



NOISE AND VIBRATION VOL 2 IMPACT INDICATORS AND METHODS

TWIN METALS MINNESOTA PROJECT Environmental Review Support Document

Prepared for Twin Metals Minnesota, LLC
Prepared by

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REVISION RECORD

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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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Environmental Review Support Document

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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

- Provide a high level summary of what is presented within this report.
- Describes a rationale for selection of indicators.
- Describes methods and approach in development of impact criteria.
- Describes rationale and approach for selection of the area of analysis.
- Describe how this report volume relates to the other volumes.
 - Indicate regulatory framework and proposed action and alternatives are defined in other volumes of the *Noise and Vibration Data Package*.
- Reference relevant sections of the FSDD, SEAW, and / or federal documents to remind the reader there is a defined scope that is being followed.

3.0 IMPACT ASSESSMENT CRITERIA

3.1 Impact Assessment Indicators and Methods

Indicators and methods for assessing direct and indirect impacts will be described within this section including the following:

- Potential noise emissions analysis developed using International Organization for Standardization (ISO) 9613-2:1996
- Noise emissions subject to Minnesota regulations for:
 - Daytime noise limits
 - Nighttime noise limits
 - Compliance with the L₅₀ standard

- Initial assessment completed with no EPM's in place
- Change from the ambient noise due to Project activities
- Changes in vibration due to Project activities

3.2 Area of Analysis

A discussion will be provided to describe the area of analysis.

- The area of analysis for noise would include the plant site, ventilation raise sites, tailings management site, and water intake corridor buffered out to 55 nearby sensitive receptors.
 - Verify if Kawishiwi homes and boaters on Birch Lake are included in sensitive receptor grid
 - Verify receptors include wildlife and other species
 - Including remoteness from sights and sounds outside the wilderness
- The area of analysis for vibration would be the underground mine area and the 55 nearby sensitive receptors that were used for the noise baseline.
 - Induced seismicity and its potential effects are to be addressed
 - Blasting plan to have required information

4.0 REFERENCES



TABLES



FIGURES



APPENDICES



**TWIN METALS MINNESOTA PROJECT
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APPENDIX [#A, B, C, D]

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APPENDIX [#A, B, C, D]

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