

**Valentine Gold Project: Federal  
Information Requirements**

Round Two Information Requirements,  
Response to IR(2)-100



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RESPONSE TO IR(2)-100**

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**RESPONSE TO IR(2)-100**

<b>IR 2 Reference #:</b>	<b>IR(2)-100</b>
Expert Department or Group:	-
IR 2 Reference #:	New
EIS Reference:	Section 5.5.2.1 Project Pathways Section 9.5.1.2 Residual Effects
Context and Rationale:	<p>Section 7.2.1 of the EIS Guidelines require an estimate of the direct greenhouse gas (GHG) emissions associated with all phases of the project.</p> <p>Environment and Climate Change Canada's guidance document Strategic Assessment of Climate Change (Revised October 2020) identifies emissions from land use change (e.g., land clearing including deforestation, biomass decay, etc.) as an example of direct GHG emissions. The Agency notes that SACC is applicable for IAA projects only but is meant in this instance to be used as a reference on direct versus indirect GHG emissions.</p> <p>Section 5.5.2.1 of the EIS states that GHG emissions from land clearing were quantified only for grubbing, as tree clearing is expected to be completed prior to the peak construction year. It further notes that emissions from grubbing were estimated using diesel combustion emission factors for off-road equipment, and the predicted diesel consumption. The EIS also states that GHG emissions from decommissioning, rehabilitation and closure activities were not quantified as they would be expected to be lower than those released during construction and operation.</p> <p>Section 5.5.1.2 of the EIS indicates the GHG emissions estimate assumed a grubbed area of 14 km<sup>2</sup>. However, the Agency notes that Section 9.5.1.2 of the EIS states that construction activities such as mine site preparation and earthworks activities are expected to result in the loss or change of up to 32.0 km<sup>2</sup>, with an additional approximately 2.8 km<sup>2</sup> of vegetated areas changed or lost within the access road upgrade footprint. This is a considerable difference from the area estimated for the purposes of quantifying greenhouse gas emissions.</p> <p>The EIS does not provide a rationale for not including tree clearing and post- operation activities in the proponent's estimate of Project-related GHG emissions. It is unclear why the estimated area of cleared vegetation is considerably lower than presented elsewhere in the EIS. Quantitative emission estimates that are inclusive of all Project activities are required to determine project effects.</p>

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Information Request:	<p>a. Clarify or revise the area of land to be cleared and provide an estimate of the resultant greenhouse gas emissions from Project construction, decommissioning, rehabilitation and closure. Ensure estimates consider Environment and Climate Change Canada’s guidance on direct emissions from land use change.</p> <p>b. Update the effects assessment, mitigation measures and conclusions, as applicable, to incorporate this additional information.</p>
Response:	<p>a. As noted in the context and rationale above, the area of site preparation activities identified for the GHG emissions evaluation (i.e., 14 km<sup>2</sup>) is different than the vegetated area considered to be disturbed, altered or lost in the Terrestrial Valued Component (VC) assessments (i.e., 32 km<sup>2</sup> within the mine site, with an additional approximately 2.8 km<sup>2</sup> associated with the access road upgrade). Rationale for the selection of these areas is provided below:</p> <ul style="list-style-type: none"> <li>• For assessments of the Terrestrial VCs (i.e., Vegetation, Wetlands, Terrain and Soils; Avifauna; Caribou; and Other Wildlife), a conservative approach was taken as described in the EIS. All habitat within the mine site (i.e., 32 km<sup>2</sup>) was assumed to be disturbed, altered or lost, to account for both direct effects of habitat loss and indirect effects that could result in a change in plant species or community disturbance and change in habitat value and function for wildlife species. Indirect effects on habitat include edge effects, habitat fragmentation, changes in habitat due to changes in surface and groundwater resources, dust and sensory disturbance. As was indicated in the EIS, in practice not all vegetation will be cleared within the mine site, and Marathon has committed to limiting the Project footprint and cleared areas to the extent practicable.</li> <li>• For the Terrestrial VC assessments, approximately 2.8 km<sup>2</sup> of vegetated areas were conservatively assumed to be disturbed, altered or lost due to access road upgrades, with the exact area dependent on the detailed engineering design. As indicated above for the mine site, this assumption accounts for both direct effects of habitat loss and indirect effects that could result in a change in plant species or community disturbance and change in habitat value and function for wildlife species.</li> <li>• Conversely, the calculation for the direct GHG emissions was based on the approximate area of land to be cleared and grubbed during the construction phase. This area includes all developed areas on site (e.g., buildings and pads, infrastructure, roads, open pits, powerline corridors), along with clearing and grubbing</li> </ul>

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	<p>associated with the access road upgrades. For the effects assessment in the EIS, a 20-m buffer around development areas was conservatively assumed, resulting in an estimated area of 14 km<sup>2</sup>. With the request to identify GHG emissions associated with land use change, Marathon has reviewed this conservatively estimated area, including engineering refinement of the developed areas on site, in order to provide a more accurate estimate of the area to be cleared and grubbed. The buffers around site features and infrastructure, including the access road, have been refined to establish a more realistic estimate of 8.95 km<sup>2</sup> to be cleared and grubbed. This is the area that has been used in estimating GHG emissions related to land use change as further described below.</p> <p>Direct emissions from Project construction were presented in Section 5.5.2.2 of the EIS and included emissions from the diesel used during land grubbing (e.g., bulldozers, refer to Table 5.20 of the EIS), however, did not include GHG emissions associated with land use change. The direct and indirect construction emissions presented in Table 5.20 of the EIS were for the construction year anticipated to have the greatest amount of construction activity occurring (i.e., peak construction year) and included diesel used during land grubbing. The direct and indirect GHG emissions presented in Table 5.20 of the EIS for the peak construction year were scaled up to provide an estimate for the entire duration of the construction period (i.e., 16-20 months) of 55.6 kt CO<sub>2</sub>e.</p> <p>The expectation for proponents with respect to potential impacts to GHG emissions and climate change is evolving, with a focus on how these topics will be addressed through the environmental assessment process under the new <i>Impact Assessment Act</i> (IAA). Environment and Climate Change Canada (ECCC) has published the following documents, which apply to designated projects under the IAA and outline how climate change should be assessed:</p> <ul style="list-style-type: none"> <li>• “Strategic Assessment of Climate Change” (Revised October 2020) (ECCC 2020)</li> <li>• “Draft Technical Guide related to the Strategic Assessment of Climate Change” (August 2021) (ECCC 2021)</li> </ul> <p>The Draft Technical Guide (ECCC 2021) includes methodologies for calculating net GHG emissions for new projects.</p>

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	<p>While the Valentine Gold Project is being assessed under the <i>Canadian Environmental Assessment Act, 2012</i>, Marathon has estimated the land clearing emissions using the guidance published by ECCC in the Draft Technical Guide (i.e., default values suggested for boreal forests and Tier 1 methodology from 2006 IPCC Guidelines for National Greenhouse Gas Inventories), as requested via this IR. The estimated land clearing emissions (exclusive of diesel emissions associated with equipment use) include those from living biomass (e.g., trees), dead organic matter (e.g., leaf litter), and soil organic carbon. The estimated land clearing emissions for the Project are 197 kt CO<sub>2</sub>e.</p> <p>Activities associated with land use change (i.e., land clearing) are not expected to occur during decommissioning, rehabilitation and closure; therefore, there is no change to the magnitude of the residual effect predicted for this phase of the Project.</p> <p>b. In the EIS, Section 5.5.2.3, the Project GHG emissions during construction were assessed as representing a small contribution to provincial and national GHG emissions and were ranked as low in magnitude for the construction phase. As outlined in Table 5.8 of the EIS, the magnitude definitions for GHGs are as follows:</p> <ul style="list-style-type: none"> <li>• Negligible – no measurable change in GHG emissions</li> <li>• Low – although a change is measurable, based on Agency guidance (CEAA 2003 and ECCC 2020) and professional judgment, relatively small changes are expected in provincial and national GHG emissions</li> <li>• Moderate – based on Agency guidance (CEAA 2003) and professional judgment, notable changes are expected in provincial and national GHG emissions</li> <li>• High – based on Agency guidance (CEAA 2003) and professional judgment, material changes are expected in provincial and national GHG emissions</li> </ul> <p>With the addition of the direct GHG emissions from land clearing (including those from living biomass (e.g., trees), dead organic matter (e.g., leaf litter), and soil organic carbon), as per the ECCC Draft Technical Guide (ECCC 2021), the total direct and indirect GHG emissions from Project construction are estimated to be 253 kt CO<sub>2</sub>e.</p>

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	<p>Note that the revised GHG emissions for construction have not been presented as a percentage of provincial and national emissions, as the National Inventory Report excludes all GHGs from the Land-Use, Land-Use Change and Forestry Sector from total GHG emissions and would therefore not be an appropriate comparison. However, even with the construction emissions totals refined from those presented in the EIS to include emissions due to land use changes, the Project emissions would continue to be ranked as low in magnitude.</p> <p>With respect to mitigation measures to reduce GHG emissions associated with land use change, there are several mitigation measures included within the EIS that are applicable:</p> <ul style="list-style-type: none"> <li>• Project footprint and disturbed areas will be limited to the extent practicable.</li> <li>• The boundaries of areas to be cleared will be well marked prior to the start of clearing activities.</li> <li>• Clearing for road construction will be limited to the width required for road embankment, drainage requirements, and safe line of sight requirements. Trees will be cut close to ground level, and only large tree stumps will be removed, where practicable. Low ground shrubs will be left in place for soil stability and erosion protection purposes.</li> <li>• Merchantable timber will be salvaged and used, or it will be made available to local communities for fuelwood.</li> <li>• Ground level cutting / mowing / mulching of wetland vegetation will be conducted instead of grubbing, where practicable.</li> </ul> <p>No additional mitigation measures related to GHG emissions and land use change have been identified as a result of the request to include GHG emissions due to land use changes. As described above, the addition of GHG emissions associated with land use change do not result in changes to the characterization of residual adverse effects, proposed mitigation, or overall conclusions described in the EIS</p> <p><u>References:</u></p> <p>Canadian Environmental Assessment Agency (CEAA). 2003. Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners. Canadian Environmental Assessment Agency. Published by the Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment.</p>

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	<p>November 2003. Available online at: <a href="https://www.canada.ca/content/dam/iaac-acei/documents/policy-guidance/incorporating-climate-change-considerations-environmental-assessment-general-guidance-practitioners/incorporating-climate-change-considerations-environmental-assessment.pdf">https://www.canada.ca/content/dam/iaac-acei/documents/policy-guidance/incorporating-climate-change-considerations-environmental-assessment-general-guidance-practitioners/incorporating-climate-change-considerations-environmental-assessment.pdf</a></p> <p>Environment and Climate Change Canada (ECCC). 2020. Strategic Assessment of Climate Change. Available online at: <a href="https://www.strategicassessmentclimatechange.ca/">https://www.strategicassessmentclimatechange.ca/</a></p> <p>Environment and Climate Change Canada (ECCC). 2021. Draft Technical Guide related to the Strategic Assessment of Climate Change. Available at: <a href="https://www.canada.ca/en/environment-climate-change/corporate/transparency/consultations/draft-technical-guide-strategic-assessment-climate-change.html">https://www.canada.ca/en/environment-climate-change/corporate/transparency/consultations/draft-technical-guide-strategic-assessment-climate-change.html</a></p>
Appendix:	None