

5.2.9 Cultural Resources

This section summarizes the environmental consequences of the NorthMet Project Proposed Action on historic properties, including the potential effects, types of avoidance, effect minimization measures, and potential mitigation measures that are relevant to these historic properties. Additionally, this section summarizes the environmental consequences of the NorthMet Project Proposed Action on 1854 Treaty resources—i.e., those areas and species that are traditionally or culturally important to the Bands.

The federal Co-lead Agencies have identified several historic properties in consultation with the SHPO and the Bands. The federal Co-lead Agencies have also consulted with the SHPO and the Bands concerning NRHP eligibility of the Sugarbush, *Mesabe Widjiu*, BBLV, Erie Mining Company Railroad Mine and Plant Track, and Erie Mining Company Concentrator Building. All other cultural resources identified as part of the NorthMet Project Proposed Action were determined to be not eligible for inclusion in the NRHP, and therefore will not receive further consideration under Section 106 during review of the NorthMet Project Proposed Action. The federal Co-lead Agencies are currently refining statements of significance and boundaries for these properties.

Preliminary effect determinations have been drafted by the federal Co-lead Agencies for review and comment by the Bands and the SHPO. The federal Co-lead Agencies believe that there will be no adverse effect on the Sugarbush and the Erie Mining Company Railroad Mine and Plant Track. However, the *Mesabe Widjiu*, BBLV, and Erie Mining Company Concentrator Building will be adversely affected by the NorthMet Project Proposed Action. These preliminary determinations will be used to facilitate ongoing consultation with the Bands and the SHPO pertaining to the application of adverse effect criteria to these properties. Mitigation measures to resolve adverse effects would be developed after consultation on the effect determinations and consideration of any measures to avoid or minimize adverse effect.

5.2.9.1 Methodology and Evaluation Criteria Overview

In consultation with the SHPO and the Bands, the federal Co-lead Agencies must apply the criteria of adverse effects to historic properties within the APE to evaluate the potential effect of the NorthMet Project Proposed Action on the historic properties, as codified in 36 CFR 800.5.

An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. These characteristics for eligibility are discussed at length in Section 4.2.9. Adverse effects may include reasonably foreseeable effects that occur later in time, are farther removed, or are cumulative.

Direct effects caused by the undertaking occur at the same time and place. Indirect effects caused by the undertaking are later in time or further removed in distance but are still reasonably foreseeable. The federal Co-lead Agencies confer with consulting parties when there are potential adverse effects, to resolve adverse effects, and develop mitigation measures as necessary. For the NorthMet Project Proposed Action, the following is a summary of potential effect types:

- 42 • physical disturbance or damage to all or part of the property caused by ground disturbance
43 (e.g., digging, trenching, etc.);
- 44 • introduction of visual, atmospheric, or audible elements that could diminish the integrity of
45 the property's significant historic features during short-term NorthMet Project Proposed
46 Action-related construction and operation of aboveground facilities and roads, as well as
47 long-term effects from operation;
- 48 • change in the character of the use or of physical features within the property's setting that
49 contribute to its significance; and
- 50 • transfer of property out of federal ownership without adequate conditions to ensure
51 consideration of historic properties.

52 Effects determinations have the following three possible outcomes:

- 53 1. Finding of no historic property affected – The undertaking does not have the potential to
54 cause effects on historic properties that may be present.
- 55 2. Finding of no adverse effect – The historic property would be affected; however, the effects
56 of an undertaking do not meet the criteria of adverse effect, or measures have been taken to
57 avoid or minimize adverse effects.
- 58 3. Finding of adverse effect – The undertaking may affect the integrity, which would alter,
59 directly or indirectly, any of the characteristics of a historic property that qualify it for
60 inclusion in the NRHP. If an adverse effect is found, the federal Co-lead Agencies shall
61 consult further to resolve the adverse effect.

62 **5.2.9.1.1 Types of Potential Effects**

63 The potential for the NorthMet Project Proposed Action to affect a historic property may depend
64 on the project stage and the development and use of the NorthMet Project area. Potential effects
65 that may occur during the construction and operations of the NorthMet Project Proposed Action
66 are discussed in the following subsections.

67 **Construction**

68 NorthMet Project Proposed Action construction activities could affect cultural resources in a
69 variety of ways, including the following:

- 70 • possible direct damage to cultural resources within the construction footprint;
- 71 • possible indirect damage to cultural resources through vibrations caused by earth-moving and
72 heavy equipment;
- 73 • temporary loss of community access to cultural resources, such as cultural resources of
74 traditional significance;
- 75 • potential permanent visual effects that alter the viewshed to or from a cultural resource as it
76 pertains to the cultural resource's setting and feeling;
- 77 • potential temporary visual effects on cultural resources while heavy equipment and numerous
78 personnel are present;

79 • increased dust and noise that may affect historic structures or cultural resources of traditional
80 significance near the construction area; and

81 • discovery of previously unknown cultural resources within the construction footprint.

82 The duration of the construction phase would affect the degree of effects on cultural resources.
83 Potential indirect effects during construction—such as noise, dust, vibrations, heavy equipment
84 traffic, and changes in viewshed—could be temporary and would be expected to last for the
85 duration of construction in specific areas and for discrete periods of time.

86 **Operations**

87 During the operations phase of the NorthMet Project Proposed Action, only previously surveyed
88 and assessed areas would be expected to require periodic disturbance; therefore, the potential for
89 additional direct effects to cultural resources would be limited.

90 Indirect effects during operations could consist of a permanent change in viewshed to historic
91 structures near NorthMet Project area facilities, and a periodic increase in noise, vibration, and
92 dust created by vehicular traffic conducting operation and maintenance activities.

93 **5.2.9.1.2 Mitigation Measures**

94 Mitigation measures would be taken to avoid or minimize effects on historic properties, to the
95 extent practicable. The following are potential mitigation measures:

96 • avoidance, which could be accomplished by shifting the footprint away from the resource,
97 limiting activities in the vicinity of the resource, monitoring construction activities near the
98 resource to inform whether additional actions are warranted, or through any combination of
99 these techniques;

100 • minimization, which would reduce the effects on the resource through avoidance measures as
101 described above, but would not completely eliminate the effects; and

102 • mitigation, which would offset that effect through some of the following means:

103 – protection of a similar resource nearby;

104 – detailed documentation of the resource through data recovery (i.e., excavations, in the
105 case of archaeological sites, or Historic American Buildings Survey/Historic American
106 Engineering Record documentation, in the case of historic structures);

107 – contributions to the preservation of cultural heritage in the affected community;

108 – interpretative exhibits highlighting information gained about cultural resources through
109 the NorthMet Project Proposed Action; or

110 – some combination of these strategies.

111 Because the NorthMet Project Proposed Action will likely result in adverse effect, the Co-lead
112 Agencies will consult with the SHPO, the Bands, and PolyMet to identify practicable ways to
113 avoid, minimize, or mitigate the harmful effects of the undertaking. The ACHP would become
114 involved in consultation if requested by an agency, SHPO, Bands, other consulting parties, or
115 member of the public with a demonstrated interest. This consultation process would likely result

116 | in the development of a Memorandum of Agreement (MOA), which identifies the steps the
117 | federal Co-lead Agencies would take to avoid, minimize, or mitigate the adverse effect.

118 | **5.2.9.2 Affected Cultural Resources**

119 | This section describes the environmental consequences of the NorthMet Project Proposed Action
120 | on historic properties within the APE. As outlined in Section 4.2.9, the federal Co-lead Agencies,
121 | the Bands, and the SHPO agree that the Concentrator Building (SL-HLC-008), Erie Mining
122 | Company railroad (SL-HLC-015), Sugarbush, the *Mesabe Widjiu*, and the BBLV are eligible for
123 | inclusion in the NRHP. The federal Co-lead Agencies have also drafted preliminary effects
124 | determinations, which will also be subject to further consultation. However, after consulting with
125 | the Bands and SHPO, the federal Co-lead Agencies will make final decisions regarding effects
126 | from the NorthMet Project Proposed Action.

127 | **5.2.9.2.1 Historic Properties**

128 | The Concentrator Building (SL-HLC-008) is a key property and reflects Erie Mining Company's
129 | decades of experimentation in production and engineering design (Zellie 2007). The Co-lead
130 | Agencies have determined the Concentrator Building eligible for inclusion in the NRHP under
131 | Criterion A in the areas of industry and engineering, and also under Criterion C in the area of
132 | engineering.

133 | Direct effects to this property would consist of interior and exterior refurbishment and use. For
134 | example, emission controls on ore grinding equipment would be replaced with components that
135 | meet or exceed the particulate emission standard required of new sources at taconite plants. To
136 | reduce space heating requirements, the building insulation would be improved. Additionally, the
137 | concentrator building would be demolished at mine closure and decommissioning, consistent
138 | with Minnesota state mining standards. There will be minor exterior and interior alterations to
139 | the other primary plant buildings and structures. The NorthMet Project Proposed Action will
140 | include the construction of several new buildings adjacent to the Concentrator Building. Based
141 | on the above considerations, the federal Co-lead Agencies believe that the NorthMet Project
142 | Proposed Action will adversely affect the Concentrator Building.

143 | The federal Co-lead Agencies have determined the Erie Mining Company railroad (SL-HLC-
144 | 015) eligible for inclusion in the NRHP under Criterion A in the areas of Commerce, Industry,
145 | and Transportation. Although the majority of the main track of railroad is outside of the
146 | NorthMet Project area, the mine track and plant track segments would be directly affected near
147 | the NorthMet Project area.

148 | Direct effects to this property would consist of refurbishment and use. Refurbishment, however,
149 | is not expected to result in significant alterations. Nonetheless, the Erie Mining Company
150 | railroad would be removed at mine closure and decommissioning, consistent with Minnesota
151 | state mining standards. There would be no expected indirect effects, as the use of the Plant Site
152 | and mining activities would be consistent with the railroad's original use. Based on the above
153 | considerations, the federal Co-lead Agencies believe that the NorthMet Project Proposed Action
154 | will not adversely affect the Erie Mining Company railroad.

155 | The federal Co-lead Agencies have determined the Sugarbush eligible for inclusion in the NRHP
156 | under Criterion A for its association with important Ojibwe spiritual and cultural practices. It has
157 | also been determined eligible for the NRHP under Criterion C as a distinguishable entity—a

158 maple stand—that represents a larger entity of traditional cultural importance. Under Criterion D,
159 the site is significant for its potential to answer important questions about possible 19th century
160 and 20th century Ojibwe maple sugaring practices.

161 Direct effects on this property will not result from the NorthMet Project Proposed Action. The
162 sugarbush is not within the footprint of the Mine Site, the Plant Site, or any other ancillary
163 NorthMet Project area features.

164 Based on an indirect visual effects analysis conducted for the NorthMet Project Proposed Action
165 and the site visits conducted in 2010, the federal Co-lead Agencies believe that the NorthMet
166 Project Proposed Action will not result in a visual intrusion that would diminish the integrity of
167 setting, feeling, or associations. The sugarbush is a number of miles from the Mine Site and
168 sufficiently screened from the Plant Site and the Tailings Basin where those project features are
169 not visible. The Plant Site and Tailings Basin are existing LTVSMC mine features. Their
170 footprint would not be expanded to any significant extent, nor would the addition of material be
171 visible from the sugarbush to a significantly greater extent than current conditions.

172 The analysis of possible atmospheric effects that was completed for the NorthMet Project
173 Proposed Action indicates that the sugarbush is not in an area expected to be affected by dust
174 deposition. The sugarbush and its grove of mature maple trees has existed throughout the past 50
175 years of mining, which included the use of the existing Plant Site and Tailings Basin as well as
176 numerous mineral extraction locations (mine pits) in close proximity to the sugarbush in
177 comparison to the Mine Site.

178 The sugarbush may be associated with the trail systems, such as the BBLV, that are known to
179 have traversed this area. The portion of that trail corridor in proximity to the sugarbush has been
180 for the most part destroyed by past mining operations. The NorthMet Project Proposed Action
181 would not result in the loss of any additional portions of that corridor, or trails, in proximity to
182 the sugarbush. For further discussion, see the discussion of effects on the BBLV.

183 Based on this analysis, the federal Co-lead Agencies believe that there will be no direct effects
184 resulting from the NorthMet Project Proposed Action nor will there be any significant changes to
185 the setting, feeling, or associations of the Spring Mine Lake Sugarbush.

186 After consultation with the Bands concerning effects to the sugarbush, the Co-lead agencies
187 acknowledged that the analysis of atmospheric effects to the sugarbush was a prediction and that
188 dust deposition is expected to occur near this property. The Co-leads feel it is reasonable to
189 believe that atmospheric effects to the sugarbush would not be adverse, but also believe that it is
190 appropriate to require monitoring of the sugarbush to ensure it is not adversely affected. The
191 details of a monitoring plan will be developed through consultation with the SHPO and the
192 Bands and incorporated into the MOA that stipulates appropriate treatment for properties or
193 mitigation for adverse effects.

194 The federal Co-lead Agencies have determined the *Mesabe Widjiu* eligible for inclusion in the
195 NRHP under Criterion A for its association with important Ojibwe spiritual and cultural
196 practices.

197 Direct effects on the *Mesabe Widjiu* would occur at the Tailing Basin, which currently abuts a
198 portion of that land form. Expansion of the Tailings Basin would intrude on that portion of the
199 *Mesabe Widjiu*. Direct effects on the *Mesabe Widjiu* at the Mine Site would not occur as the
200 *Mesabe Widjiu* is not considered to be within the footprint of the Mine Site. However, the

201 boundaries of this property is still the subject of consultations with SHPO and the Bands and
202 may change due to these ongoing consultations.

203 Indirect effects to the *Mesabe Widjiu* would result from the features at the Mine Site location.
204 Although there are existing mine features between the *Mesabe Widjiu* and the Mine Site location,
205 the NorthMet Project Proposed Action would further diminish the integrity of setting and feeling.
206 The large-scale alterations to the landscape resulting from mine pits, stockpiles, material
207 handling facilities, etc. are long-term changes that will further diminish the association of the
208 *Mesabe Widjiu* with the natural features of the Partridge River headwaters. Although the Mine
209 Site has been disturbed by logging, roads brushed out for mineral exploration, and linear
210 features, such as Dunka Road or the railroad, these disturbances are smaller. The effect of the
211 NorthMet Project Proposed Action would also remove a portion of the BBLV corridor, further
212 diminishing the *Mesabe Widjiu*'s association with that historic property.

213 Although the federal Co-lead Agencies are not aware of specific locations adjacent to the
214 NorthMet Project area that are used by the Bands, this does not diminish the significance of
215 effects for that portion of the *Mesabe Widjiu*. Given the nature of Ojibwe spiritual practices,
216 which is a personal connection to the natural elements of the environment, locations of this type
217 are very difficult to identify. The *Mesabe Widjiu* is a historic property to which the Ojibwe have
218 had a spiritual connection for hundreds of years.

219 Based on the above considerations, the federal Co-lead Agencies believe that the NorthMet
220 Project Proposed Action would adversely affect the *Mesabe Widjiu*.

221 The federal Co-lead Agencies have determined that the BBLV is significant for the role it played
222 in the broad patterns of Ojibwe land use and early mineral exploration. It is eligible for inclusion
223 in the NRHP under Criteria for Evaluation A and D.

224 The portion of the BBLV that lies within the Mine Site will be directly affected by the NorthMet
225 Project Proposed Action, which would result in its permanent removal. Based on this, the federal
226 Co-lead Agencies believe that the NorthMet Project Proposed Action would adversely affect the
227 BBLV.

228 **5.2.9.2.2 Treaty Resources**

229 Natural resources important to Ojibwe culture can be recognized even when tribal use of a
230 natural resource may not qualify that resource as a historic property in the NRHP. The right to
231 hunt, fish, and gather on lands within the 1854 Ceded Territory is protected by the 1854 Treaty.
232 Limitation or elimination of access to public lands within the 1854 Ceded Territory for these
233 purposes may be considered an effect on 1854 Treaty rights. The loss of traditional use areas
234 would have a cultural effect because commonality of place is essential in Ojibwe culture and the
235 replacement of those sites may not adequately replace their cultural value.

236 An analysis of effects on 1854 Treaty resources, as described and discussed in Section 4.2.9, is
237 limited by the lack of available information concerning the use of such resources. To help
238 determine how the Bands have traditionally exercised their usufructuary rights on or near the
239 NorthMet Project area, the Bands conducted interviews of individual members of Bois Forte,
240 Fond du Lac, and Grand Portage, although only the results of interviews with Bois Forte were
241 made available.

242 There is little specific information concerning the use of natural resources by the Bands in the
 243 NorthMet Project area, other than the Sugarbush, which is being considered under Section 106 of
 244 the NHPA. This likely reflects limited present day or recent past subsistence gathering in the
 245 NorthMet Project area due to general inaccessibility. This lack of data also precludes the
 246 quantitative analysis of how Band members would be affected socioeconomically by effects on
 247 1854 Treaty resources, further discussed in Section 5.2.10. The primary source of data for
 248 assessing effects from the NorthMet Project Proposed Action on 1854 Treaty resources is from
 249 the analysis of the environment discussed in detail in Section 4.2.9 of this SDEIS.

250 As stated in Table 5.2.9-1 below, the NorthMet Project Proposed Action would affect 4,016.1
 251 acres within the Nashwauk Uplands and Laurentian Uplands subsections, which constitutes a
 252 total of 0.3 percent of these two subsections.

253 ***Table 5.2.9-1 Acres of the Laurentian Uplands and Nashwauk Uplands Subsections***
 254 ***Affected by the NorthMet Project Proposed Action***

Land Cover	Total Acres	Acres Affected by the NorthMet Project Proposed Action	Percent of Combined Nashwauk Uplands and Laurentian Uplands Subsections Affected by the NorthMet Project Proposed Action
Aquatic Environments	396,966	581.4	0.1
Disturbed	46,174	1,240.9	2.7
Forest	885,566	1,903.6	0.2
Cropland/Grassland	48,602	290.2	0.6
Total	1,377,308	4,016.1	0.3

255 Source: MDNR 2011g; MDNR 2011i.

256 The cover type most affected by the NorthMet Project Proposed Action is disturbed land, which
 257 includes reuse of the existing LTVSMC Tailings Basin. Less than 1 percent of each of the
 258 remaining cover types would be affected. Effects on the 1854 Treaty resources associated with
 259 these cover types is discussed below.

260 **Vegetation**

261 Vegetation that would be affected by the NorthMet Project Proposed Action is covered in the
 262 vegetation analysis in Section 5.2.4. Consequences of the NorthMet Project Proposed Action
 263 would include direct effects on land cover types.

264 The NorthMet Project Proposed Action would disturb 1,718.6 acres of land at the Mine Site,
 265 with the largest effects to upland conifer forest and lowland conifer forest. Consequently, the
 266 plant species or resources regulated by the 1854 Treaty Authority for gathering within these
 267 cover types would likely be most affected (Table 5.2.9-2). The Plant Site contains 2,177.5 acres
 268 that would be disturbed, although most effects occur in areas already previously disturbed.
 269 Though the aquatic environment cover type would be heavily affected at the Plant Site, it
 270 consists mostly of tailings ponds where no regulated plant species or resources would be present.
 271 The majority of the 120.2 acres of the Transportation and Utility Corridor has also already been
 272 disturbed.

273 ***Table 5.2.9-2 Affected Cover Types of Associated Species and Resources Regulated by the***
 274 ***1854 Treaty Authority at the NorthMet Project Area***

Cover Types	Associated Plant Species or Resource	Affected Mine Site (Acres) ¹	Affected Transportation and Utility Corridor (Acres) ¹	Affected Plant Site (Acres) ¹
Upland coniferous forest	Conifer boughs, princess pine, birch bark, firewood, other plants or forest products	741.9	2.6	52.0
Lowland coniferous forest	Conifer boughs, princess pine, firewood, other plants or forest products	437.2	0.2	20.7
Upland deciduous forest	Princess pine, ginseng, birch bark, firewood, other plants or forest products	354.7	2.7	290.1
Shrubland	Firewood, other plants or forest products	133.0	7.7	139.5
Disturbed	NA	44.0	94.4	1,102.5
Aquatic environments	Wild rice, other plants or forest products	6.0	2.7	572.7
Cropland/Grassland	NA	0.2	9.8	0.0
Upland conifer-deciduous mixed forest	Conifer boughs, princess pine, ginseng, birch bark, firewood, other plants or forest products	1.5	0.0	0.0
Lowland deciduous forest	Princess pine, birch bark, firewood, other plants or forest products	0.0	0.0	0.0
Total		1,718.6	120.1	2,177.5

275 Source: 1854 Treaty Authority 2007.

276 ¹ Acres from Section 5.2.4.

277 | In addition to the direct effects discussed above, there may also be indirect effects on cover
 278 types. Hydrology changes and dust from traffic and mining operations could affect plant
 279 communities near the NorthMet Project area, which could further reduce plant species or
 280 resources regulated by 1854 Treaty Authority. Mitigation measures, which would minimize these
 281 effects, are discussed in Section 5.2.4. Subsistence gathering at these locations is probably
 282 limited because of general inaccessibility.

283 According to the NorthMet Project Cultural Landscape Study (Zellie 2012), some of the most
 284 common species include balsam fir, speckled alder, and low-bush blueberry (Table 4.2.9-4).
 285 These species were identified in multiple community types and are more likely to remain within
 286 the NorthMet Project area, despite the direct and indirect effects from the NorthMet Project
 287 Proposed Action. Within the combined Laurentian Uplands and Nashwauk Uplands ecological
 288 subsections, less than 0.3 percent would be affected by the NorthMet Project Proposed Action.
 289 As an estimate, the species or resources listed in Table 4.2.9-4 could likely decrease by the same
 290 margin within these Ecological Classification System (ECS) subsections.

291 **Wildlife**

292 | Similar to the effects on species in greatest conservation need (SGCN) discussed in Section
 293 5.2.5, the NorthMet Project Proposed Action would affect 1854 Treaty Authority-regulated
 294 species as a result of increased human activity and noise, collisions with vehicular and rail
 295 traffic, and decrease of habitat. See Section 5.2.5 for a more thorough discussion of the types of
 296 effects on wildlife.

297 ***Increased Human Activity***

298 The 1854 Treaty Authority-regulated species would be directly affected through increased
 299 human activity due to mining activities. Factors such as noise, dust, light, and vehicle traffic may

300 frighten some species and discourage their use of otherwise suitable habitat. Displaced to other
301 habitat, individuals could face increased competition for resources. Less mobile species, such as
302 herptiles (e.g., frogs, turtles), would likely incur relatively high mortality rates due to less ability
303 to leave the affected area. Cliff-nesting birds could be affected by disturbance if they were to
304 nest along the cliffs created by the pit rims.

305 ***Noise Effects***

306 Noise associated with mining activities, including noise from
307 vehicle and rail traffic, would likely affect wildlife, including 1854 Treaty Authority-regulated
308 species. Section 5.2.8 provides further discussion on the noise modeling predictions for the
309 NorthMet Project area. Though wildlife species are likely to be sensitive to changes in noise
310 levels, there are no local, national, or international standards or limits that are applicable to the
311 NorthMet Project Proposed Action. State standards are discussed Section 5.2.8, Noise. Wildlife
312 species may be affected by noise in the NorthMet Project area, though adjacent habitat is
313 available.

314 ***Vehicular and Rail Traffic Effects***

315 Traffic effects from collisions with wildlife depend upon factors such as traffic volume, traffic
316 speed, and the species involved. Species that utilize the small preserved forest island remnants
317 between haul roads at the Mine Site would be most affected. Indirect effects from vehicle
318 activities are expected locally at the Mine Site for 1854 Treaty Authority-regulated species and
319 overall local ecosystem. Effects at the Transportation and Utility Corridor are primarily related to
320 vehicle and rail traffic. The 1854 Treaty Authority-regulated species may be affected by noise
321 and light associated with vehicle and rail traffic, and by collisions with vehicles or trains.
322 Transportation effects at the Plant Site are primarily related to vehicle traffic associated with the
323 construction of the Tailings Basin embankments and bentonite application, primarily during the
324 construction phase of the NorthMet Project Proposed Action. The 1854 Treaty Authority-
325 regulated species may be affected by noise and light associated with vehicle traffic and by
326 collisions with vehicles.

327 ***Habitat Effects***

328 The direct effect on wildlife habitat, and thus on species regulated by the 1854 Treaty Authority,
329 was assessed by evaluating the acres of habitat types that would be lost under the NorthMet
330 Project Proposed Action. The changes in cover type are summarized in Table 5.2.9-3.

331 **Table 5.2.9-3 Direct Effects on Key Habitat Types**

Key Habitat Types	Total Acres¹ of Cover Type Directly Affected at the Mine Site	Total Acres¹ of Cover Type Directly Affected at the Transportation and Utility Corridor	Total Acres¹ of Cover Type Directly Affected at the Plant Site
Mature Upland Forest, Continuous Upland/Lowland Forest (MIH1-13)	1,535.3	5.5	362.8
Open Ground, Bare Soils (no MIH)	44.0	94.4	1,102.5
Grassland and Brushland, Early Successional Forest (no MIH)	133.2	17.5	139.5
Aquatic Environments (MIH 14)	6.0	2.7	572.7
Total	1,718.5	120.1	2,177.5

332 Data from Tables 5.2.4-1, 5.2.4-4, and 5.2.4-5.

333 ¹ Total acres may be more or less than presented due to rounding.

334 *Mature Upland/Lowland Forest*

335 | At the Mine Site, 1,535.3 acres of the mature forest would be lost as a result of the NorthMet
 336 Project Proposed Action. All 5.5 acres of mature upland/lowland forest along the Transportation
 337 and Utility Corridor would be affected. Approximately 363 acres of forest habitat at the Plant
 338 Site would be disturbed, most of which is in small or isolated patches of aspen-birch forest that
 339 are in poor to fair condition (MDNR 2013a).

340 The 1854 Treaty Authority-regulated species are largely mobile and would likely be displaced,
 341 not injured or killed, during mine construction and operation. Reclamation of the Mine Site
 342 would include revegetating nearly all disturbed ground according to *Minnesota Rules*, part
 343 6132.2700. Reclamation and revegetation of the NorthMet Project area would improve wildlife
 344 habitat relative to conditions during mine operations; however, the quality of habitat for 1854
 345 Treaty Authority-regulated species would remain degraded for decades after closure relative to
 346 pre-mining conditions.

347 *Open Ground/Bare Soils*

348 No 1854 Treaty Authority regulated species are identified as utilizing open ground or bare soils
 349 habitat at the Mine Site, Transportation and Utility Corridor, or Plant Site. These areas were the
 350 result of past mining activity, are generally of low-quality, and are expected to decrease after
 351 mine closure as a result of reclamation.

352 *Brush/Grassland*

353 Approximately 133 acres of brush/grassland at the Mine Site would be directly affected by the
 354 NorthMet Project Proposed Action. Young trees (less than 4 inches dbh) make up most of this
 355 | habitat type (ENSR 2005). Although all 17.5 acres of brush/grassland at the Transportation and
 356 Utility Corridor would be directly affected, activities at the Transportation and Utility Corridor
 357 would not affect grassland/brush 1854 Treaty Authority-regulated species based on the

358 fragmented nature of this habitat. Approximately 140 acres of brush/grassland at the Plant Site
359 would be directly affected by the activities at the Plant Site. The reclaimed Plant Site,
360 specifically the Tailings Basin, would be revegetated with grassland vegetation species. Overall,
361 the NorthMet Project Proposed Action would minimal effect on grassland/brush 1854 Treaty
362 Authority-regulated species.

363 Open Water

364 The NorthMet Project Proposed Action would create approximately 321 acres of open water at
365 the Mine Site by eventually flooding the West Pit, which is estimated to fill in year 40. At the
366 Plant Site, open water habitat primarily occurs in the existing LTVSMC Tailings Basin. Existing
367 open water habitat would be maintained during operations, though the acreage of open water
368 would fluctuate according to processing needs. See Section 5.2.5 for further discussion of
369 wildlife use of the open water at the NorthMet Project area.

370 Wetlands

371 Based on the site-specific wetland delineation, the NorthMet Project Proposed Action would
372 directly affect 758.2 acres of wetlands at the Mine Site, though surrounding similar wetland
373 habitat would likely be adequate to absorb the displaced wildlife. There are 7.2 acres of wetlands
374 along the Transportation and Utility Corridor, all of which would be affected by activities along
375 the corridor. There would be 147.1 acres of wetland at the Plant Site directly affected (see
376 Section 4.2.3 and 5.2.3). On-site wetland use by 1854 Treaty Authority-regulated species may be
377 limited. Wetlands at the Mine Site are considered 99 percent high quality, 100 percent high
378 quality along the Transportation and Utility Corridor, and 94 percent low quality and 6 percent
379 moderate quality at the Plant Site.

380 Wetland mitigation is proposed both on- and off-site. Approximately 101.8 acres of wetland
381 creation is proposed for on-site mitigation. Off-site mitigation would consist of 1,856.4 acres of
382 wetland restoration and upland buffer.

383 Aquatic Species

384 The potential environmental effects of the NorthMet Project Proposed Action on fish and aquatic
385 macroinvertebrate communities found in the vicinity of the NorthMet Project area are primarily
386 discussed in Section 5.2.6. Direct and indirect effects could include changes in water quality and
387 alteration of physical habitat.

388 The NorthMet Project Proposed Action would not result in physical habitat effects on the
389 Partridge River or Embarrass River watersheds as a result of hydrologic changes. Generally, fish
390 species regulated by the 1854 Treaty Authority (Table 4.2.9-6) that occur in the NorthMet
391 Project area would not experience effects from physical habitat loss or alteration.

392 The GoldSim water quality model predicts that the Proposed Action would not cause or
393 contribute to any exceedances of groundwater and surface water quality evaluation criteria
394 within the Partridge River, Embarrass River, or downstream along the St. Louis River. See
395 Section 5.2.2 for a more thorough discussion of water quality effects and 5.2.6 for a discussion of
396 water quality effects pertaining to aquatic species.

397 The NorthMet Project Proposed Action is expected to result in a net decrease in mercury
398 loadings to the Partridge River from 24.2 to 23.0 grams per year, primarily as a result of a

399 decrease in natural runoff and a proportional increase in water discharged from the West Pit via
400 the WWTF. It is also expected to result in a net increase in mercury loadings to the Embarrass
401 River from 22.3 to 22.9 grams per year, primarily due to the redirection of flow associated with
402 the construction of the East Dam as part of the Tailings Basin expansion to the Embarrass River.
403 However, the NorthMet Project Proposed Action would also result in a 31 percent reduction in
404 sulfate loads at PM-13, which would reduce the potential for mercury methylation. Overall, the
405 NorthMet Project Proposed Action is not expected to increase the mercury content in fish in the
406 St. Louis River. See Sections 5.2.2 and 5.2.6 for a more thorough discussion of mercury
407 bioaccumulation.

408 **Overall Effects on 1854 Treaty Resources**

409 As discussed above, the NorthMet Project Proposed Action would have effects on 1854 Treaty
410 resources—i.e., those areas and species that are traditionally or culturally important to the Bands.
411 There are two categories of effects: those relating to plant and animal species of interest to Band
412 members, and those relating to areas where these plant and animal species are hunted, fished, or
413 gathered. As discussed above and in other resource-specific sections of the SDEIS, the NorthMet
414 Project Proposed Action would result in direct environmental effects due to ground-disturbing
415 activities. Band members' use of the NorthMet Project area is not well-defined, and did not
416 emerge through interviews. A good faith effort was made on the part of the Co-lead Agencies to
417 identify use areas in or adjacent to the NorthMet Project area; however, those efforts resulted in
418 little specific information concerning historic subsistence use and no information regarding
419 recent subsistence activity at the Mine Site, Transportation and Utility Corridor, or Plant Site. In
420 addition, as described in Section 5.2.11, the NorthMet Project area is surrounded by private land,
421 and cannot be easily accessed due to private roads. Without private landowner permission, there
422 is minimal opportunity for the Bands to exercise usufructuary rights (hunting, fishing, and
423 gathering) on this property.

424 Construction and operation of the NorthMet Project Proposed Action is not likely to significantly
425 reduce overall availability of 1854 Treaty resources that are typically part of subsistence
426 activities in the 1854 Ceded Territory. Some individuals and localized populations may be
427 affected, but overall species populations are expected to remain available. Additionally, noise
428 and other consequences of operations would affect migration or other animal species behavior.

429 The importance of fish as a subsistence resource in Ojibwe communities is well documented
430 historically, and fish continue to be an important component of the day-to-day diet, while fishing
431 itself remains an important socio-cultural and economic activity in Tribal communities across the
432 Upper Great Lakes. The NorthMet Project Proposed Action could affect the availability of 1854
433 Treaty resources for some Band members because of real or perceived factors. For instance,
434 bioaccumulation of mercury in fish could affect band members' willingness to rely on
435 subsistence fishing as a contribution to household economies as well as continuation of
436 traditional fishing practices.

437 Effects on the environment, including those from increased mercury, are all expected to meet the
438 standards and regulations set forth by the appropriate state or federal agency or program. These
439 laws are intended to protect important natural and cultural resources and include but are not
440 limited to the ESA, CWA, and CAA. Effects on 1854 Treaty resources are difficult to quantify
441 when the effects are within environmental standards yet above current baseline conditions. As

442 | such, cultural effects on the Bands would be difficult to quantify in regards to such incremental
443 | increases below standards or effects to species where appropriate mitigation is used.

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