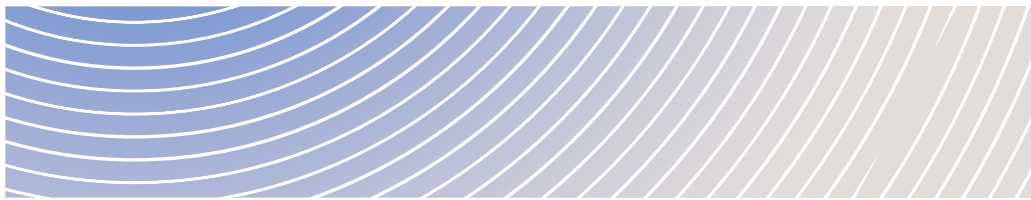


Impact Assessment Agency of Canada



DRAFT ANALYSIS OF GREENSTONE GOLD MINES' PROPOSED CHANGES
TO THE HARDROCK GOLD MINE PROJECT (TEMPORARY WATER BY-
PASS CHANNEL)

JUNE 2024

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1. Introduction

The Hardrock Gold Mine Project (the Project), as proposed by Greenstone Gold Mines (the Proponent), includes the construction, operation, decommissioning, and abandonment of an open pit gold mine and on-site metal mill located approximately five kilometres south of Geraldton, Ontario, at the intersection of Highway 11 (Trans-Canada Highway) and Michael Power Boulevard. The gold mine will have an ore production capacity of 30 000 tonnes per day, and the metal mill will have an ore input capacity of 30 000 tonnes per day. The Project began construction in 2022.

The Project was subject to an environmental assessment under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). The environmental assessment was conducted by the Canadian Environmental Assessment Agency. The former Minister of Environment and Climate Change issued a Decision Statement for the Project on December 10, 2018 (Canadian Impact Assessment Registry Reference Number 80068, Document Number [36](#)). The Decision Statement contains 116 legally binding conditions, which include mitigation measures and follow-up program requirements that the Proponent must comply with throughout the life of the Project. It was amended in February 2021 to reflect modifications to the project development area related to a new access road and the repositioning of several project components (Canada Impact Assessment Registry Reference Number 80068, Document Number [45](#)).

Condition 2.14 of the Decision Statement requires the Proponent to notify the Agency in advance of carrying out any proposed change to the Project.

This report includes the Agency's analysis of the Project change and of the potential adverse environmental effects of those changes, including any additional impacts on the exercise of rights of Indigenous groups, to assess:

- whether the changes would constitute a new or different designated project that may require a new impact assessment; and
- whether any changes (including addition or removal) may be required to the mitigation measures and follow-up program requirements included as conditions in the Decision Statement to address the proposed Project changes.

2. Context

In the spring of 2023, the Proponent notified the Agency pursuant to the accident and malfunction (A&M) notification procedure in condition 9.4 of the Decision Statement, that the Goldfield Creek Diversion (GFCD) Channel failed, causing erosion of the lower reaches of the channel and the release of sediment into the receiving aquatic environment. The failure resulted in Fisheries and Oceans Canada (DFO) issuing several Fisheries Act orders, requiring the Proponent to mitigate further erosion and establish and implement a plan to re-design and remediate the GFCD Channel. Regular meetings between the Proponent and federal and provincial authorities, including DFO, and Indigenous groups began in the fall 2023 to review plans and stay apprised of the updates and next steps related to the re-design and remediation and are on-going.

To implement the re-design and remediation and avoid further adverse environmental effects from the failure, the Proponent needed to divert flows around the GFCD channel prior to the 2024 spring freshet.

The Proponent developed a diversion plan that identified a temporary by-pass channel as the best option for diverting these flows. The plan was shared with federal and provincial regulatory agencies, and Indigenous groups in October 2023. In November 2023, the Proponent provided these federal and provincial agencies and Indigenous groups with a preliminary design for the by-pass channel, which included an expansion of the project development area to accommodate a portion of the by-pass channel. The Proponent constructed the by-pass channel from January to March 2024, completing the work in time for the 2024 spring freshet.

In this context, the Agency's analysis is being conducted retroactively. The objective of this analysis was to determine if, in the Agency's view, amendments should be made to the Decision Statement, including the modification or addition of mitigation measures and follow-up programs, to avoid or limit adverse environmental effects related to the temporary by-pass channel.

3. Project Change

The Proponent has expanded the Project Development Area (PDA) by 6.46 ha, as shown in Figure 1, to accommodate a temporary by-pass channel that will divert flows around the Goldfield Creek Diversion (GFCD) channel, allowing for the re-design and remediation of the GFCD channel, which failed in early 2023. The temporary by-pass channel is regarded as a temporary feature, with an estimated in-service life of 5 years. It will remain in active service until the GFCD channel has been restored, vegetated, and is considered stable enough to receive flowing water. It will divert water from the head pond of the GFCD channel to the headwaters of the Southwest Arm Tributary (Figure 1) to temporarily limit the amount of water in the failed GFCD channel. Reclamation of the temporary by-pass channel will occur during the operations phase of the project, as part of progressive reclamation.

The expansion of the PDA as well as the construction, operation and decommissioning of the temporary by-pass channel is the subject of the following analysis.

4. Analysis under the *Physical Activities Regulations*

The *Physical Activities Regulations* under IAA identify the physical activities that constitute designated projects that may require an impact assessment. Section 19(c) of the *Physical Activities Regulations* reads:

19 The expansion of an existing mine, mill, quarry or sand or gravel pit in one of the following circumstances:

(c) in the case of an existing metal mine, other than a rare earth element mine, placer mine or uranium mine, if the expansion would result in an increase in the area of mining operations of 50% or more and the total ore production capacity would be 5 000 t/day or more after the expansion;

According to the Proponent's analysis, the temporary by-pass channel extends 6.46 hectares beyond the current PDA. To accommodate this, the Proponent is requesting to expand the PDA from 2,201 hectares

to 2,208 hectares, an increase of 0.1%. The daily ore production capacity will remain unchanged at 30,000 tons per day.

5. Assessment of potential adverse environmental effects

The following draft analysis evaluates whether the proposed project change would cause adverse environmental effects within federal jurisdiction as defined under section 5 of CEAA 2012, including effects on fish and fish habitat, migratory birds, and Indigenous peoples. Additionally, we consider whether these changes necessitate modifications, including additions or removals, to the mitigation measures and follow-up program requirements included as conditions in the Decision Statement.

5.1 Fish and fish habitat

5.1.1 Proponent's Assessment

The Proponent conducted an assessment of fish habitat in the PDA and local assessment area for the Project's original Environmental Impact Statement and found no waterbodies or watercourses within the temporary by-pass channel alignment capable of supporting fish. The nearest fish habitat is newly created offsetting habitat located at both ends of the temporary by-pass channel, within the existing PDA. The Proponent indicated that work related to the project change in the vicinity of these habitats would be done in consultation with DFO.

The Proponent is of the view that the project change is minor in nature and would not cause any adverse environmental effects not already considered as part of the original environmental assessment or require additional or modified mitigation measures and follow-up program requirements from what was described in the 2018 Environmental Assessment Report.

5.1.2 Views Expressed

DFO is supportive of the course of action to construct the temporary by-pass channel and agrees with the Proponent's assessment that the construction and operation of the temporary by-pass channel will not directly create or destroy fish habitat, as long as the Proponent excludes fish from entering the channel for the duration of its operation. As part of its own regulatory tools, DFO noted it would be requiring the Proponent to install fish exclusion fencing at the inlet and outlet of the channel and to implement several measures to reduce erosion and sedimentation prior to and during the introduction of flows to the channel. DFO recommended that the fish and fish habitat measures in section 3 of the Decision Statement apply to the temporary by-pass channel and that a plan for reclamation of the temporary by-pass channel be developed, including measures to ensure that the barrier at the inlet of the by-pass channel be reinforced to prevent failure.

5.1.3 Agency's Analysis and Conclusions

The Agency is of the view that the Project change will not result in adverse environmental effects on fish and fish habitat that would change the conclusions made in the 2018 Environmental Assessment Report.

Following DFO's advice, the Agency is recommending a mitigation measure for inclusion in the Decision Statement that would require the Proponent to prevent fish from entering the temporary by-pass channel for the life of the channel.

Additionally, the Agency recommends that the PDA be updated to include reference to Figure 1 of this report in condition 1.25. Doing so would ensure that existing conditions in the Decision Statement apply to the temporary by-pass channel, including conditions related to fish and fish habitat and progressive reclamation.

5.2 Migratory birds

5.2.1 Proponent's assessment

The Proponent is of the view that the 6.46 hectares expansion of the PDA will have minimal impacts on wildlife and wildlife habitat, including migratory birds. While minor vegetation clearing occurred, clearing was completed during the winter 2024 and outside of the migratory bird nesting period for the region.

5.2.2 View's Expressed

Federal authorities did not have any comments or concerns in relation to impacts on migratory birds. Indigenous groups flagged the importance of mitigating potential harm to nests during construction.

5.2.3 Agency's Analysis and Conclusions

The agency is of the view that by updating the definition of the PDA in condition 1.25, as described in section 4.1.3 of this report, the existing condition 4.1 in the Decision Statement, which prohibits the harming of migratory birds and their nests, would apply to the project change and would mitigate for any potential effects to migratory birds.

The Agency is also of the view that effects of the temporary by-pass channel to migratory birds are within the range of effects predicted during the original environmental assessment and would not change the conclusions made in the original environmental assessment

5.3 Indigenous peoples

5.3.1 Proponent's Assessment

Current use of lands and resources for traditional purposes

The Proponent conducted an assessment of current use of lands and resources for traditional purposes and indicated that the temporary by-pass channel could impede navigation through the area and between the Southwest Arm of the Kenogamisis Lake and Goldfield Lake until the temporary by-pass channel is reclaimed. The Proponent also indicated that the 6.46 hectares expansion of the PDA will have minimal to no impact on wildlife species of importance to Indigenous groups, particularly denning mammals, as the area is not ideal habitat given its proximity to the existing access road. The Proponent does not expect any impacts to the existing fen habitat that lies a minimum of 150 metres, as the zone of influence related to any potential construction dewatering would only extend a maximum of 55 metres.

Physical and cultural heritage and structures, sites or things of historical, archaeological, paleontological or architectural significance

The Proponent indicated that the area occupied by the temporary by-pass channel was assessed as part of the original environmental assessment, and the area was not found to have archaeological potential. Existing chance find protocols for the site would be applied for any discoveries made during the construction of the temporary by-pass channel. As a result, the Proponent indicated that there would be no residual impacts to physical and cultural heritage and structures, sites or things of historical, archaeological paleontological or architectural significance from the construction of the temporary by-pass channel.

5.3.2 Views Expressed

Indigenous groups raised concerns about the potential impacts of the temporary by-pass channel construction on the adjacent fen habitat, nesting and denning wildlife species, archaeological chance finds, as well as impacts resulting from potential overflow flooding of the temporary by-pass channel. Indigenous groups requested that, during construction, the Proponent limit the footprint of the temporary by-pass channel outside the existing project development area and mitigate any potential harm to bird nests and denning mammals. Additionally, Indigenous groups requested a plan be developed and implemented to reclaim the area occupied by the temporary by-pass channel when the GFCD Channel is fully operational again.

5.3.3 Agency's Analysis and Conclusions

The Agency is of the view that effects of the temporary by-pass channel to the current use of lands and resources for traditional purposes and to cultural heritage are within the range of effects predicted during the original environmental assessment and would not change the conclusions made in the original environmental assessment and that the project change will not impact any Indigenous groups that are not identified in the Decision Statement for the Project. Additionally, the Agency is of the view that by updating the definition of the PDA in condition 1.25 as described in section 4.1.3 of this report, the existing conditions, including those related to chance find protocols (7.1), progressive reclamation (6.6), Indigenous access (6.1), and follow-up monitoring for Indigenous access (6.9) would be sufficient to mitigate and monitor these effects.

6. Consultation and Engagement

6.1 Proponent's Engagement with Indigenous Groups

In September, October and November 2023, the Proponent indicated it engaged with the potentially affected Indigenous groups defined in condition 1.18 of the Decision Statement, this included Animbiigoo Zaagi'igan Anishinaabek, Aroland First Nation, Ginoogaming First Nation, Long Lake #58 First Nation and Métis Nation of Ontario in relation to the redesign of GFCD channel and construction of the temporary by-pass channel. As part of their engagement with Indigenous groups, the Proponent shared key documents related to the project change (i.e. the GFCD mitigation plan and alternatives assessment for the Goldfield

Creek Remediation¹, and the Goldfield Creek Remediation Project Temporary By-Pass Channel Preliminary Design Report²) and attended meetings with Indigenous groups as part of Environmental Advisory Subcommittee meetings and ongoing weekly technical workshops. The Proponent also attended individual meetings with communities.

6.2 Agency's Engagement on Project Change

The Agency will engage with the groups listed in the Decision Statement (Animbiigoo Zaagi'igan Anishinaabek, Aroland First Nation, Ginoogaming First Nation, Long Lake #58 First Nation and Métis Nation of Ontario) to validate the views presented above. Additionally, the Agency will invite these Indigenous groups to provide any further comments related to the project change, the Agency's analysis or recommended amendments to the Decision Statement.

The Agency will also seek additional comments from federal authorities and the public as part of the comment period, to inform advice to the Minister of Environment and Climate Change on a final recommendation for potential amendments to the Decision Statement.

7. Conclusion

Based on the information provided by the Proponent, including the summarized input of Indigenous groups, and the input provided by DFO, the Agency is of the view that the project change will not increase the extent of adverse environmental effects beyond what was described in the 2018 Environmental Assessment Report. The Agency's draft analysis determined that the temporary by-pass channel would not create or destroy fish habitat, as long as fish do not enter the temporary by-pass channel. As such, the Agency is recommending that the Proponent exclude fish from entering the temporary by-pass channel at the channel's inlet and outlet for the life of the channel (see Table 1). Potential minor adverse effects described above will also be managed by existing conditions and follow-up programs already identified as conditions in the Decision Statement.

Given that the project change is not captured by the definition of the Designated Project as currently written in the Decision Statement, the Agency also recommends that the definitions of *Designated Project* (condition 1.7) and *Project development area* (condition 1.25) be updated, to include the temporary by-pass channel and expanded PDA (see Table 1). Potential minor adverse effects described above will therefore be covered by the mitigation and follow-up programs in the existing conditions of the Decision Statement.

Finally, the Agency also recommends that conditions 2.14 and 2.15 be amended to improve how future Project change(s) will be assessed to determine whether any change to the mitigation measures and/or follow-up requirements included as conditions may be necessary in response to the Project change(s)

¹ Matrix Solutions Inc. (Matrix). 2023a. Goldfield Creek Environmental Remediation Surfaces – Diversion Concept Memorandum (V2). Prepared for Greenstone Gold Mines. September 29, 2023

² Matrix Solutions Inc. (Matrix). 2023b. Goldfield Creek Remediation Project Temporary By-Pass Channel Preliminary Design Report. Prepared for Greenstone Gold Mines. November 7, 2023.

(Table 1). These amendments would ensure that the process for assessing Project change(s) is consistent with other decision statements issued more recently, and that there is greater clarity and certainty about the information that the Proponent must submit to the Agency and how the Agency will consider this information.

Table 1- Recommended amendments to the Decision Statement

Current Decision Statement	Recommended amendment to the Decision Statement
<p>1.7 <i>Designated Project</i> means the Hardrock Gold Mine Project as described in section 2 of the environmental assessment report prepared by the Canadian Environmental Assessment Agency (Canadian Environmental Assessment Registry Reference Number 80068).</p>	<p>1.7 <i>Designated Project</i> means the Hardrock Gold Mine Project as described in section 2 of the environmental assessment report prepared by the Canadian Environmental Assessment Agency (Canadian Environmental Assessment Registry Reference Number 80068, <u>Document Number 35) and the temporary by-pass channel described in section 2 of the Agency’s Analysis of Greenstone Gold Mines’ Proposed Changes to the Hardrock Gold Mine Project (temporary water by-pass channel) (Canadian Environmental Assessment Registry Reference Number 80068).</u></p>
<p>1.25 <i>Project development area</i> means the area labelled “project development area” in figure 1 of the analysis report of Greenstone Gold Mines’ proposed changes to the Hardrock Gold Mine Project prepared by the Impact Assessment Agency of Canada (Canadian Impact Assessment Registry Reference Number 80068).</p>	<p>1.25 <i>Project development area</i> means the area labelled “project development area” on figure 1 <u>and figure 2 of the Agency’s Analysis of Greenstone Gold Mines’ Proposed Changes to the Hardrock Gold Mine Project (temporary water by-pass channel) (Canadian Environmental Assessment Registry Reference Number 80068).</u></p>
	<p>New condition</p> <p><u>3.2 The Proponent shall exclude fish from accessing the temporary by-pass channel at the channel’s inlet and outlet until the temporary by-pass channel is reclaimed.</u></p>
<p>2.14 The Proponent shall consult with Indigenous groups and relevant authorities prior to initiating any changes to the Designated Project that may result in adverse environmental effects, and shall notify the Agency in writing no later than 60 days prior to initiating the change(s).</p>	<p><u>2.14 If the Proponent is proposing to carry out the Designated Project in a manner other than described in condition 1.7, the Proponent shall notify the Agency in writing in advance of carrying out the proposed activities. As part of the notification, the Proponent shall provide:</u></p>

	<p><u>2.14.1 a description of the proposed change(s) to the Designated Project and the environmental effects that may result from the proposed change(s);</u></p> <p><u>2.14.2 any modified or additional measure(s) to mitigate any environmental effect that may result from the proposed change(s) and any modified or additional follow-up requirement(s); and</u></p> <p><u>2.14.3 an explanation of how, taking into account any modified or additional mitigation measures referred to in condition 2.14.2, the environmental effects that may result from the proposed change(s) may differ from the environmental effects of the Designated Project identified during the environmental assessment.</u></p>
<p>2.15 In notifying the Agency pursuant to condition 2.14, the Proponent shall provide the Agency with a description of the potential adverse environmental effects of the change(s) to the Designated Project, the proposed mitigation measures and follow-up requirements to be implemented by the Proponent and the results of the consultation with Indigenous groups and relevant authorities.</p>	<p><u>2.15 The Proponent shall provide to the Agency any additional information required by the Agency about the proposed change(s) referred to in condition 2.14, which may include the results of consultation with Indigenous groups, and relevant authorities on the proposed change(s) and environmental effects referred to in condition 2.14.1 and the modified or additional mitigation measures and follow-up requirements referred to in condition 2.14.2.</u></p>

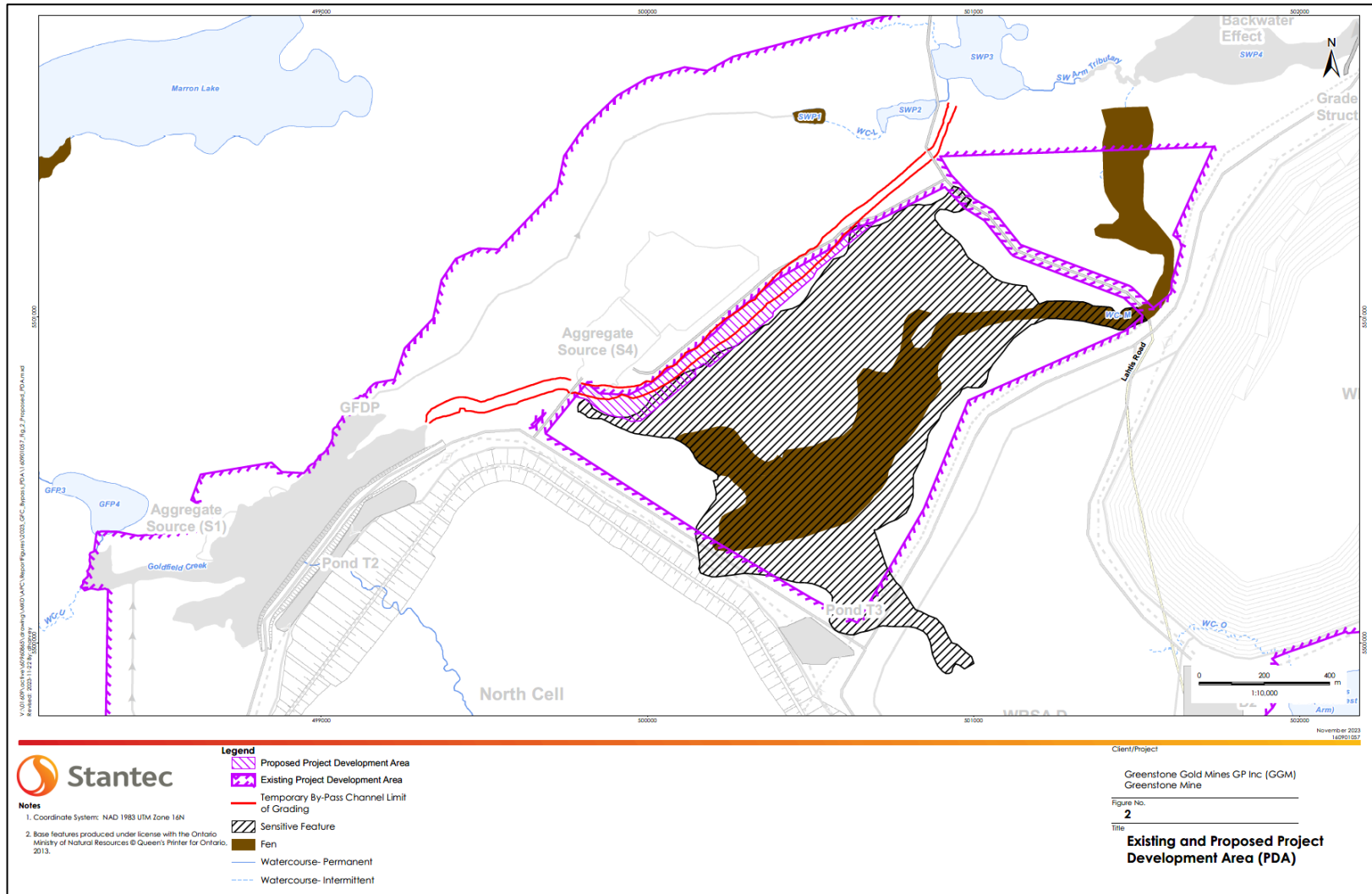


Figure 1. Existing and Proposed expansion of the Project Development Area (PDA) for the temporary by-pass channel

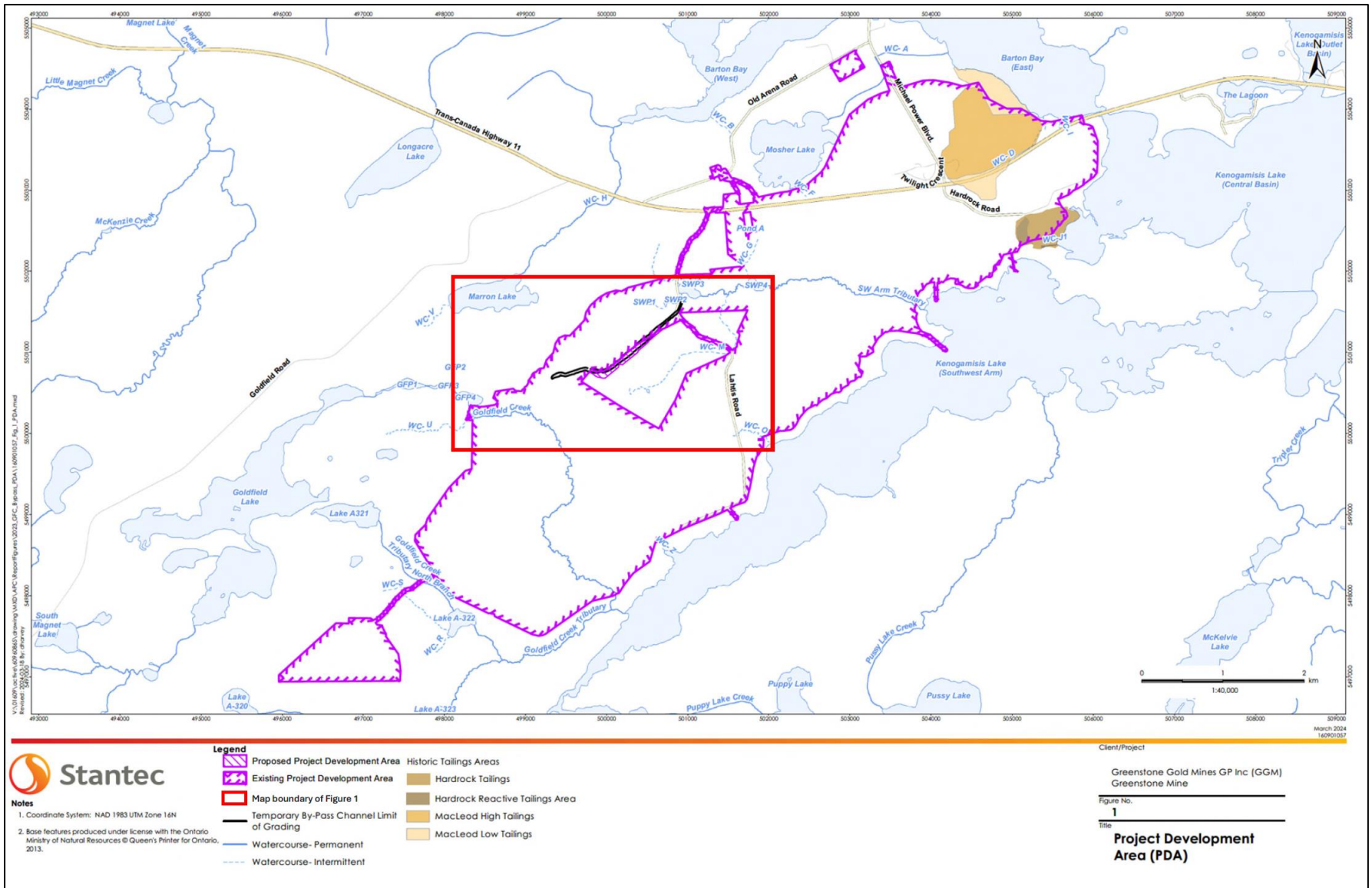


Figure 2. Project development area showing location of area represented in figure 1.