental conditions including temperature, community-level physiological profiles of microbiota, and surface water chemistry (including sulfate concentrations). The CCME reports that typically, methyl-mercury represents less than 10% of the total mercury in surface waters. As such, even if fish or other aquatic receptors were to be introduced into the pit-lake in the passive Post-Closure phase of the Project, it is unlikely that the predicted concentration of mercury in the pit-lake would result in concentrations of methyl-mercury that pose a risk to the aquatic receptors.</p> <p>The Follow-Up Program described for fish and fish habitat, and surface water quality provided in Section 13 of the EIS (April 018) as well as in the Follow-Up Addendum submitted in support of the Round 2 Information Request process should be relied upon for confirming the predicted mercury concentrations in all surface water bodies, including the pit-lake as well as the effects of the Project on fish and fish habitat. The Follow-Up Program would also be used to confirm the predictions that there are no potential risks to mammals and birds or species at risk via exposure to pit-lake water.</p> <p>References:</p> <ul style="list-style-type: none"> • Canadian Council of Ministers of Environment (CCME). 1996. A protocol for the derivation of Environmental and Human Health Soil Quality Guidelines. ISBN 0-662-2344-7. • Canadian Council of Ministers of the Environment (CCME). 2003. Canadian Water Quality Guidelines for the Protection of Aquatic Life. Mercury (inorganic mercury and methylmercury). http://cegg-rcqe.ccme.ca/download/en/191 • Government of Canada, Federal Contaminated Sites Action Plan (FCSAP). 2012. Ecological Risk Assessment Guidance. March 2012. • Health Canada (HC). 2010. Part V: Guidance on Human Health Detailed Quantitative Risk Assessment for Chemicals (DQRACHem). Dated 2010 Health Canada (HC), 2011a. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise. Draft, January 2011. <p><u>Agency Comment on Draft Response:</u></p> <p>None Received</p>

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				<p><u>Specific Response to Agency Comments:</u></p> <p>Not required. Agency accepted Draft Response as final. Small updates have been made to ensure consistency with the final responses to all other technical disciplines. A final response has been provided.</p> <p><u>Revised Response:</u></p> <p>Although the Agency accepted the response as complete for TMI_875-WL(2)-06, since the time of the draft submission, further refinements have been made to the assessment of the effects on surface water quality, as well as to the human health and ecological risk assessment. Specifically, TMI_887-SW(2)-04 asked that Treasury Metals Provide modelled predicted final effluent concentrations for the point of discharge to Blackwater Creek. The modelled effluent quality was then used in updating the surface water quality modelling for use in the Human Health and Ecological Risk Assessment (November Submission).</p> <p><u>Part A.</u></p> <p>Based on the results of the revised Ecological Risk Assessment completed in support of the Round 2 information request process and submitted as part of the HHERA (November Submission), no mitigation measures are required at closure to restrict access for wildlife. These results are based on predicted pit lake water quality and the results of the ecological risk assessment (ERA) completed as per Canadian Council of Ministers of the Environment guidance for ERA. The results do not rely on Treasury Metals commitment to meet PWQO values or background when the background is greater than the PWQO. As shown in Table 1 the predicted pit lake water quality does not exceed the ecological toxicity-based screening criteria protective of mammals and birds. The screening criteria is based on the “no observable effect level (NOAEL)” not the “lowest observable effect level (LOAEL)” and is therefore protective of species at risk as per Federal ERA guidance in Canada. Aluminum was the only contaminant of concern identified in the pit lake as posing potential risk to human or ecological receptors and given the nature of aluminum toxicity it was only a potential concern to aquatic receptors including. Treasury Metals have no plans for stocking fish in the pit-lake following closure, and the spillway from the pit-lake will be constructed to inhibit fish passage. Therefore, exposure to aluminum in the pit lake by aquatic organisms is an inoperable exposure pathway, and no potential risk to aquatic receptors is identified. The Ecological Risk Assessment provided as part of the Goliath Gold HHERA (November Submission) indicated that there was no potential risk to wildlife, including migratory birds, species at risk and species of use to Indigenous groups (e.g., waterfowl, moose) via exposure to the pit lake. No risk management or mitigation measures are required.</p> <p>Table 1: Ecological (Mammals and Birds) COC Supplemental Screening: Pit-Lake Water Quality (Post-closure) [Table 5.3.3.4-2 of the November 2018 HHERA]</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Predicted Concentration in Open Water Project Feature (mg/L/ppm)</th> <th>No Observable</th> <th>Ecological Toxicity Reference Value Source</th> </tr> </thead> </table>	Parameter	Predicted Concentration in Open Water Project Feature (mg/L/ppm)	No Observable	Ecological Toxicity Reference Value Source
Parameter	Predicted Concentration in Open Water Project Feature (mg/L/ppm)	No Observable	Ecological Toxicity Reference Value Source					

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					Predicted Mine Water Pond	Predicted Pit-Lake Post-Closure	Predicted Tailings Supernatant (mg/L or ppm)	Effect Level for the Protection of Mammals / Birds (ppm) ¹	
				Aluminum	2.34×10^1	2.74×10^{-1}	1.99×10^{-1}	4.50×10^2	Los Alamos National Laboratory
				Antimony	9.59×10^{-4}	1.13×10^{-3}	2.00×10^{-3}	1.47×10^3	MECP
				Arsenic	1.19×10^{-2}	1.42×10^{-3}	1.80×10^{-2}	3.33×10^2	MECP
				Cadmium	2.03×10^{-3}	9.37×10^{-5}	2.00×10^{-3}	1.90	MECP
				Cobalt	2.07×10^{-1}	9.00×10^{-4}	4.00×10^{-3}	1.80×10^2	MECP
				Copper	7.69×10^{-2}	3.89×10^{-3}	1.80×10^{-2}	3.06×10^3	MECP
				Cyanide	3.49×10^{-3}	2.07×10^{-3}	<1**	0.16 (1.6) ^{2,3}	Los Alamos National Laboratory
				Lead	5.86×10^{-2}	2.91×10^{-3}	8.20×10^{-2}	3.20×10^1	MECP
				Mercury	4.06×10^{-5}	2.00×10^{-5}	1.80×10^{-3}	2.00×10^1	MECP
				Methyl Mercury	4.06×10^{-7}	2.00×10^{-7}	1.80×10^{-5}	3.40×10^{-2}	MECP
				Molybdenum	1.54×10^{-3}	1.01×10^{-3}	1.00×10^{-3}	7.40×10^1	MECP
				Silver	1.48×10^{-4}	9.96×10^{-5}	5.00×10^{-5}	4.50×10^3	Los Alamos National Laboratory
				Sulphates	2.23×10^1	2.00×10^1	6.87×10^1	—	—
				Thallium	1.07×10^{-3}	3.00×10^{-4}	6.42×10^{-1}	4.70×10^1	MECP
				Uranium	3.55×10^{-2}	5.00×10^{-3}	5.00×10^{-3}	3.30×10^1	MECP
				Zinc	9.31×10^{-1}	3.00×10^{-2}	4.00×10^{-2}	3.37×10^2	MECP
<p>NOTES:</p> <p>— no data. Parameter not modelled or insufficient toxicity data available for mammals and birds to drive a toxicity reference value</p> <p>1 No observable effect level selected as the lowest of birds or mammals from the applicable toxicity reference value data source</p> <p>2 Exceeds NOEL for birds, however does not exceed NOEL for mammals</p> <p>3 Does not exceed Lowest Observable Effect Level for Birds of 1.6 mg/L</p> <p>Part B.</p> <p>In keeping with risk assessment methodology, the residual adverse effects for the ecological risk assessment have been identified in the absence of risk management measures. Thus, the results of the ecological risk assessment for</p>									

Unique Identifier	Agency IR #	Annex	Agency / Group / Stakeholder	Cross Reference / Comment / Information Request / Response
				Part A were determined without the implementation of risk management/mitigation measures. As described in the response to Part A, even in the absence of mitigation measures, no potential risks to wildlife, including migratory birds, species at risk and species of use to Indigenous groups (e.g., waterfowl, moose) are anticipated via exposure to pit lake water quality. Treasury Metals have no plans for stocking fish in the pit-lake following closure, and the spillway from the pit-lake will be constructed to inhibit fish passage, exposure of aquatic organisms to pit lake water quality is not an operable exposure pathway. There are no indications that the pit lake water quality would be described as “contaminated” simply based on an exceedance of a PWO value (protective of freshwater aquatic life not mammals and birds). It is important to note that the PQWO are protective of freshwater aquatic life, and toxicity data specific to mammals and birds such as those provided in Table 1 of Part A, are more appropriate toxicity endpoints for consideration.

TMI_952-WL(2)-07

Unique Identifier	Agency IR #	Annex	Agency / Group / Stakeholder	Cross Reference / Comment / Information Request / Response	
TMI_952-WL(2)-07	WL(2)-07	4	Eagle Lake First Nation	Reference to EIS Guidelines:	Part 2, Section 9.1.2
				Reference to EIS / Appendix	n/a
				Cross-reference to Round 1 IRs	n/a

Unique Identifier	Agency IR #	Annex	Agency / Group / Stakeholder	Cross Reference / Comment / Information Request / Response
				<p><u>Context and Rationale:</u></p> <p>The Eagle Lake First Nation has expressed concern regarding the proponent’s assessment of wildlife and species at risk. The proponent has presented an incomplete list of wildlife field survey data in EIS Chapters 5 and 6, and Appendix R. Traditional knowledge and Indigenous values appear to have not been considered in scoping wildlife species of interest to Indigenous groups in the project area.</p> <p>Further, the proponent has not provided an assessment of project effects on several species at risk that were reported in the EIS to be observed or were determined to be likely to be observed within the PDA, LSA or RSA, including Olive-Sided Flycatcher, Canada Warbler, Eastern Whip-Poor-Will, Eastern Wood-Pewee, Bobolink, Loggerhead Shrike, Wood Thrush, Least Bittern, Yellow Rail, Rusty Blackbird and the Short-Eared Owl. In addition, Section 6.1.3.13 states monarchs were excluded from the list of VCs because they are listed as “Special Concern” in Ontario, however monarchs are listed as “Special Concern” by SARA and “Endangered” by COSEWIC, and are therefore covered under CEAA 2012. Section 6.1.3.11 states Gray Fox, a species at risk, is not included as a VC although it has been captured in the RSA and habitat exists within the LSA. This is important for the Agency to understand as seepage from the Project can lead to contamination of surrounding waterbodies and affect the fish and fish habitat. Seepage can also lead to contamination of private groundwater wells identified in Section 6.11.4.2, which may be used by Indigenous groups.</p> <p><u>Specific Question / Request for Information:</u></p> <p>A. Describe information sources to identify wildlife species in the project, including traditional knowledge, and provide a table with all wildlife species identified in the PDA, LSA or RSA, including species of interest to Indigenous communities and species at risk. Include the date of observation, federal status, whether it is a migratory bird, and location within the PDA, LSA or RSA.</p> <p>B. Reassess the valued components for wildlife and species at risk and provide an effects assessment for species of interest to Indigenous communities and species at risk that have been observed, or likely to occur, within the Project footprint, that were not presented in the EIS, including Olive-Sided Flycatcher, Canada Warbler, Eastern Whip-Poor-Will, Eastern Wood-Pewee, Bobolink, Loggerhead Shrike, Wood Thrush, Least Bittern, Yellow Rail, Rusty Blackbird, Short-Eared Owl, Monarchs and Gray Fox.</p> <p>C. Consider the capacity of adjacent habitat in the LSA to support the displacement of wildlife species.</p> <p>D. Describe the mitigation measures to address the potential effects to each species at risk, ensuring that the measures are consistent with applicable recovery strategies and management plans.</p> <p>E. Describe the residual effects on each species at risk and their habitat and the significance of those residual effects, based on the Agency’s methodology for assessing significance (including the criteria of magnitude, geographic extent, timing, duration, frequency, reversibility, and ecological and social context).</p> <p>F. Describe the monitoring program for each species at risk, including objectives and any monitoring measures that will be implemented, to verify presence and effectiveness of mitigation measures.</p>

Unique Identifier	Agency IR #	Annex	Agency / Group / Stakeholder	Cross Reference / Comment / Information Request / Response
				<p><u>Response:</u></p> <p><u>Part A:</u> Baseline information on wildlife and wildlife habitat was obtained through an extensive background review of existing databases and several years of field surveys (TMI_952-WL(2)-07_Table 1). All species identified within the Project Area (including migratory birds) and SAR likely to occur within the Project Area are presented in Appendix R of the Revised EIS. Traditional knowledge was incorporated where it was provided. Discussions on fur-bearers and ungulates were included in Appendix R, as they are known to represent important wildlife resources for Indigenous Communities.</p> <p>Please note: With respect, the individual wildlife observation dates and locations will not be provided as this represents a significant amount of work that is not normally included as part of the EIS process. The surveys dates and survey station locations presented in Appendix R are sufficient to assess the field surveys.</p> <p><u>Part B:</u> Rusty Blackbird, Common Nighthawk, Olive-sided Flycatcher, Barn Swallow, Bald Eagle, Peregrine Falcon, Black Tern, American White Pelican, Short-eared Owl, Whip-poor-will, Canada Warbler, Bobolink, Yellow Rail, Least Bittern and Chimney Swift were individually discussed in Appendix R of the Revised EIS.</p> <p>In-depth assessments of all SAR likely to occur within the Project area (include all the species presented in Question B) were previously prepared as a response to TMI_153-WL(1)-10. The response to TMI_153-WL(1)-10 presented detailed information on SAR natural history, life history, regional importance, potential project effects (presented as an impact matrix), suggested mitigation measures and expected residual effects, and mapped potential habitat within the LSA. Information pertaining to life-history, natural history, regional importance and Indigenous Traditional Knowledge were synthesized from available documentation, including (but not limited to): Species at Risk Evaluations (COSSARO), Assessment and Status Reports (COSEWIC), Management Plans, and Recovery Strategies. The full response package for IR TMI_153-WL(1)-10 has been attached for the convenience and consideration of the reviewers.</p> <p><u>Part C:</u> Wildlife habitat was recently remapped for the RSA, LSA and Operations Area following the guidance of the Agency and ECCC (see IR response TMI_870-WL(2)-01). Habitat areas within the LSA and Operations Area are presented in TMI_952-WL(2)-07_Table 2. The Operations Area results in the loss of 6.2% of the total LSA Area, and only exceeds 10% loss for one habitat type, Barren Ground. There is ample habitat in the LSA to compensate for the loss of the Operations Area, and displaced wildlife will be able to comfortably persist in the area.</p> <p><u>Part D:</u> Please refer to the response to IR TMI_153-WL(1)-10 (attached) for a detailed discussion of project effects, mitigation and residual effects on SAR. In general terms, proposed mitigation methods are intended to counteract the effects and/or the likelihood of direct habitat loss, functional habitat loss, exposure to contamination, direct mortality and vehicular collisions, which were identified as the most likely adverse effects of the Project on SAR.</p>

Unique Identifier	Agency IR #	Annex	Agency / Group / Stakeholder	Cross Reference / Comment / Information Request / Response
				<p><u>Part E:</u> Please refer to the response to IR TMI_153-WL(1)-10 (attached) for a detailed discussion of project effects, mitigation and residual effects on SAR. In general terms, this SAR assessment concluded that there would be no residual Project effects on SAR.</p> <p><u>Part F:</u> Presently there are no plans for a monitoring program specifically for SAR. As a group, SAR tend to be scarce, occurring within the Operations Area, and regional landscape in low densities. As such, they are difficult to detect during field surveys and make poor targets for monitoring. Treasury Metals intends to pursue a community-based wildlife monitoring plan, using changes in wildlife community composition as an indicator of Project effects and habitat condition. A detailed discussion of Treasury Metals' intended Follow-Up and Monitoring programs for wildlife and wildlife habitat are presented in Section 13.12 of the Revised EIS (April 2018).</p> <p><u>Agency Comment on Draft Response:</u> <i>Please note that there is no TMI_876-WL(2)-07. The correct identifier is TMI_952-WL(2)-07.</i></p> <p>B. The Agency has reviewed the response to TMI_876-WL(2)-07B. The Agency acknowledges the discussion of SAR in Appendix R of the Revised EIS and the response to TMI_153-WL(1)-10, however the Agency requests the proponent include the following SAR in the TMI_870-WL(2)-01H summary table for the valued components listed below in order to assess the potential direct and indirect effects to their suitable habitat:</p> <ul style="list-style-type: none"> • Monarchs: TMI_153-WL(1)-10 states the "Project area" could potentially be used for breeding and nectar habitats, however abundance is considered low. • Gray Fox: TMI_153-WL(1)-10 states the "Project footprint" does not include "sufficient shrubland to support a denning family unit." • Rusty Blackbird: Appendix R states that three Rusty Blackbirds were observed flying over the LSA, however "no evidence of nesting was observed" • Olive-sided Flycatcher: Appendix R states Olive-sided Flycatcher was recorded in the LSA and PDA, and likely nesting in the LSA • Canada Warbler: Appendix R states Canada Warbler observed in LSA, and likely a nesting species in the LSA • Short-eared Owl: Appendix R states suitable Short-eared Owl habitat in the LSA, and may occur in low numbers in the LSA • Eastern Whip-poor-will: Appendix R states it was not observed, however suitable habitat occurs in the LSA • Eastern Wood pewee: Appendix R states it was not observed, however suitable habitat occurs in the LSA • Bobolink: Appendix R states it was not observed, however suitable habitat occurs in the LSA • Loggerhead Shrike: Appendix R states it was observed and the habitat occurs in the LSA • Wood thrush: Appendix R states it was observed and the habitat occurs in the LSA • Least bittern: Appendix R states it was not observed, however suitable habitat occurs in the LSA

Unique Identifier	Agency IR #	Annex	Agency / Group / Stakeholder	Cross Reference / Comment / Information Request / Response
				<ul style="list-style-type: none"> • Yellow Rail: Appendix R states it was not observed, however suitable habitat occurs in the LSA • Barn Swallow: The draft response to TMI_870-WL(2)-011 states that no potential barn swallow nesting habitat will be removed, however EIS Section 6 states: "Barn Swallows have been observed in the buildings at the tree nursery as well as in some out buildings at a residence within the Project area. A concerted effort was made to close all doors and windows of the buildings at the tree nursery, which eliminated nesting opportunities for Barn Swallows. <p>Barn Swallows are known to nest in human-built structures such as barns, sheds and the overhangs of houses. They will also nest in culverts and under bridges, as well as natural rock faces. The residence and associated outbuildings will be removed as part of the site preparation and construction phase of the project. The removal of these buildings will displace approximately 3 to 5 breeding pairs of Barn Swallow." MNRF has indicated that they will require the proponent to create or enhance Barn Swallow habitat, including constructing Barn Swallow nesting habitat to compensate for the loss of Barn Swallow nesting sites, that would meet the requirements of Ontario's Endangered Species Act (2007), administered by the Ontario Ministry of Natural Resources and Forestry, and the proposed Recovery Strategies developed under the federal Species at Risk Act.</p> <p>Reassess the valued components for wildlife and species at risk and provide an effects assessment for species of interest to Indigenous communities and species at risk that have been observed, or likely to occur, within the Project footprint, that were not presented in the EIS, including Monarchs, Gray Fox, Rusty Blackbird, Olive-Sided Flycatcher, Barn Swallow, Canada Warbler, Short-Eared Owl, Eastern Whip-poor-will, Eastern Wood-pewee, Bobolink, Loggerhead Shrike, Wood Thrush, Least Bittern and Yellow Rail.</p> <p>C. The Agency has reviewed the response to TMI_876-WL(2)-07C and TMI_952-WL(2)-07_Table 2. The Agency requests the proponent complete the TMI_870-WL(2)-01H summary table for the valued components.</p> <p>D. The Agency has reviewed the response to TMI_876-WL(2)-07D. ECCC has compiled information on core nesting periods for all regions in Canada. Proponents can access the latest "General Avoidance Information" at: http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=1B16EAFB-1. This information should be used to establish mitigation measures to avoid or reduce impacts on migratory birds including species at risk.</p> <p>For Barn Swallows: The draft response to TMI_870-WL(2)-011 states that no potential barn swallow nesting habitat will be removed, however EIS Section 6 states: "Barn Swallows have been observed in the buildings at the tree nursery as well as in some out buildings at a residence within the Project area. A concerted effort was made to close all doors and windows of the buildings at the tree nursery, which eliminated nesting opportunities for Barn Swallows. Barn Swallows are known to nest in human-built structures such as barns, sheds and the overhangs of houses. They will also nest in culverts and under bridges, as well as natural rock faces. The residence and associated outbuildings will be removed as part of the site preparation and construction phase of the project. The removal of these buildings will displace approximately 3 to 5 breeding pairs of Barn Swallow." MNRF has indicated that they will require the proponent to create or enhance Barn Swallow habitat, including constructing Barn Swallow nesting habitat to compensate for the loss of Barn Swallow nesting sites, that would meet the requirements of Ontario's Endangered</p>

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				<p>Species Act (2007), administered by the Ontario Ministry of Natural Resources and Forestry, and the proposed Recovery Strategies developed under the federal Species at Risk Act.</p> <p>Update the mitigation measures for migratory bird species at risk (such as Barn Swallow), using:</p> <ul style="list-style-type: none"> • “General Avoidance Information” provided at http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=1B16EAFB-1; • requirements under Ontario’s Endangered Species Act where appropriate; and <p>Recovery Strategies such as the “Barn Swallow Recovery Strategy” provided at https://www.ontario.ca/page/barn-swallow-recovery-strategy</p> <p>F. The Agency has reviewed the response to TMI_876-WL(2)-07E and the FUP addendum and has the following comments:</p> <p>F1. The FUP addendum states wildlife monitoring will occur at 5 year intervals. As stated earlier, given the project timeline, five year intervals will not allow for the collection of sufficient data.</p> <p>F2. The Agency requests the proponent include follow-up measures to assess Mit_068: Closure activities should include revegetation with species suitable for the development of habitats capable of supporting a diversity of wildlife species.</p> <p>Update the FUP wildlife monitoring program to occur more frequently, as described in TMI_873_WL(2)-04A1. Provide a follow-up monitoring program to assess the success of Mig_068: Closure activities should include revegetation with species suitable for the development of habitat capable of supporting a diversity of wildlife species.</p> <p>Include a FUP monitoring program for the creation or enhancement of Barn Wallow nesting habitat.</p> <p><u>Specific Response to Agency Comments:</u> <i>Please note that there is no TMI_876-WL(2)-07. The correct identifier is TMI_952-WL(2)-07.</i></p> <p>Part B: <u>Species at Risk</u></p> <p>Species at Risk were assessed as a VC in the revised EIS (April 2018), and specifically assessed the 3 species of SAR that were observed during baseline surveys of the Project (Table 6.1.3.11-1). The SAR that were listed in the response to TMI_153-WL(1)-10 were not observed during the baseline surveys and in most cases have an extremely low probability of inhabiting the area. It was stated in Appendix R that there is potential suitable habitat within the LSA for the species listed by the Agency in this IR. To accommodate the Agency request, Treasury Metals has included potential habitat loss for the SAR species listed in this IR.</p> <p>In addition to the potential habitat loss of the SAR species listen in this IR, an updated effects assessment was completed for SAR, which incorporated the new PSA and LSA boundaries (discussed in detail in TMI_870-WL(2)-01), and was based on the loss of potential habitat for the individual SAR species, whether they are present or not. The</p>

Unique Identifier	Agency IR #	Annex	Agency / Group / Stakeholder	Cross Reference / Comment / Information Request / Response																				
				<p>updated SAR effects analysis has been provided in TMI_952-WL(2)-06_Table_2. SAR habitat mapping was consistent with TMI_153-WL(1)-10. Where necessary, descriptions of individual species assessments have been presented in Table 3 below for clarity. Please note that the broadest potentially suitable habitat categories were used for the purpose of assessing potential effects to SAR species habitat. For example, all coniferous forests were considered potential habitat for a species that specializes in mature coniferous forests. In this way, the most conservative habitat estimates possible were used in evaluating the potential effects on SAR habitat.</p> <table border="1"> <thead> <tr> <th colspan="2">Table 3: Description of Individual Species Assessments (Where Necessary)</th> </tr> <tr> <th>Species</th> <th>Description of Assessment (If Necessary)</th> </tr> </thead> <tbody> <tr> <td>Bald Eagle</td> <td>Potential nesting habitat was defined as all coniferous and deciduous forest within 200 m of waterbodies ≥ 10 ha in size, and ≥ 1 km from human settlements.</td> </tr> <tr> <td>Bank Swallow</td> <td>Potential habitat is difficult to map based on solely on ecosite classifications. But for the purposes of this exercise, all "Barren" habitats were considered to be "potential" Bank Swallow habitat. Barren habitat across the three study areas was composed of three ecosites: B007 – Active Mineral Barren; B165 – Open Rock Barren; and B189 – Constructed Vertical Surface. This resulted in 2.53 ha of Active Mineral Barren present within the PSA, however there are no vertical surfaces associated with these areas. In other words, there is no suitable Bank Swallow nesting habitat within the PSA, and this value is merely an artefact of the habitat-based approach to modeling Bank Swallow habitat.</td> </tr> <tr> <td>Black Tern</td> <td>Potential habitat was defined as contiguous marsh areas that were ≥ 20 ha in size.</td> </tr> <tr> <td>Golden Eagle</td> <td>Potential habitat included the areas identified through the Bald Eagle habitat mapping, as well as "cliff" habitats represented by ecosites B165 – Open Rock Barren, and B189 – Constructed Vertical Surface.</td> </tr> <tr> <td>Peregrine Falcon</td> <td>Potential habitat was defined as "cliff" habitats represented by ecosites B165 – Open Rock Barren, and B189 – Constructed Vertical Surface.</td> </tr> <tr> <td>Northern Myotis and Little Brown Myotis</td> <td>Potential roosting habitat was identified by the following ecosites: B015-B019, B023-B028, B039-B043, B054-B059, B069-B076, B087-B092, B103-B108, B118-B125, and B130-B133 (Jill Van Walleghem, MNRF Dryden District Biologist, pers. comm.); please refer to TMI_870-WL(2)-01_Table 2 for detailed descriptions of the ecosites listed above.</td> </tr> <tr> <td>Wolverine</td> <td>Potential habitat was defined as all coniferous forest for the purpose of this exercise.</td> </tr> <tr> <td>Monarch</td> <td>Potential habitat was mapped as all ecosites that may potentially support milkweed, the sole food source for the species. Ecosites include: B006, B008, B020, B021, B029,</td> </tr> </tbody> </table>	Table 3: Description of Individual Species Assessments (Where Necessary)		Species	Description of Assessment (If Necessary)	Bald Eagle	Potential nesting habitat was defined as all coniferous and deciduous forest within 200 m of waterbodies ≥ 10 ha in size, and ≥ 1 km from human settlements.	Bank Swallow	Potential habitat is difficult to map based on solely on ecosite classifications. But for the purposes of this exercise, all "Barren" habitats were considered to be "potential" Bank Swallow habitat. Barren habitat across the three study areas was composed of three ecosites: B007 – Active Mineral Barren; B165 – Open Rock Barren; and B189 – Constructed Vertical Surface. This resulted in 2.53 ha of Active Mineral Barren present within the PSA, however there are no vertical surfaces associated with these areas. 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				<p>B030, B044, B045, B126, B127, B128, B129, B130, B131, B132, B133, B134, B135, B136, B137, B138, B139, B140, B141, B142, B143, B144, B145, B146, B147, B148, B149, B150, B151, B152, B153, B154, B155, B156, B170, B171, B172, B222, B223 and B224; please refer to TMI_870-WL(2)-01_Table 2 for detailed descriptions of the ecosites listed above. However, it is important to note that it is unlikely that milkweed would be present uniformly across these areas. The habitat mapping resulted in 41.49 ha of potential milkweed-bearing areas within the PSA. However, as previously discussed in TMI_153-WL(1)-10, Swamp Milkweed (<i>Asclepias incarnata</i>) was present in the LSA at very low density. The values presented here for all three study areas are likely large over-representations of viable Monarch habitat.</p> <p>Snapping Turtle Potential habitat was defined as all surface water features within the study areas for this exercise. However, the area presented for the RSA is likely an under-representation of available habitat because we were not able to accurately calculate river/stream areas without detailed width measurements for all watercourses.</p>
				<p><u>Species of Interest to Indigenous Groups</u></p> <p>An updated effects assessment was conducted for species of interest to Indigenous groups, incorporating the new PSA and LSA boundaries (TMI_952-WL(2)-07_Table_4).</p> <p><u>Part C:</u></p> <p>Wildlife habitat was recently remapped for the RSA, LSA and PSA following the guidance of the Agency and ECCC (see also the response to TMI_870-WL(2)-01). Habitat areas and losses within the LSA and PSA are presented in TMI_952-WL(2)-07_Tables_5. The Project will result in both direct (where habitat is physically overprinted by the Project, which includes all of the PSA) and indirect (habitat impacted by elevated noise levels, degraded dust levels, excess light, changes in flows, and effects due to groundwater drawdown) loss of habitat. Following closure, the indirect habitat losses will largely be reversed, and the site will be reclaimed forming new habitats.</p> <p>During operations, the Project is predicted to result in the loss of 5.83% of the total LSA habitats, with a maximum loss for any one habitat subcategory of 10.38% for deciduous swamp. Given 90% of all of the individual habitat subcategories within the LSA will remain throughout operations, there is ample habitat in the LSA to accommodate displaced wildlife as a result of the loss of the habitat within the PSA, during operations.</p> <p><u>Part D:</u></p> <p>One existing Barn Swallow nesting site (building) will be demolished through the course of Project activities. Barn Swallow nesting structures will be constructed to compensate for the loss of this building, and to meet the requirements of Ontario’s Endangered Species Act (2007). A detailed plan of this compensation habitat has been</p>

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				<p>provided in the Goliath Gold Project Follow-up Addendum and Treasury Metals has already initiated discussion with MNRF regarding the specifications for Barn Swallow offset habitat.</p> <p><u>Part F:</u> Procedures for verifying effectiveness of Mit_068 (revegetation with species suitable for habitat capable of supporting a diversity of wildlife species) have been incorporated into the Goliath Gold Project Follow-Up Program Addendum. This includes the establishment of permanent sample plots within the PSA and monitored to verify native vegetation species are being established within the PSA (See the Goliath Gold Project Follow-Up Program Addendum for details) The Goliath Gold Project Follow-Up Program Addendum has also been expanded to include monitoring plans for verifying Barn Swallow use of offsetting structures. There is no other proposed monitoring for SAR species on site. As a group, SAR tend to be scarce, occurring within the PSA and regional landscape in low densities. As such, they are difficult to detect during field surveys and make poor targets for monitoring. Treasury Metals intends to pursue a community-based wildlife monitoring plan, using changes in wildlife community composition as an indicator of Project effects and habitat condition. A detailed discussion of Treasury Metals' intended Follow-Up and Monitoring programs for wildlife and wildlife habitat are presented in Section 13.12 of the Revised EIS (April 2018). Wildlife and wildlife habitat monitoring will occur at 3 year intervals, as discussed with the Agency on the October 12, 2018 teleconference.</p> <p><u>Final Response</u></p> <p><u>Part A:</u> Baseline information on wildlife and wildlife habitat was obtained through an extensive background review of existing databases and several years of field surveys (TMI_952-WL(2)-07_Table 1). All species identified within the Project Area (including migratory birds) and SAR likely to occur within the Project Area are presented in Appendix R of the Revised EIS. Traditional knowledge was incorporated where it was provided. Discussions on fur-bearers and ungulates were included in Appendix R, as they are known to represent important wildlife resources for Indigenous Communities.</p> <p>Please note: With respect, the individual wildlife observation dates and locations will not be provided as this represents a significant amount of work that is not normally included as part of the EIS process. It is the professional opinion of the independent consultants that the surveys dates and survey station locations presented in Appendix R are sufficient to assess the field surveys.</p> <p><u>Part B:</u> Rusty Blackbird, Common Nighthawk, Olive-sided Flycatcher, Barn Swallow, Bald Eagle, Peregrine Falcon, Black Tern, American White Pelican, Short-eared Owl, Whip-poor-will, Canada Warbler, Bobolink, Yellow Rail, Least Bittern and Chimney Swift were individually discussed in Section 4.16 in Appendix R of the revised EIS.</p>

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				<p>In-depth assessments of all SAR likely to occur within the Project area (include all the species presented in Question B) were previously prepared as a response to TMI_153-WL(1)-10. The response to TMI_153-WL(1)-10 presented detailed information on SAR natural history, life history, regional importance, potential project effects (presented as an impact matrix), suggested mitigation measures and expected residual effects, and mapped potential habitat within the LSA. Information pertaining to life-history, natural history, regional importance and Indigenous Traditional Knowledge were synthesized from available documentation, including (but not limited to): Species at Risk Evaluations (COSSARO), Assessment and Status Reports (COSEWIC), Management Plans, and Recovery Strategies. The full response package for IR TMI_153-WL(1)-10 has been attached for the convenience and consideration of the reviewers.</p> <p>Little Brown Myotis, Barn Swallow and Common Nighthawk were assessed as a species at risk based on the data collected as part of the terrestrial baseline studies presented in Section 5 of the revised EIS (April 2018), and have been recently reassessed using the updated PSA and LSA boundaries (TMI_952-WL(2)-07_Table 1). The SAR that were listed in the response to TMI_153-WL(1)-10 were not observed during the baseline surveys and in most cases have an extremely low probability of inhabiting the area. It was stated in Section 4.1.6 in Appendix R of the revised EIS that there is potential suitable habitat within the LSA for the species listed by the Agency in this IR. To accommodate the Agency request, Treasury Metals has added the potential habitat loss of these species at risk to the effects assessment of the SAR VC.</p> <p>In addition to the potential habitat loss of the SAR species listed in this IR, an updated effects assessment was completed for SAR, which incorporated the new PSA and LSA boundaries (discussed in detail in TMI_870-WL(2)-01), and was based on the loss of potential habitat for the individual SAR species, whether they are present or not. The updated SAR effects analysis has been provided in TMI_952-WL(2)-06_Table_2. SAR habitat mapping was consistent with TMI_153-WL(1)-10. Where necessary, descriptions of individual species assessments have been presented in Table 3 below for clarity. Please note that the broadest potentially suitable habitat categories were used for the purpose of assessing potential effects to SAR species habitat. For example, all coniferous forests were considered potential habitat for a species that specializes in mature coniferous forests. In this way, the most conservative habitat estimates possible were used in evaluating the potential effects on SAR habitat.</p> <table border="1"> <thead> <tr> <th colspan="2">Table 3: Description of Individual Species Assessments (Where Necessary)</th> </tr> <tr> <th>Species</th> <th>Description of Assessment (If Necessary)</th> </tr> </thead> <tbody> <tr> <td>Bald Eagle</td> <td>Potential nesting habitat was defined as all coniferous and deciduous forest within 200 m of waterbodies ≥ 10 ha in size, and ≥ 1 km from human settlements.</td> </tr> <tr> <td>Bank Swallow</td> <td>Potential habitat is difficult to map based on solely on ecosite classifications. But for the purposes of this exercise, all "Barren" habitats were considered to be "potential" Bank Swallow habitat. Barren habitat across the three study areas was composed of three ecosites: B007 – Active Mineral Barren; B165 – Open Rock Barren; and B189 – Constructed Vertical Surface. This resulted in 2.53 ha of Active Mineral Barren present</td> </tr> </tbody> </table>	Table 3: Description of Individual Species Assessments (Where Necessary)		Species	Description of Assessment (If Necessary)	Bald Eagle	Potential nesting habitat was defined as all coniferous and deciduous forest within 200 m of waterbodies ≥ 10 ha in size, and ≥ 1 km from human settlements.	Bank Swallow	Potential habitat is difficult to map based on solely on ecosite classifications. But for the purposes of this exercise, all "Barren" habitats were considered to be "potential" Bank Swallow habitat. Barren habitat across the three study areas was composed of three ecosites: B007 – Active Mineral Barren; B165 – Open Rock Barren; and B189 – Constructed Vertical Surface. This resulted in 2.53 ha of Active Mineral Barren present
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				Snapping Turtle Potential habitat was defined as all surface water features within the study areas for this exercise. However, the area presented for the RSA is likely an under-representation of available habitat because we were not able to accurately calculate river/stream areas without detailed width measurements for all watercourses.
<u>Species of Interest to Indigenous Groups</u>				

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				<p>An updated effects assessment was conducted for species of interest to Indigenous groups, incorporating the new PSA and LSA boundaries (see TMI_952-WL(2)-07_Table 4).</p> <p><u>Part C:</u> Wildlife habitat was recently remapped for the RSA, LSA and PSA following the guidance of the Agency and ECCC (see also the response to TMI_870-WL(2)-01). Habitat areas and losses within the LSA and PSA are presented in TMI_952-WL(2)-07_Tables_5. The Project will result in both direct (where habitat is physically overprinted by the Project, which includes all of the PSA) and indirect (habitat impacted by elevated noise levels, degraded dust levels, excess light, changes in flows, and effects due to groundwater drawdown) loss of habitat. Following closure, the indirect habitat losses will largely be reversed, and the site will be reclaimed forming new habitats.</p> <p>During operations, the Project is predicted to result in the loss of 5.83% of the total LSA habitats, with a maximum loss for any one habitat subcategory of 10.38% for deciduous swamp. Given 90% of all of the individual habitat subcategories within the LSA will remain throughout operations, there is ample habitat in the LSA to accommodate displaced wildlife as a result of the loss of the habitat within the PSA, during operations.</p> <p><u>Part D:</u> Please refer to the response to IR TMI_153-WL(1)-10 (TMI_952-WL(2)-07_Attachment_1) for a detailed discussion of Project effects, mitigation and residual effects on SAR. In general terms, proposed mitigation methods are intended to counteract the effects and/or the likelihood of direct habitat loss, functional habitat loss, exposure to contamination, direct mortality and vehicular collisions, which were identified as the most likely adverse effects of the Project on SAR. One existing Barn Swallow nesting site (building) will be demolished through the course of Project activities. Barn Swallow mitigation will include the construction of nesting structures to compensate for the loss of building that actively supports several nesting pairs, as per the Recovery Strategy developed under the federal Species at Risk Act. A full description of the mitigation plan and subsequent monitoring has been incorporated into the Goliath Gold Project Follow-Up Program Addendum. A detailed plan of this compensation habitat has been provided in the Goliath Gold Project Follow-up Addendum and Treasury Metals has already initiated discussion with MNRF regarding the specifications for Barn Swallow offset habitat.</p> <p><u>Part E:</u> Please refer to the response to IR TMI_153-WL(1)-10 (attached) for a detailed discussion of project effects, mitigation and residual effects on SAR. In general terms, this SAR assessment concluded that there would be no residual Project effects on SAR.</p> <p><u>Part F:</u></p>

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				<p>Procedures for verifying effectiveness of Mit_068 (revegetation with species suitable for habitat capable of supporting a diversity of wildlife species) have been incorporated into the Goliath Gold Project Follow-Up Program Addendum. This includes the establishment of permanent sample plots within the PSA and monitored to verify native vegetation species are being established within the PSA (See the Goliath Gold Project Follow-Up Program Addendum for details) The Goliath Gold Project Follow-Up Program Addendum has also been expanded to include monitoring plans for verifying Barn Swallow use of offsetting structures. There is no other proposed monitoring for SAR species on site. As a group, SAR tend to be scarce, occurring within the PSA and regional landscape in low densities. As such, they are difficult to detect during field surveys and make poor targets for monitoring. Treasury Metals intends to pursue a community-based wildlife monitoring plan, using changes in wildlife community composition as an indicator of Project effects and habitat condition. A detailed discussion of Treasury Metals' intended Follow-Up and Monitoring programs for wildlife and wildlife habitat are presented in Section 13.12 of the Revised EIS (April 2018). Wildlife and wildlife habitat monitoring will occur at 3 year intervals, as discussed with the Agency on the October 12, 2018 teleconference.</p> <p>References:</p> <ul style="list-style-type: none"> • Canadian Council of Ministers of Environment (CCME). 1996. A protocol for the derivation of Environmental and Human Health Soil Quality Guidelines. ISBN 0-662-2344-7. • Canadian Council of Ministers of the Environment (CCME). 2003. Canadian Water Quality Guidelines for the Protection of Aquatic Life. Mercury (inorganic mercury and methylmercury). http://cegg-rcqe.ccmec.ca/download/en/191 • Government of Canada, Federal Contaminated Sites Action Plan (FCSAP). 2012. Ecological Risk Assessment Guidance. March 2012. • Health Canada (HC). 2010. Part V: Guidance on Human Health Detailed Quantitative Risk Assessment for Chemicals (DQRACHem). Dated 2010 Health Canada (HC), 2011a. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise. Draft, January 2011.

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				<p><u>Agency Comment on Draft Response</u></p> <p>B. The Agency has reviewed the response to TMI_952_WL(2)-07B.</p> <p>See TMI_870-WL(2)-01_H for questions regarding TMI_952-WL(2)-07_Table _2.</p> <p>See TMI_870-WL(2)-01_H for questions regarding TMI_952-WL(2)-07_Table _4.</p> <p>C. The Agency has reviewed the response to TMI_952_WL(2)-07C.</p> <p>D. The Agency has reviewed the response to TMI_952_WL(2)-07D.</p> <p>F. The Agency has reviewed the response to TMI_952_WL(2)-07F.</p>
				<p><u>FINAL RESPONSE</u></p> <p>Agency accepted Revised Response as Final.</p>

TMI_953-WL(2)-08

Unique Identifier	Agency IR #	Annex	Agency / Group / Stakeholder	Cross Reference / Comment / Information Request / Response
TMI_953-WL(2)-08	WL(2)-08	4	Eagle Lake First Nation	<p>Reference to EIS Guidelines: Part 2, Section 11.1</p>
				<p>Reference to EIS / Appendix Sections 6.15.4, 13.15</p>
				<p>Cross-reference to Round 1 IRs TMI_938-AC(2)-05</p>
				<p><u>Context and Rationale:</u></p> <p>Section 6.15.4.1 states “floral invasive species can also be a concern” and Section 6.15.5 states “avoid broadcast spraying of herbicide for vegetation management. [Mig_086].” An invasive management plan has not been presented,</p>

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				<p>and the proponent does not describe alternate mitigation measures to herbicide that will be implemented or circumstances where herbicide avoidance would not be possible.</p> <p>The implementation of an invasive species management plan developed in consultation with Indigenous groups would minimize project effects on adjacent habitat for migratory bird, species at risk and species of use to Indigenous groups, and improve the efficacy of the vegetation rehabilitation program during decommissioning.</p> <p><u>Specific Question / Request for Information:</u></p> <p>A. Consider the response to AC(2)-05 and describe the mitigation measures that would be implemented to avoid the introduction or spread of invasive species due to Project activities during construction, operation and decommissioning.</p> <p><u>Response:</u></p> <p><u>Part A:</u> Prior to the implementation of mitigation programs to control invasive plant species, Treasury Metals intend work with local Indigenous communities to discuss and develop the final programs.</p> <p>In addition to the potential mitigation measures listed below, there are further avoidance measures that were considered during the planning of the project including (e.g., using existing infrastructure as much as possible, not building additional roads).</p> <p>Mitigation measures:</p> <ul style="list-style-type: none"> • Surveys of existing invasive species populations will be conducted prior to construction, followed by a monitoring plan to ensure invasive species populations are not increasing in numbers or areas • Vegetation stripping/removal will be limited to only those areas required for Project activities, thereby limiting exposed soil which may open areas for infiltration by invasive species • Ensure that invasive seed sources are not brought onto Project work site from non-Project work sites by washing all machinery and equipment off site before entering the Project area • Locate vehicle wash areas a minimum of 30 m from the High-Water Mark from all surface water features • Keep machinery on designated routes to reduce damage to surrounding vegetation • Utilize existing roads, trails or cut lines wherever possible • Locate lay-down areas a minimum of 15 m from the High-Water Mark from all surface water features • Prevent all debris from entering watercourses through a comprehensive erosion and sediment control plan • Only local seeds will be used for any re-vegetation efforts (e.g. MTO seed mix) • Only native species will be planting during all reclamation activities • Herbicides will only be used when necessary to reduce the spread of invasive species (as per vegetation management plan developed in conjunction with local indigenous groups and the MNR)

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				<p><u>Agency Comment on Draft Response:</u></p> <p>None Received</p> <p><u>Specific Response to Agency Comments:</u></p> <p>Not required. Agency accepted Draft Response as Final. Small changes have been made to ensure consistency across all technical disciplines. A final response has been provided.</p> <p><u>Revised Response:</u></p> <p>Part A: Prior to the implementation of mitigation programs to control invasive plant species, Treasury Metals intend work with local Indigenous communities to discuss and develop the final programs.</p> <p>In addition to the potential mitigation measures listed below, there are further avoidance measures that were considered during the planning of the project including (e.g., using existing infrastructure as much as possible, not building additional roads).</p> <p>Mitigation measures:</p> <ul style="list-style-type: none"> • Surveys of existing invasive species populations will be conducted prior to construction, followed by a monitoring plan to ensure invasive species populations are not increasing in numbers or areas • Vegetation stripping/removal will be limited to only those areas required for Project activities, thereby limiting exposed soil which may open areas for infiltration by invasive species • Ensure that invasive seed sources are not brought onto Project work site from non-Project work sites by washing all machinery and equipment off site before entering the Project area • Locate vehicle wash areas a minimum of 30 m from the High-Water Mark from all surface water features • Keep machinery on designated routes to reduce damage to surrounding vegetation • Utilize existing roads, trails or cut lines wherever possible • Locate lay-down areas a minimum of 15 m from the High-Water Mark from all surface water features • Prevent all debris from entering watercourses through a comprehensive erosion and sediment control plan • Only local seeds will be used for any re-vegetation efforts (e.g. MTO seed mix) • Only native species will be planting during all reclamation activities • Herbicides will only be used when necessary to reduce the spread of invasive species (as per vegetation management plan developed in conjunction with local indigenous groups and the MNR)

TMI_870-WL(2)-01_Table_11: Updated Effects Assessment for Wetlands and Vegetation

Valued Components (VCs)	Indicators	Baseline			Construction and Operations				Abandonment ⁽⁴⁾			
		Habitat Area (ha)			Habitat loss (ha)		Percent of habitat lost (%)		Area rehabilitated post-abandonment (ha)	Irreversible habitat change post-abandonment (ha)	Habitat change post-abandonment (%)	
		PSA	LSA	RSA	Direct ⁽¹⁾⁽³⁾	Indirect ⁽²⁾	LSA	RSA			LSA	RSA
Wetlands	Wetland Extent	40.54	1709.70	48104.30	34.54 ⁽³⁾	15.71	2.94	0.10	39.42	16.82	0.98	0.03
	Wild Rice	0	102.11	1419.23	0	0	0	0	0	0	0	0
	Floating Marsh Marigold	0.00	1.25*	1.25*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vegetation Communities	Predominantly coniferous forest	195.41	2415.38	101806.72	195.41	13.17	8.64	0.20	20.69	187.89	7.78	0.18
	Predominantly deciduous forest	75.91	1184.44	79131.85	75.91	8.09	7.09	0.11	16.71	67.29	5.68	0.09
	Successional areas	3.85	142.52	9840.22	3.85	0.00	2.70	0.04	185.98	-182.13 ⁽⁴⁾	-127.79 ⁽⁴⁾	-1.85 ⁽⁴⁾
	Potential berry harvesting areas	271.57	3574.83	169438.52	271.57	21.37	8.19	0.17	37.51	255.43	7.15	0.15

Notes:

- (1) Habitat directly removed within the Project Study Area during construction and/or operations
- (2) Habitat indirectly impacted by Project activities including noise, light, dust, changes in flows and the effects of groundwater drawdown.
- (3) The construction of the fish compensation ponds during the site preparation and construction phase will add 6 ha of marsh habitat.
- (4) The negative values represent the new wetland areas as a result of the Project.

TMI_870-WL(2)-01_Appendix_1:
Correspondence with ECCC regarding Habitat Classifications and
Songbird Surveys

June 15th, 2018

From: Terry Honsberger [mailto:thonsberger@kbm.ca]
Sent: June 15, 2018 11:16 AM
To: Watton, Paul (EC)
Subject: FW: ecosite-habitat class correlation

Hi Paul. Please review and provide us with some feedback. Once you do that, we can generate these habitat categories, and check the coverage of the wildlife surveys.

Thanks.

From: Watton, Paul (EC) <paul.watton@canada.ca>
Sent: June 15, 2018 12:00 PM
To: Terry Honsberger <thonsberger@kbm.ca>
Cc: Russell, Rich (EC) <rich.russell@canada.ca>
Subject: RE: ecosite-habitat class correlation

Hi Terry

Can you send a version with the Ecosite Name or description along with the code. It can also be a separate document.

Thanks

Hi Paul,

Sorry about the delay. Here is the information you requested.
Thanks

Zachary Long
Biologist
zlong@kbm.ca
349 Mooney Ave, Thunder Bay, Ontario P7B 5L5
T: 587-987-6696

Hi Terry and Zach,

We like it:
A couple of tweaks:

054 is currently in Coniferous but should be Mixedwood
Split Wetland Swamp into Wetland Swamp Coniferous and Wetland Swamp Hardwood
Wetland Swamp Coniferous = 127,128,129,222,223,224
Wetland Swamp Hardwood = 130,131,132,133,134,135,216

Cheers,

Paul

Paul Watton

Senior Environmental Specialist
Canadian Wildlife Service
Ontario Region
Environment and Climate Change Canada / Government of Canada
4905 Dufferin Street
Toronto, ON M3H 5T4
paul.watton@ec.gc.ca
Telephone 647-215-7017
Facsimile 416-739-5845
Website www.ec.gc.ca

June 28th, 2018

From: Terry Honsberger [<mailto:thonsberger@kbm.ca>]
Sent: June 28, 2018 11:49 AM
To: Watton, Paul (EC)
Cc: Zachary Long
Subject: FW: TMI Songbird Survey Habitat Summary by Study Area

Here you go Paul.

From: Zachary Long
Sent: June 28, 2018 11:44 AM
To: Terry Honsberger <thonsberger@kbm.ca>
Subject: TMI Songbird Survey Habitat Summary by Study Area

There are two tables in the attached word document summarizing:

1. Habitat by Study area, and
2. Songbird Survey Habitat Coverage by Study Area

Please note:

- Only terrestrial habitat was included in these tables (i.e., open water areas were omitted)

From: Watton, Paul (EC) <paul.watton@canada.ca>
Sent: June 28, 2018 2:04 PM
To: Terry Honsberger <thonsberger@kbm.ca>
Cc: Zachary Long <zlong@kbm.ca>; Russell, Rich (EC) <rich.russell@canada.ca>

Subject: RE: TMI Songbird Survey Habitat Summary by Study Area

Hi Zach,

A bit confusion about the second table.

For each column, how were the numbers derived?

Were values for patch area summed across only those patches in which a point count station was surveyed?

Thanks,

Paul

From: Zachary Long [mailto:zlong@kbm.ca]
Sent: June 28, 2018 2:27 PM
To: Watton, Paul (EC); Terry Honsberger
Cc: Russell, Rich (EC)
Subject: RE: TMI Songbird Survey Habitat Summary by Study Area

No Problem.

I prepared a figure to illustrate how the data were separated (attached).

- Each point is associated with a 100-m radius survey area.
- Survey areas that crossed study area boundaries were split following the boundary line.
- Overlaps among survey areas were merged, so that the overlapped areas were not counted twice.

I hope this helps clear things up. Let me know if you have any further questions.

Zachary Long
Biologist
zlong@kbm.ca
349 Mooney Ave, Thunder Bay, Ontario P7B 5L5
T: 587-987-6696

From: "Watton, Paul (EC)" <paul.watton@canada.ca>
Date: 2018-06-28 4:00 PM (GMT-05:00)
To: Zachary Long <zlong@kbm.ca>, Terry Honsberger <thonsberger@kbm.ca>
Cc: "Russell, Rich (EC)" <rich.russell@canada.ca>
Subject: RE: TMI Songbird Survey Habitat Summary by Study Area

Hi Zach and Terry,

Based on the information provided, we are going to recommend that the Fen community be surveyed. We'll pass along our advice tomorrow, just wanted to give you the heads up.

Thanks,

Paul

From: Zachary Long [mailto:zlong@kbm.ca]
Sent: June 28, 2018 4:28 PM
To: Watton, Paul (EC); Terry Honsberger
Cc: Russell, Rich (EC); James Barber
Subject: Re: TMI Songbird Survey Habitat Summary by Study Area

Hi Paul,

That sounds fine. I have CC'd James Barber, our resident bird expert who will likely be conducting the additional fieldwork.

Just to reiterate something from our correspondence the other day, the deficit of surveyed fen habitat within the LSA is almost entirely associated with the Lola Lake Wetland complex, which is upstream of anticipated project effects. Without the Lola Lake Wetland, fen habitat only comprises roughly 1.5% of the LSA, and we have surveyed 0.3% (if memory serves, I don't have the numbers in front of me).

For planning the additional surveys, will we be expected to increase the fen sampling to approximate the representation of fen habitat within the entire LSA (i.e., including Lola Lake), or the 1.5% from the remainder?

Thanks for the quick turnaround.
Zach

June 29th, 2018

From: Watton, Paul (EC)
Sent: June 29, 2018 9:35 AM
To: 'Zachary Long'; Terry Honsberger
Cc: Russell, Rich (EC); James Barber
Subject: RE: TMI Songbird Survey Habitat Summary by Study Area

Hi Zach and Terry,

As part of the EA process, the RSA, LSA and PDA must be described. From the EIS Guidelines:

“The EIS will describe migratory and non-migratory birds (including waterfowl, raptors, shorebirds, marsh birds and other landbirds), ungulates, furbearers, amphibians, small mammals, and their habitat at the project site and within the local and regional areas.”

To that end, based on the habitat summary provided, it's clear that Fen Habitat, which is present in the RSA, LSA and Project Footprint was not surveyed for Migratory Birds. In consideration of this, we are providing advice in order to ensure this community is characterized properly.

To characterize the heretofore unaccounted fen community (otherwise known as Lola Wetland Complex), it is desirable to conduct the following sampling for breeding birds:

Using acoustic recording units (ARUs) deployed at a minimum of 10 stations distributed across the fen, spaced with a minimum of 500 m between stations, schedule the recording to occur as follows:

Across at least 5 dates with weather conditions conducive to good recording (max of only light drizzle and only light winds)

No later than July 07, 2018 (the current end of allowable survey window in Breeding Bird Survey),

Three recording periods every day:

1. Pre-dawn: Starting 2 hrs before local sunrise, ending at sunrise
2. Morning: Starting at Sunrise, ending 2 hrs after sunrise
3. Dusk: Starting ½ hr before sunset, ending 2 hrs after sunset

Attached is an SM4 config file with these suggested recording parameters.

If you have any questions please contact me directly.

Thanks,

Paul Watton

Senior Environmental Specialist

Canadian Wildlife Service

Ontario Region

Environment and Climate Change Canada / Government of Canada

4905 Dufferin Street

Toronto, ON M3H 5T4

paul.watton@ec.gc.ca

Telephone 647-215-7017

Facsimile 416-739-5845

Website www.ec.gc.ca

Hi Zach and Terry,

In light of the fact that a permit would be required from Ontario in order to access and survey the Lola Wetland Complex, and it seems unlikely that a permit would be issued in time to complete surveys by the end of the breeding bird window, **breeding bird surveys do not need to be completed in 2018 for Lola Wetland Complex**. However, we are drafting an IR which will request surveys be completed in order to evaluate and monitor the effects of the project on the surrounding environment. This request will result in the need for a commitment from TMI to complete breeding bird surveys in 2019 and/or 2020 in order to gather the baseline information for a monitoring program. The monitoring program will need to be

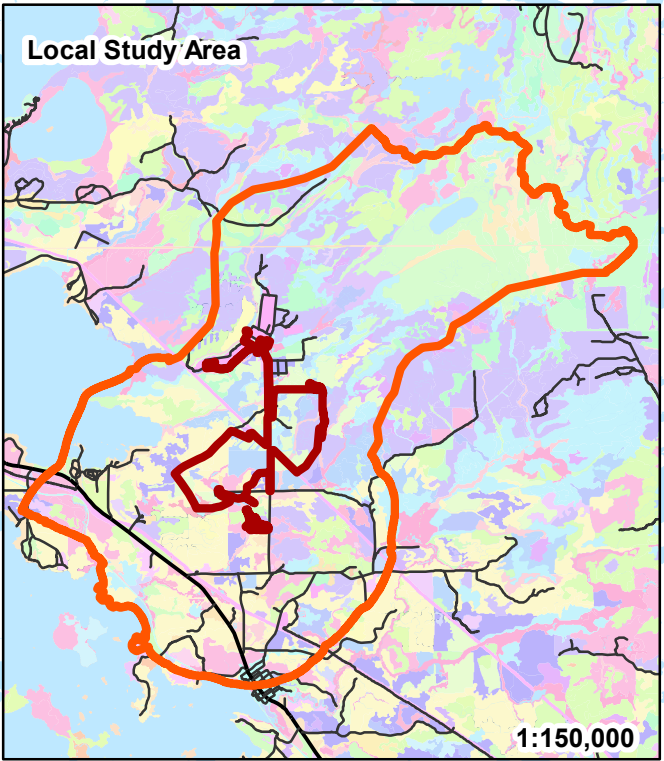
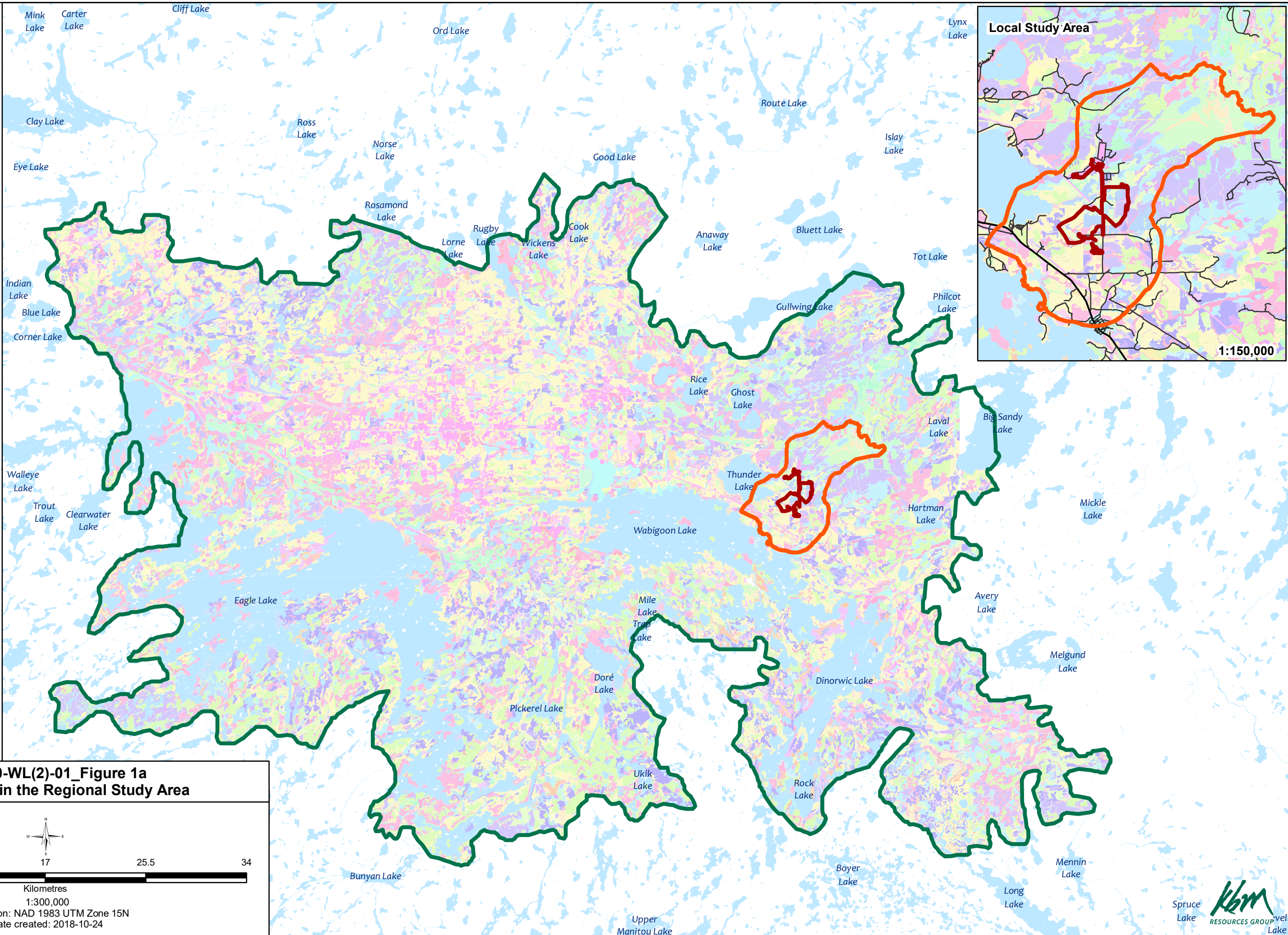
designed such that these effects can be detected and that will likely include the need for repeated surveys of the Lola Wetland Complex.

All the best,

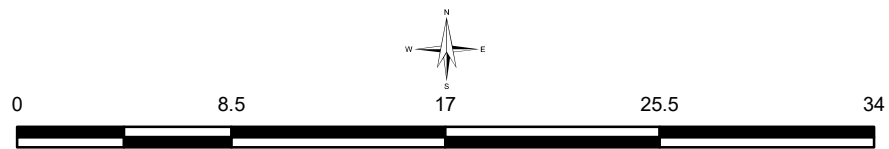
Paul

Legend

- PSA
 - LSA
 - RSA
 - Waterbody
- Ecosite**
- B101
 - B102
 - B103
 - B104
 - B105
 - B109
 - B111
 - B112
 - B113
 - B114
 - B115
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 - B197
 - B198
 - B199
 - B200
 - B222
 - B223
 - B224
 - U997
 - U998
 - U999



TMI_870-WL(2)-01_Figure 1a
Ecosites Within the Regional Study Area



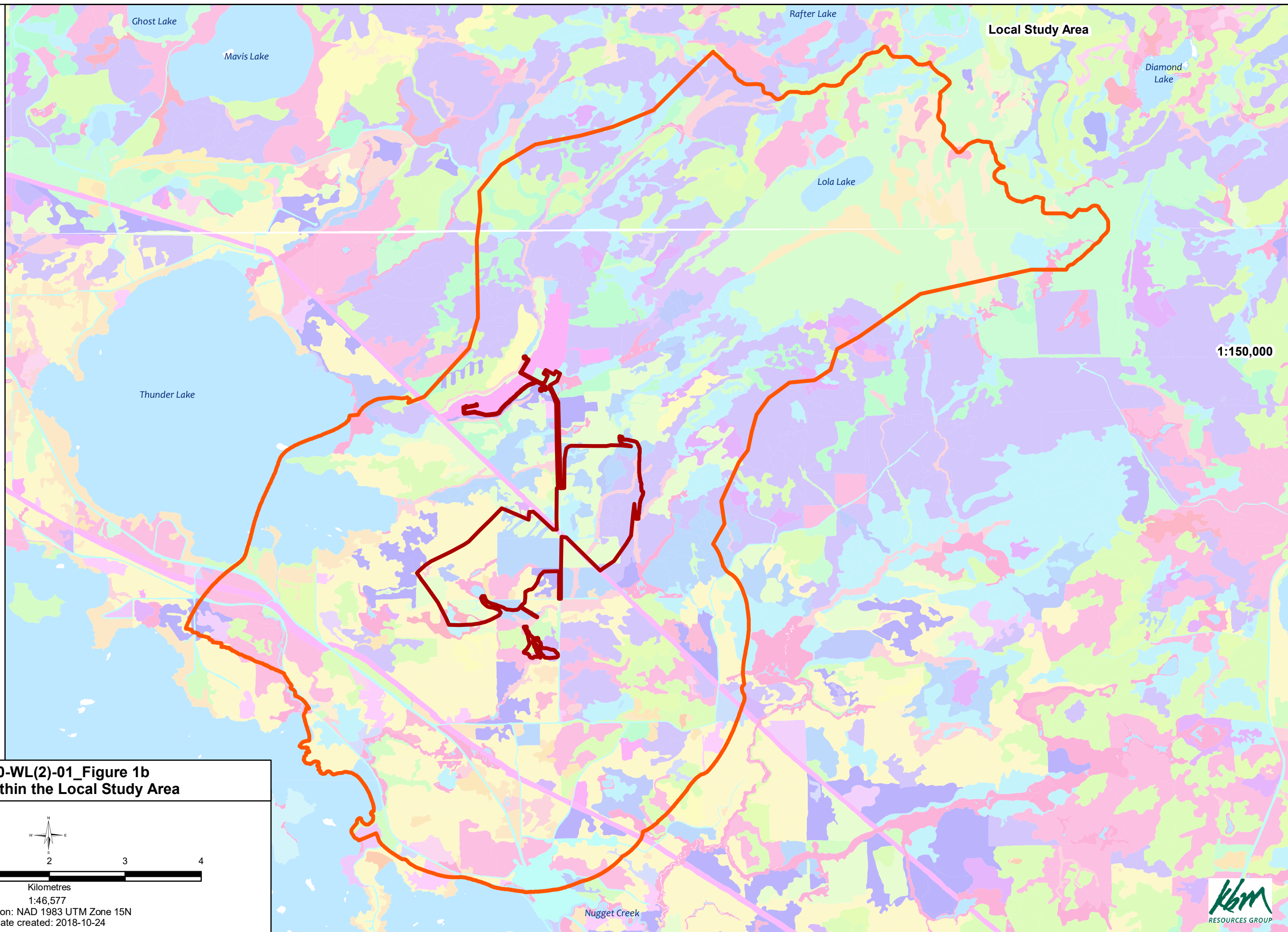
1:300,000
Projection: NAD 1983 UTM Zone 15N
Date created: 2018-10-24

Legend

- PSA
- LSA
- Waterbody
- B222
- B223
- U997
- U998
- U999

Ecosite

- B007
- B012
- B034
- B035
- B040
- B048
- B049
- B050
- B051
- B052
- B053
- B055
- B065
- B067
- B070
- B071
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- B142
- B144
- B146
- B191
- B197



**TMI_870-WL(2)-01_Figure 1b
Ecosites Within the Local Study Area**

0 1 2 3 4
Kilometres
1:46,577
Projection: NAD 1983 UTM Zone 15N
Date created: 2018-10-24



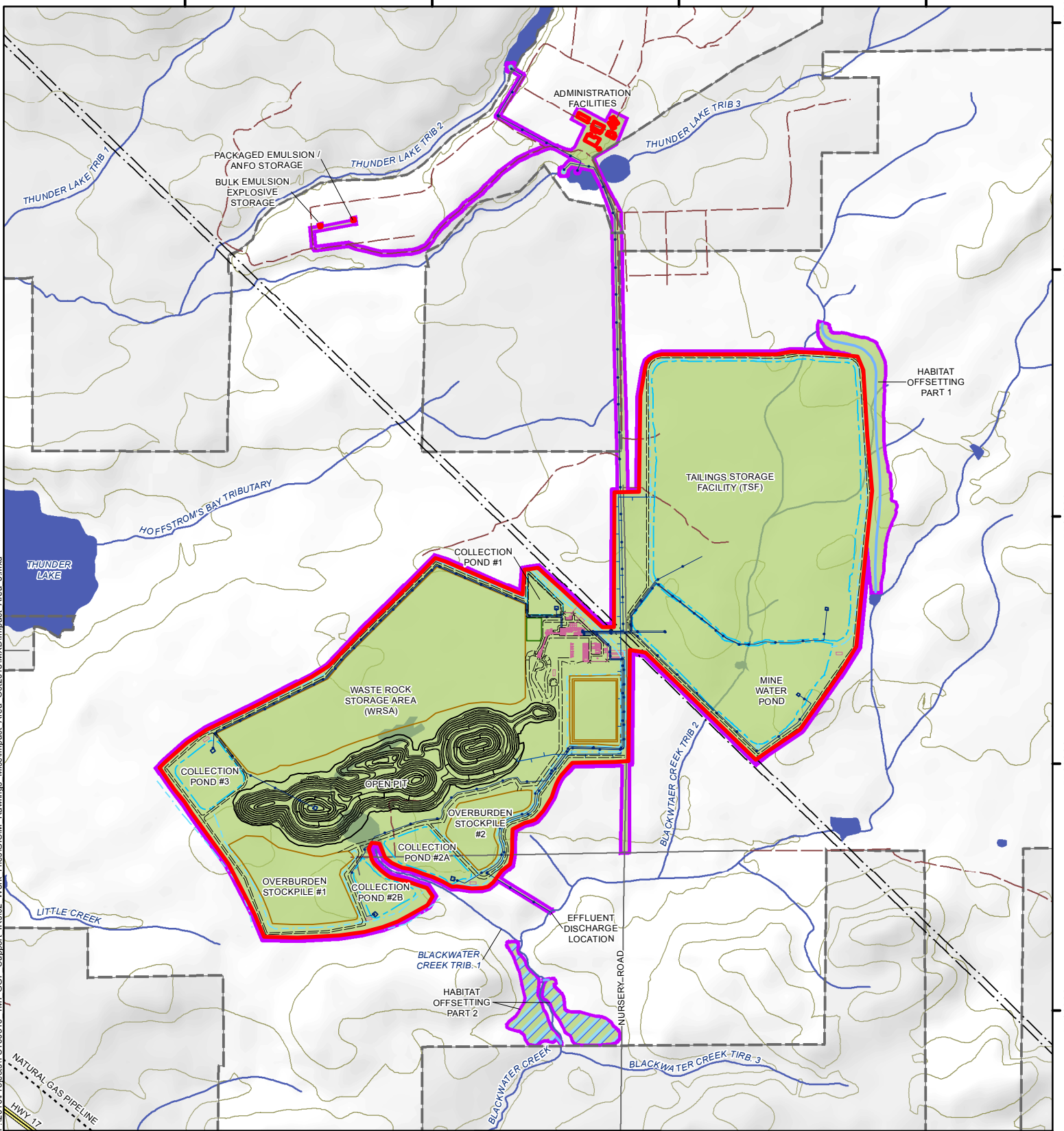
527000

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LEGEND

--- Hydro Line	--- Natural Gas Pipeline	--- Highway	--- Local Street	--- Resource / Recreation Trail	Watercourse	Waterbody	Contours (10 m interval)	Property Boundary of Claims and Dispositions	Area Beyond Property Boundary	Physical Disturbance Footprint	Project Study Area	Site Infrastructure	Operations Area	Access Haul Roads	Pipeline	Ditching	Emergency Spillway	Habitat Offsetting Options	Part 1: Blackwater Creek Tributary 2 Diversion (0.3 ha)	Part 2: Potential New Pond / Basin Along Blackwater Creek (6 ha)	Processing Plant and Ancillary Facilities	Security Fence	Stockpile
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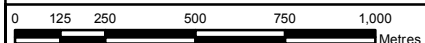
NOTES:
- Watercourses represent pre-development conditions based on LIO database, as modified by KBM.

Datum: NAD83
Projection: UTM Zone 15N

GOLIATH GOLD PROJECT

Project Study Area

PROJECT N°: TC160516	FIGURE: TMI_870-WL(2)-01_Figure_2
SCALE: 1:21,000	DATE: October 2018



TMI_870-WL(2)-01_Table 1a: Summary of Ecosite Areas

Habitat Category	Ecosite	Ecosite Description	Baseline			Construction and Operations				Abandonment *			
			Habitat Area (ha)			Habitat loss (ha)		Percent of habitat lost (%)		Area rehabilitated post-abandonment (ha)	Irreversible habitat change post-abandonment (ha)	Habitat change post-abandonment (%)	
			PSA	LSA	RSA	Direct ⁽¹⁾	Indirect ⁽²⁾	LSA	RSA			LSA	RSA
Upland	B007	Active Mineral Barren	2.53	34.91	464.17	2.53	—	7.25	0.55	0.00	2.53	7.25	0.55
	B011	Very Shallow, Dry to Fresh: Red Pine - White Pine Conifer	—	—	44.13	—	—	0.00	0.00	0.00	0.00	—	0.00
	B012	Very Shallow, Dry to Fresh: Black Spruce Conifer	—	62.34	5367.81	—	—	0.00	0.00	0.00	0.00	0.00	0.00
	B014	Very Shallow, Dry to Fresh: Conifer	—	—	29.68	—	—	0.00	0.00	0.00	0.00	—	0.00
	B016	Very Shallow, Dry to Fresh: Aspen - Birch Hardwood	—	—	170.19	—	—	0.00	0.00	0.00	0.00	—	0.00
	B031	Dry, Sandy: Sparse Shrub	—	—	15.74	—	—	0.00	0.00	0.00	0.00	—	0.00
	B032	Dry, Sandy: Shrub	—	—	7.59	—	—	0.00	0.00	0.00	0.00	—	0.00
	B033	Dry, Sandy: Red Pine - White Pine Conifer	—	—	637.11	—	—	0.00	0.00	0.00	0.00	—	0.00
	B034	Dry, Sandy: Jack Pine - Black Spruce Dominated	—	34.56	2569.04	—	—	0.00	0.00	0.00	0.00	0.00	0.00
	B035	Dry, Sandy: Pine - Black Spruce Conifer	—	—	1124.97	—	—	0.00	0.00	0.00	0.00	—	0.00
	B037	Dry, Sandy: Spruce - Fir Conifer	—	—	22.16	—	—	0.00	0.00	0.00	0.00	—	0.00
	B039	Dry, Sandy: Red Pine - White Pine Mixedwood	—	—	41.62	—	—	0.00	0.00	0.00	0.00	—	0.00
	B040	Dry, Sandy: Aspen - Birch Hardwood	—	—	448.59	—	—	0.00	0.00	0.00	0.00	—	0.00
	B046	Dry to Fresh, Coarse: Sparse Shrub	—	—	34.42	—	—	0.00	0.00	0.00	0.00	—	0.00
	B047	Dry to Fresh, Coarse: Shrub	—	—	61.64	—	—	0.00	0.00	0.00	0.00	—	0.00
	B048	Dry to Fresh, Coarse: Red Pine - White Pine Conifer	—	3.52	2488.28	—	—	0.00	0.00	0.00	0.00	0.00	0.00
	B049	Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	39.75	794.79	18577.67	39.75	—	5.00	0.21	0.00	39.75	5.00	0.21
	B050	Dry to Fresh, Coarse: Pine - Black Spruce Conifer	1.96	428.08	27990.66	1.96	—	0.46	0.01	0.00	1.96	0.46	0.01
	B051	Dry to Fresh, Coarse: Cedar - Hemlock Conifer	—	—	539.23	—	—	0.00	0.00	0.00	0.00	—	0.00
	B052	Dry to Fresh, Coarse: Spruce - Fir Conifer	—	83.99	3386.45	—	—	0.00	0.00	0.00	0.00	0.00	0.00
	B053	Dry to Fresh, Coarse: Conifer	—	—	168.98	—	—	0.00	0.00	0.00	0.00	—	0.00
	B054	Dry to Fresh, Coarse: Red Pine - White Pine Mixedwood	—	—	434.52	—	—	0.00	0.00	0.00	0.00	—	0.00
	B055	Dry to Fresh, Coarse: Aspen - Birch Hardwood	12.59	322.22	26063.77	12.59	—	3.91	0.05	1.31	11.28	3.50	0.04
	B062	Moist, Coarse: Sparse Shrub	—	—	1.54	—	—	0.00	0.00	0.00	0.00	—	0.00
	B063	Moist, Coarse: Shrub	—	—	5.52	—	—	0.00	0.00	0.00	0.00	—	0.00
	B064	Moist, Coarse: Red Pine - White Conifer	—	—	98.33	—	—	0.00	0.00	0.00	0.00	—	0.00
	B065	Moist, Coarse: Pine - Black Spruce Conifer	<0.01	162.01	2165.67	<0.01	—	<0.01	<0.01	0.00	<0.01	<0.01	<0.01
	B066	Moist, Coarse: Hemlock - Cedar Conifer	—	—	215.58	—	—	0.00	0.00	0.00	0.00	—	0.00
	B067	Moist, Coarse: Spruce - Fir Conifer	—	—	300.44	—	—	0.00	0.00	0.00	0.00	—	0.00
	B068	Moist, Coarse: Conifer	—	—	62.17	—	—	0.00	0.00	0.00	0.00	—	0.00
	B070	Moist, Coarse: Aspen - Birch Hardwood	4.23	14.28	1427.83	4.23	—	29.60	0.30	3.04	1.19	8.30	0.08
	B071	Moist, Coarse: Elm - Ash Hardwood	—	8.72	195.98	—	—	0.00	0.00	0.00	0.00	0.00	0.00
B081	Fresh, Clayey: Red Pine - White Pine Conifer	—	—	5.66	—	—	0.00	0.00	0.00	0.00	—	0.00	
B082	Fresh, Clayey: Jack Pine - Black Spruce Dominated	—	—	302.64	—	—	0.00	0.00	0.00	0.00	—	0.00	
B083	Fresh, Clayey: Pine - Black Spruce Conifer	—	—	860.14	—	—	0.00	0.00	0.00	0.00	—	0.00	
B084	Fresh, Clayey: Hemlock - Cedar Conifer	—	—	22.11	—	—	0.00	0.00	0.00	0.00	—	0.00	
B085	Fresh, Clayey: Spruce - Fir Conifer	—	—	65.79	—	—	0.00	0.00	0.00	0.00	—	0.00	
B088	Fresh, Clayey: Aspen - Birch Hardwood	—	—	1479.21	—	—	0.00	0.00	0.00	0.00	—	0.00	
B093	Fresh, Silty to Fine Loamy: Field	1.48	83.12	6191.02	1.48	—	1.78	0.02	159.39	-157.91 ⁽⁶⁾	-189.97 ⁽⁶⁾	-2.55 ⁽⁶⁾	
B095	Fresh, Silty to Fine Loamy: Sparse Shrub	0.31	36.21	2364.61	0.31	—	0.85	0.01	0.00	0.31	0.85	0.01	
B096	Fresh, Silty to Fine Loamy: Shrub	2.06	9.96	606.94	2.06	—	20.71	0.34	26.59	-24.53 ⁽⁶⁾	-246.32 ⁽⁶⁾	-4.04 ⁽⁶⁾	
B097	Fresh, Silty to Fine Loamy: Red Pine - White Pine Conifer	—	11.54	892.87	—	—	0.00	0.00	0.00	0.00	0.00	0.00	
B098	Fresh, Silty to Fine Loamy: Jack Pine - Black Spruce Dominated	74.21	302.06	5690.23	74.21	6.68	26.78	1.42	12.55	68.34	22.63	1.20	
B099	Fresh, Silty to Fine Loamy: Pine - Black Spruce Conifer	3.36	158.79	17312.26	3.36	4.61	5.02	0.05	4.61	3.37	2.12	0.02	
B100	Fresh, Silty to Fine Loamy: Hemlock - Cedar Conifer	—	4.85	1633.47	—	—	0.00	0.00	0.00	0.00	0.00	0.00	
B101	Fresh, Silty to Fine Loamy: Spruce - Fir Conifer	0.81	69.56	4396.47	0.81	—	1.16	0.02	0.00	0.81	1.16	0.02	
B102	Fresh, Silty to Fine Loamy: Conifer	—	—	350.53	—	—	0.00	0.00	0.00	0.00	—	0.00	
B103	Fresh, Silty to Fine Loamy: Red Pine - White Pine Mixedwood	—	—	249.99	—	—	0.00	0.00	0.00	0.00	—	0.00	
B104	Fresh, Silty to Fine Loamy: Aspen - Birch Hardwood	58.69	827.30	45164.97	58.69	8.09	8.07	0.15	13.53	53.25	6.44	0.12	
B105	Fresh, Silty to Fine Loamy: Elm - Ash Hardwood	—	—	24.68	—	—	0.00	0.00	0.00	0.00	—	0.00	
B109	Moist, Fine: Field	—	—	112.78	—	—	0.00	0.00	0.00	0.00	—	0.00	
B111	Moist, Fine: Sparse Shrub	—	—	39.54	—	—	0.00	0.00	0.00	0.00	—	0.00	
B112	Moist, Fine: Shrub	—	13.23	398.88	—	—	0.00	0.00	0.00	0.00	0.00	0.00	
B113	Moist, Fine: White Pine Conifer	—	4.51	40.67	—	—	0.00	0.00	0.00	0.00	0.00	0.00	
B114	Moist, Fine: Pine - Black Spruce Conifer	75.32	257.94	2913.30	75.32	1.87	29.93	2.65	2.36	74.83	29.01	2.57	
B115	Moist, Fine: Hemlock - Cedar Conifer	—	—	705.24	—	—	0.00	0.00	0.00	0.00	—	0.00	
B116	Moist, Fine: Spruce - Fir Conifer	—	36.83	681.25	—	—	0.00	0.00	0.00	0.00	0.00	0.00	

	B117	Moist, Fine: Conifer	—	—	145.75	—	—	0.00	0.00	0.00	0.00	—	0.00	
	B118	Moist, Fine: White Pine Mixedwood	—	—	5.32	—	—	0.00	0.00	0.00	0.00	—	0.00	
	B119	Moist, Fine: Aspen - Birch Hardwood	0.40	11.92	3814.60	0.40	—	3.32	0.01	0.00	0.40	3.32	0.01	
	B120	Moist, Fine: Elm - Ash Hardwood	—	—	342.02	—	—	0.00	0.00	0.00	0.00	—	0.00	
	B165	Open Rock Barren	—	—	12.27	—	—	0.00	0.00	0.00	0.00	—	0.00	
	B189	Constructed Vertical Surface	—	—	7.39	—	—	0.00	0.00	0.00	0.00	—	0.00	
Upland Total			277.69	3777.25	191994.06	277.69	21.26	7.91	0.16	223.38	75.57	2.00	0.04	
Wetland	B126	Treed Bog	—	—	26.09	—	—	0.00	0.00	0.00	0.00	—	0.00	
	B127	Poor Conifer Swamp	0.26	58.90	1306.01	0.26	—	0.44	0.02	0.00	0.26	0.44	0.02	
	B128	Intermediate Conifer Swamp	15.83	453.73	18298.86	15.83	7.20	5.08	0.13	7.20	15.83	3.49	0.09	
	B129	Rich Conifer Swamp	8.28	61.16	3052.03	8.28	0.79	14.83	0.30	0.79	8.28	13.54	0.27	
	B130	Intolerant Hardwood Swamp	—	16.50	1272.05	—	0.11	0.68	0.01	0.11	0.00	<0.01	<0.01	
	B133	Hardwood Swamp	—	—	39.07	—	—	0.00	39.07	0.00	0.00	0.00	—	0.00
	B134	Mineral Thicket Swamp	—	—	59.96	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
	B135	Organic Thicket Swamp	10.23	139.03	5902.75	10.23	6.29	11.88	0.28	6.29	10.23	7.36	0.17	
	B136	Sparse Treed Fen	0.80	641.27	3147.26	0.80	0.45	0.19	0.04	0.00	1.25	0.19	0.04	
	B138	Open Bog	—	—	2.48	—	—	0.00	0.00	0.00	0.00	—	0.00	
	B139	Poor Fen	—	98.48	3412.47	—	—	0.00	0.00	0.00	0.00	0.00	0.00	
	B140	Open Moderately Rich Fen	—	16.20	904.88	—	—	0.00	0.00	0.00	0.00	0.00	0.00	
	B141	Open Extremely Rich Fen	—	62.27	62.27	—	—	0.00	0.00	0.00	0.00	0.00	0.00	
	B142	Mineral Meadow Marsh	5.14	107.39	8237.95	5.14	0.15	4.93	0.06	0.15	5.14	-17.71 ⁽⁶⁾	-0.23 ⁽⁶⁾	
	B144	Organic Meadow Marsh	—	53.35	109.17	—	—	0.00	0.00	0.00	0.00	0.00	0.00	
	B146	Open Shore Fen	—	1.43	2154.74	—	0.72	50.00	0.03	0.72	0.00	<0.01	<0.01	
	B147	Shrub Shore Fen	—	—	3.26	—	—	0.00	0.00	0.00	0.00	—	0.00	
	B222	Mineral Poor Conifer Swamp	—	—	16.51	—	—	0.00	0.00	0.00	0.00	—	0.00	
	B223	Mineral Intermediate Conifer Swamp	—	—	77.28	—	—	0.00	0.00	0.00	0.00	—	0.00	
	B224	Mineral Rich Conifer Swamp	—	—	19.20	—	—	0.00	0.00	0.00	0.00	—	0.00	
	Fish compensation ponds (marsh) ⁽³⁾	—	—	—	-6.00 ⁽⁶⁾	0.00	—	—	6.00	-6.00 ⁽⁶⁾	—	—		
	Collection ponds 2A and 2B (marsh) ⁽⁴⁾	—	—	—	—	—	—	—	7.02	-7.02 ⁽⁶⁾	—	—		
	West basin of pit lake (marsh) ⁽⁵⁾	—	—	—	—	—	—	—	11.14	-11.14 ⁽⁶⁾	—	—		
Wetland Total			40.54	1709.70	48104.30	34.54	15.71	2.94	0.10	39.42	16.82	0.98	0.03	
Disturbed	B191	Active Waste Disposal/Landfill	—	2.52	44.60	—	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	B195	Active Fine Clean Fill	—	—	69.87	—	0.00	—	0.00	0.00	0.00	—	0.00	
	B197	Pavement/Concrete	—	100.29	3900.47	—	0.09	0.09	0.00	0.09	0.00	0.00	0.00	
	B198	Compact Gravelled Surface	—	—	13.91	—	0.00	—	0.00	0.00	0.00	—	0.00	
	B199	Compact Mineral Surface	—	—	1.50	—	0.00	—	0.00	0.00	0.00	—	0.00	
	B200	Other Materials	—	—	7.03	—	0.00	—	0.00	0.00	0.00	—	0.00	
	U997-U999	Commercial/Industrial; Utilities; Residential	12.04	189.42	4437.10	12.04	1.18	6.98	0.30	80.81	-67.59 ⁽⁶⁾	-35.68 ⁽⁶⁾	-1.52 ⁽⁶⁾	
Disturbed Total			12.04	292.23	8474.48	12.04	1.27	4.55	0.16	80.90	-67.59⁽⁶⁾	-23.13⁽⁶⁾	-0.80⁽⁶⁾	
Open Water			3.99	280.08	65274.94	3.99	0.22	1.50	0.01	20.92	-16.71	-5.97	-0.03	
Total			334.26	6059.27	313847.79	328.26	38.46	6.05	0.12	364.62	8.10	0.13	<0.01	

Notes:

(1) Habitat directly removed within the Project Study Area during construction and/or operations

(2) Habitat indirectly impacted by Project activities including noise, light, dust, changes in flows and the effects of groundwater drawdown.

(3) The construction of the fish compensation ponds during the site preparation and construction phase will add 6 ha of marsh habitat.

(4) At closure, collection ponds 2A and 2B will be rehabilitated to form 7.02 ha of additional marsh habitat.

(5) Following the end of mining, dewatering activities will cease and the open pit will be allowed to fill with water. The west basin will be shallow (i.e., 2 to 3 m) and half of the area is expected to form marsh habitat.

(6) The negative values represent the new wetland areas as a result of the Project.

*marsh percentages include the values include the contributions from the fish compensation ponds, rehabilitated collection ponds and the rehabilitated west basin of pit lake

TMI_870-WL(2)-01_Table 1b: Summary of Habitat Classes

Habitat Category	Habitat Sub-category	Baseline			Construction and Operations				Abandonment*			
		Habitat Area (ha)			Habitat loss (ha)		Percent of habitat lost (%)		Area rehabilitated post-abandonment (ha)	Irreversible habitat change post-abandonment (ha)	Habitat change post-abandonment (%)	
		PSA	LSA	RSA	Direct ¹	Indirect ²	LSA	RSA			LSA	RSA
Upland	Barren	2.53	34.91	483.83	2.53	0.00	7.25	0.52	0.00	2.53	7.25	0.52
	Coniferous forest	195.41	2415.38	101806.72	195.41	13.17	8.64	0.20	20.69	187.89	7.78	0.18
	Deciduous forest	75.91	1184.44	79131.85	75.91	8.09	7.09	0.11	16.71	67.29	5.68	0.09
	Mixedwood forest	—	—	731.45	0.00	0.00	—	0.00	0.00	0.00	—	0.00
	Grassland	1.48	83.12	6303.81	1.48	0.00	1.78	0.02	159.39	-157.91 ⁽⁶⁾	-189.97 ⁽⁶⁾	-2.51 ⁽⁶⁾
	Shrubland	2.37	59.40	3536.41	2.37	0.00	3.99	0.07	26.59	-24.22 ⁽⁶⁾	-40.78 ⁽⁶⁾	-0.68 ⁽⁶⁾
Upland Total		277.70	3777.25	191994.06	277.70	21.26	7.91	0.16	223.38	75.58	2.00	0.04
Wetland	Bog	—	—	28.56	0.00	0.00	—	0.00	—	0.00	—	0.00
	Fen	0.80	819.64	9684.89	0.80	1.17	0.24	0.02	0.72	1.25	0.15	0.01
	Marsh	5.14	160.74	8347.12	5.14	0.15	3.29	0.06	0.15	5.14	-11.83 ⁽⁶⁾	-0.23 ⁽⁶⁾
	Swamp – coniferous	24.37	573.79	22769.90	24.37	7.99	5.64	0.14	7.99	24.37	4.25	0.11
	Swamp – deciduous	10.23	155.53	7273.83	10.23	6.40	10.69	0.23	6.40	10.23	6.58	0.14
	Fish compensation ponds (marsh) (3)	—	—	—	-6.00 ⁽⁶⁾	0.00	—	—	6.00	-6.00 ⁽⁶⁾	—	—
	Collection ponds 2A and 2B (marsh) (4)	—	—	—	—	—	—	—	7.02	-7.02 ⁽⁶⁾	—	—
	West basin of pit lake (marsh) (5)	—	—	—	—	—	—	—	11.14	-11.14 ⁽⁶⁾	—	—
Wetland Total		40.54	1709.70	48104.30	34.54	15.71	2.94	0.10	39.42	16.82	0.98	0.03
Disturbed	12.04	292.23	8474.48	12.04	1.27	4.55	0.16	80.90	-67.59 ⁽⁶⁾	-23.13 ⁽⁶⁾	-0.80 ⁽⁶⁾	
Open Water	3.99	280.08	65274.94	3.99	0.22	1.50	0.01	20.92	-16.71 ⁽⁶⁾	-5.97 ⁽⁶⁾	-0.03 ⁽⁶⁾	
Total		334.26	6059.27	313847.79	328.26	38.46	6.05	0.12	364.62	8.10	0.13	<0.01

- Notes:**
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 - (3) The construction of the fish compensation ponds during the site preparation and construction phase will add 6 ha of marsh habitat.
 - (4) At closure, collection ponds 2A and 2B will be rehabilitated to form additional marsh habitat.
 - (5) Following the end of mining, dewatering activities will cease and the open pit will be allowed to fill with water. The west basin will be shallow (i.e., 2 to 3 m) and half of the area is expected to form r
 - (6) The negative values represent the new wetland areas as a result of the Project.
- *marsh percentages include the values include the contributions from the fish compensation ponds, rehabilitated collection ponds and the rehabilitated west basin of pit lake

TMI_870-WL(2)-01_Table 2: Ecosite and Habitat Class Relationships

Ecosite #	Ecosite Name	Habitat Class
B001	Excavated Bluff	Barren
B002	Active Bluff	Barren
B003	Open Bluff	Barren
B004	Bluff	Barren
B005	Active Mineral Shoreline	Barren
B006	Active Sand Dune	Barren
B007	Active Mineral Barren	Barren
B008	Very Shallow, Dry to Fresh: Meadow	Grassland
B009	Very Shallow, Dry to Fresh: Sparse Shrub	Shrubland
B010	Very Shallow, Dry to Fresh: Shrub	Shrubland
B011	Very Shallow, Dry to Fresh: Red Pine - White Pine Conifer	Coniferous
B012	Very Shallow, Dry to Fresh: Black Spruce Conifer	Coniferous
B013	Very Shallow, Dry to Fresh: Hemlock Conifer	Coniferous
B014	Very Shallow, Dry to Fresh: Conifer	Coniferous
B015	Very Shallow, Dry to Fresh: Red Pine - White Pine Mixedwood	Mixedwood
B016	Very Shallow, Dry to Fresh: Aspen - Birch Hardwood	Deciduous
B017	Very Shallow, Dry to Fresh: Oak Hardwood	Deciduous
B018	Very Shallow, Dry to Fresh: Maple Hardwood	Deciduous
B019	Very Shallow, Dry to Fresh: Mixedwood	Mixedwood
B020	Very Shallow, Humid: Meadow	Grassland
B021	Very Shallow, Humid: Sparse Shrub	Shrubland
B022	Very Shallow, Humid: Shrub	Shrubland
B023	Very Shallow, Humid: Red Pine - White Pine Conifer	Coniferous
B024	Very Shallow, Humid: Black Spruce - Pine Conifer	Coniferous
B025	Very Shallow, Humid: Hemlock Conifer	Coniferous
B026	Very Shallow, Humid: Conifer	Coniferous
B027	Very Shallow, Humid: Red Pine - White Pine Mixedwood	Mixedwood
B028	Very Shallow, Humid: Mixedwood	Mixedwood
B029	Dry, Sandy: Field	Grassland
B030	Dry, Sandy: Meadow	Grassland
B031	Dry, Sandy: Sparse Shrub	Shrubland
B032	Dry, Sandy: Shrub	Shrubland
B033	Dry, Sandy: Red Pine - White Pine Conifer	Coniferous
B034	Dry, Sandy: Jack Pine - Black Spruce Dominated	Coniferous
B035	Dry, Sandy: Pine - Black Spruce Conifer	Coniferous
B036	Dry, Sandy: Cedar - Hemlock Conifer	Coniferous
B037	Dry, Sandy: Spruce - Fir Conifer	Coniferous
B038	Dry, Sandy: Conifer	Coniferous
B039	Dry, Sandy: Red Pine - White Pine Mixedwood	Mixedwood
B040	Dry, Sandy: Aspen - Birch Hardwood	Deciduous
B041	Dry, Sandy: Oak Hardwood	Deciduous
B042	Dry, Sandy: Maple Hardwood	Deciduous
B043	Dry, Sandy: Mixedwood	Mixedwood
B044	Dry to Fresh, Coarse: Field	Grassland

B045	Dry to Fresh, Coarse: Meadow	Grassland
B046	Dry to Fresh, Coarse: Sparse Shrub	Shrubland
B047	Dry to Fresh, Coarse: Shrub	Shrubland
B048	Dry to Fresh, Coarse: Red Pine - White Pine Conifer	Coniferous
B049	Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	Coniferous
B050	Dry to Fresh, Coarse: Pine - Black Spruce Conifer	Coniferous
B051	Dry to Fresh, Coarse: Cedar - Hemlock Conifer	Coniferous
B052	Dry to Fresh, Coarse: Spruce - Fir Conifer	Coniferous
B053	Dry to Fresh, Coarse: Conifer	Coniferous
B054	Dry to Fresh, Coarse: Red Pine - White Pine Mixedwood	Mixedwood
B055	Dry to Fresh, Coarse: Aspen - Birch Hardwood	Deciduous
B056	Dry to Fresh, Coarse: Elm - Ash Hardwood	Deciduous
B057	Dry to Fresh, Coarse: Oak Hardwood	Deciduous
B058	Dry to Fresh, Coarse: Maple Hardwood	Deciduous
B059	Dry to Fresh, Coarse: Mixedwood	Mixedwood
B060	Moist, Coarse: Field	Grassland
B061	Moist, Coarse: Meadow	Grassland
B062	Moist, Coarse: Sparse Shrub	Shrubland
B063	Moist, Coarse: Shrub	Shrubland
B064	Moist, Coarse: Red Pine - White Conifer	Coniferous
B065	Moist, Coarse: Pine - Black Spruce Conifer	Coniferous
B066	Moist, Coarse: Hemlock - Cedar Conifer	Coniferous
B067	Moist, Coarse: Spruce - Fir Conifer	Coniferous
B068	Moist, Coarse: Conifer	Coniferous
B069	Moist, Coarse: Red Pine - White Mixedwood	Mixedwood
B070	Moist, Coarse: Aspen - Birch Hardwood	Deciduous
B071	Moist, Coarse: Elm - Ash Hardwood	Deciduous
B072	Moist, Coarse: Oak Hardwood	Deciduous
B073	Moist, Coarse: Sugar Maple Hardwood	Deciduous
B074	Moist, Coarse: Red Maple Hardwood	Deciduous
B075	Moist, Coarse: Maple Hardwood	Deciduous
B076	Moist, Coarse: Mixedwood	Mixedwood
B077	Fresh, Clayey: Field	Grassland
B078	Fresh, Clayey: Meadow	Grassland
B079	Fresh, Clayey: Sparse Shrub	Shrubland
B080	Fresh, Clayey: Shrub	Shrubland
B081	Fresh, Clayey: Red Pine - White Pine Conifer	Coniferous
B082	Fresh, Clayey: Jack Pine - Black Spruce Dominated	Coniferous
B083	Fresh, Clayey: Pine - Black Spruce Conifer	Coniferous
B084	Fresh, Clayey: Hemlock - Cedar Conifer	Coniferous
B085	Fresh, Clayey: Spruce - Fir Conifer	Coniferous
B086	Fresh, Clayey: Conifer	Coniferous
B087	Fresh, Clayey: Red Pine - White Pine Mixedwood	Mixedwood
B088	Fresh, Clayey: Aspen - Birch Hardwood	Deciduous
B089	Fresh, Clayey: Elm - Ash Hardwood	Deciduous
B090	Fresh, Clayey: Oak Hardwood	Deciduous
B091	Fresh, Clayey: Maple Hardwood	Deciduous

B092	Fresh, Clayey: Mixedwood	Mixedwood
B093	Fresh, Silty to Fine Loamy: Field	Grassland
B094	Fresh, Silty to Fine Loamy: Meadow	Grassland
B095	Fresh, Silty to Fine Loamy: Sparse Shrub	Shrubland
B096	Fresh, Silty to Fine Loamy: Shrub	Shrubland
B097	Fresh, Silty to Fine Loamy: Red Pine - White Pine Conifer	Coniferous
B098	Fresh, Silty to Fine Loamy: Jack Pine - Black Spruce Dominated	Coniferous
B099	Fresh, Silty to Fine Loamy: Pine - Black Spruce Conifer	Coniferous
B100	Fresh, Silty to Fine Loamy: Hemlock - Cedar Conifer	Coniferous
B101	Fresh, Silty to Fine Loamy: Spruce - Fir Conifer	Coniferous
B102	Fresh, Silty to Fine Loamy: Conifer	Coniferous
B103	Fresh, Silty to Fine Loamy: Red Pine - White Pine Mixedwood	Mixedwood
B104	Fresh, Silty to Fine Loamy: Aspen - Birch Hardwood	Deciduous
B105	Fresh, Silty to Fine Loamy: Elm - Ash Hardwood	Deciduous
B106	Fresh, Silty to Fine Loamy: Oak Hardwood	Deciduous
B107	Fresh, Silty to Fine Loamy: Maple Hardwood	Deciduous
B108	Fresh, Silty to Fine Loamy: Mixedwood	Mixedwood
B109	Moist, Fine: Field	Grassland
B110	Moist, Fine: Meadow	Grassland
B111	Moist, Fine: Sparse Shrub	Shrubland
B112	Moist, Fine: Shrub	Shrubland
B113	Moist, Fine: White Pine Conifer	Coniferous
B114	Moist, Fine: Pine - Black Spruce Conifer	Coniferous
B115	Moist, Fine: Hemlock - Cedar Conifer	Coniferous
B116	Moist, Fine: Spruce - Fir Conifer	Coniferous
B117	Moist, Fine: Conifer	Coniferous
B118	Moist, Fine: White Pine Mixedwood	Mixedwood
B119	Moist, Fine: Aspen - Birch Hardwood	Deciduous
B120	Moist, Fine: Elm - Ash Hardwood	Deciduous
B121	Moist, Fine: Oak Hardwood	Deciduous
B122	Moist, Fine: Sugar Maple Hardwood	Deciduous
B123	Moist, Fine: Red Maple Hardwood	Deciduous
B124	Moist, Fine: Maple Hardwood	Deciduous
B125	Moist, Fine: Mixedwood	Mixedwood
B126	Treed Bog	Bog
B127	Poor Conifer Swamp	Swamp - Coniferous
B128	Intermediate Conifer Swamp	Swamp - Coniferous
B129	Rich Conifer Swamp	Swamp - Coniferous
B130	Intolerant Hardwood Swamp	Swamp - Deciduous
B131	Maple Hardwood Swamp	Swamp - Deciduous
B132	Oak Hardwood Swamp	Swamp - Deciduous
B133	Hardwood Swamp	Swamp - Deciduous
B134	Mineral Thicket Swamp	Swamp - Deciduous
B135	Organic Thicket Swamp	Swamp - Deciduous
B136	Sparse Treed Fen	Fen
B137	Sparse Treed Bog	Bog
B138	Open Bog	Bog

B139	Poor Fen	Fen
B140	Open Moderately Rich Fen	Fen
B141	Open Extremely Rich Fen	Fen
B142	Mineral Meadow Marsh	Marsh
B143	Rock Meadow Marsh	Marsh
B144	Organic Meadow Marsh	Marsh
B145	Floating Marsh	Marsh
B146	Open Shore Fen	Fen
B147	Shrub Shore Fen	Fen
B148	Mineral Shallow Marsh	Marsh
B149	Organic Shallow Marsh	Marsh
B150	Open Water Marsh: Floating-leaved	Marsh
B151	Open Water Marsh: Mineral	Marsh
B152	Open Water Marsh: Organic	Marsh
B153	Constructed Water Collections	Other
B154	Active Limnetic Rock	Barren
B155	Active Limnetic Mineral	Barren
B156	Active Limnetic Organic	Barren
B157	Active Cliff	Barren
B158	Cliff	Barren
B159	Open Cliff	Barren
B160	Active Bedrock Shoreline	Barren
B161	Bedrock Shoreline	Barren
B162	Open Bedrock Shoreline	Barren
B163	Active Rock Barren	Barren
B164	Rock Barren	Barren
B165	Open Rock Barren	Barren
B166	Active Talus or Historic/Raised Beach	Barren
B167	Talus or Historic/Raised Beach	Barren
B168	Open Talus or Historic/Raised Beach	Barren
B169	Anthropogenic Coarse Shoreline	Disturbed
B170	Active Coarse Shoreline	Barren
B171	Coarse Shoreline	Barren
B172	Open Coarse Shoreline	Barren
B173	Calcareous Active Cliff	Barren
B174	Calcareous Cliff	Barren
B175	Calcareous Open Cliff	Barren
B176	Calcareous Active Bedrock Shoreline	Barren
B177	Calcareous Bedrock Shoreline	Barren
B178	Calcareous Open Bedrock Shoreline	Barren
B179	Calcareous Active Bedrock Shoreline	Barren
B180	Calcareous Rock Barren	Barren
B181	Calcareous Open Rock Barren	Barren
B182	Calcareous Active Talus or Historic/Raised Beach	Barren
B183	Calcareous Talus or Historic/Raised Beach	Barren
B184	Calcareous Open Talus or Historic/Raised Beach	Barren
B185	Calcareous Anthropogenic Coarse Shoreline	Disturbed

B186	Calcareous Active Coarse Shoreline	Barren
B187	Calcareous Coarse Shoreline	Barren
B188	Calcareous Open Coarse Shoreline	Barren
B189	Constructed Vertical Surface	Barren
B190	Industrial Waste	Disturbed
B191	Active Waste Disposal/Landfill	Disturbed
B192	Waste Disposal/Landfill	Disturbed
B193	Active Coarse Clean Fill	Disturbed
B194	Coarse Clean Fill	Disturbed
B195	Active Fine Clean Fill	Disturbed
B196	Fine Clean Fill	Disturbed
B197	Pavement/Concrete	Disturbed
B198	Compact Gravelled Surface	Disturbed
B199	Compact Mineral Surface	Disturbed
B200	Other Materials	Disturbed
B201	Active Coastal Cliff	Barren
B202	Open Coastal Cliff	Barren
B203	Coastal Cliff	Barren
B204	Active Coastal Bedrock Shoreline	Barren
B205	Open Coastal Bedrock Shoreline	Barren
B206	Coastal Bedrock Shoreline	Barren
B207	Active Coastal Coarse Shoreline	Barren
B208	Open Coastal Coarse Shoreline	Barren
B209	Coastal Coarse Shoreline	Barren
B210	Active Coastal Bluff	Barren
B211	Open Coastal Bluff	Barren
B212	Coastal Bluff	Barren
B213	Active Coastal Mineral Shoreline	Barren
B214	Active Coastal Sand Dune	Barren
B215	Coastal Mineral Barren	Barren
B216	Salt Thicked Swamp	Swamp - Deciduous
B217	Salt Poor Fen	Fen
B218	Open Salt Fen	Fen
B219	Salt Meadow Marsh	Marsh
B220	Salt Marsh	Marsh
B221	Open Salt Marsh	Marsh
B222	Mineral Poor Conifer Swamp	Swamp - Coniferous
B223	Mineral Intermediate Conifer Swamp	Swamp - Coniferous
B224	Mineral Rich Conifer Swamp	Swamp - Coniferous
U997	Commercial/Industrial	Disturbed
U998	Utilities	Disturbed
U999	Residential	Disturbed

TMI_870-WL(2)-01_Table_3: Habitat Loss by Project Component

Project Element	Habitat Area (ha)											TOTAL
	Barren	Coniferous	Deciduous	Disturbed	Fen	Grassland	Marsh	Shrubland	Swamp - Coniferous	Swamp - Deciduous	Open Water	
Collection Pond	0.60	6.71	4.57	0.34					0.39	0.73		13.34
Compensation Ponds		1.84	0.88					1.95		1.35		6.02
Diversion Channel (Bankfull)		2.99			0.10					0.81		3.90
Effluent Pipeline		0.99	0.44	0.19						0.01		1.63
Explosives Storage						0.02						0.02
Fuel Storage		0.01										0.01
Interstitial Areas	0.71	59.58	20.33	2.33	0.43	-0.02	0.96	0.00	9.34	2.42	1.03	97.11
Laydown Cold Storage		0.57										0.57
Low Grade Stockpile		5.44										5.44
Mine Waste Pond		16.81							4.19	1.43	0.26	22.69
Office and Parking Lot (existing)		0.48		2.54		0.18	<0.01				0.13	3.33
Open Pit	1.21	9.89	13.25				4.11		0.92		2.46	31.84
Overburden		6.30	8.62	1.31					1.22			17.45
Pump (existing)		<0.01								0.03	0.05	0.08
Processing Plant		6.96										6.96
RO plant		<0.01										0.00
Road ROW (existing)		2.63	0.40	5.31		1.30	0.02	0.42	0.23	0.34	0.05	10.70
Switchroom		0.08	0.03									0.11
Tailings Storage Facility (TSF)		55.56			0.27				6.56	3.11		65.50
TSF Sump		0.04								<0.01	0.01	0.05
Waste Rock Stockpile		18.55	27.39				0.05		1.52			47.51
TOTAL	2.52	195.43	75.91	12.02	0.80	1.48	5.14	2.37	24.37	10.23	3.99	334.26

TMI_870-WL(2)-01_Table 4a: Number of Vegetation Survey Locations by Ecosite

Ecosite Code	Ecosite Name	RSA		LSA		PSA	
		Count	%	Count	%	Count	%
B007	Active Mineral Barren	7	2.2	7	3.0	7	15.6
B048	Dry to Fresh, Coarse: Red Pine - White Pine Conifer	1	0.3	1	0.4		
B049	Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	25	7.7	21	9.0		
B050	Dry to Fresh, Coarse: Pine - Black Spruce Conifer	1	0.3	1	0.4		
B055	Dry to Fresh, Coarse: Aspen - Birch Hardwood	5	1.5	4	1.7	1	2.2
B065	Moist, Coarse: Pine - Black Spruce Conifer	1	0.3	1	0.4		
B093	Frush, Silty to Fine Loamy: Field	10	3.1	10	4.3		
B096	Frush, Silty to Fine Loamy: Shrub	4	1.2	4	1.7		
B097	Frush, Silty to Fine Loamy: Red Pine - White Pine Conifer	3	0.9	3	1.3		
B098	Frush, Silty to Fine Loamy: Jack Pine - Black Spruce Dominated	3	0.9	3	1.3	2	4.4
B099	Frush, Silty to Fine Loamy: Pine - Black Spruce Conifer	2	0.6	2	0.9		
B101	Frush, Silty to Fine Loamy: Spruce - Fir Conifer	2	0.6	2	0.9		
B104	Frush, Silty to Fine Loamy: Aspen - Birch Hardwood	27	8.4	21	9.0	1	2.2
B119	Moist, Fine: Aspen - Birch Hardwood	3	0.9	3	1.3	3	6.7
B128	Intermediate Conifer Swamp	2	0.6	1	0.4		
B129	Rich Conifer Swamp	2	0.6	2	0.9		
B135	Organic Thicket Swamp	16	5.0	16	6.9		
B140	Open Moderately Rich Fen	1	0.3	0	0.0		
B142	Mineral Meadow Marsh	58	18.0	19	8.2	4	8.9
B144	Organic Meadow Marsh	1	0.3	1	0.4		
B197	Pavement/Concrete	126	39.0	96	41.2	26	57.8
U997 - U999	Commercial/Industrial; Utilities; Residential	23	7.1	15	6.4	1	2.2
TOTAL		323	100	233	100	45	100

TMI_870-WL(2)-01_Table 4b: Number of Vegetation Survey Locations by Habitat Class

Habitat	RSA		LSA		PSA	
	Count	%	Count	%	Count	%
Barren	7	2.167	7	3.004	7	15.6
Coniferous	38	11.8	34	14.6	2	4.4
Deciduous	35	10.8	28	12.0	5	11.1
Disturbed	149	46.1	111	47.6	27	60.0
Fen	1	0.3	0	0.0		
Grassland	10	3.1	10	4.3		
Marsh	59	18.3	20	8.6	4	8.9
Shrubland	4	1.2	4	1.7		
Swamp - Coniferous	4	1.2	3	1.3		
Swamp - Deciduous	16	4.954	16	6.9		
TOTAL	323	100	233	100	45	100

TMI_870-WL(2)-01_Table 5a: Breeding Bird Species Richness by Habitat Category

Habitat Category	PSA		LSA		RSA		Total	
	# of Points	# of Species	# of Points	# of Species	# of Points	# of Species	# of Points	# of Species
Coniferous	20	48	38	50	5	19	63	62
Deciduous	3	18	36	60	6	15	45	59
Disturbed	0	0	5	27	6	28	11	39
Fen	0	0	0	0	1	8	1	8
Grassland	0	0	2	12	0	0	2	12
Marsh	0	0	1	5	4	20	5	22
Shrubland	0	0	1	9	0	0	1	9
Swamp - Coniferous	1	12	7	23	1	8	9	31
Swamp - Deciduous	0	0	3	19	0	0	3	19

TMI_870-WL(2)-01_Table 6: Breeding Bird Survey Areas by Habitat Class

Habitat	PSA		LSA		RSA		Songbird Survey		PSA Difference	LSA Difference	RSA Difference
	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	%	%	%
Barren	2.53	0.76	34.91	0.58	483.83	0.15	3.43	0.75	0.0	0.15	0.56
Bog	0.00	0.00	0.00	0.00	28.56	0.01	0.00	0.00	0.0	0.00	-0.01 ⁽¹⁾
Coniferous	195.41	58.46	2415.38	39.92	101806.72	32.44	216.41	47.41	-11.8 ⁽¹⁾	5.54	6.45
Deciduous	75.91	22.71	1184.44	19.58	79131.85	25.21	115.13	25.22	2.2	4.69	-6.61
Disturbed	12.04	3.60	292.23	4.83	8474.48	2.70	39.17	8.58	4.9	3.52	5.17
Fen	0.80	0.24	819.64	13.55	9684.89	3.09	1.06	0.23	0.0	-13.98 ⁽¹⁾	-3.66 ⁽¹⁾
Grassland	1.48	0.44	83.12	1.37	6303.81	2.01	20.56	4.50	4.1	3.06	1.97
Marsh	5.14	1.54	160.74	2.66	8347.12	2.66	22.67	4.97	3.4	2.18	1.61
Mixedwood	0.00	0.00	0.00	0.00	731.45	0.23	0.00	0.00	0.0	0.00	-0.29
Shrubland	2.37	0.71	59.40	0.98	3536.41	1.13	10.27	2.25	1.5	1.22	0.83
Swamp - Coniferous	24.37	7.29	563.64	9.32	22769.90	7.26	19.36	4.24	-3.1 ⁽¹⁾	-5.53 ⁽¹⁾	-4.92 ⁽¹⁾
Swamp Deciduous	10.23	3.06	155.53	2.57	7273.83	2.32	8.44	1.85	-1.3 ⁽¹⁾	-0.85 ⁽¹⁾	-1.08 ⁽¹⁾
Open Water	3.99	1.19	281.03	4.65	65273.99	20.80	0.00	0.00	-1.2 ⁽¹⁾	-4.65 ⁽¹⁾	-20.80 ⁽¹⁾
Total	334.26	100.00	6050.07	100.00	313846.83	100.00	456.49	100.00			

Notes:

(1) The negative values represent the new wetland areas as a result of the Project.

TMI_870-WL(2)-01_Table 7: Projected Densities by Habitat Type for all Migratory Birds

Species	Projected Densities by Habitat										# Individuals
	Coniferous	Deciduous	Disturbed	Fen	Grassland	Marsh	Shrubland	Swamp - Conifer.	Swamp - Decid.	Total	
Alder Flycatcher	11.76	7.39	0.49	0.00	0.00	0.77	0.01	1.55	0.76	22.7	23
American Bittern	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.5	1
American Goldfinch	11.76	0.53	0.66	0.00	0.00	0.00	0.00	0.77	0.76	14.5	15
American Kestrel	0.00	0.53	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.7	1
American Redstart	0.98	0.53	0.16	0.00	0.00	0.00	0.00	0.00	0.00	1.7	2
American Robin	47.04	25.86	2.78	0.44	0.01	0.39	0.01	4.64	2.28	83.4	83
Barn Swallow	6.86	0.00	4.91	0.00	0.00	0.00	0.00	0.00	0.00	11.8	12
Bay-breasted Warbler	5.88	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.4	6
Black-and-white Warbler	3.92	4.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.1	8
Blackbacked Woodpecker	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.0	1
Black-billed Cuckoo	1.96	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.5	3
Blackburnian Warbler	3.92	2.64	0.16	0.00	0.00	0.00	0.00	0.00	0.00	6.7	7
Black-capped Chickadee	5.88	10.56	0.49	0.00	0.00	0.00	0.00	0.00	0.76	17.7	18
Black-throated Green Warbler	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.5	1
Blue Jay	8.82	9.50	0.49	0.00	0.00	0.00	0.00	0.77	0.76	20.3	20
Blue-headed Vireo	5.88	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.9	7
Boreal Chickadee	5.88	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.00	6.7	7
Brown Creeper	7.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.8	8
Canada Warbler	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.5	1
Cape May Warbler	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	1.7	2
Cedar Waxwing	7.84	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.4	8
Chestnut Sided Warbler	10.78	12.67	1.64	0.00	0.01	0.77	0.00	0.00	2.28	28.1	28
Chipping Sparrow	17.64	5.81	0.82	0.00	0.00	0.00	0.01	2.32	0.00	26.6	27
Clay-colored Sparrow	3.92	0.53	0.00	0.00	0.01	0.00	0.00	0.00	0.00	4.5	5
Common Yellowthroat	6.86	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.4	7
Common Goldeneye	0.00	0.53	0.33	0.22	0.00	0.00	0.00	0.00	1.52	2.6	3
Common Loon	0.00	2.64	0.33	0.00	0.00	0.00	0.00	0.00	0.00	3.0	3
Common Merganser	0.00	0.00	1.31	0.00	0.00	0.00	0.00	0.00	0.00	1.3	1
Common Raven	19.60	11.08	0.49	0.00	0.00	0.77	0.00	1.55	0.00	33.5	34
Common Yellowthroat	5.88	7.39	0.16	0.22	0.00	1.16	0.00	1.55	0.00	16.4	16
Connecticut Warbler	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.00	0.00	0.4	0
Dark-eyed Junco	14.70	1.06	0.16	0.00	0.00	0.00	0.00	0.00	0.76	16.7	17
Downy Woodpecker	3.92	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.76	5.2	5
Eastern Phoebe	1.96	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.76	3.2	3
European Starling	2.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.9	3
Evening Grosbeak	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.5	1
Golden-crowned Kinglet	16.66	2.11	0.00	0.00	0.00	0.00	0.00	1.55	0.00	20.3	20
Gray Catbird	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.2	0
Gray Jay	12.74	3.17	0.16	0.00	0.00	0.39	0.00	8.50	0.00	25.0	25
Great Blue Heron	0.98	1.06	0.00	0.00	0.00	0.39	0.00	0.77	0.00	3.2	3
Great Crested Flycatcher	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.5	1
Greater Yellowlegs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.8	1
Hairy Woodpecker	3.92	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.4	4
Herring Gull	39.20	6.86	0.16	0.00	0.00	0.39	0.00	9.28	0.00	55.9	56
Killdeer	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.2	0
Least Flycatcher	17.64	7.92	1.15	0.00	0.00	0.00	0.01	2.32	0.00	29.0	29
LeConte's Sparrow	0.98	0.00	0.00	0.00	0.00	0.39	0.00	0.00	0.00	1.4	1
Lincoln's Sparrow	6.86	4.22	0.16	0.00	0.00	1.55	0.00	3.09	0.00	15.9	16
Magnolia Warbler	19.60	15.83	0.49	0.00	0.01	0.00	0.00	0.77	0.00	36.7	37
Mallard	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.3	0
Mourning Dove	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.0	1
Mourning Warbler	23.52	13.72	1.47	0.00	0.01	0.77	0.00	0.77	3.03	43.3	43
Nashville Warbler	63.71	19.53	0.82	0.00	0.00	0.39	0.00	9.28	0.00	93.7	94
Northern Flicker	11.76	4.75	0.49	0.00	0.00	0.00	0.01	0.77	0.00	17.8	18
Northern Harrier	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.00	0.00	0.4	0
Northern Parula	5.88	4.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.1	10
Northern Waterthrush	0.98	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.5	2
Ovenbird	27.44	22.17	2.29	0.00	0.00	0.00	0.00	0.77	3.03	55.7	56
Palm Warbler	2.94	0.53	0.00	0.00	0.00	0.00	0.00	3.86	0.00	7.3	7
Philadelphia Vireo	0.98	4.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.2	5
Pileated Woodpecker	2.94	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.0	4
Pine Siskin	0.98	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.51	2
Purple Finch	0.00	0.53	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.7	1
Red-breasted Nuthatch	23.52	11.61	0.98	0.00	0.01	0.77	0.01	1.55	0.76	39.2	39
Red-eyed Vireo	64.69	50.67	3.77	0.44	0.01	1.16	0.01	3.86	3.79	128.4	128
Red-necked Grebe	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.00	0.00	0.8	1
Red-tailed Hawk	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.5	0
Ring-billed Gull	0.00	0.00	0.82	0.22	0.00	0.00	0.00	0.00	0.00	1.0	1
Rose-breasted Grosbeak	0.98	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.0	2
Ruby-crowned Kinglet	37.24	12.14	0.33	0.00	0.00	0.77	0.01	14.69	1.52	66.7	67
Ruby-throated Hummingbird	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0
Ruffed Grouse	9.80	3.17	0.00	0.00	0.00	0.00	0.00	0.00	1.52	14.5	15
Sandhill Crane	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.00	1.8	2
Savannah Sparrow	0.00	0.00	0.16	0.00	0.01	0.00	0.00	0.00	0.00	0.2	0
Song Sparrow	8.82	7.39	0.33	0.22	0.00	0.39	0.00	0.77	0.00	17.9	18
Spotted Sandpiper	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.0	1
Swainson's Thrush	48.02	14.78	0.66	0.00	0.00	3.48	0.00	7.73	0.00	74.7	75
Swamp Sparrow	5.88	2.11	0.00	0.66	0.00	2.32	0.00	3.86	3.79	18.6	19
Tennessee Warbler	16.66	3.69	0.16	0.00	0.00	0.00	0.00	1.55	0.00	22.1	22
Tree Swallow	0.98	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	1.3	1
Veery	6.86	7.39	0.00	0.00	0.00	0.00	0.00	1.52	0.00	15.8	16
White-throated Sparrow	98.01	48.56	3.28	0.22	0.01	1.55	0.03	10.82	4.55	167.0	167
White-winged Crossbill	2.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.9	3
Wilson's Snipe	11.76	2.11	0.00	0.00	0.00	0.39	0.00	6.18	0.00	20.4	20
Winter Wren	16.66	4.22	0.33	0.00	0.00	0.39	0.00	3.09	0.76	25.4	25
Yellow-bellied Flycatcher	1.96	0.53	0.00	0.00	0.00	0.39	0.00	3.86	0.00	6.7	7
Yellow-bellied Sapsucker	1.96	2.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.6	5
Yellow-rumped Warbler	20.58	4.22	0.66	0.00	0.00	0.00	0.00	3.09	0.00	28.6	29
TOTAL	867.38	402.21	35.53	2.62	0.09	21.26	0.08	118.26	36.41	1483.8	1489

TMI_870-WL(2)-01_Table 8: Displacement of Migratory Bird Individuals

Habitat Category	Baseline			Construction and Operations				Abandonment*			
	# Individuals			# Individuals Displaced		Percent of habitat lost (%)		# Individuals return post-abandonment	#Individuals Irreversibly displaced post-abandonment	Habitat change post-abandonment (%)	
	PSA	LSA	RSA	Direct ¹	Indirect ²	LSA	RSA			LSA	RSA
Alder Flycatcher	25	385	19350	24	3	7.03	0.14	22	5	1.40	0.03
American Bittern	1	8	560	1	0	7.09	0.11	0	0	5.68	0.09
American Goldfinch	16	226	9368	16	2	7.97	0.19	10	8	3.40	0.08
American Redstart	2	28	1307	2	0	7.15	0.16	2	0	-0.64	-0.01
American Robin	91	1897	74376	91	11	5.37	0.14	135	-33	-1.74	-0.04
Barn Swallow	16	304	10006	16	1	5.76	0.18	60	-43	-14.02	-0.43
Bay-breasted Warbler	7	85	3800	7	0	8.48	0.19	1	6	7.57	0.17
Black-and-white Warbler	8	118	6638	8	1	7.76	0.14	1	8	6.59	0.12
Blackbacked woodpecker	1	13	540	1	0	8.64	0.20	0	1	7.78	0.18
Black-billed Cuckoo	3	34	1640	3	0	8.26	0.17	0	2	7.26	0.15
Blackburnian Warbler	7	100	5167	7	1	7.70	0.15	3	5	4.70	0.09
Black-capped Chickadee	19	296	16833	19	2	7.27	0.13	35	-14	-4.57	-0.08
Black-throated Green Warbler	1	8	560	1	0	7.09	0.11	0	0	5.68	0.09
Blue-headed Vireo	7	94	4360	7	1	8.36	0.18	1	7	7.40	0.16
Boreal Chickadee	7	95	3965	7	1	8.06	0.19	1	7	7.10	0.17
Brown Creeper	8	103	4321	8	1	8.64	0.20	1	8	7.78	0.18
Canada Warbler	1	8	560	1	0	7.09	0.11	0	0	5.68	0.09
Cape May Warbler	2	29	1312	2	1	9.79	0.22	1	2	7.10	0.16
Cedar Waxwing	9	111	4881	9	1	8.52	0.19	1	8	7.62	0.17
Chestnut Sided Warbler	32	510	26835	31	5	6.93	0.13	80	-44	-8.70	-0.17
Chipping Sparrow	30	451	21342	30	3	7.24	0.15	31	2	0.40	0.01
Clay-coloured Sparrow	5	99	5730	5	0	5.77	0.10	77	-71	-71.42	-1.24
Common Yellowthroat	8	98	4340	8	1	8.50	0.19	1	7	7.60	0.17
Common Goldeneye	4	317	5601	4	2	1.71	0.10	6	0	-0.08	0.00
Common Loon	3	56	3214	3	0	6.45	0.11	5	-1	-1.66	-0.03
Common Merganser	2	57	1660	2	0	4.55	0.16	16	-13	-23.13	-0.80
Common Yellowthroat	17	529	17411	16	2	3.37	0.10	10	8	1.54	0.05
Connecticut Warbler	0	10	531	0	0	-0.44	-0.01	2	-2	-15.56	-0.30
Dark-eyed Junco	18	233	10200	18	2	8.54	0.19	5	15	6.59	0.15
Downy Woodpecker	6	76	3492	6	1	8.91	0.19	1	6	7.29	0.16
Eastern Phoebe	4	51	2412	4	1	9.05	0.19	1	4	7.04	0.15
Evening Grosbeak	1	8	560	1	0	7.09	0.11	0	0	5.68	0.09
Golden-crowned Kinglet	21	288	12870	21	2	8.08	0.18	3	20	7.09	0.16
Gray Catbird	0	7	208	0	0	4.55	0.16	2	-2	-23.13	-0.80
Great Blue Heron	3	58	2916	3	0	5.65	0.11	2	1	1.95	0.04
Great Crested Flycatcher	1	8	560	1	0	7.09	0.11	0	0	5.68	0.09
Greater Yellowlegs	1	18	725	1	0	5.64	0.14	0	1	4.25	0.11
Hairy Woodpecker	5	60	2720	5	0	8.42	0.18	1	4	7.48	0.16
Hermit Thrush	58	858	38317	58	7	7.53	0.17	13	52	6.07	0.14
Herring Gull	0	7	208	0	0	4.55	0.16	2	-2	-23.13	-0.80
Killdeer	0	7	208	0	0	4.55	0.16	2	-2	-23.13	-0.80
Least Flycatcher	32	480	22871	32	3	7.28	0.15	27	8	1.69	0.04
LeConte's Sparrow	1	23	1071	1	0	4.61	0.10	2	-1	-2.58	-0.06
Lincoln's Sparrow	16	278	13491	15	2	6.03	0.12	11	6	2.11	0.04
Magnolia Warbler	39	574	30948	39	3	7.40	0.14	63	-20	-3.53	-0.07
Mallard	1	14	415	1	0	4.55	0.16	4	-3	-23.13	-0.80
Mourning Dove	1	13	540	1	0	8.64	0.20	0	1	7.78	0.18
Mourning Warbler	48	721	36265	47	6	7.41	0.15	80	-27	-3.74	-0.07
Nashville Warbler	98	1408	66084	98	10	7.66	0.16	26	82	5.81	0.12
Northern Flicker	20	288	13992	20	2	7.43	0.15	17	4	1.51	0.03
Northern Parula	11	144	7719	11	1	7.92	0.15	2	10	6.80	0.13
Northern Waterthrush	2	21	1100	2	0	8.03	0.15	0	1	6.95	0.13
Ovenbird	61	895	45349	61	8	7.66	0.15	39	30	3.33	0.07
Palm Warbler	8	138	5804	8	2	6.56	0.16	2	7	5.32	0.13
Philadelphia Vireo	5	80	5018	5	1	7.34	0.12	1	5	6.02	0.10
Pileated Woodpecker	4	55	2740	4	0	8.17	0.16	1	4	7.14	0.14
Pine Siskin	2	21	1100	2	0	8.03	0.15	0	1	6.95	0.13
Purple Finch	1	16	767	1	0	5.92	0.12	2	-1	-7.59	-0.15
Red-breasted Nuthatch	43	654	32938	42	4	7.12	0.14	81	-34	-5.21	-0.10
Red-eyed Vireo	139	2600	113533	138	16	5.93	0.14	158	-4	-0.17	0.00
Red-necked Grebe	1	20	1063	0	0	-0.44	-0.01	3	-3	-15.56	-0.30
Ring-billed Gull	2	297	4120	2	1	0.76	0.05	10	-8	-2.66	-0.19
Rose-breasted Grosbeak	2	30	1660	2	0	7.76	0.14	0	2	6.59	0.12
Ruby-crowned Kinglet	71	1113	51316	70	10	7.20	0.16	29	52	4.63	0.10
Ruby-throated Hummingbird	0	13	1003	0	0	1.78	0.02	25	-25	-189.97	-2.51
Sandhill Crane	2	31	1265	2	0	6.87	0.17	0	2	5.70	0.14
Savannah Sparrow	1	60	4221	1	0	2.11	0.03	103	-102	-170.10	-2.42
Song sparrow	19	550	18455	19	2	3.78	0.11	34	-13	-2.41	-0.07
Spotted Sandpiper	1	13	540	1	0	8.64	0.20	0	1	7.78	0.18
Swainson's Thrush	78	1166	54998	74	8	7.04	0.15	33	49	4.20	0.09
Swamp Sparrow	20	1128	25399	18	6	2.18	0.10	16	9	0.78	0.03
Tennessee Warbler	23	320	14757	23	2	7.92	0.17	5	20	6.30	0.14
Tree Swallow	2	27	955	2	0	6.48	0.18	4	-2	-8.53	-0.24
Veery	17	240	13161	17	3	8.16	0.15	4	16	6.59	0.12
White-throated Sparrow	182	2967	137155	180	21	6.77	0.15	185	16	0.52	0.01
White-winged Crossbill	3	38	1620	3	0	8.64	0.20	0	3	7.78	0.18
Wilson's Snipe	21	344	15050	21	3	6.94	0.16	5	18	5.38	0.12
Winter Wren	27	399	18277	27	3	7.53	0.16	10	20	5.02	0.11
Yellow-bellied Flycatcher	7	136	5795	6	1	5.84	0.14	3	5	3.51	0.08
Yellow-bellied Sapsucker	5	68	3879	5	0	7.68	0.13	1	4	6.48	0.11
Yellow-rumped Warbler	30	438	19549	30	3	7.63	0.17	12	21	4.85	0.11
TOTAL	1493	25570	1127584	1473	176	6.45	1.17	1531	118		

¹ = Habitat directly removed within the Project Study Area during construction and operations; ² = Habitat indirectly impacted by Project activities including noise, light, dust and changes to hydrology.

*negative values represent a net gain of habitat post-abandonment

TMI_870-WL(2)-01_Table_9: Updated Effects Assessment for Wildlife and Wildlife Habitat

Valued Components (VCs)	Indicators	Baseline			Construction and Operations				Abandonment ⁽⁴⁾			
		Habitat Area (ha)			Habitat loss (ha)		Percent of habitat lost (%)		Area rehabilitated post-abandonment (ha)	Irreversible habitat change post-abandonment (ha)	Habitat change post-abandonment (%)	
		PSA	LSA	RSA	Direct ⁽¹⁾	Indirect ⁽²⁾	LSA	RSA			LSA	RSA
Ungulates	Moose	84.00	220.00	22632.00	78.00 ⁽³⁾	56.00	63.64	0.62	56.00	78.00	35.45	0.34
Furbearer	American Marten	195.41	2415.38	101806.72	195.41	13.17	8.64	0.20	20.69	187.89	7.78	0.18
	American Beaver	3.99	280.08	65274.94	3.99	0.22	1.50	0.01	20.92	-16.71	-5.97	-0.03
Upland Birds	Upland Birds	277.70	3777.25	191994.06	277.70	21.26	7.91	0.16	223.38	75.58	2.00	0.04
Wetland Birds	Wetland Birds	44.53	1989.78	113379.24	38.53	15.93	2.74	0.05	60.34	0.11	0.01	<0.01
Small Mammals	Small Mammals	330.27	5779.19	248572.84	324.27 ⁽³⁾	38.12	15.53	0.42	343.97	24.43	0.42	0.01
Reptiles and Amphibians	Reptiles and Amphibians	194.79	3510.59	132097.30	194.79	26.37	6.30	0.02	26.37	194.79	5.55	0.15
Invertebrates	Terrestrial Invertebrates	330.27	5779.19	248572.84	324.27 ⁽³⁾	38.12	15.53	0.42	343.97	24.43	0.42	0.01

Notes:

- (1) Habitat directly removed within the Project Study Area during construction and/or operations
- (2) Habitat indirectly impacted by Project activities including noise, light, dust, changes in flows and the effects of groundwater drawdown.
- (3) The construction of the fish compensation ponds during the site preparation and construction phase will add 6 ha of marsh habitat.
- (4) The negative values represent the new wetland areas as a result of the Project.

TMI_870-WL(2)-01_Table_10: Updated Effects Assessment for Migratory Birds

Valued Components (VCs)	Indicators	Baseline			Construction and Operations				Abandonment ⁽⁴⁾			
		Habitat Area (ha)			Habitat loss (ha)		Percent of habitat lost (%)		Area rehabilitated post-abandonment (ha)	Irreversible habitat change post-abandonment (ha)	Habitat change post-abandonment (%)	
		PSA	LSA	RSA	Direct ^{(1) (3)}	Indirect ⁽²⁾	LSA	RSA			LSA	RSA
Upland Birds	Upland Birds	277.70	3777.25	191994.06	277.70	21.26	7.91	0.16	223.38	75.58	2.00	0.04
Wetland Birds	Wetland Birds	44.53	1989.78	113379.24	38.53	15.93	2.74	0.05	60.34	0.11	0.01	<0.01

Notes:

- (1) Habitat directly removed within the Project Study Area during construction and/or operations
- (2) Habitat indirectly impacted by Project activities including noise, light, dust, changes in flows and the effects of groundwater drawdown.
- (3) The construction of the fish compensation ponds during the site preparation and construction phase will add 6 ha of marsh habitat.

Need to confirm with Zach

525000

530000

535000

5520000

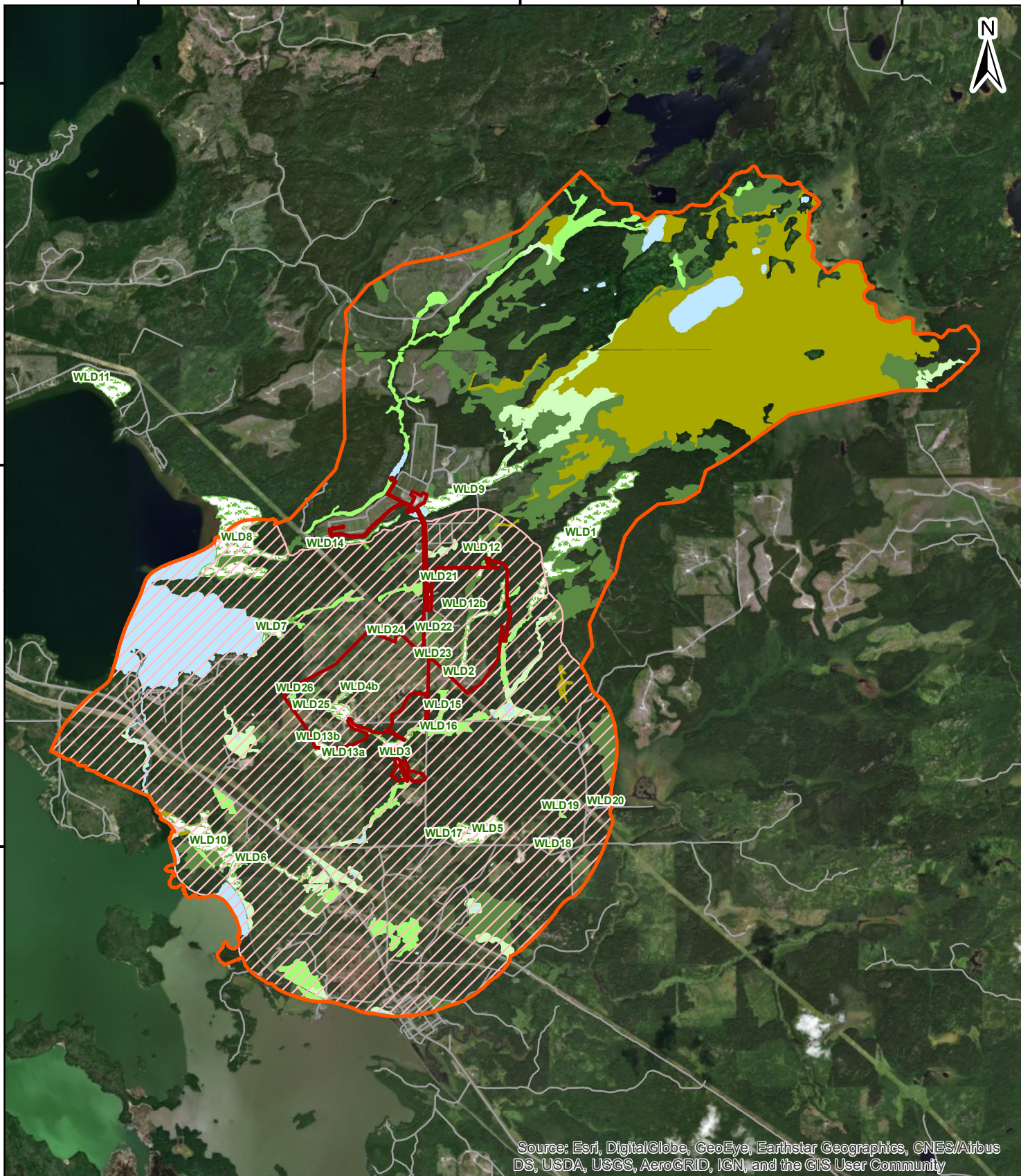
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5515000

5515000

5510000

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TMI_871-WL(2)-02_Figure 1

Projection: NAD 1983 UTM Zone 15N

Date created: 2018-11-20

Legend

PSA

LSA

Groundwater ZOI

Surveyed Wetlands

Fen

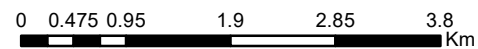
Marsh

Swamp - Coniferous

Swamp - Deciduous

Waterbody

SCALE: 1:68,511



525000

530000

535000

5520000

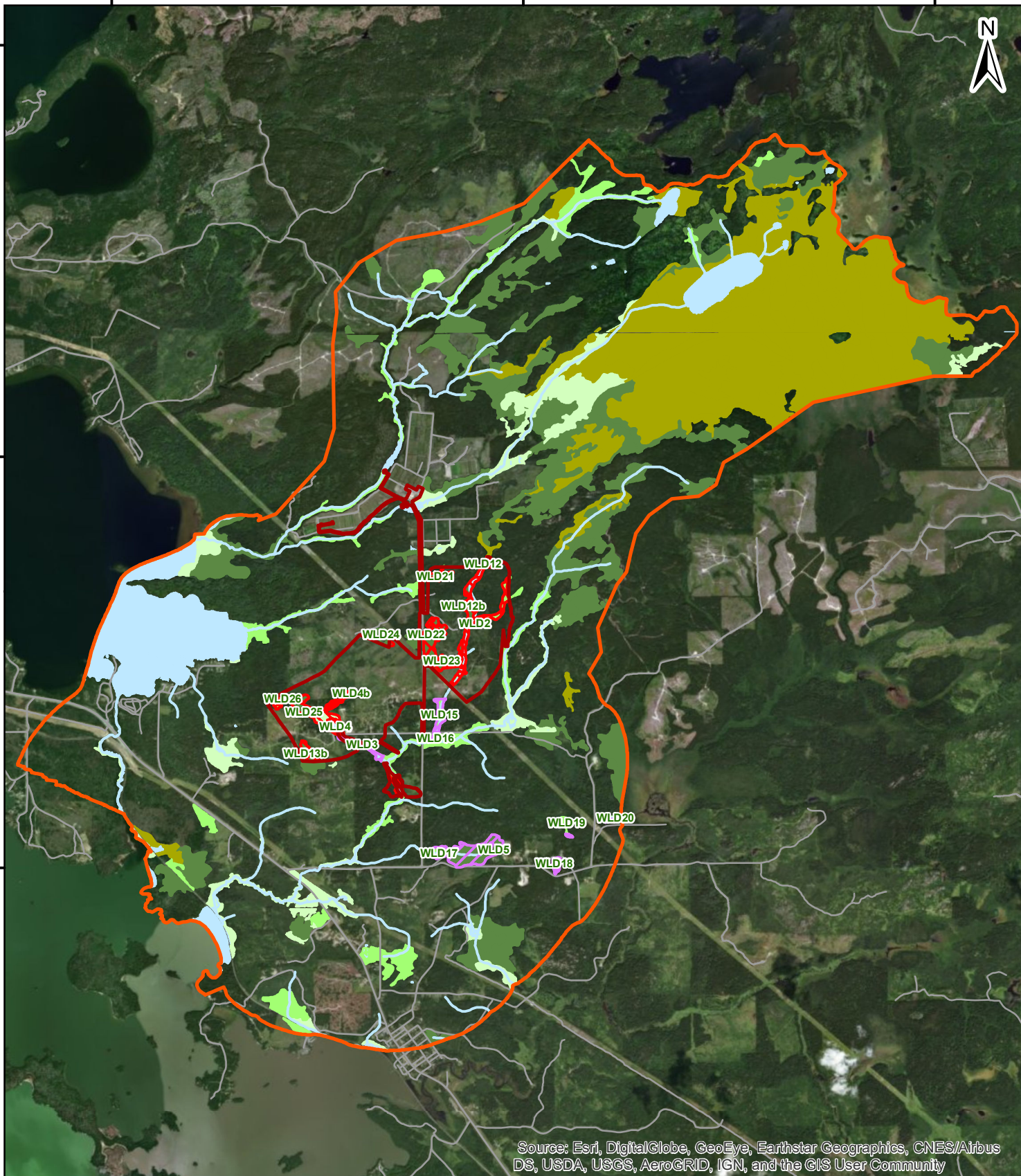
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5510000



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

TMI_871-WL(2)-02_Figure 2a

Legend

- PSA
- LSA

Impacted Wetlands

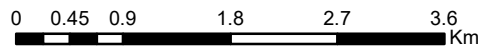
- Direct
- Indirect

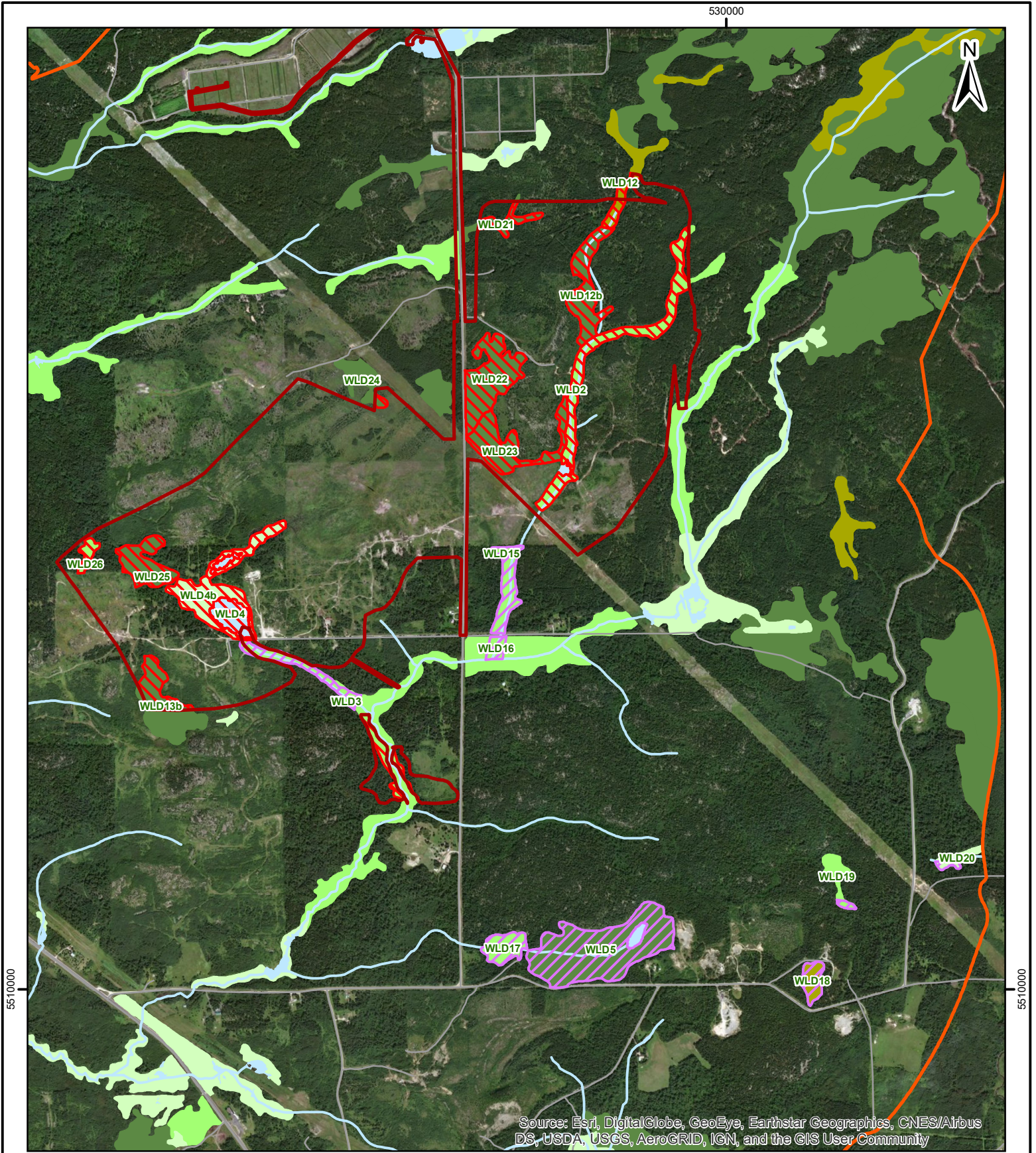
- Fen
- Marsh
- Swamp - Coniferous
- Swamp - Deciduous
- Waterbody

Projection: NAD 1983 UTM Zone 15N

Date created: 2018-11-20

SCALE: 1:63,594





Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

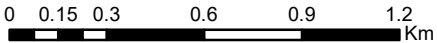
TMI_871-WL(2)-02_Figure 2b

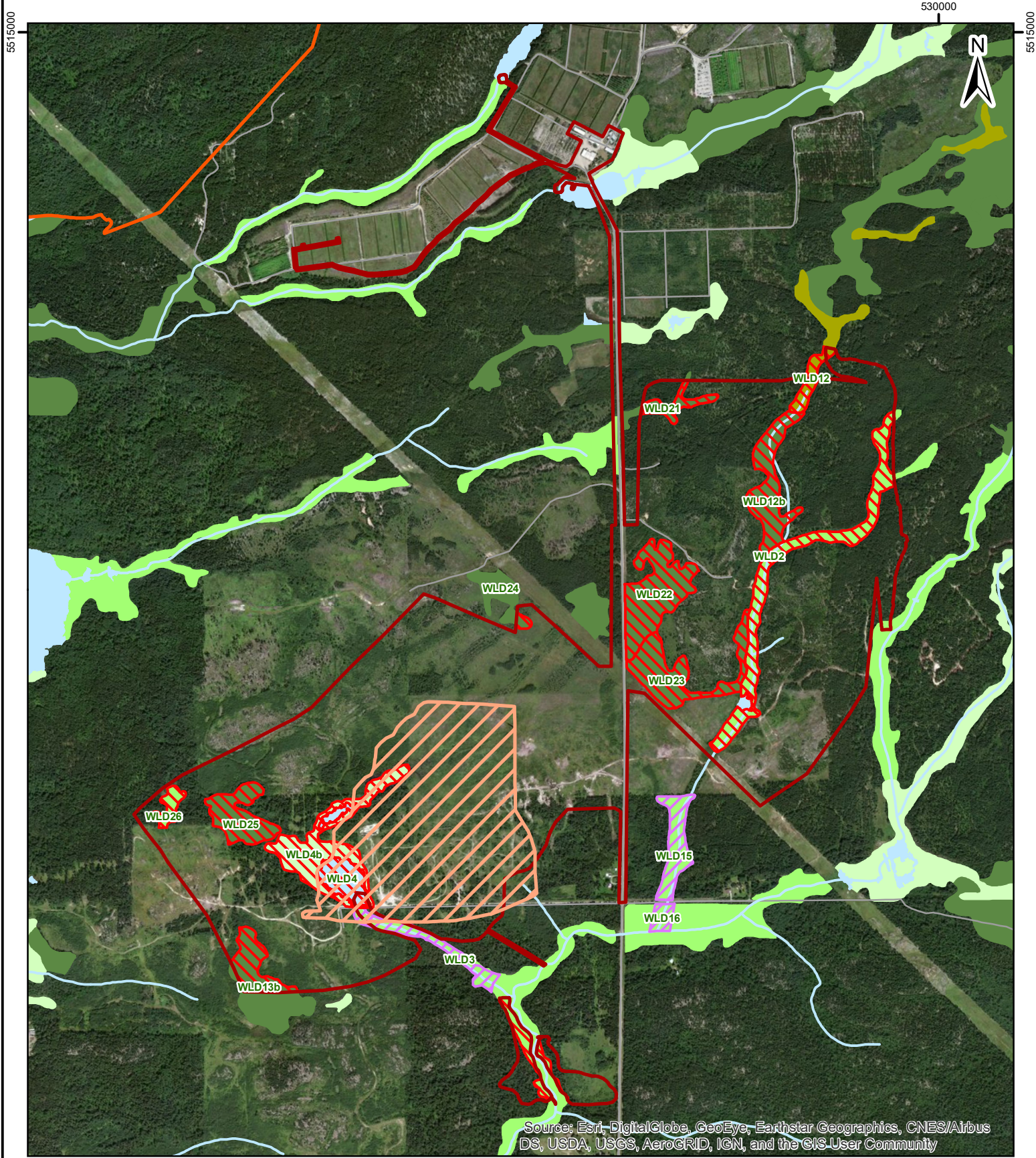
Projection: NAD 1983 UTM Zone 15N
 Date created: 2018-11-20

Legend

- PSA
- LSA
- Impacted Wetlands**
- Direct
- Indirect
- Fen
- Marsh
- Swamp - Coniferous
- Swamp - Deciduous
- Waterbody

SCALE: 1:23,259





Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

TMI_871-WL(2)-02_Figure 3

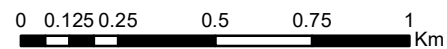
Projection: NAD 1983 UTM Zone 15N

Date created: 2018-11-20

Legend

- | | | |
|-----------|--------------------|--------------------------|
| PSA | Fen | Waterbody |
| LSA | Marsh | Impacted Wetlands |
| Dust Zone | Swamp - Coniferous | Direct |
| | Swamp - Deciduous | Indirect |

SCALE: 1:19,475



TMI_871-WL(2)-02_Table_4: Summary of Predicted Project Effects on Wetland Categories

Habitat Category	Habitat Sub-category	Baseline			Construction and Operations				Abandonment			
		Habitat Area (ha)			Habitat loss (ha)		Percent of habitat lost (%)		Area rehabilitated post-abandonment (ha)	Irreversible habitat change post-abandonment (ha)	Habitat change post-abandonment (%)	
		PSA	LSA	RSA	Direct ⁽¹⁾	Indirect ⁽²⁾	LSA	RSA			LSA	RSA
Wetland	Bog	0.00	0.00	28.56	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
	Fen	0.80	819.64	9684.89	0.80	1.17	0.24	0.02	0.72	1.25	0.15	0.01
	Marsh	5.14	160.74	8347.12	5.14	0.15	3.29	0.06	0.15	5.14	-11.83	-0.23
	Swamp – coniferous	24.37	573.79	22769.90	24.37	7.99	5.64	0.14	7.99	24.37	4.25	0.11
	Swamp – deciduous	10.23	155.53	7273.83	10.23	6.40	10.69	0.23	6.40	10.23	6.58	0.14
	Fish compensation ponds (marsh) ⁽³⁾	—	—	—	-6.00 ⁽⁶⁾	0.00	—	—	6.00	-6.00 ⁽⁶⁾	—	—
	Collection ponds 2A and 2B (marsh) ⁽⁴⁾	—	—	—	—	—	—	—	7.02	-7.02 ⁽⁶⁾	—	—
	West basin of pit lake (marsh) ⁽⁵⁾	—	—	—	—	—	—	—	11.14	-11.14 ⁽⁶⁾	—	—
Wetland Total		40.54	1709.70	48104.30	34.54	15.71	2.94	0.10	39.42	16.82	0.98	0.03

Notes:

(1) Habitat directly removed within the Project Study Area during construction and/or operations

(2) Habitat indirectly impacted by Project activities including noise, light, dust, changes in flows and the effects of groundwater drawdown.

(3) The construction of the fish compensation ponds during the site preparation and construction phase will add 6 ha of marsh habitat.

(4) At closure, collection ponds 2A and 2B will be rehabilitated to form additional marsh habitat.

(5) Following the end of mining, dewatering activities will cease and the open pit will be allowed to fill with water. The west basin will be shallow (i.e., 2 to 3 m) and half of the area is expected to form marsh habitat.

(6) The negative values represent the new wetland areas as a result of the Project.

*marsh percentages include the values include the contributions from the fish compensation ponds, rehabilitated collection ponds and the rehabilitated west basin of pit lake

TMI_871-WL(2)-02_Table_5: Effects of Wetland Impacts on Species/Indicators of Importance to Indigenous People

Discipline	Valued Components (VCs)	Indicators	Baseline			Construction and Operations				Abandonment ⁽⁴⁾			
			Habitat Area (ha)			Habitat loss (ha)		Percent of habitat lost (%)		Area rehabilitated post-abandonment (ha)	Irreversible habitat change post-abandonment (ha)	Habitat change post-abandonment (%)	
			PSA	LSA	RSA	Direct ⁽¹⁾⁽³⁾	Indirect ⁽²⁾	LSA	RSA			LSA	RSA
Wildlife and Wildlife Habitat	Ungulates	Moose	84.00	220.00	22632.00	78.000	56.00	63.64	0.62	56.00	78.00	35.45	0.34
	Furbearer	American Beaver	3.99	280.08	65274.94	3.99	0.22	1.50	0.01	20.92	-16.71	-5.97	-0.03
	Wetland Birds	Wetland Birds	40.54	1709.70	48104.30	34.54	15.71	2.94	0.10	39.42	16.82	0.98	0.03
	Reptiles and Amphibians	Reptiles and Amphibians	194.79	3510.59	132097.30	194.79	26.37	6.30	0.02	26.37	194.79	5.55	0.15
Migratory Birds	Wetland Birds	Wetland Birds	40.54	1709.70	48104.30	34.54	15.71	2.94	0.10	39.42	16.82	0.98	0.03
Wetlands and Vegetation	Wetlands	Wetland Extent	40.54	1709.70	48104.30	34.54	15.71	2.94	0.10	39.42	16.82	0.98	0.03
		Wild Rice	0	102.11	1419.23	0	0	0	0	0	0	0	0
		Floating Marsh Marigold	0	1.25*	1.25*	0	0	0	0	0	0	0	0
Aboriginal Peoples	Hunting	Beavers	3.99	280.08	65274.94	3.99	0.22	1.50	0.01	20.92	-16.71	-5.97	-0.03
		Moose	84.00	220.00	22632.00	78.000	56.00	63.64	0.62	56.00	78.00	35.45	0.34
		Waterfowl	3.99	280.08	65274.94	3.99	0.22	1.50	0.01	20.92	-16.71	-5.97	-0.03
	Harvesting and Gathering of Plant Material	Wild Rice	0.00	102.11	1419.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Medicinal Plants	311.86	5299.37	229775.26	305.86	36.58	6.46	0.15	76.82	271.63	5.13	0.12

Notes:

(1) Habitat directly removed within the Project Study Area during construction and/or operations

(2) Habitat indirectly impacted by Project activities including noise, light, dust, changes in flows and the effects of groundwater drawdown.

(3) Direct loss of wetlands (marsh) during construction and operations includes the addition of the 6 ha of fish compensation ponds.

(4) The negative values represent a net gain of habitat post-abandonment.

*Marsh Marigold have moderate affinity to coolwater streams, alder thicket swamps, floating-leaved marsh and sedge meadow marsh habitats. However, these habitats are not easily mapped in the study area. A partial ecosite list includes B145, B148-B153, but these ecosites are not represented in the RSA. So although Marsh Marigold habitat is likely more abundant throughout the RSA, we have only included the areas where we have confirmed its presence

TMI_871-WL(2)-02_Table_6: Significance Determination for VCs related to Wetlands

Discipline	Valued Components (VCs)	Indicators	Project Phase	Magnitude	Geographic Extent	Timing	Duration	Frequency	Reversibility	Significance Determination	
Wildlife and Wildlife Habitat	Ungulates	Moose	Site Preparation and Construction	Level I	Level II	Level III	Level III	Level III	Level II	Not Significant	
			Operations	Level I	Level II	Level III	Level III	Level III	Level II	Not Significant	
			Closure	Level I	Level II	Level III	Level III	Level III	Level II	Not Significant	
			Post-closure	Level I	Level II	Level III	Level III	Level III	Level II	Not Significant	
	Furbearer	American Beaver	Site Preparation and Construction	Level I	Level II	Level III	Level III	Level III	Level II	Not Significant	
			Operations	Level I	Level II	Level III	Level III	Level III	Level II	Not Significant	
			Closure	Level I	Level II	Level III	Level III	Level III	Level II	Not Significant	
			Post-closure	Level I	Level II	Level III	Level III	Level III	Level II	Not Significant	
	Wetland Birds	Wetland Birds	Site Preparation and Construction	Level I	Level II	Level I	Level III	Level III	Level II	Not Significant	
			Operations	Level I	Level II	Level I	Level III	Level III	Level II	Not Significant	
			Closure	Level I	Level II	Level I	Level III	Level III	Level II	Not Significant	
			Post-closure	Level I	Level II	Level I	Level III	Level III	Level II	Not Significant	
	Reptiles and Amphibians	Reptiles and Amphibians	Site Preparation and Construction	Level I	Level II	Level I	Level III	Level III	Level II	Not Significant	
			Operations	Level I	Level II	Level I	Level III	Level III	Level II	Not Significant	
			Closure	Level I	Level II	Level I	Level III	Level III	Level II	Not Significant	
			Post-closure	Level I	Level II	Level I	Level III	Level III	Level II	Not Significant	
Migratory Birds	Wetland birds	Marsh birds	Site Preparation and Construction	Level I	Level II	Level I	Level III	Level III	Level II	Not Significant	
			Operations	Level I	Level II	Level I	Level III	Level III	Level II	Not Significant	
			Closure	Level I	Level II	Level I	Level III	Level III	Level II	Not Significant	
			Post-closure	Level I	Level II	Level I	Level III	Level III	Level II	Not Significant	
Wetlands and Vegetation	Wetlands	Wetland extent	Site Preparation and Construction	Level II	Level II	Level II	Level III	Level III	Level II	Not Significant	
			Operations	Level II	Level II	Level II	Level III	Level III	Level II	Not Significant	
			Closure	Level II	Level II	Level II	Level III	Level III	Level II	Not Significant	
			Post-closure	Level II	Level II	Level II	Level III	Level III	Level II	Not Significant	
		Wild Rice	Site Preparation and Construction	-	-	-	-	-	-	-	-
			Operations	-	-	-	-	-	-	-	-
			Closure	-	-	-	-	-	-	-	-
			Post-closure	-	-	-	-	-	-	-	-
	Floating Marsh Marigold (Caltha natans)	Site Preparation and Construction	-	-	-	-	-	-	-	-	
		Operations	-	-	-	-	-	-	-	-	
		Closure	-	-	-	-	-	-	-	-	
		Post-closure	-	-	-	-	-	-	-	-	
Aboriginal Peoples	Hunting	American Beavers	Site Preparation and Construction	Level I	Level II	Level III	Level III	Level III	Level II	Not Significant	
			Operations	Level I	Level II	Level III	Level III	Level III	Level II	Not Significant	
			Closure	Level I	Level II	Level III	Level III	Level III	Level II	Not Significant	
			Post-closure	Level I	Level II	Level III	Level III	Level III	Level II	Not Significant	
		Ungulates (Moose)	Site Preparation and Construction	Level I	Level II	Level III	Level III	Level III	Level II	Not Significant	
			Operations	Level I	Level II	Level III	Level III	Level III	Level II	Not Significant	
			Closure	Level I	Level II	Level III	Level III	Level III	Level II	Not Significant	
			Post-closure	Level I	Level II	Level III	Level III	Level III	Level II	Not Significant	
		Waterfowl	Site Preparation and Construction	Level I	Level II	Level I	Level III	Level III	Level II	Not Significant	
			Operations	Level I	Level II	Level I	Level III	Level III	Level II	Not Significant	
			Closure	Level I	Level II	Level I	Level III	Level III	Level II	Not Significant	
			Post-closure	Level I	Level II	Level I	Level III	Level III	Level II	Not Significant	
	Harvesting and Gathering of Plant Material	Wild Rice	Site Preparation and Construction	-	-	-	-	-	-	-	
			Operations	-	-	-	-	-	-	-	
			Closure	-	-	-	-	-	-	-	
			Post-closure	-	-	-	-	-	-	-	
Medicinal Plants (wetlands)		Site Preparation and Construction	Level II	Level II	Level III	Level II	Level III	Level II	Not Significant		
		Operations	Level II	Level II	Level III	Level II	Level III	Level II	Not Significant		
		Closure	Level II	Level II	Level III	Level II	Level III	Level II	Not Significant		
		Post-closure	Level II	Level II	Level III	Level II	Level III	Level II	Not Significant		

Notes:

- = No residual adverse effects for significance determination

TMI_871-WL(2)-02_Table 2: Summary of Wetland Surveys

Wetlands	PSA		LSA		Surveyed		Difference PSA	Difference LSA
	Area (ha)	%	Area (ha)	%	Area (ha)	%	%	
Fen	0.8	1.924	819.6	48.2	19.7	9.3	7.3	-38.9
Marsh	6.1	14.69	161.7	9.5	41.9	19.8	5.1	10.3
Swamp - Coniferous	24.4	58.72	563.6	33.1	117.8	55.5	-3.2	22.4
Swamp Deciduous	10.2	24.67	155.5	9.1	32.7	15.4	-9.2	6.3
Total	41.5	100	1700.5	100	212.1	100		

TMI_871-WL(2)-02_Table 3: Surveyed Wetland Habitat Classification

Wetland ID	Area of Wetland Type (ha)				Total
	Fen	Marsh	Swamp - Coniferous	Swamp - Deciduous	
WLD 1	11.5		28.4	2.7	42.5
WLD 2			0.7	6.2	6.9
WLD 3			0.6	7.0	7.6
WLD 4		2.8			2.8
WLD 4B		1.8		0.1	1.9
WLD 5			13.9		13.9
WLD 6		8.8	0.3	0.2	9.3
WLD 7			0.2	5.7	5.9
WLD 8		12.4	40.1	0.8	53.3
WLD 9		9.2	8.3		17.5
WLD 10	5.1	3.6	9.6	3.8	22.2
WLD 11		3.2	9.8	1.7	14.6
WLD 12	3.1				3.1
WLD 13A		0.3			0.3
WLD 13B			6.1		6.1
WLD 14				4.6	4.6
Total	19.7	41.9	117.8	32.7	212.1

525000

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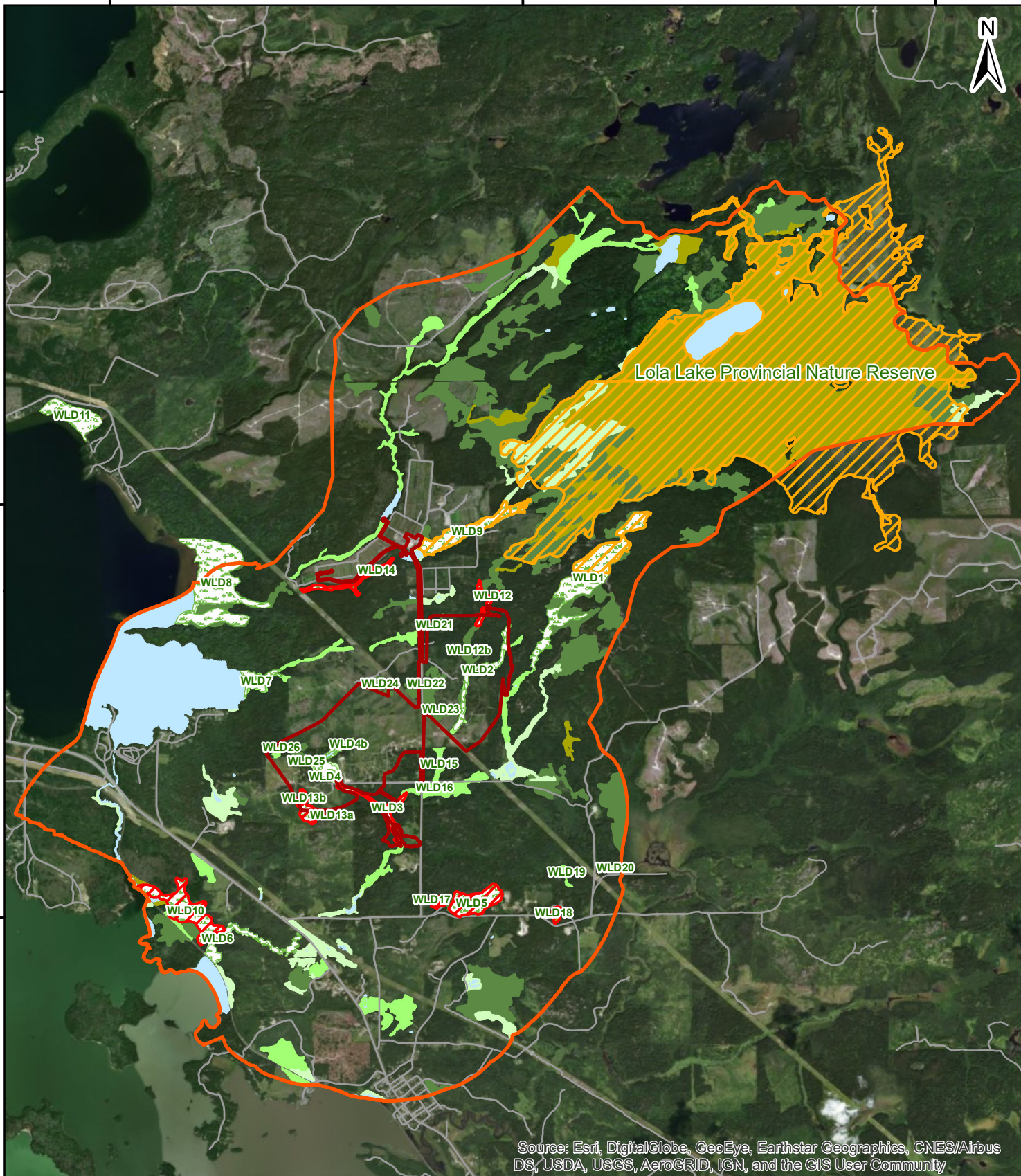
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

TMI_873-WL(2)-04_Figure 1

Projection: NAD 1983 UTM Zone 15N

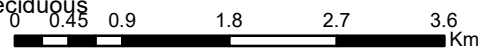
Date created: 2018-11-20

Legend

- PSA
- LSA
- Effects Monitoring Wetlands
- Control Monitoring Wetlands

- Surveyed Wetlands
- Waterbody
- Fen
- Marsh
- Swamp - Coniferous
- Swamp - Deciduous

SCALE: 1:63,360



If individuals or nests are sighted within the Project area:

- Mark location and inform supervisor
- Flag/rope off nest area
- Report the sighting to the Ministry of Natural Resources and Forestry
- Qualified person to trap and relocate the Snapping Turtle from the Project area

TMI_874-WL(2)-05_Table_1a: Natural History / Life History of Snapping Turtles

Taxon	Species	Seasonal Movements	Movement Corridors	Residences	Habitat Requirements	Habitat Present	Life History	Habitat Mapping
Reptile	Snapping Turtle <i>Chelydra serpentina</i>	Emergence and dispersal of young towards water in fall	Uses streams to travel between waterbodies	<p>Nests - Open, flask-shaped, in soft substrate (e.g., sand or gravel) along waterways, may use anthropogenic features</p> <p>Hibernacula - under cover in streams that flow continuously through winter, wedged beneath submerged logs and covered in silt along lakeshores, or buried deep in anoxic mud/under floating mats of vegetation in marshy areas</p>	Found in slow-moving water with a soft mud bottom and dense aquatic vegetation. Established populations are most often located in ponds, sloughs, shallow bays or river edges and slow streams, or areas combining several of these wetland habitats.	Yes	<p>Snapping Turtles have a life-history strategy characterized by high and variable mortality of embryos and hatchlings, delayed sexual maturity, extended adult longevity, and iteroparity (repeated reproductive events) with low reproductive success per reproductive event. Females, and presumably also males, in more northern populations mature later (at 15-20 years) and at a larger size than in more southern populations (~12 years). Lifespan in the wild is poorly known, but long-term mark-recapture data from Algonquin Park suggest a maximum age of over 100 years. Mating takes place in early spring. Nesting takes place in late May and June, with females laying approximately 40 eggs (range of 12-69) in a flask-shaped nest. Sex determination in Snapping Turtles is temperature-dependent, although adult sex ratios tend to remain near 1:1. Likewise, incubation is temperature dependant and highly variable, ranging from approximately 70-100 days. The probability of a Snapping Turtle embryo surviving to sexual maturity may be less than 0.1%.</p>	Potential Habitat: Waterbodies, watercourses and marsh wetlands

TMI_874-WL(2)-05_Table_1b: Regional Importance of Snapping Turtle

Taxon	Species	Distribution	Abundance and Trend	Importance / Status	Survey Methods / Timing
Reptile	Snapping Turtle <i>Chelydra serpentina</i>	The Snapping Turtle has the greatest latitudinal distribution of any turtle in North America, ranging from southern Manitoba south to Texas. In Canada, the species is present in mainland Nova Scotia, southern New Brunswick, southern and central Quebec, southern and central Ontario, southern Manitoba and southeastern Saskatchewan. Within the Canadian range of the species, a range disjunction occurs in northwestern Ontario, north of Lake Superior. Where summers are likely too cool for Snapping Turtle embryos to complete development successfully.	Ontario has the largest number of recorded Snapping Turtle sightings of any province, with 4466 observations in the Ontario Ministry of Natural Resources Natural Heritage Information Centre database from 1800 to 2002 (Ontario Herpetofaunal Survey 2005). However, accurate population estimates are not available.	Snapping Turtles are listed as " <i>Special Concern</i> " federally (2008) and provincially (2009) because its life history characteristics (late maturity, great longevity, low recruitment, lack of density-dependent responses) and its dependence on long warm summers to complete incubation successfully make it unusually susceptible to anthropogenic threats.	Visual Encounter Survey (2011); Marshbird and Waterfowl Surveys (2011-2012, 2016)

TMI_874-WL(2)-05_Table_1c: Effects Assessment for Snapping Turtle

Taxon	Species	Phase	Effects	Indicators	Impact	Rationale	Figures
Reptile	Snapping Turtle <i>Chelydra serpentina</i>	ALL	Direct Habitat Loss	Reduction of potential habitat in the LSA	low	Potential habitat loss in LSA is negligible (<1%)	TMI_874-WL(2)-05_Figure 1
		Site Prep/Construction	Functional Habitat Loss	Ccumulative reduction of potential habitat in the LSA	low	Cumulative potential habitat loss in LSA is negligible (<1%)	
		Operation	Functional Habitat Loss	Cumulative reduction of potential habitat in the LSA	low	Cumulative potential habitat loss in LSA is negligible (<1%)	
		Closure	Functional Habitat Loss	Cumulative reduction of potential habitat in the LSA	low	Cumulative potential habitat loss in LSA is negligible (<1%)	
		Site Prep/Construction and Operation	Exposure to contaminants	SAR behavior and biology	low	Snapping Turtles are tolerant of environmental contamination and can persist in polluted areas	
		Site Prep/Construction and Operation	Direct Mortality	SAR behavior and biology	low	Project activities will not impact waterbodies or watercourses	
		Site Prep/Construction and Operation	Vehicle Collision	SAR behavior and biology	high	vehicle collisions are a leading cause of wildlife mortality associated with human activity. Snapping Turtles may be drawn to road rights-of-way when searching for basking or nesting sites	

TMI_874-WL(2)-05_Table_1d: Summary of Snapping Turtle Habitat Losses Associated with the Project

Reach	General Reach / Wetland Location	Specific Reach / Wetland Location	Area of Snapping Turtle Habitat Loss (m ²)	Habitat Alteration
Blackwater Creek Tributary 1 Catchment				
Tributary 1 Reach 1	Downstream end of Blackwater Creek Tributary 2, upstream to the berm that surrounds the operations area.	Same as General Reach Location.	777	Flow temporarily reduced or eliminated. (95% reduction in flow)
Tributary 1 Reach 2	Upstream end of Blackwater Creek Tributary 2 downstream to berm that surrounds the operations area.	WLD4b(Pond1) located partially within proposed open pit.	13,244	Overprinted by open pit.
		WLD4b(Pond2) located entirely within proposed open pit.	3,097	Overprinted by open pit.
		WLD4a(Pond) located immediately upstream of berm surrounding the operation area.	22,084	Overprinted by open pit.
		Reach connecting WLD4b(Pond1) to WLD4b(Pond2)	86	Overprinted by open pit.
		Reach connecting WLD4b(Pond2) to WLD4a(Pond).	195	Overprinted by open pit.
Overall Snapping Turtle Habitat Loss for Tributary 1 Catchment			39,483	
Blackwater Creek Tributary 2 Catchment				
Tributary 2 Reach 1	Downstream end of Blackwater Creek Tributary 2 upstream to the berm that surrounds the operation area.	Same as General Reach Location.	856	Flow temporarily reduced or eliminated. (86% reduction in flow)
Tributary 2 Reach 2	Blackwater Creek Tributary 2 reach contained within the berm that surrounds the operation area.	Reach from berm at downstream end to WLD2(Pond) located within operation area.	237	Overprinted.
		WLD2(Pond) located within operations area.	1,445	Overprinted.
		Blackwater Creek Tributary 2 as well as T2-A and T2-B R1 upstream of WLD2(Pond) and within berm that surrounds operation area.	2,560	Overprinted.
Tributary 2 Reach 3	Blackwater Creek Tributary 2 reach upstream of the berm that surrounds the operation area.	Reach from berm surrounding operations area upstream to proposed diversion channel.	140	Flow temporarily reduced or eliminated. (100% reduction in flow)
Overall Snapping Turtle Habitat Loss for Tributary 2 Catchment			5,238	
Blackwater Creek Unnamed Tributary Catchment				
Unnamed Tributary	The Unnamed Tributary of Blackwater Creek from the headwaters to the confluence with Blackwater Creek main channel	Same as General Reach Location.	327	Flow temporarily reduced or eliminated. (65% reduction in flow)
Overall Snapping Turtle Habitat Loss for Unnamed Tributary Catchment			327	
Blackwater Creek Tributary 4				
WLD5(Pond)	The open water portion of the wetland within the Zone of Influence (ZOI) that is underlain by a granular deposit southeast of the Project	Same as General Wetland Location	5,864	Dewatering of the open pit could temporarily drain the open water within the wetland (conservatively assumed 100% loss of open water, which will be offset at a minimum of 1:1 ratio)

Blackwater Creek Tributary 4	The open water portion of the wetland within the Zone of Influence (ZOI) that is underlain by a granular deposit southeast of the Project	Same as General Wetland Location	793	Dewatering of the open pit could temporarily drain the open water within the wetland (conservatively assumed 100% loss of open water, which will be offset at a minimum of 1:1 ratio)
Overall Snapping Turtle Habitat Loss for WLD5			6,657	
Marsh Habitat for Hibernacula				
Marsh Habitat (Direct Loss)	Marsh habitat within the PSA that will be overprinted by the Project.	Same as General Wetland Location	36,695	100% loss of the wetlands that are overprinted by the Project
Marsh Habitat (Indirect Loss)	Marsh habitat outside of the PSA within the Zone of Influence (ZOI) that is underlain by a granular deposit southeast of the Project.	Same as General Wetland Location	100	Dewatering of the open pit could temporarily drain a portion of the wetland (conservatively assumed 50% loss of the wetland)
Overall Snapping Turtle Habitat Loss for Marsh Habitat			36,795	
Total Snapping Turtle Habitat Loss for Project			88,500	

TMI_874-WL(2)-05_Table_1e: Mitigation Measures for Effects to Snapping Turtles

Taxon	Species	Effects	Mitigation
Reptile	Snapping Turtle <i>Chelydra serpentina</i>	Direct Habitat Loss	Provide vegetated buffers of 120 m along rivers creeks and wetlands wherever feasible.
			Implement sediment and erosion control plans for the Project, with an emphasis on the protection of wetlands, and sensitive surface water receptors
			Develop a wetland clearing strategy with the local MNRF to reduce the effects (e.g., draining wetlands to discourage hibernation)
			Roughly 6 ha of potential Snapping Turtle habitat will be created within the LSA during the construction phase of the Project as partial fulfillment of the habitat compensation strategy for fish.
			Once the open pit is filled in post-closure, the shallow portions of the pit lake will be considered potential snapping turtle habitat
			Construction of the fish compensation / offsetting ponds will provide 6 ha of snapping turtle habitat
			The collection ponds 2a and 2b will be left to establish naturally as a marsh wetland in the post-closure phase and will provide 7 ha of Snapping Turtle Habitat
		Functional Habitat Loss	Implementation of sound abatement strategies to limit the negative effects of sound on wildlife
			Where feasible, direct anthropogenic lighting to reduce excess production of light into the surrounding environment.
		Exposure to contaminants	Proper management of waste rock storage area (WRSA), including covering with a low-permeability dry cover at closure to help manage acid rock drainage (ARD)
			Treatment of Project tailings prior to release back into the surrounding environment
		Direct Mortality	Restricting the clearing of potential terrestrial reptile and amphibian breeding habitats to periods outside the breeding season as directed by MNRF
			All workers will receive an orientation regarding what to do if Snapping Turtles or their nests are observed on site
		Vehicle Collision	Enforce speed limits of between 30 and 80 km/h within the Project area to reduce the potential for wildlife/vehicle collisions
			Optimize utilization of existing road network
All workers will receive an orientation regarding what to do if Snapping Turtles or their nests are observed on site			

TMI_874-WL(2)-05_Table_1f: Residual Adverse Effects to Snapping Turtles

Taxon	Species	Residual Effects
Reptile	Snapping Turtle <i>Chelydra serpentina</i>	No Residual Effects (Net surplus of potential habitat in the post-closure phase)

TMI_874-WL(2)-05_Table_2: Summary of Predicted Project Effects on Snapping Turtle Habitat

Taxon	Indicator Species	Habitat	Baseline			Construction and Operations				Abandonment*			
			Potential Habitat Area (ha)			Habitat loss (ha)		Percent of habitat lost (%)		Area rehabilitated post-abandonment (ha)	Irreversible habitat change post-abandonment (ha)	Habitat change post-abandonment (%)	
			PSA	LSA	RSA	Direct ⁽¹⁾	Indirect ⁽²⁾	LSA	RSA			LSA	RSA
Reptiles	Snapping Turtles	most often located in ponds, sloughs, shallow bays or river edges and slow streams, or areas combining several of these habitats	8.86	431.32	71223.91	8.86	0.02	2.06	<0.01	24.31 ^{(3) (4) (5)}	±15.43 ⁽⁶⁾	-3.58 ⁽⁶⁾	-0.02 ⁽⁶⁾

Notes:

- (1) Habitat directly removed within the Project Study Area during construction and/or operations
 - (2) Habitat indirectly impacted by Project activities including noise, light, dust, changes in flows and the effects of groundwater drawdown.
 - (3) The construction of the fish compensation ponds during the site preparation and construction phase will add 6 ha of marsh habitat.
 - (4) At closure, collection ponds 2A and 2B will be rehabilitated to form 7.02 ha of additional marsh habitat.
 - (5) Following the end of mining, dewatering activities will cease and the open pit will be allowed to fill with water. The west basin will be shallow (i.e., 2 to 3 m) and half of the area is expected to form marsh habitat.
 - (6) The negative values represent the new wetland areas as a result of the Project.
- *marsh percentages include the values include the contributions from the fish compensation ponds, rehabilitated collection ponds and the rehabilitated west basin of pit lake

#	Agency Reference #	Parties Asking Questions	Reference to EIS	Reference to EIS Guideline Section	Comment / Information Request / Response
153	WL(1)-10	CEA Agency	EIS Sections 5.10, 6.3.1.11, Table 6.3.1 Appendix G Section 8.6, Table 8.12	Sections 7.1.1, 9.1.2	<p><u>Summary of Comment / Rationale:</u></p> <p>Section 9.1.2 of the EIS Guidelines states “As background for the analysis of the project’s effects on Species at Risk (SAR), the EIS will:</p> <ul style="list-style-type: none"> – Identify all SARs that may be affected by the project, using existing data and literature as well as surveys to provide current field data, as appropriate; – Provide assessments of regional importance, abundance and distribution that optimize the ability to detect all species at risk and sufficient survey effort to obtain comprehensive coverage; and – Identify residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable) and general life history of SARs that may occur in the project area, or be affected by the project.” <p>However, the information in the EIS on SAR and their habitats is unclear. For example, the EIS indicates no reptile valued components (VCs) were identified because no reptile, amphibian, or terrestrial invertebrate SAR were detected in the local study area (LSA), while Section 8.6 and Table 8.13 of Appendix G indicate that habitat for snapping turtle, a federal SAR, occurs in the LSA and the species may also breed in the area.</p> <p>In addition, Section 5.10.2 of the EIS identifies the following SAR that are not included in the effects assessment:</p> <ul style="list-style-type: none"> - Plants: Western Silvery Aster (<i>Symphyotrichum sericeum</i>) - Mammals: American Badger (<i>Taxidea taxus</i>), Grey Fox (<i>Urocyon cinereoargenteus</i>), Eastern Timber Wolf (<i>Canis lupus lycaon</i>) - Reptiles: Snapping Turtle (<i>Chelydra serpentina</i>) - Arthropods: Monarch (<i>Danaus plexippus</i>) <p>The effects assessment for the American Badger should focus on the subspecies <i>Taxidea taxus taxus</i> since that subspecies is considered to be potentially present in the study areas for the Project.</p> <p>Section 7.1.1 of the EIS Guidelines states the “proponent will identify the VCs deemed appropriate to ensure the full consideration of the factors listed in subsection 19(1) of CEAA, 2012 as well as the 2012 amendment to section 79 of the <i>Species at Risk Act</i>.” To comply with</p>

#	Agency Reference #	Parties Asking Questions	Reference to EIS	Reference to EIS Guideline Section	Comment / Information Request / Response
					<p>Section 79 of the <i>Species at Risk Act</i>, potential effects to all SAR, as well as appropriate mitigation and follow-up measures, must be identified. These measures should be consistent with the applicable federal recovery strategies (http://sararegistry.gc.ca/sar/recovery/recovery_e.cfm) and management plans (http://sararegistry.gc.ca/sar/recovery/management_e.cfm).</p> <p>This information on SAR and their habitat, including a revised effects assessment, details on the potential effects, appropriate mitigation and follow-up measures, is required for the Agency to complete its analysis on the effects of the Project on all SAR.</p> <p>Information Request / Comment:</p> <ul style="list-style-type: none"> A. Identify and describe residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable) and general life history of all SAR that may occur in the project area, or be affected by the Project. Include ecosite information and maps for all SAR habitats within the project footprint and LSA. B. Provide an assessment of the regional importance, abundance, and distribution for each SAR. Describe how surveys were used to obtain a sufficient level of coverage for SAR (e.g. snapping turtle), including a summary of locations and timing in relation to ecosite information and identification of the survey protocols that were followed. C. Revise the effects assessment to include all SAR species as VCs, including all bird, mammal, plant, reptile, and arthropod SAR identified in the EIS. Provide the indicators used to assess potential project effects on each VC. Use an impact matrix to describe the potential effects on each SAR species, including SAR habitats, for each project phase. D. Describe the mitigation measures to address the potential effects to all SAR, ensuring that the measures are consistent with applicable recovery strategies and management plans. E. Describe the residual effects on all SAR (including all bird, mammal, plant, reptile, and arthropod species) and their habitat and the significance of those residual effects, based on the Agency’s methodology for assessing significance (including the criteria of magnitude, geographic extent, timing, duration, frequency, reversibility, and ecological and social context).

#	Agency Reference #	Parties Asking Questions	Reference to EIS	Reference to EIS Guideline Section	Comment / Information Request / Response
					<p>Describe the follow-up program for the SAR and their habitats, including objectives and any monitoring measures that will be implemented, to verify the predictions of effects and evaluate the effectiveness of the proposed mitigation measures.</p> <p>Response:</p> <p>The RSA presented in the original EIS was defined as the entire Wabigoon Ecoregion, providing a comprehensive representation of the conditions and species that are likely to exist in the Project area. However, this approach will also capture species with highly limited distributions that would not otherwise be associated with the Project area. Also, several SAR were mentioned in the original EIS to illustrate the due diligence of the field investigations. For instance, American Badger (<i>Taxidea taxus taxus</i>; a subspecies listed as Endangered in Ontario) and Gray Fox (<i>Urocyon cinereoargenteus</i>; listed as Threatened in Ontario) were initially mentioned in Section 2.2.4.1 of the original EIS describing the methodology employed for conducting mammal encounter surveys. Transects were placed to targeted key SAR habitats to improve the likelihood of detecting these species should they be present, but <u>not because</u> they were present. As such, several of the SAR presented in TMI_153-WL(1)-10 are artifacts of the EIS that were not thoroughly explain in the round 1 submission. The species presented below in this document will not occur within the Project area, either due to restrictions to geographical distribution or habitat. Detailed responses for of the remaining SAR that are expected to, or may occur within the Project area have been included in the attached files.</p> <p>Notes Regarding IR responses</p> <ul style="list-style-type: none"> - For the purposes of this assessment, SAR habitat falling within the updated Project footprint is considered “lost” for the duration of Project activities until post-closure regeneration. - For the purposes of this assessment, SAR habitat falling within the 50 dB noise contour of each project phase is considered degraded by human activity (i.e., functional habitat loss). - A critical threshold of 20% was used to assess the effects of habitat loss within the LSA. This threshold was selected as a conservative estimate for the degree of habitat loss the LSA can withstand while providing the same conditions for SAR. The cumulative effect of functional habitat loss was assessed against the same threshold. This approach to assessing the effects of habitat loss has been used successfully in existing Federal environmental impact assessments in the past (see link below for examples). - SAR biology and behavior were used as indicators for assessing the risk of direct mortality, contaminant exposure and vehicle collisions. <p>Example of Critical Habitat Loss Threshold Use</p> <p>Value Creations Inc. Advanced TriStar Project - Wildlife Consultant Report, Section 3.2.4.6</p>

#	Agency Reference #	Parties Asking Questions	Reference to EIS	Reference to EIS Guideline Section	Comment / Information Request / Response
					<p>- https://open.alberta.ca/dataset/e5b33b7c-1b85-448a-90bf-c594d57bdc3d/resource/cf4705ee-7e32-4ee9-a30e-bffcf4fc54b4/download/CR-11---Wildlife.pdf</p> <p>SAR Not Assessed</p> <p><u>Western Silvery Aster</u> Western Silvery Aster (<i>Symphyotrichum sericeum</i>; listed as Endangered in Ontario) occurs in only two areas in Ontario, roughly 130–150 km from Dryden. In the northern Ontario portion of its range, this species is only found in Bur Oak (<i>Quercus macrocarpa</i>) savannah on shallow soil over mafic (i.e., basic) bedrock. This habitat is very uncommon, with most bedrock across the Boreal Shield composed of acidic (usually granite) rock. These observations represent the north-eastern extent of the species’ global range. Although Western Silvery Aster was captured in the RSA, suitable habitat does not occur within the LSA. Project effects will not impact the existing populations. No assessment is required for this species.</p> <p><u>Gray Fox</u> Gray Fox distribution is closely associated with the presence of deciduous forest, with denning usually occurring in shrublands close to water. Recent (i.e., within the last 20 years) observations in the Wabigoon Ecoregion were located near the US and Manitoba borders, roughly 150–170 km from Dryden. This represents the northern extent of this species’ global range. The primary threats to Gray Fox in northern Ontario are trapping and road mortality. Although this species was captured in the RSA and habitat capable of supporting Gray Foxes exists within the LSA, the Project footprint does not include sufficient shrubland to support a denning family unit. The Project effects will not impact existing populations. No assessment is required for this species.</p> <p><u>Eastern Wolf</u> The Eastern Wolf (<i>Canis lycaon</i>; listed as Threatened federally)—formerly assessed as Eastern Timber Wolf (<i>C. lupus lycaon</i>), recently listed as provincially Threatened by COSSARO under Algonquin Wolf (<i>Canis sp.</i>)—was included as a statement to illustrate that they were not present in the study area.</p> <p>Eastern wolves exploit a relatively narrow ecological niche, inhabiting mixedwood forests with low levels of human disturbance, and requiring larger prey (e.g., White-tailed Deer [<i>Odocoileus virginianus</i>] and American Beaver [<i>Castor canadensis</i>]) to meet their energy requirements. Eastern Wolf distribution is limited to southeastern Ontario, the nearest record occurring in Killarney Provincial Park, over 900 km from Dryden. Although Eastern Wolf-Grey Wolf hybrids—the Great Lakes-Boreal Wolf (<i>C. lupus x C. sp. cf. lycaon</i>)—may extend further into central and northern Ontario, the hybrids are ecological analogues of Grey Wolves (<i>Canis Lupus</i>). Although the Great Lakes-Boreal Wolf range extends over the Project area, they are not afforded the same protection as the Eastern Wolf proper.</p>

#	Agency Reference #	Parties Asking Questions	Reference to EIS	Reference to EIS Guideline Section	Comment / Information Request / Response
					<p>Eastern Wolves do not occur within the local or regional study areas. No assessment is required for this species.</p> <p><u>Woodland Caribou</u></p> <p>Although historically Woodland Caribou occurred in the LSA, no caribou records have been reported in that area since 1990-1999. A portion of the existing Woodland Caribou range is captured by the RSA, but the wildlife assessment focuses on the scale at which the Project will have the greatest impact (LSA and Project footprint). The Project area is found in Cervid Ecological Zone C1. This zone is currently being managed for moderate to high densities of moose, and low densities of white-tailed deer. There are currently no management objectives for woodland caribou other than recoding and documenting any sightings. As such, no assessment for this species is required.</p> <p><u>Monarch</u></p> <p>The range of Monarch butterflies (<i>Danaus plexippus</i>; listed as Special Concern in Ontario) extends across the Project area. Monarchs require four distinct habitats for different parts of their life history, including overwintering, breeding, staging and nectar (feeding) habitats. Monarchs overwinter in Mexico, and the Project area does not appear to be an important migratory staging area or exist within a high volume migratory corridor. The Project area could potentially be used for breeding and nectar habitats.</p> <p>Breeding habitat is confined to where milkweed (<i>Asclepias sp.</i>) grows, since this serves as the sole food for their caterpillars. Although Swamp Milkweed (<i>Asclepias incarnata</i>) was identified in the LSA, it was not abundant enough to provide high quality Monarch breeding habitat. Monarchs breeding activity within the Project area is expected to be negligible.</p> <p>Several flowering plants occur within the LSA, so adults may feed throughout Project area. However, adult Monarch abundance is considered very low because there were no observations during three years of fieldwork and the lack of abundant breeding habitat.</p> <p>Generally, species listed as “Special Concern” in Ontario are not afforded any additional protection. Nevertheless, Project effects are not expected to impact Monarchs. No Assessment is needed for this species.</p> <p><u>Skillet Clubtail Dragonfly</u></p> <p>The 2011 COSARO Species at Risk Evaluation for Skillet Clubtail Dragonflies indicated that it was present in the Rainy River area, which falls within the Kenora Forest, but there was insufficient data to accurately estimate its distribution in the area. As such, it was included in the list of potential SAR that may occur within the LSA or RSA. However, Rainy River is ~170 km southwest of the Project area, and the nearest NHIC observation of this species is >1,300 km east of the LSA. Further, Skillet Clubtail Dragonflies were not observed during the field survey programs, while 1 other provincially rare (but non-SAR) clubtail species was reported. As such, we are confident this species is not present in the Project are. No assessment is needed for this species.</p>

#	Agency Reference #	Parties Asking Questions	Reference to EIS	Reference to EIS Guideline Section	Comment / Information Request / Response
					<p>The responses to the specific sections of the request are as follows:</p> <ul style="list-style-type: none"> A. See Table TMI_153-WL(1)-10_Table 1, and Figures TMI_153-WL(1)-10_Figures 1 to 8 B. See Table TMI_153-WL(1)-10 Table 2 C. See Table TMI_153-WL(1)-10 Table 3 D. See Table TMI_153-WL(1)-10_Table 4 E. See Section 6.12 for the assessment of effects on wildlife and wildlife habitat, Section 6.12.6 of the revised EIS for a listing of the residual effects on wildlife and wildlife habitat, and TMI_153-WL(1)-10 Table 5 <p>A description of the proposed follow-up monitoring programs is provided in Section 13 of the revised EIS, and specifically Section 13.12 for the proposed follow monitoring for wildlife.</p>

TMI_952-WL(2)-07: Table 1

Baseline Wildlife and Wildlife Habitat Data Sources	
Background Review	Field Surveys
Species At Risk in Ontario List	Forest Bird Survey (2011, 2012, 2016)
Dryden Forest Management Company Forest Management Plan (2011-2021)	Bird Migration Survey (2011)
Ontario Breeding Bird Atlas	Marshbird and Waterfowl Survey (2011, 2012, 2016)
Natural Heritage Information Centre (NHIC) Database	Whip-poor-will and Common Nighthawk Survey (2011, 2012)
Ontario Odonata Atlas	Bobolink Survey (2011)
Ontario Reptile and Amphibian Atlas	Amphibian Visual Encounter Survey (2011)
Land Information Ontario (LIO)	Amphibian Roadside Call Count Survey (2011, 2012)
Forest Resource Inventory (FRI)	Reptile Visual Encounter Survey (2011)
Aerial/Satellite Imagery	Mammal Encopunter Survey (2011)
	Small Mammals Trapping (2012, 2016)
	Bat Acoustic Recorder Survey (2011, 2012)
	Bat Maternal Roost Monitoring Program (2015-2016)

TMI_952-WL(2)-07_Table_2: Analysis of Project Effects on Potential SAR Habitat

Taxon	Indicator Species	Habitat	Baseline			Construction and Operations				Abandonment ⁽⁶⁾			
			Potential Habitat Area (ha)			Habitat loss (ha)		Percent of habitat lost (%)		Area rehabilitated post-abandonment (ha)	Irreversible habitat change post-abandonment (ha)	Habitat change post-abandonment (%)	
			PSA	LSA	RSA	Direct ⁽¹⁾	Indirect ⁽²⁾	LSA	RSA			LSA	RSA
Birds	American White Pelican	Marine or freshwater environments (e.g., rivers, lakes, open water marshes and estuaries)	3.99	280.08	65274.94	3.99	0.22	1.50	0.01	20.92	-16.71	-5.97	-0.03
	Bald Eagle	Mature forest with scattered supercanopy trees, adjacent (6-200 m) to large waterbodies (>10 ha for this exercise) with abundant prey and low human activity (further than 1 km from human settlement)	0.00	52.52	25964.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bank Swallow	Natural and artificial sites with vertical banks and sand-silt substrates (e.g., riverbanks, lake and ocean bluffs and aggregate pits) are necessary for nesting burrows.	2.53	34.91	483.83	2.53	0.00	7.25	0.52	0.00	2.53	7.25	0.52
	Barn Swallow (# human structures)	areas with artificial structures to nest, adjacent to open foraging habitat	3	183	7326	1 (outside PSA)	0.00	0.55	0.01	0.00	1.00	0.55	0.01
	Barn Swallow and Chimney Swift foraging habitat	non-forested clearings, both natural (grassland, shrubland and wetland) and anthropogenic (disturbance features)	24.36	1450.05	36859.10	24.36	2.59	1.86	0.07	291.91	-264.97	-18.27	-0.72
	Black Tern	freshwater marshes > 20 ha with abundant emergent vegetation	0.00	51.72	2789.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bobolink	Grasslands and tall-grass prairies, croplands (hayfields, pasture, no-till and small-grain fields), wet prairies, graminoid peatlands	1.48	83.12	6303.81	1.48	0.00	1.78	0.02	159.39	-157.91	-189.97	-2.51
	Canada Warbler	Deciduous, coniferous or mixedwood forests with well-developed shrub layers and a structurally complex forest floor	271.32	3599.82	181670.01	271.32	21.26	8.13	0.16	37.40	255.18	7.09	0.14
	Chimney Swift (# human structures)	associated with human development. Found in urban and rural areas where chimneys (or similar structures) are available for nesting and roosting.	3	183	7326	1 (outside PSA)	0.00	0.55	0.01	0.00	1.00	0.55	0.01
	Common Nighthawk	Open habitat (e.g., sand dunes, beaches, logged and burned areas, forest clearings, winter roads and seismic lines, rock barrens, rocky outcrops, prairies, peatbogs and pasture)	18.41	469.67	18827.09	18.41	1.54	4.25	0.11	267.15	-247.20	-52.63	-1.31
	Eastern Loggerhead Shrike	Open areas dominated by grasses and/or forbes, interspersed with scattered shrubs/trees and bare ground	3.85	142.52	9840.22	3.85	0.00	2.70	0.04	185.98	-182.13	-127.79	-1.85
	Eastern Whip-poor-will	Habitat requirements are based on forest structure rather than composition. Avoid wide-open areas and closed-canopy forests. Prefer semi-open or patchy forests with clearings (e.g., barrens or regenerating areas) and little ground cover	2.37	59.40	3536.41	2.37	0.00	3.99	0.07	26.59	-24.22	-40.78	-0.68
	Eastern Wood Pewee	deciduous and mixed wood forest clearings and edge habitat. Most abundant in intermediate-to-mature forest stands with little understory vegetation	75.91	1184.44	79863.30	75.91	8.09	7.09	0.11	16.71	67.29	5.68	0.08
	Golden Eagle	Typically nest on cliffs, but may also nest in large superstory trees or artificial structures	0.00	52.52	25984.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Least Bittern	Marshes with abundant emergent vegetation, usually cattails	5.14	160.74	8347.12	5.14	0.15	3.29	0.06	0.15	5.14	-11.83	-0.23
	Olive-sided Flycatcher	Generally associated with open areas containing tall trees/snags, forest edges near natural or man-made openings, burned forests or semi-open mature coniferous or mixedwood forest stands. More likely to occur near wetlands	195.41	2415.38	101806.72	195.41	13.17	8.64	0.20	20.69	187.89	7.78	0.18
	Peregrine Falcon	Nest on cliff ledges or crevices, occasionally on tall buildings or bridges	0.00	0.00	19.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Rusty Blackbird	Habitat characterized by forest wetlands, slow-moving streams, peatbogs, sedge meadows, marshes, swamps and beaver ponds.	41.49	1700.50	48105.25	41.49	15.32	2.99	0.11	39.42	17.39	1.02	0.04
Short-Eared Owl	Ground nests established in natural or artificial open habitat	18.41	469.67	18798.53	18.41	1.27	4.19	0.10	266.88	-247.20	-52.63	-1.31	
Wood Thrush	Found mainly in second-growth and mature deciduous and mixed forests	75.91	1184.44	79863.30	75.91	8.09	7.09	0.11	16.71	67.29	5.68	0.08	
Yellow Rail	Typically associated with marshes dominated by sedges, true grasses, and rushes	5.14	160.74	8347.12	5.14	0.15	3.29	0.06	0.15	5.14	-11.83	-0.23	
Mammals	American Badger	non-forested grassland and shrubland	3.85	142.52	9840.22	3.85	0.00	2.70	0.04	185.98	-182.13	-127.79	-1.85
	Eastern Cougar	habitat selection based primarily on the abundance of prey, particularly White-tailed Deer	330.27	5779.19	248572.84	324.27	38.24	6.27	0.15	343.70	24.81	0.43	0.01
	Gray Fox	associated with the presence of deciduous forest, with denning usually occurring in shrublands	75.91	1184.44	79131.85	75.91	8.09	7.09	0.11	16.71	67.29	5.68	0.09
	Northern Myotis/Little Brown Myotis	forested areas where hibernacula and roosting habitat is abundant; Maternal roosts - cavities in large-diameter snags at a moderate state of decay, or buildings	75.91	1184.44	79863.30	75.91	8.09	7.09	0.11	8.09	75.91	6.41	0.10
	Wolverine	Undisturbed, contiguous mature coniferous forest	195.41	2415.38	101806.72	195.41	13.17	8.64	0.20	13.17	195.41	8.09	0.19
Insects	Monarch	Breeding habitat is confined to where milkweed (Asclepias sp.) grows	41.49	1700.50	48105.25	41.49	18.41	3.52	0.12	18.56	41.34	2.43	0.09
Reptiles	Snapping Turtles	most often located in ponds, sloughs, shallow bays or river edges and slow streams, or areas combining several of these habitats	8.86	431.32	71223.91	8.86	0.02	2.06	<0.01	24.31 ⁽³⁾ (4) (5)	=15.43	-3.58	-0.02

- Notes:
- (1) Habitat directly removed within the Project Study Area during construction and/or operations
 - (2) Habitat indirectly impacted by Project activities including noise, light, dust, changes in flows and the effects of groundwater drawdown.
 - (3) The construction of the fish compensation ponds during the site preparation and construction phase will add 6 ha of marsh habitat.
 - (4) At closure, collection ponds 2A and 2B will be rehabilitated to form 7.02 ha of additional marsh habitat.
 - (5) Following the end of mining, dewatering activities will cease and the open pit will be allowed to fill with water. The west basin will be shallow (i.e., 2 to 3 m) and roughly half of the basin will be rehabilitated to form marsh habitat.
 - (6) The negative values represent the new wetland areas as a result of the Project.
- *marsh percentages include the values include the contributions from the fish compensation ponds, rehabilitated collection ponds and the rehabilitated west basin of pit lake

TMI_952-WL(2)-07_Table_4: Analysis of Project Effects on VC of Interest to Indigenous Peoples

VCs	Indicators	Habitat	Baseline			Construction and Operations				Abandonment ⁽³⁾			
			Habitat Area (ha)			Habitat loss (ha)		Percent of habitat lost (%)		Area rehabilitated post-abandonment (ha)	Irreversible habitat change post-abandonment (ha)	Habitat change post-abandonment (%)	
			PSA	LSA	RSA	Direct ⁽¹⁾	Indirect ⁽²⁾	LSA	RSA			LSA	RSA
Furbearers	Beaver and American Marten	Open waterbodies and coniferous forest (Beaver and American Marten habitat, respectively)	199.40	2695.46	167081.66	199.40	13.39	7.89	0.13	41.61	171.18	6.35	0.10
Beavers	Beaver	Open waterbodies	3.99	280.08	65274.94	3.99	0.22	1.50	0.01	20.92	-16.71	-5.97	-0.03
Ungulates	Moose	All marsh habitat (potential Moose Aquatic Feeding Areas)	84.00	220.00	22632.00	78.00 ⁽³⁾	56.00	63.64	0.62	56.00	78.00	35.45	0.34
Waterfowl	Wetland Birds	Wetlands and open waterbodies	44.53	1989.78	113379.24	38.53	15.93	2.74	0.05	60.34	0.11	0.01	<0.01
Gathering and Harvesting of Plants	Wild Rice	Identified through Land Information Ontario	0.00	102.11	1419.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Berries	Ecosite B012, B034, B048, B049, B050, B055, B065, B070, B071, B098, B099, B101, B104, B113, B114, B116, B119, B127, B130	271.57	3574.83	169438.52	271.57	21.37	8.19	0.17	37.51	255.43	7.15	0.15
	Medicinal Plants	All forests and wetlands	311.86	5309.52	229774.31	311.86	36.97	6.57	0.15	52.66	296.17	5.58	0.13
Forestry	—	All upland coniferous, deciduous and mixedwood forests	271.32	3599.82	181670.01	271.32	21.26	8.13	0.16	37.40	255.18	7.09	0.14

NOTES: (1) Habitat directly removed within the Project Study Area (PSA) during construction and operations.

(2) Habitat indirectly impacted by Project activities including noise, light, dust, changes to flows and effects associated with groundwater drawdown.

(3) The negative values represent a net gain of habitat post-abandonment.

TMI_952-WL(2)-07_Table_5: Habitat Losses within the PSA and LSA

Habitat Category	Habitat Sub-category	Baseline			Construction and Operations				Abandonment*					
		Habitat Area (ha)			Habitat loss (ha)		Percent of habitat lost (%)		Area rehabilitated post-abandonment (ha)	Irreversible habitat change post-abandonment (ha)	Habitat change post-abandonment (%)			
		PSA	LSA	RSA	Direct ¹	Indirect ²	LSA	RSA			PSA	LSA	RSA	
Upland	Barren	2.53	34.91	483.83	2.53	0.00	7.25	0.52	0.00	2.53	100.00	7.25	0.52	
	Coniferous forest	194.46	2414.43	101806.72	194.46	13.17	8.60	0.20	20.69	186.94	96.13	7.74	0.18	
	Deciduous forest	75.91	1184.44	79131.85	75.91	8.09	7.09	0.11	16.71	67.29	88.65	5.68	0.09	
	Mixedwood forest	0.00	0.00	731.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Grassland	1.48	83.12	6303.81	1.48	0.00	1.78	0.02	159.39	-157.91	-10683.96	-189.97	-2.51	
	Shrubland	2.37	59.40	3536.41	2.37	0.00	3.99	0.07	26.59	-24.22	-1022.42	-40.78	-0.68	
Upland Total		276.75	3776.30	191994.06	276.75	21.26	7.89	0.16	223.38	74.63	26.97	1.98	0.04	
Wetland	Bog	0.00	0.00	28.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Fen	0.80	819.64	9684.89	0.80	1.17	0.24	0.02	1.17	0.80	100.00	0.15	0.01	
	Marsh	6.09	161.69	8348.07	6.09	0.15	0.15*	<0.01*	0.15	6.09	100.00	-11.18 (6)*	-0.22 (6)*	
	Swamp – coniferous	24.37	563.64	22769.90	24.37	7.02	5.57	0.14	7.02	24.37	100.00	4.29	0.11	
	Swamp – deciduous	10.23	155.53	7273.83	10.23	6.98	11.07	0.24	6.98	10.23	100.00	6.45	0.14	
	Fish compensation ponds (marsh) (3)	—	—	—	-6.00 (6)	0.00	—	—	6.00	-6.00 (6)	—	—	—	—
	Collection ponds 2A and 2B (marsh) (4)	—	—	—	-7.02 (6)	0.00	—	—	7.02	-7.02 (6)	—	—	—	—
	West basin of pit lake (marsh) (5)	—	—	—	-11.14 (6)	0.00	—	—	11.14	-11.14 (6)	—	—	—	—
Wetland Total		41.49	1700.50	48105.25	35.49	15.32	2.99	0.11	39.42	17.39	100.00	1.02	0.04	
Disturbed		12.04	292.23	8474.48	12.04	1.54	4.65	0.16	81.17	-67.59	-561.58	-23.13	-0.80	
Open Water		3.99	281.03	65273.99	3.99	0.22	1.50	0.01	20.92	-16.71	-418.78	-5.95	-0.03	
Total		334.26	6050.07	313847.79	328.26	38.34	6.06	0.12	364.89	7.72				

Notes:

- (1) Habitat directly removed within the Project Study Area during construction and/or operations
- (2) Habitat indirectly impacted by Project activities including noise, light, dust, changes in flows and the effects of groundwater drawdown.
- (3) The construction of the fish compensation ponds during the site preparation and construction phase will add 6 ha of marsh habitat.
- (4) At closure, collection ponds 2A and 2B will be rehabilitated to form 7.02 ha of additional marsh habitat.
- (5) Following the end of mining, dewatering activities will cease and the open pit will be allowed to fill with water. The west basin will be shallow (i.e., 2 to 3 m) and half of the area is expected to form marsh
- (6) The negative values represent the new wetland areas as a result of the Project.

*marsh percentages include the values include the contributions from the fish compensation ponds, rehabilitated collection ponds and the rehabilitated west basin of pit lake