



**WETLANDS AND RIPARIAN
RESOURCES VOL 3
ENVIRONMENTAL EFFECTS AND WETLAND
REPLACEMENT PLAN**

TWIN METALS MINNESOTA PROJECT
Environmental Review Support Document

Prepared for Twin Metals Minnesota, LLC
Prepared by

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REVISION RECORD

Revision	Date	Description	EDMS Download Date	Project Configuration Version
0A	11-20-2020	Submitted for Agency Review – TOC		

REVISION NARRATIVE

DISCLAIMER

This document is a working document. This document may change over time because of new information, or further analysis or deliberation.



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APPENDICES

LIST OF ABBREVIATIONS, ACRONYMS, AND SYMBOLS

TMM

Twin Metals Minnesota, LLC

1.0 INTRODUCTION

The Twin Metals Minnesota, LLC (TMM) Project (Project) is focused on designing, permitting, constructing, and operating an underground copper, nickel, cobalt, platinum, palladium, gold, and silver mining project. Located approximately nine miles (14 kilometers [km]) southeast of Ely, Minnesota, and 11 miles (18 km) northeast of Babbitt, Minnesota, the Project targets valuable state, federal, and private minerals within the Maturi deposit, which is a part of the Duluth Complex geologic formation.

All potential Project infrastructure locations presented herein are considered preliminary and are undergoing further design and engineering evaluations which will dictate final design and locations. Further information about TMM and the Project is located at <http://www.twin-metals.com/>.

The purpose of this document is to provide necessary information for the environmental review and permitting process. TMM retained [insert Consultant name] (insert abbreviated Consultant name) to complete [insert text].

2.0 SUMMARY

This report will describe the impacts of the proposed action and alternatives on the baseline conditions of wetlands and riparian resources.

The results presented in this volume are defined by overlaying the impacts from the proposed action and alternatives described in on the baseline conditions described in the other volumes of the *Wetlands and Riparian Resources Data Package*.

Reference to relevant sections of the FSDD, SEAW, and / or federal documents will be provided to remind the reader there is a defined scope that is being followed.

3.0 ENVIRONMENTAL EFFECTS

Provide a high level summary of what is presented in the environmental effects. Section summarizes what environmental effects are and the effects of the proposed action and alternatives.

3.1 Impact Assessment Indicators and Methods

- Describe the baseline conditions at a high level using the other volumes of the *Wetlands and Riparian Resources Data Package*.
- Describe the impact assessment indicators and methods at a high level using the other volumes of the *Wetlands and Riparian Resources Data Package* and indicate where additional details can be found within this document.

- Review direct impacts – as described in the other volumes of the *Wetlands and Riparian Resources Data Package*
 - Direct wetland impacts from mining-related activities such as filling or excavation of wetlands
 - Will require mitigation as described in Section 4.
- Review potential indirect effects – as described in the other volumes of the *Wetlands and Riparian Resources Data Package*
 - Indirect wetland impacts from mining-related activities that result in a reduced function or value of the wetlands.
 - Mitigation to be determined by subsequent permitting and monitoring.
 - Indirect effect analyses should be used to inform where monitoring should take place for those areas that were identified as having a potential for indirect wetland effects.
- Describe time for analysis:
 - Timeline for analysis for direct effects would be during the construction and operations phase.
 - Timeline for analysis of the indirect effects would likely be the construction, operations, and portions of the closure phase. This would be further defined by the indirect impact modeling in the *Water Resources Data Package*

3.2 Discussion of Environmental Effects

Utilizing the impact assessment methods, areas of direct impacts, and areas of potential indirect impacts summarized in Section 3.1, an assessment of direct and indirect impacts will be conducted and described within this section. The following items will be assessed and described for the proposed action, alternatives to the proposed action, and the no action alternative:

Direct Impacts

- Discussion on direct impacts – wetland acreages and types. Figures and tables.

Potential Indirect Effect

- Discussion on potential indirect effects:
 - Wetland Fragmentation
 - Changes in Hydrology Due to Change in Watershed Area
 - Changes in Wetland Hydrology Due to Drawdown
 - Wetlands Abutting Keeley Creek
 - Water Quality Changes

- Potential indirect effects will be informed by water modeling from *Water Resources Vol 3*.

3.2.1 Proposed Action

Direct and indirect impacts associated with the proposed action will be described in this section.

3.2.2 Alternatives to the Proposed Action

Direct and indirect impacts associated with the alternatives will be discussed in this section. This discussion will focus on differences in impacts between the alternatives and proposed action. Impacts that are the same between the proposed action and alternatives will be noted but not discussed in detail.

3.2.3 No Action Alternative

Direct and indirect impacts associated with the no action alternative will be described in this section.

4.0 WETLAND REPLACEMENT

4.1 Wetland Avoidance and Minimization

4.1.1 Section 404 Regulations of the Clean Water Act

- Review regulatory requirements of Section 404(b)1 permitting requirements, specifically:
 - Avoid impacts
 - Minimize impacts
 - Mitigate remaining impacts

4.1.2 Minnesota Wetland Conservation Act

- Review regulatory requirements of WCA, specifically:
 - Avoid impacts
 - Minimize impacts
 - Mitigate remaining impacts
- Also include discussion on Minnesota's water quality standards under Minnesota Rules, part 7050.0186

4.1.3 Project Avoidance / Minimization Steps

- Discuss avoidance / minimization steps involved in siting and design of project features.

4.2 Wetland Mitigation

4.2.1 USACE Mitigation Ratios and Financial Assurance

- Discussion on requirements for USACE mitigation and financial assurance. Review factors determining the mitigation ratio including:
 - On-site vs. Off-site
 - In-Advance vs. Concurrent
 - In-Kind vs. Out-of-Kind

4.2.2 State Mitigation Ratios and Financial Assurance

- Discussion on requirements for WCA mitigation and financial assurance. Review factors determining the mitigation ratio including:
 - Type
 - Location
 - Project-specific replacement or banking credits
 - Size
 - Timing

4.2.3 Mitigation Options

Discuss the different mitigation options available for the proposed action and alternatives.

On-site Mitigation

Off-site Mitigation

Wetland Bank Credits

Permittee-Responsible Mitigation

4.3 Monitoring Plan for Wetland for Potential Indirect Effects

Discuss results of the other volumes of the *Wetlands and Riparian Resources Data Package* and purpose of monitoring for potential indirect effects.

4.3.1 Monitoring Sites

Based on Section 3.0 and inputs from the *Water Resource Data Package* include a discussion on potential monitoring sites.

Pre-Project Wetland Hydrology Monitoring Sites

Project Wetland Hydrology Monitoring Sites

Reference Wetland Hydrology Monitoring Sites

In addition to potential monitoring sites, discuss reference wetland hydrology monitoring sites.

4.3.2 Wetland Vegetation and Boundary Monitoring

Discuss monitoring plan for wetland vegetation and boundaries.

4.3.3 Indirect Effects Mitigation

Discuss potential mitigation options for indirect effects.

4.3.4 Wetlands Adaptive Monitoring Plan

Discuss adaptive monitoring plan to be implemented if issues are noted from hydrology monitoring site or from the wetland vegetation and boundary.

5.0 REFERENCES



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APPENDIX [#A, B, C, D]

[APPENDIX TITLE]



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APPENDIX [#A, B, C, D]

[APPENDIX TITLE]

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