



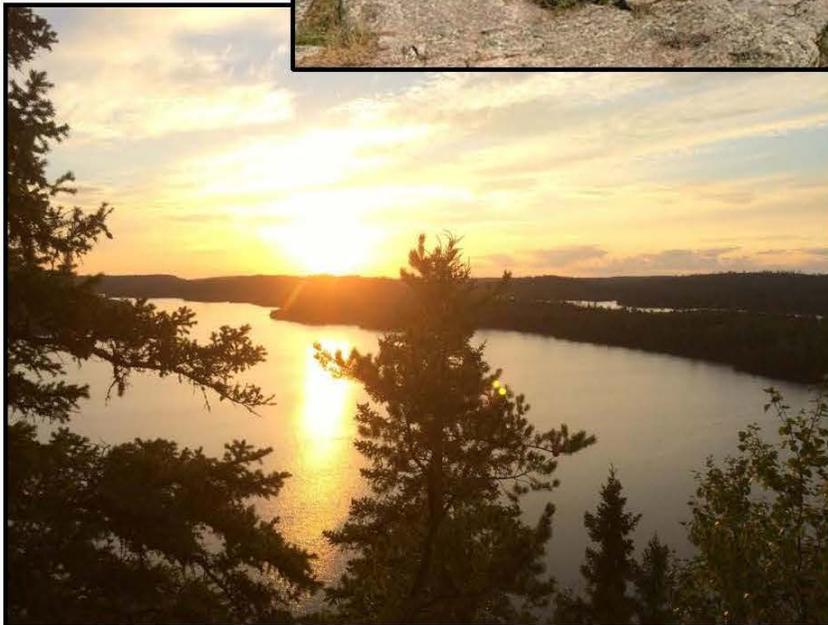
U.S. Department of Agriculture
Forest Service
Superior National Forest
Duluth, Minnesota

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U.S. Department of the Interior
Bureau of Land Management
Milwaukee, Wisconsin

Rainy River Withdrawal Environmental Assessment



Lead Agency: U.S. Department of Agriculture, Forest Service

Cooperating Agency: U.S. Department of the Interior, Bureau of Land Management

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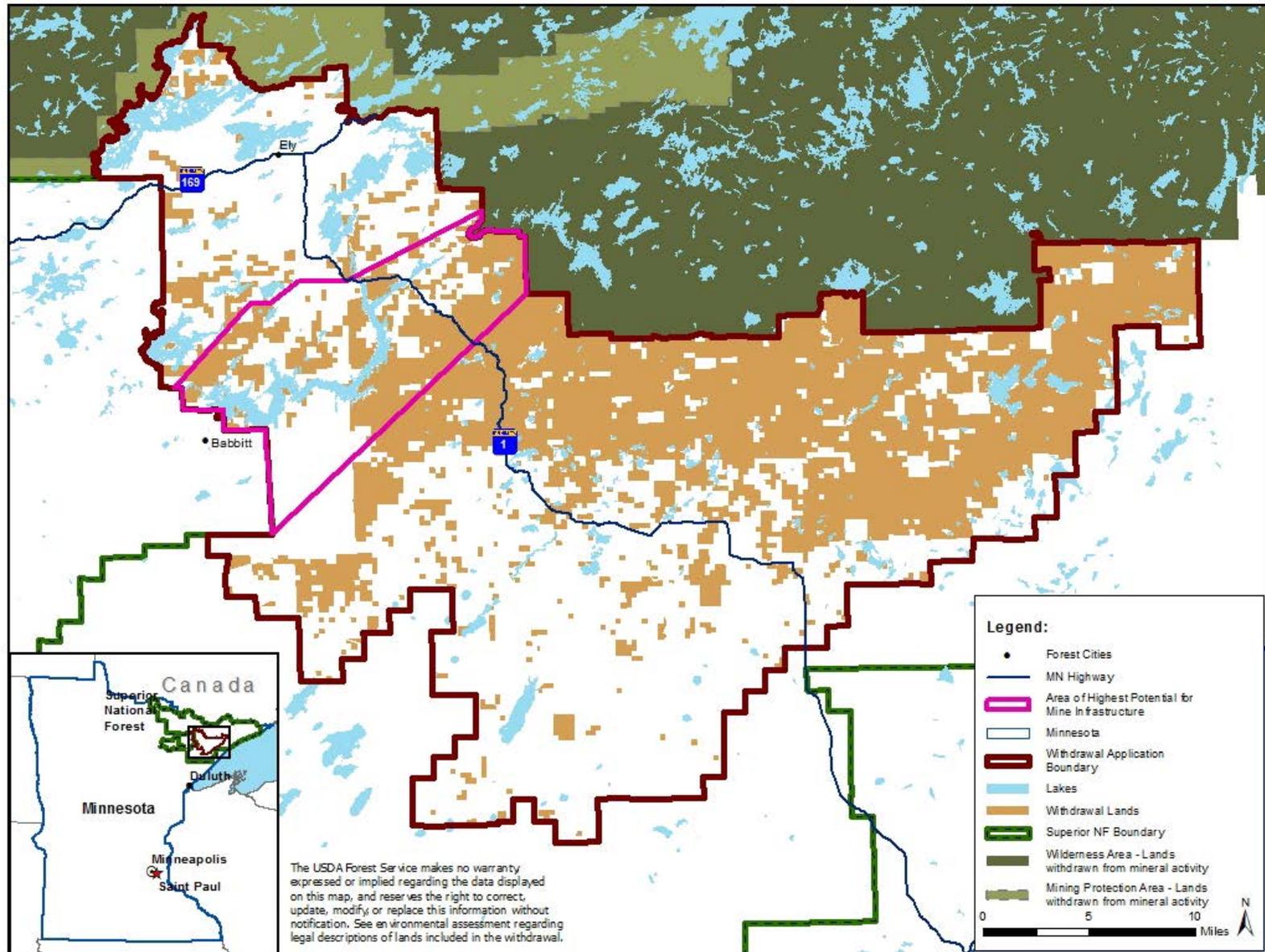


Figure 1. Withdrawal application area.

Chapter 1 Purpose and Need

Introduction

The Superior National Forest has submitted an application requesting that the Secretary of the Interior withdraw¹ approximately 225,504 acres of National Forest System lands in the Rainy River watershed from disposition under the United States mineral and geothermal leasing laws² for 20 years, subject to valid existing rights. If approved, no new prospecting permits or lease applications would be authorized on federal lands within the withdrawal application area during the pendency of the withdrawal.

Under the Bureau of Land Management (BLM) withdrawal regulations at 43 Code of Federal Regulations (CFR) Part 2300, the Forest Service, as the applicant, must prepare information, studies, analyses, and reports to be included in the case file that informs the Secretary of the Interior's consideration of the Forest Service's request.

This environmental assessment is a component of that case file and is written in accordance with Council for Environmental Quality regulations implementing the National Environmental Policy Act (NEPA), found at 40 CFR Parts 1500–1508 and the Department of the Interior's NEPA regulatory requirements found at 43 CFR Part 46.³

Withdrawal Authority

The BLM manages subsurface mineral resources on public lands administered by the Forest Service. Section 204 of the Federal Land Policy and Management Act of 1976, as amended (43 U.S.C. 1714) (FLPMA), authorizes the Secretary of the Interior to make, modify, extend, or revoke most withdrawals on federal lands, including from operation of the mineral leasing laws. The surface managing agency, in this case the Forest Service, may apply to the Secretary of the Interior for a withdrawal (Forest Service Manual 2761.01).

If the Secretary of the Interior were to grant the withdrawal requested by the Forest Service, the BLM would lack the authority to approve any new prospecting permits or mineral or geothermal leases on federal mineral estate lands within the boundary of the area requested for withdrawal while the withdrawal remains in place.

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1. Withdrawal means “withholding an area of federal land from settlement, sale, location, or entry under some or all of the general land laws, for the purpose of limiting activities under those laws in order to maintain other public values in the area or reserving the area for a particular public purpose or program” (43 U.S.C. 1702(j)).
 2. This refers to the federal government's authority to lease federal minerals and geothermal resources to private parties for development, including under the Mineral Leasing Act of 1920 (30 U.S.C. 181 et seq. as amended), the Mineral Leasing Act for Acquired Lands of 1947 (30 U.S.C. 351 et seq. as amended), section 402 of the President's Reorganization Plan No. 3 of 1946, 16 U.S.C. 520, 16 U.S.C. 508b, and the Geothermal Steam Act, as amended, 30 U.S.C. 1001-1028.
 3. This analysis was prepared in accordance with the July 2020 and April 2022 revisions to the Council on Environmental Quality's NEPA regulations, 85 Fed. Reg. 43,304 (July 16, 2020); 87 Fed. Reg. 23,453 (April 20, 2022).

For more information on statutory context and consistency with the Superior National Forest Land and Resource Management Plan⁴ (forest plan), see Appendix A – Statutory Context and Forest Plan Consistency. For more information on conformance with requirements for processing withdrawal requests, see Appendix B – Withdrawal Regulatory Requirements.

Background

The Duluth Complex, a large geologic formation, hosts one of the world's largest deposits of copper, nickel, platinum, palladium, and other associated metals. These resources lie underground beneath an area in northeast Minnesota that includes parts of the Superior National Forest. The presence and abundance of metal mineralization in northeastern Minnesota, primarily iron ores, has been known and mined for well over 120 years and has played a pivotal role in the development of communities in the region. Over the past few decades, the BLM and the Forest Service have authorized and administered exploration for semi-precious metals on the Superior National Forest on both federal and privately held mineral estates. Exploration includes drilling for core samples, conducting geophysical surveys, and construction of temporary roads and associated sites.

A 2012 Federal Hardrock Mineral Prospecting Permits Final Environmental Impact Statement (also referred to as the 2012 prospecting permits EIS) evaluated 29 prospecting permit applications from Lehmann Exploration Management, Inc.; Encampment Resources, DMC (USA) LLC.; Twin Metals Minnesota, LLC; and Prime Meridian to conduct exploration activities on 39,000 acres of National Forest System lands on the Superior National Forest. To date, the BLM has issued 22 of the 29 permits evaluated, and exploration drilling has occurred on 13 of them. The BLM has also received at least 24 additional new prospecting permit applications for Superior National Forest lands since the 2012 prospecting permits EIS was completed.

During the past two decades, the agencies have seen increasing interest within the private sector for developing the copper-nickel ore minerals in the Duluth Complex, and the BLM has received multiple applications to lease hardrock minerals in the area. The BLM has received three new lease applications since 2006 and made a preliminary valuable deposit determination on two of the lease applications in 2018.

Forest Service Manual 2820 states that there should be relatively few requests for withdrawals from operation of the mineral leasing laws, because the land and surface resources ordinarily can be protected by proper stipulations, or because detrimental leasing can be prevented by recommendations or refusal to consent to applications. However, where there are numerous or repeated offers or applications to lease certain lands where leasing would be incompatible with existing or planned uses because of impacts to the natural resources on which those uses depend, it may be advantageous for the Forest Service to request a withdrawal.

The Forest Service previously filed a withdrawal application in 2017 that requested that the Secretary of the Interior withdraw approximately 234,328 acres of National Forest System lands from operation of the mineral and geothermal leasing laws, subject to valid existing rights. Included within that application were the approximately 225,504 acres identified in this new 2021 application. On January 19, 2017, the BLM published a notice in the *Federal Register* announcing its receipt and acceptance of the withdrawal application, initiating a 2-year segregation of the lands

4. U.S. Department of Agriculture, Forest Service. 2004. Superior National Forest Land and Resource Management Plan. Eastern Region, Milwaukee, WI.
https://www.fs.usda.gov/detail/superior/landmanagement/planning/?cid=fsm91_049716.

from disposal under mineral and geothermal leasing laws, initiating a 90-day comment period, and announcing that the agencies would hold a public meeting regarding the requested withdrawal. On January 13, 2017, the Forest Service published a notice of intent in the *Federal Register* to prepare an environmental impact statement, initiating a separate but concurrent 90-day comment period (that was later extended to 217 days). The environmental impact statement was subsequently continued as an environmental assessment. On September 6, 2018, the Forest Service submitted a letter to the BLM cancelling the withdrawal application. The letter concluded a withdrawal was not needed because the mineral leasing laws provide considerable discretion as to whether to allow new mineral leases. The withdrawal was cancelled prior to completion of an environmental assessment and the document was not made available for public review.

The Superior National Forest had two hardrock mineral leases (MNES-1352 and MNES-1353) covering about 4,900 acres,⁵ held by Franconia Minerals (US) LLC, a wholly owned subsidiary of Twin Metals Minnesota LLC (collectively “Twin Metals”). The leases were originally issued in 1966, and were renewed in 1989 and in 2004. Extensive exploration and bulk sample analyses were conducted within areas of the leased lands; however, no mining has occurred on these leases. In response to Twin Metals’ application to renew the leases a third time, the BLM requested the Forest Service’s consent, as is required under the relevant legal authorities. On December 14, 2016, the Chief of the Forest Service denied consent to renewal of the leases, and on December 15, 2016, the BLM denied the renewal of the leases, causing the leases to expire.

After cancellation of the 2017 Forest Service withdrawal application, the BLM subsequently reinstated the leases and Twin Metals’ lease renewal application in May 2018, and then renewed the two leases in May 2019. In reinstating the leases and lease renewal application and in renewing the leases, BLM relied upon an opinion issued by the Office of the Solicitor, Department of the Interior that stated the lessor was entitled to a third 10-year term renewal of the leases.⁶ The Solicitor’s 2017 M-Opinion concluded that the renewed leases were required to be issued and the exercise of the Forest Service’s consent role was constrained to preclude denial. As a result, in May of 2019 the Forest Service presented stipulations to BLM for inclusion in the Twin Metals renewed leases.

The lessee submitted a mine plan of operation for proposed mine operations on one of those two leases in December 2019. The agencies were also considering three previously submitted preference right lease applications for new leases at this time; one was rejected by BLM, while the other two had preliminary valuable deposit determinations made and were forwarded to the Forest Service for a consent determination.

On September 29, 2021, the Forest Service submitted a new withdrawal application to the BLM requesting that the Secretary of the Interior withdraw approximately 225,378⁷ acres in the Rainy River watershed from disposition under the mineral and geothermal leasing laws for a 20-year period,

5. GIS calculated acres are 4,920; lease documents calculated 4,864.78; and land status books show 5,127.03.

6. See Solicitor’s Opinion, M-37049, “Reversal of M-37036, ‘Twin Metals Minnesota Application to Renew Preference Right Leases (MNES-01352 and MNES-01353)’” (December 22, 2017).

7. The withdrawal application included a list of all fee title lands within the boundary based on initial review of land status records and the Automated Lands Program Land Status and Encumbrance database records. Since then, the list has been reviewed by the Lands Staff and the Forest Surveyor, and updated based on land status records and deed language. This has resulted in the current list of 225,504 acres of fee title lands within the withdrawal application boundary.

subject to valid existing rights. The BLM published a notice in the *Federal Register* on October 21, 2021, announcing its receipt of the Forest Service's application, initiating a 2-year segregation of the lands from disposal under mineral and geothermal leasing laws, initiating a 90-day comment period, and announcing that the agencies would hold a public meeting regarding the withdrawal application. Since publication of the October 21, 2021, *Federal Register* notice and initiation of the 2-year segregation, the BLM has rejected applications within the withdrawal application area in accordance with 43 CFR 2310.2(d), including all pending preference right lease applications and prospecting permit applications in the withdrawal application area.

On January 26, 2022, based on a new M-Opinion from the Office of the Solicitor, the Deputy Secretary of the Interior canceled hardrock mineral leases MNES-1352 and MNES-1353 as improperly renewed.⁸ In the decision canceling the leases, the Deputy Secretary stated that the "lease renewals violated applicable statutes and regulations," including the requirement to obtain Forest Service consent. The Deputy Secretary also stated: "[b]ecause the Forest Service . . . has denied consent for leasing in the area of the MNES-01352 and the MNES-01353 leases, and because the subject lands are currently segregated from the operation of the mineral leasing laws, the Department will not issue Twin Metals any amended leases, will not reinstate or reconsider Twin Metals' prior lease renewal application, and will not reinstate the prior leases issued in 2004." The Deputy Secretary concluded that "BLM would similarly be barred from approving any new application to re-lease the lands covered by MNES-01352 and MNES-01353 because the withdrawal application includes lands encompassed by the former leases and those lands are segregated from operation of the mineral leasing laws." The Twin Metals Minnesota Project mine plan of operations was rejected, first as incomplete on December 8, 2021, and then as lacking any underlying mineral use authorization on February 18, 2022.

Location of Area Requested for Withdrawal

The withdrawal application area is located on the Superior National Forest, in the arrowhead region of Northeastern Minnesota. It falls within the Kawishiwi, LaCroix, Laurentian, and Tofte Ranger Districts, within Cook, Lake, and St. Louis Counties.

North of the withdrawal application area is the Boundary Waters Canoe Area Wilderness and the Boundary Waters Canoe Area Mining Protection Area, which extend along 200 miles of the international boundary with Canada. Portions of the wilderness are downstream of the withdrawal application area, as are the lands of Voyageurs National Park to the west and Quetico Provincial Park, located in Ontario, Canada, to the north. The withdrawal application area is located within the 1854 Ceded Territory.

8. See Solicitor's Opinion, M-37072, Authority to Cancel Improperly Renewed Twin Metals Mineral Leases and Withdrawal of M-37049, "Reversal of M-37036, 'Twin Metals Minnesota Application to Renew Preference Right Leases (MNES-01352 and MNES-01353)'" (January 25, 2022). As stated above, on December 14, 2016, the Chief of the Forest Service sent a letter to BLM denying consent to the renewal of leases (MNES-1352 and MNES-1353), citing environmental concerns and impacts to the Boundary Waters Canoe Area Wilderness (BWCAW): "I find unacceptable the inherent potential risk that development of a regionally untested copper-nickel sulfide ore mine within the same watershed as the BWCAW might cause serious and irreplaceable harm to this unique, iconic, and irreplaceable wilderness area." On January 24, 2022, the Chief affirmed that the 2016 consent denial continues to be the position of the agency.

The withdrawal application area lies within the Rainy River Headwaters catchment (HUC08) portion of the Rainy River watershed where surface water flows into the Boundary Waters Canoe Area Wilderness. Sections that straddle the watershed divide boundary are included in the withdrawal application area. The lands selected for withdrawal within the boundary of the withdrawal application area are described below down to the township (640 acres) parcel resolution.

All public domain and fee title acquired lands within the withdrawal application area are included in the proposed action. The Forest Service also requests that the withdrawal be made applicable to all fee title lands, including all the mineral rights thereto, which may subsequently be acquired by the federal government and situated within the exterior boundaries of the area depicted in the withdrawal application map.

- Townships 61 and 62 N., Range 5 W.
- Township 60 to 62 N., Range 6 W.
- Townships 59 and 61 N., Range 7 W.
- Townships 59 to 61 N., Range 8 W.
- Townships 58 to 61 N., Range 9 W.
- Townships 57 to 62 N., Range 10 W.
- Townships 57 to 63 N., Range 11 W.
- Township 59 N., Range 12 W.
- Townships 61 to 63 N., Range 12 W.
- Townships 61 to 63 N., Range 13

There are non-federal (surface and mineral estate) ownerships within the withdrawal application area boundary. These lands would not be subject to a withdrawal (figure 1). However, if fee title ownership of these lands was ever acquired by the Forest Service through means such as sale or exchange, such lands would be subject to the requested withdrawal.

For a legal description of the lands requested for withdrawal, see the Legal Description for Withdrawal Application Area document.

Purpose and Need

The purpose of the requested withdrawal⁹ is to protect and preserve natural and cultural resources in the Rainy River watershed, including the Boundary Waters Canoe Area Wilderness, the Boundary Waters Canoe Area Mining Protection Area, and the 1854 Ceded Territory, in a comprehensive and holistic manner from the known and potential adverse environmental impacts arising from exploration and development of federally owned minerals. The withdrawal is needed because the Forest Service and the BLM have seen and can reasonably anticipate increasing interest within the private sector for developing the copper-nickel ore minerals, and potentially other minerals, in the Duluth Complex that may adversely impact the Rainy River watershed.

Decision Process

Section 204 of FLPMA authorizes the Secretary of the Interior to make, modify, extend, or revoke withdrawals in accordance with the terms of that section. Under the BLM's withdrawal regulations at 43 CFR Part 2300, the Forest Service, as the applicant for the withdrawal, prepares the information, studies, analyses, and reports that the BLM will use to prepare the case file for the withdrawal application. The BLM uses the case file to develop findings and recommendations for consideration by the Secretary of the Interior. The Secretary of the Interior has discretion to allow

9. As explained in the withdrawal application, the withdrawal provides a strategic and comprehensive approach for broad-scale protection of ecological integrity of whole landscapes or ecosystems.

or deny, in whole or in part, a withdrawal application.¹⁰ Thus, the Secretary of the Interior could withdraw only a portion of the withdrawal application area from disposition under the mineral and geothermal leasing laws. Similarly, the Secretary of the Interior could make a withdrawal for less than 20 years.

Should the Secretary of the Interior decide to establish a withdrawal, the Secretary would issue a public land order that the BLM will publish in the *Federal Register*. The Secretary of the Interior may also decide to deny the Forest Service's application. A denial would also be published in the *Federal Register*.

The decision to withdraw the land requested lies with the Secretary of the Interior; the Forest Service is an applicant in this process. Neither the request to the Secretary of the Interior, nor any decision by the Secretary to withdraw the land requested, is subject to the administrative review provisions of the Forest Service regulatory framework. That is, the environmental assessment and the other documents being prepared by the Forest Service are not subject to the Forest Service pre-decisional administrative review (objection) process under 36 CFR 218. Additionally, the Secretary of the Interior's decision on the Forest Service's application is not subject to the administrative appeal process at 43 CFR Part 4 or at 36 CFR Part 214.

10. 43 CFR 2310.3-3.

Chapter 2 Alternatives

This section describes a range of reasonable alternatives, including Alternative A – Proposed Action (withdrawal) and Alternative B – No Action (no withdrawal), as well as alternatives that were considered but eliminated from detailed analysis.

Elements Common to both Alternatives

Neither alternative proposes ground disturbing activity. Aside from the mineral and geothermal exploration and development activities that would be prohibited by the proposed action, all activities currently consistent with the forest plan and applicable laws and regulations, including public recreation and other Forest Service management activities (e.g., timber management), could continue under both alternatives. Neither alternative would prohibit rights-of-way or access to non-federal lands or minerals within the withdrawal application area.

Alternative A – Proposed Action (Withdrawal)

Under alternative A, the Secretary of the Interior would issue a public land order to withdraw all or a portion of public domain and fee title National Forest System lands within the depicted boundary (figure 1) from disposition under the United States mineral and geothermal leasing laws, for up to a 20-year term, subject to valid existing rights. Should the Secretary make a withdrawal, the BLM would not have the authority to process or issue new hardrock prospecting permits or mineral leases, or geothermal leases on the withdrawn National Forest System lands. However, the withdrawal would not restrict ongoing or future exploration or mining extraction operations on valid existing rights, as determined by the BLM.

A withdrawal would not apply to non-federal lands or minerals. Holders of state, county, and private mineral interests could continue to exercise their mineral rights. However, if fee title ownership of these non-federal lands were acquired by the United States through means such as sale or exchange to be managed by the Forest Service, such lands would be subject to the withdrawal. Partial federal mineral interests, where the federal government owns less than 100 percent of the mineral estate, would also not be restricted by the withdrawal. No management changes would be made affecting access to private inholdings, federal mineral material operations (sand, gravel, and dimension stone), or management of other forest resources such as timber, wildlife habitat, and recreation.

After the duration of the withdrawal (which can be no longer than 20 years under Section 204 of FLPMA), the Forest Service may apply for an extension of any withdrawal established. If the Secretary of the Interior determines that the purpose for which the withdrawal was first made requires the extension based on information presented for consideration at that time, the Secretary may extend the withdrawal, but only for a period that shall not exceed the duration of the original withdrawal period.

Alternative B – No Action (No Withdrawal)

Under alternative B, the Secretary of the Interior would not withdraw National Forest System lands in the Rainy River watershed from disposition under the United States mineral and geothermal leasing laws, subject to valid existing rights. National Forest System lands within the withdrawal application area would remain available for prospecting permitting and leasing.

The BLM and Forest Service would complete case-by-case consideration of new prospecting permit and lease applications in accordance with existing laws, regulations, and policies.¹¹ If the Forest Service grants consent to any new lease applications, and the BLM decides to issue new leases, the leases would grant a right to mine to the lessee(s), committing those lands to potential mine development subject to the terms and conditions of the leases, the applicable laws and regulations, and agency approval of any mining plan of operations. This could lead to the development of a mine on the leased lands, should the lessee submit and the BLM approve a mine plan of operations that meets all of the required standards. In other words, under the no action alternative, the agencies could decide to grant a new lease, a mine plan of operations could be submitted and approved, and mining operations could occur on the lands within the withdrawal application area. However, there are no specific development proposals pending within the withdrawal application area. Accordingly, the analysis in this environmental assessment qualitatively describes the effects of future mineral exploration or development that could occur in the absence of a withdrawal, as projected in the Reasonably Foreseeable Development report under the no action scenario (alternative B).

Selection of alternative B does not constitute consent to or authorize any prospecting permits, leases, or operations on mineral resources, and as such, does not authorize any current or future ground disturbing activity. Any future permitting or leasing decisions as well as any future mineral exploration or development proposals would be subject to appropriate NEPA analysis to examine, for example, site-specific impacts of specific proposed exploration or development projects.

For more information on the Forest Service consent role, see Appendix C – Forest Service Consent.

Alternatives Considered but Eliminated from Detailed Analysis

Sometimes alternatives are suggested or proposed that on examination do not adequately respond to the purpose and need for the action, are technically or economically cost prohibitive, are not ripe for consideration, are remote or speculative, are substantially similar in design to an existing alternative, would have substantially similar effects as an existing alternative, or the authority does not exist to approve such actions (Forest Service Handbook 1909.15, Section 14.4). In such cases, these alternatives are usually eliminated from detailed analysis. Alternatives that were considered and eliminated from detailed analysis are described below, along with the rationale for their elimination.

Permanently Withdraw the Lands from Disposition under Mineral Laws

Following *Federal Register* publication of the Forest Service withdrawal application, some commenters suggested that the environmental assessment evaluate the environmental effects of a permanent withdrawal, in addition to the evaluation of the Forest Service's requested 20-year withdrawal. The rationale for a permanent withdrawal alternative is that the protection and preservation of cultural resources, wilderness character, water quality, scenic integrity, important wildlife corridors, and high-quality recreation values is a longer-term need and should be

11. BLM regulations, at 43 CFR Part 3500, recognize that the consent of the Secretary of Agriculture is a condition precedent to the BLM's issuance of any lease or prospecting permit concerning federal hardrock minerals located on National Forest System lands in Minnesota that were acquired under the Weeks Act or reserved as part of the public domain. Additionally, those regulatory provisions also provide that any conditions, or stipulations, of that consent must be included as requirements of any lease or prospecting permit issued by the BLM.

addressed within a longer, more permanent timeframe. The Forest Service considered this alternative but eliminated it from detailed analysis because a permanent withdrawal would require congressional action. The Secretary of the Interior does not have the authority to make a withdrawal lasting more than 20 years for areas aggregating more than 5,000 acres (Section 204(c) of FLPMA). However, the Secretary of the Interior may extend withdrawals established under FLPMA if the purpose for the withdrawal warrants that the withdrawal remains in place, but only for a period that shall not exceed the duration of the original withdrawal period. Additionally, the environmental consequences of a permanent withdrawal are likely to be substantially similar to those of alternative A, a withdrawal of the lands for an up-to-20-year term.

Withdraw the Lands from Disposition under Mineral Laws for Fewer Than 20 Years

Some commenters requested that the environmental assessment evaluate a withdrawal for a term shorter than 20 years . Because the Secretary of the Interior may make a withdrawal for fewer than the 20 years requested by the Forest Service (including, for example, for 10 years), an alternative that considers a withdrawal that lasts less than 20 years would be substantially similar in design to, and within the scope of, alternative A. Moreover, the Secretary of the Interior may extend a withdrawal provided that the Secretary determines that the purpose for which the withdrawal was first made requires the extension based on information presented for consideration at that time. Protection of the Rainy River watershed is a long-term need, and mining interest is likely to be long-term. As a result, the Secretary may extend a 10-year withdrawal into a 20-year withdrawal, resulting in no meaningful difference in effects between a 20-year withdrawal and a withdrawal of a shorter duration.

Withdraw a Subset of the Withdrawal Application Area

Many commenters suggested that the environmental assessment evaluate the withdrawal of a generic and undefined subset of lands that the Forest Service has requested for withdrawal. The Secretary of the Interior, as the decision maker, has the authority to approve or deny the proposed action, in part or in whole. Therefore, while the Secretary may decide to withdraw the entire withdrawal application area from disposition under the mineral and geothermal leasing laws, the Secretary could also make a more limited withdrawal that applies to only a subset of those lands. As such, an alternative that withdraws only a subset of the withdrawal application area is within the scope of alternative A.¹² Further, a generic request to withdraw an undefined “subset” of lands within the withdrawal application area is not sufficiently defined to form an alternative capable of detailed analysis.

Other commenters suggested that the environmental assessment evaluate alternatives that would involve the Secretary of the Interior withdrawing more specifically defined subsets of land within the withdrawal application area. In several instances, these suggested alternatives would be substantially similar in design, and have substantially similar effects, to either alternative A or alternative B. These more specific suggestions for alternatives are addressed below.

12. As demonstrated by the discussion of more specific proposed alternatives below, several alternatives that involve the Secretary of the Interior withdrawing a subset of lands in the withdrawal application area from operation of the mineral and geothermal leasing laws would be substantially similar in design, and have substantially similar effects, to either alternative A or alternative B.

Withdraw only Lands within a Buffer Area Around the Wilderness

Several commenters suggested that the environmental assessment evaluate a withdrawal of lands within a specified “buffer” from the wilderness boundary to protect wilderness resources. They stated that impacts from mining to soundscape, night skies, and water quality resources would be reduced by greater distances (e.g., dilution). As a result, these commenters assert that withdrawing only lands within a buffer area could adequately protect the Boundary Waters Canoe Area Wilderness and Mining Protection Area.

An alternative involving a buffer area around the Boundary Waters Canoe Area Wilderness was eliminated from detailed analysis because it would not respond adequately to the purpose and need, would have similar effects to an existing alternative, or both. For example, one commenter suggested a six-mile linear buffer alternative, under which the Secretary would withdraw only National Forest System lands that are within six miles of the wilderness boundary from disposition under the mineral and geothermal leasing laws. Such an alternative, which would withdraw only two of the four primary deposits in the withdrawal application area, would not respond adequately to the purpose and need for the proposed action. As noted above, the purpose and need is broader than protecting the Boundary Waters Canoe Area Wilderness and Mining Protection Area, and also includes protecting and preserving natural and cultural resources on national forest lands outside the wilderness within the Rainy River watershed, which also are located within the 1854 Ceded Territory. Even if a six-mile linear buffer could protect the wilderness and mining protection area from the impacts of mining, it would not address impacts to other portions of the Rainy River watershed, including the 1854 Ceded Territory, which could result from exploration and development of the deposits that are located outside the buffer area.

An alternative that withdraws National Forest System lands within six “stream miles”¹³ would similarly fail to provide protection for resources on national forest lands outside the wilderness within the Rainy River watershed, which are also located within the 1854 Ceded Territory and, therefore, would not respond adequately to the purpose and need for the proposed action. Additionally, reducing the withdrawal area to six stream miles from the wilderness would result in none of the high mineral potential lands that could be developed during the duration of a withdrawal (as described in the Reasonably Foreseeable Development report) being included in the withdrawal. In that situation, the buffer alternative would essentially have no impact on potential mining activity and would be substantially similar effects to alternative B (no action). Moreover, neither a six linear mile nor six stream mile alternative accounts for the fact that mining operations with accidents and failures can affect water chemistry tens to hundreds of kilometers downstream (Kossoff et al. 2014, Lewin and Macklin 1987, Macklin et al. 2006, Moore et al. 1991).¹⁴ Thus, a potentially adequate buffer is likely at least 37 stream miles (see footnote 14). An alternative based on a 37 stream-mile buffer, however,

13. Stream mile is a measure of distance in miles along a body of water when measured along the course of a stream, river, or through a lake.

14. The commentor’s basis for a six-mile (linear) buffer was from the draft water resources report. The report cited a white paper review of modern Canadian mines that suggested that most mines (15) operating under routine operating conditions had fish habitat impacts of six stream miles downstream from effluent discharge. However, ten mining facilities reported observing evidence of fish effects ranging from 0.6 mile to 37 miles downstream from the effluent discharge point. Two of these were base metals mines located in Ontario with reported distances of 35 and 37 miles downstream (Thompson 2022). Other literature has shown that mining operations with accidents and failures can affect water chemistry tens to hundreds of miles downstream (Kossoff et al. 2014, Lewin and Macklin 1987, Macklin et al. 2006, Moore et al. 1991).

would withdraw all the high mineral potential areas, including all four deposits listed in the Reasonably Foreseeable Development report. As a result, it would essentially prohibit the issuance of any new prospecting permits and leases within the withdrawal application area and would have substantially similar effects to alternative A.

Finally, as noted above, because the Secretary of the Interior has the discretion to withdraw only a subset of the withdrawal application area, withdrawing a buffer area falls within the scope of alternative A. For these reasons, an alternative that involves only a buffer area being withdrawn has been eliminated from detailed analysis.

Withdraw only Lands with Low Mineral Potential

One commenter suggested that the environmental assessment evaluate a withdrawal only of lands with low mineral potential. Such an alternative was suggested as a possible means to leave the high-potential lands available for mineral development. This alternative was eliminated from detailed analysis because it would have similar effects to the no action alternative. Because mining activities are likely to focus on areas with high mineral potential, withdrawing only those lands with low mineral potential would have little, if any, impact on mineral development in the Rainy River watershed. In that respect, it would be essentially identical to the no action alternative.

Withdraw only Lands with High Mineral Potential

One commentor suggested that the environmental assessment evaluate a withdrawal only of lands with high mineral potential. This alternative would leave only lands with low mineral potential available for mineral leasing activities. However, because those lands have low mineral potential, they are expected to have few or no exploration or development proposals over the next 20 years. As a result, an alternative that withdraws only lands with high mineral potential would essentially prohibit all mining activity in the withdrawal application area and, therefore, is substantially similar to the proposed action. For that reason, it was eliminated from detailed analysis.

Withdraw only Lands within the State Minerals Management Corridor

One commenter suggested that the environmental assessment evaluate a withdrawal only of lands within the State Minerals Management Corridor (Minnesota Administrative Rules 6132.2000 Subpart 3) from disposition under the mineral and geothermal leasing laws, subject to valid existing rights. This alternative would result in up to 17,866 acres of federal lands being withdrawn, including approximately 17 acres of federal lands having high mineral potential (Spruce Road deposit), as described in the Reasonably Foreseeable Development report. Based on information in the Mineral Potential Report, this would leave almost all high mineral potential lands open to mineral leasing. Like an alternative that withdraws only lands with low mineral potential, an alternative that withdraws only lands within the State Minerals Management Corridor would have similar effects to the no action alternative. It was therefore eliminated from detailed analysis.

Withdraw only Specific Mineral Commodities or Activities

Several commenters requested that the environmental assessment evaluate a withdrawal only from exploration and development of copper, nickel, or platinum-group metal commodities. Other commenters suggested that the environmental assessment evaluate a withdrawal from mining, but not mineral exploration. While Section 204 of FLPMA authorizes the Secretary of the Interior to withdraw federal lands from disposition under particular laws, such as the mineral and geothermal leasing laws, Section 204 does not expressly authorize withdrawals pertaining to specific mineral commodities or specific mining activities. Accordingly, this alternative was eliminated from detailed study.

Withdraw all Federal Surface Estate, Including Lands with Privately Owned Minerals

One commenter suggested that the environmental assessment evaluate an alternative involving a withdrawal of lands over which the Forest Service manages the surface estate and a private entity owns the mineral estate. Such an alternative would have no effect because the mineral and geothermal leasing laws have no effect on privately owned minerals. This alternative would also require the Secretary of the Interior to withdraw privately owned minerals from operation of the mineral and geothermal leasing laws, subject to valid existing rights. However, the Secretary of the Interior's withdrawal authority under Section 204 of FLPMA extends only to federal lands and interests in lands, not private land or interests in lands (43 U.S.C. 1702(j)). This alternative was therefore eliminated from detailed analysis as being infeasible.

Evaluate a No Tailings Disposal in the Watershed Alternative

A commentor requested that the environmental assessment analyze an alternative that prohibits tailings disposal in the watershed. While such an alternative would eliminate a hazard associated with mineral development to the Rainy River watershed, its ability to be implemented is remote or speculative. Tailings that are not disposed in the Rainy River watershed would have to be transferred to the Lake Superior watershed. Transport of tailings would likely involve the use of process water, which would have to then be returned to the Rainy River watershed.¹⁵ Under the Great Lakes Compact (and Minnesota Statute 103G.801), the intra-basin transfer of water out of the Lake Superior watershed requires approval from eight states (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin) and two Canadian provinces (Ontario and Quebec). Neither the Secretary of the Interior nor the Forest Service would have control over the outcome of that administratively complex and burdensome process. Because the ability to require tailings to be disposed outside the Rainy River watershed is remote and speculative, this proposed alternative has been eliminated from detailed analysis.

Evaluate Consent for Lease Applications and Use the Current Regulations for Plans of Operations for Protection

Another commenter requested analysis of an alternative that would allow the area included in the Forest Service's withdrawal application to remain open to mineral leasing and be governed by current Forest Service and BLM programs, policies, and regulations. This alternative is a restatement of the no action alternative (alternative B), and therefore was eliminated from detailed analysis.

Under the no action alternative, should future mineral development activities be proposed, the Forest Service and BLM would continue to oversee mineral exploration and development and manage surface resources in accordance with their existing programs, policies, and regulations. The mitigation or avoidance of potential effects from exploration, development, and operations would continue under the Forest Service regulations, the forest plan, and other applicable federal and state laws, regulations, and policies.

15. Process water is typically kept in a closed system to prevent loss. Not recovering or reusing process water from a tailings management facility would require the operator to increase make-up water, with water withdrawals. This would increase environmental effects from increased water use and greatly increase costs associated with the treatment of process water. As a result, not returning process water to the Rainy River watershed is likely to be an economically infeasible option.

Requests for consent are also considered under the no action alternative; consent would be considered if applications are forwarded to the Forest Service.

Forest Plan Amendment that Supplements Current Mineral Direction

Several commenters requested that the Forest Service evaluate an alternative that amends the applicable forest plan to protect surface resources and then consider if a withdrawal is still needed. These commenters suggested that, among other things, a forest plan amendment could 1) incorporate standards and guidelines on siting facilities setback from rivers and streams, and noise and visual standards; 2) require underground mining only; or 3) prohibit tailings disposal or permanent waste rock piles in the Rainy River watershed. An alternative that amends the forest plan to protect surface resources is outside the scope of this environmental assessment and was therefore eliminated from detailed analysis. This environmental assessment was prepared in response to the Forest Service's request that the Secretary of the Interior withdraw certain National Forest System lands in the Rainy River watershed from disposition under the mineral and geothermal leasing laws, subject to valid existing rights. The environmental assessment therefore analyzes actions that the Secretary of the Interior could take to provide a comprehensive and systematic approach for protecting the Rainy River watershed, including the Boundary Waters Canoe Area Wilderness, Mining Protection Area, and 1854 Ceded Territory. The Secretary of the Interior, however, is not authorized to amend the forest plan. Authority for that decision stems from the National Forest Management Act, not FLPMA, and rests with the Forest Service. The disparate nature of the two types of actions is demonstrated by the fact that the Secretary of the Interior making the withdrawal requested by the Forest Service would not eliminate the Forest Service's ability to amend the forest plan to prevent mineral development related impacts in a more systematic fashion. If anything, a withdrawal could aid that endeavor by maintaining the status quo while the Forest Service completes what is often a complex and drawn-out process. A forest plan amendment could also be pursued subsequent to the no action alternative.

Chapter 3 Affected Environment and Environmental Trends

This section briefly describes the environmental and social resource conditions within the withdrawal application area and the adjacent Boundary Waters Canoe Area Wilderness. This section also provides a general overview and description of the affected resources to address case file requirements for the withdrawal application, including present users and potential resource uses incompatible or in conflict with the proposed use of the lands involved (43 CFR 2310.3-2). References cited in the environmental assessment may be found in each corresponding resource report. More information about the affected environment for each resource analyzed may be found in the resource reports.

Geology and Mineral Potential

The lands requested for withdrawal contain approximately 67,663 acres categorized as having high potential for occurrence of leasable copper, nickel, cobalt, and platinum-group metals, which constitutes approximately 30 percent of all application lands and 33 percent of application lands within the Midcontinent Rift – Duluth Complex.¹⁶ Considered a world-class deposit and one of the largest undeveloped copper-nickel and platinum-group metal deposits in the world, geologic formations of the Midcontinent Rift – Duluth Complex, such as the South Kawishiwi Intrusion, have seen 70 years of study generating mine development proposals as recently as 2019. These formations may potentially contain vast economic quantities of copper, nickel, cobalt, and platinum-group metals.

Numerous gold prospects have also been identified within the greenstone belt of the Wawa subprovince within the withdrawal application area. Based on available data, there is considered a high potential for the occurrence of gold, copper, zinc, and Algoma-type (non-taconite) iron-ore. within these areas, totaling approximately 1,218 acres (0.5 percent). Though no economic discoveries have been made in Minnesota, the area may be geologically analogous to the Hemlo mining district in Ontario, Canada which has multiple gold mines that have been operational for decades.

The area requested for withdrawal in the Rainy River watershed has a long history of mineral prospecting, exploration, and development related activities, though no mining has occurred on withdrawal application lands.

The remaining 157,881 acres (70 percent) acres of the withdrawal application lands have mineral occurrence potential that varies from low to high depending on commodity, but all non-South Kawishiwi Intrusion related mineralization occurring on the withdrawal application lands is considered low potential for mineral development.

There are no reasonably foreseeable planned mining actions on non-federal mineral interests within the withdrawal application area. Presently no proposals or operating plans for exploration or mining have been submitted to the Minnesota Department of Natural Resources or the Forest

16. U.S. Geological Survey deposit model publications refer to platinum, palladium, rhodium, ruthenium, iridium, and osmium as platinum-group elements. These are chemical elements with similar properties and tend to occur together in nature. All six elements are transition metals on the periodic table and are often referred to as platinum-group metals interchangeably.

Service for mining on non-federal mineral interests within the withdrawal application area to date. However, as described in the Reasonably Foreseeable Development report, exploration activity on non-federal lands is expected to continue following the existing trend within the withdrawal application area:

Each year an average of two operating plans are submitted to the Superior National Forest for exploration activities on reserved or outstanding private mineral estate lands within the withdrawal area. This equates to approximately 40 operating plans over the 20-year withdrawal scenario. Based on assumptions used in the 2012 prospecting permits EIS, this would result in 14 exploration core holes at 7 well pads per year, and approximately 280 core holes, 140 well pads, and 22.4 miles of road construction over the 20-year withdrawal scenario. The State of Minnesota Department of Health rules limit the duration of borings to 10 years, after which time the operator must reclaim the borehole and the surrounding lands. The total disturbance for private reserved or outstanding exploration activities would equate to approximately 65 acres using estimates from the 2012 prospecting permits EIS (Reasonably Foreseeable Development report, section 4.3.1.).

Projected mining activities on federal minerals within the withdrawal application area that might occur absent a withdrawal are described in the alternative B (no action) reasonably foreseeable development scenario and are analyzed under the direct and indirect effects sections in the environmental assessment and resource reports.

There are also several reasonably foreseeable planned mining actions in the areas outside the withdrawal application area:

- Northmet Mining Project and Land Exchange—This hardrock minerals open-pit mining project and land exchange is located near the withdrawal application area. Figure 1 of the [NorthMet FEIS Executive Summary](#) documents this location.
- Taconite Mines—Northeast Minnesota has multiple taconite mines, some of which are located near the withdrawal application area. Figure 1 of the [NorthMet FEIS Executive Summary](#) displays existing taconite mine locations.

Socioeconomics

The region has a long history of mineral exploration and extraction, with mining activity attracting migrants and establishing communities since the 19th century. Similarly, the region's unique natural amenities and recreation opportunities has been the source of a recreation, tourism, and amenity-based economy. The relative concentration of jobs in both mining and tourism-related sectors demonstrate these economic dependencies within the region.

In 2019, mining-related employment was an estimated 3 percent (4,350 jobs) of total employment in St. Louis, Cook and Lake counties. However, mining-related jobs in these three counties represented over 40 percent of all mining sector jobs in the state (IMPLAN 2019). Sectors associated with recreation and tourism also make up a higher proportion of total jobs in the study area relative to the statewide average (IMPLAN 2019). In 2019, recreation and tourism-dependent sectors—retail trade, arts, entertainment and recreation and accommodation and food services—employment was an estimated 22 percent (30,000 jobs) of total employment in the three-county analysis area (IMPLAN 2019).

Job numbers tell only part of the economic picture. Average annual wages vary substantially by sector. The average wage in natural resource extraction sectors is generally high compared to wages in many other sectors. (IMPLAN 2019). Below average wages are more common in seasonal, part-time or lower skilled jobs that are often found in the food, accommodations, and retail sectors.

The Boundary Waters Canoe Area Wilderness provides many thousands of visitors with a unique, primitive, and nature-based recreation experience. The wilderness area is also an economic driver to local communities and the state of Minnesota. The Boundary Waters Canoe Area Wilderness is surrounded by resorts, outfitters, guides, campgrounds, other visitor service businesses, and hundreds of homes and cabins. One estimate finds that visitors to the wilderness area alone were estimated to contribute between 230 and 570 jobs and \$6 million to \$14.8 million in labor income annually in the Arrowhead Region (Eichman 2018). Other studies find the regional economic contributions of the Boundary Waters Canoe Area Wilderness to be much higher, estimates range between 1,100 and 5,200 jobs supported (Hjerpe 2018, Stock and Bradt 2020). The distinctive character of the Boundary Waters Canoe Area Wilderness and surrounding region, which includes both ecological processes and social resources, attracts retirees, mobile professionals, and entrepreneurs, which is the basis of amenity driven economic development.

Since 2019, mineral activity on National Forest System lands within the withdrawal application area was focused on geotechnical and hydrogeologic data gathering for development and engineering design of a proposed underground mining operation (figure 2). There are other proposed and operational mines in northern Minnesota, such as taconite mines and the Northmet Mining project (a copper-nickel mining proposal located outside the withdrawal application area). Many employment opportunities offered through mining offer above average wages and non-wage benefits such as health insurance, increasing prosperity at both the household and community level.



Figure 2. Exploration drilling. Photo credit: Superior National Forest

Individuals, organizations, and families from within and outside the local region value the withdrawal application area for its contributions to livelihoods and their cultural heritage. People agree that the area requested for withdrawal contains many resources that sustain a way of life and tie people to historical uses of the land. These activities and areas provide connections to the past and a sense of identity. Interested members of the public share a deep sense of concern for how future management would affect their values, heritage and livelihoods.

Tribal Traditional Needs and Values

The land proposed for withdrawal includes the homelands and traditional use areas of the *Gichigamiwininiwag* (Lake Superior Chippewa) Tribe, comprised of multiple independent bands living around Lake Superior in what is now the northern parts of Wisconsin, Minnesota, and Michigan.¹⁷ These Ojibwe bands were signatories of key treaties executed with the federal government in the 19th century (referred to as Chippewa or Ojibwe, but who refer to themselves as Anishinaabe (s) or Anishinaabeg (pl)). The withdrawal application area falls entirely within the 1854 Ceded Territory of the Lake Superior Chippewa, from lands deemed to have been under the sole control of the signatories at the time of signing.

The Treaty of 1854 established two reservations (Fond du Lac and Grand Portage) in Northeastern Minnesota and reserved off-reservation hunting and fishing rights for the signatory bands (Kappler 1904). The Treaty of 1866, which ceded lands to the west of the withdrawal application area, formalized the establishment of a reserve (Nett Lake and Deer River) for the Bois Forte Band, which were guaranteed in article 12 of the Treaty of 1854. The Vermilion Lake Reserve was established for the Bois Forte Band by Executive Order 853 on December 21, 1881. Currently, the Bois Forte Band of Chippewa, the Fond du Lac Band of Lake Superior Chippewa, and the Grand Portage Band of Lake Superior Chippewa assert and actively exercise treaty rights in the 1854 Ceded Territory, to include the withdrawal application area.

Terrestrial wildlife such as moose and deer, fish, berries, wild rice, sugarbush sites (maple stands utilized for sap and sugar production), white cedar stands, ducks, and other forest resources used by the bands and identified as treaty resources are located within the withdrawal application area, however the list of resources meeting that definition is more expansive. Within the context of traditional values and needs, the importance of treaty resources to the bands is multifaceted. Within the 1854 Ceded Territory, both the locations where treaty resources are commonly encountered, and the practices associated with harvest continue to function as vital places and processes for sharing and maintaining traditional knowledge and spiritual connections to the world; both of which are fundamental to the cultural identity and survival of the Ojibwe people.

Wild Rice

Wild rice (*Zizania palustris*) is a culturally and biologically important annual wetland plant that occurs in a variety of lakes and rivers within the withdrawal application area (Minnesota Tribal Wild Rice Task Force 2018). This grass grows in shallow freshwater in marshes, fringes of lakes and rivers and typically grows in depths 0.5 to 3 feet (figure 3). Wild rice or *manoomin* is an important plant to the Ojibwe people for sustenance, foundational to their cultural identity, and a treaty resource (further addressed in the Tribal Traditional Needs and Values Report).

17. The words tribe and band are used interchangeably here, but both refer to federally recognized sovereign Indian nations.

Approximately 99 waterbodies within the withdrawal area boundary support populations of wild rice, in addition to Fall Lake, Newton Lake, and Basswood Lake located downstream of the withdrawal application area.



Figure 3. Manoomin collected by canoe. Photo credit: Superior National Forest

Cultural Resources

A Class I literature search and cultural resource site and survey records review was conducted to identify all known cultural resources within the withdrawal application area boundary. The review identified 287 previously recorded Native American pre-contact and contact period and Euro-American historic period cultural resources sites within the boundary of the withdrawal application area. The pre-contact (around 10,500 to 300 years before present) and contact period sites (around 1650 to 1950) include permanent and semi-permanent habitations, limited activity areas such as lithic scatters, artifact scatters, or areas used for gathering and processing specific resources (primarily wild rice). Euro-American historic period cultural resources sites include logging camps and logging related infrastructure (including railroad grades, dams, and landing sites), trapper's cabins, historic mining features (exploratory pits), homestead locations, roads and trails, trash scatters, Civilian Conservation Corps buildings, and early Forest Service administrative sites (lookout tower foundations, collapsed structures).

Of these sites, two have been determined eligible for listing on the National Register of Historic Places, and four sites have been determined not eligible for listing on the National Register. The remaining 281 sites remain unevaluated for the National Register. Intensive cultural resource surveys have been limited to less than 10 percent of the withdrawal application area, so it is reasonable to infer that there are many cultural resource sites within the area that have yet to be identified.

Water Resources and Wetlands

The Minnesota Pollution Control Agency conducted a Rainy-River Headwaters Watershed Monitoring and Assessment Report in 2017. All the lakes and streams monitored within the withdrawal application area supported aquatic life and recreational use standards, with a couple exceptions due to naturally high background conditions (Mielke 2017). In summary, the report stated:

Overall, lakes and streams within the Rainy River-Headwaters watershed have benefited from little developmental pressure. However, these systems are highly sensitive to anthropogenic stressors like most waterbodies in northern Minnesota. A continued vigilance is necessary to monitor areas where developmental pressures are or will be expected to occur. Point and non-point pollutants are affecting water quality and quantity in select drainages, and will be addressed in future [total maximum daily load] TMDLs. A combination of stressors, including urban/industrial development, forest cover change, draining of wetlands/lakes, and the damming of streams, are likely contributing to the reduction of sensitive species in some stream reaches. The Shagawa and Dunka River Subwatersheds appeared to be the most impacted by urban/industrial development. An emphasis should be given to maintaining natural vegetative buffer areas along shorelines to prevent overland runoff and reduce erosion potential in these more developed watersheds to maintain the existing high quality of the lakes and streams. Some of the top aquatic resources found in this watershed include Bezhik Creek, Denley Creek, and Little Isabella River (Mielke 2017).

Overall water quality conditions are excellent, characterized by low specific conductance and low sulfate concentrations (ranging from 1 to 5 mg/L) (Rye 2022, MPCA 2021). The low alkalinity (about 5 to 10 mg/L) and hardness of these waters reduce the buffering capacity and make them very susceptible to changes in hydrogen ion concentration (pH) (Garn 1975, Mielke 2017, Air Quality Report).

Water quality monitoring for sulfate in Birch Lake has been performed by numerous entities over the years (see Rye and Thompson 2022 for summary). The results of these efforts affirm elevated sulfate concentrations in the southern portion of Birch Lake near the inflow from the watersheds that include the Dunka Mine and the Northshore Mine (Kiesling 2022). The sulfate concentrations are lower in the northern portion of Birch Lake and downstream lakes (Rye and Thompson 2022).

Two hundred and twelve lakes within the Rainy River Headwaters have aquatic consumption impairments due to an exceedance of standards for mercury in fish tissue. A body of water is impaired when 10 percent of a fish species in a lake or river have a mercury concentration in fillets that exceeds 0.2 parts per million. Lakes and rivers exceeding 0.57 parts per million require additional reductions (and therefore reduced consumption advisories). Mercury poses a health hazard to humans and to wildlife who consume fish. Climate change related to rising temperatures is increasing the overall availability and accumulation of forms of mercury in northern Minnesota wetlands (Pierce et al. 2019) which are connected to downstream aquatic food chains (Monson 2009).

Wetlands are an ecologically important component of the landscape and provide numerous ecological services including water storage and diverse habitat for flora and fauna. The wetlands on the Superior National Forest are forested with varying degrees of connection to local or area groundwater (figure 4). “The Rainy River-Headwaters watershed occurs entirely within the Mixed Wood Shield Ecoregion. Wetland condition in this ecoregion is very good, especially when

compared to other ecoregions in the state. Based on plant community floristic quality, 84 percent of the wetlands in the Mixed Wood Shield Ecoregion are estimated to be in Exceptional or Good condition and an estimated 0 percent are in Poor condition” (Mielke 2017).



Figure 4. Creek and wetland. Photo credit: Superior National Forest

Boundary Waters Canoe Area Wilderness

Located in the Superior National Forest in northeastern Minnesota, the Boundary Waters Canoe Area Wilderness is over 1,098,000 acres in size and extends approximately 200 miles along the international boundary with Canada (figure 1). Voyageurs National Park, encompassing over 125,000 acres of recommended wilderness, lies directly to the west of the Boundary Waters Canoe Area Wilderness, while Canada’s Quetico Provincial Park, with over a million acres of land managed as wilderness, lies to the north. Together, these three contiguous areas form a wilderness core of approximately 2.5 million acres in the heart of the North American continent. All three areas are within the Rainy River watershed and are downstream of the withdrawal application area.

South of the Boundary Waters Canoe Area Wilderness is the Laurentian divide that separates the major watersheds of the Hudson Bay to the North and drainage flowing east to the Atlantic through the Great Lakes. The lands included within the withdrawal application area were identified to capture those lands where water flows into the Hudson Bay system, including the Rainy River watershed. The Boundary Waters Canoe Area Wilderness supplies high water quality and other watershed benefits, including purifying water, sustaining surface water and groundwater flow, providing fish habitats, terrestrial habitats and other benefits. The State of Minnesota has designated the waters of the Boundary Waters Canoe Area Wilderness as outstanding resource value waters (Minn. R. 7050.0335) and bans new or expanded discharges.

The Boundary Waters Canoe Area Wilderness is a complex and interconnected ecosystem and offers recreational opportunities and other uses such that it is considered an irreplaceable national treasure. It provides opportunities for solitude, outstanding primitive recreation in an unconfined and undeveloped natural setting, and a connection with untrammelled nature. Irreplaceable natural qualities of the Boundary Waters Canoe Area Wilderness were recognized when the Department of Agriculture set aside this area in 1926 to protect its primitive and other extraordinary qualities. The 1964 Wilderness Act designated land inside today's Boundary Waters Canoe Area Wilderness as part of the national wilderness preservation system. Congress passed the Boundary Waters Canoe Area Wilderness Act of 1978, which expanded the wilderness area, halted various commercial and noncommercial human activities, and established a separate mining protection area to protect existing natural values and high standards of environmental quality from the adverse impacts associated with mineral development.

The Boundary Waters Canoe Area Wilderness is one of the most popular wilderness areas in the country and receives approximately 150,000 visitors each year. To accommodate the high recreational use, it contains 67 entry point locations with access to over 1,200 miles of canoe routes, 12 hiking trails, and nearly 2,000 designated campsites. Opportunities for canoeing (figure 5), kayaking, motorboating, camping, hiking, fishing, and hunting abound in summer and fall, while winter visitors can enjoy ice fishing (figure 6), skiing, snowshoeing, and dogsledding.



Figure 5. Fog canoeing. Photo credit: Superior National Forest



Figure 6. Ice fishing. Photo credit: Lance Cheung

The Boundary Waters Canoe Area Wilderness is the only large temperate lake-land wilderness in the National Wilderness Preservation System and is renowned for its water-based recreational opportunities. Great glaciers repeatedly scraped and gouged this area over the past 2 million years, leaving behind rugged cliffs and crags, gentle hills, shorelines of exposed bedrock, sandy beaches, and an abundance of rivers and lakes dotted with islands (figure 7 and figure 8). With several hundred miles of streams and over 1,000 lakes, approximately 190,000 acres (20 percent) of the surface area of the Boundary Waters Canoe Area Wilderness is water. This network of connecting water bodies provides unique opportunities for long distance travel by watercraft—a rare experience within the continental United States.



Figure 7. Kawishiwi River. Photo credit: Superior National Forest



Figure 8. Lake with an island. Photo credit: Superior National Forest

Recreation

Valued for its boreal forest ecosystem, the Superior National Forest is home to clean lakes, rivers, streams, and bogs; abundant winter snow and alluring summer temperatures; as well as a rich cultural history. The Superior is renowned for its vast remote settings, as well as the Boundary Waters Canoe Area Wilderness. These distinctive qualities provide the setting for a full range of motorized and non-motorized recreation opportunities. Forest management focuses on delivering sustainable recreation activities and opportunities appropriate to these remote, natural settings.

Recreation facilities including developed campgrounds, dispersed campsites (figure 9) and trails, Kawishiwi Falls (figure 10) as well as the scenic integrity of the forest and lands surrounding the facilities, are managed to conserve high quality recreation experiences. Additionally, 75 percent of the withdrawal application area is in the semi-primitive motorized setting of the Recreation Opportunity Spectrum, a nationally recognized classification system that describes different settings, opportunities, and experiences. The semi-primitive motorized Recreation Opportunity Spectrum class is characterized by natural and natural appearing environments of moderate to large size where concentration of use is low.

There are 76 camping areas within the withdrawal application area boundary, including 12 developed campgrounds. These sites range from the more developed (electric hook-ups, canoe rentals) that may be reserved online to smaller, more rustic areas that are first come, first served. Most are located near lakes, trails, or other points of interest. The other camping areas are dispersed use, without facilities. Campground use is generally high, though is only known for the campgrounds that charge a fee because those campgrounds have records of use based on the fees collected. For example, Birch Lake Campground had 7,350 campers in 2020 and 8,471 in 2021; South Kawishiwi (figure 11) had 8,302 campers in 2020 and 7,897 campers in 2021.

There are three trailheads and 15 day-use sites within the withdrawal application area boundary. Day use sites include picnic areas and boat ramp areas. Fifty-four recreation residence permits have been issued within the withdrawal application area boundary.



Figure 9: Dispersed campsite in wilderness. Photo credit: Joanna Gilkeson



Figure 10. Kawishiwi waterfall. Photo credit: Jim Liestman



Figure 11. Historic South Kawishiwi Campground pavilion. Photo credit: Superior National Forest

There are approximately 200 miles of snow trails (dogsled, ski, and snowmobile) and approximately 68 miles of terra trails (all-terrain vehicle, pedestrian, mountain bike, and equestrian) within the withdrawal application area boundary. The roads within the withdrawal application area boundary include National Forest System roads and a combination of county, state, township and private. Forest system road use includes access to campsites, boat launches, and scenic driving.

Recreation events that occur within the withdrawal application area boundary include a bicycle race, a snowmobile fun run, an all-terrain vehicle cancer fundraiser, the Wolf Track Classic Sled Dog Race, the Ely Marathon, and a rubber duck race. Outfitter-guide permitted activities in the application boundary include canoeing, fishing, hunting, winter camping, dogsledding (figure 12), educational activities, and livery services.



Figure 12. Dog sledding. Photo credit: Lance Cheung

Dark Sky and Soundscape

The Boundary Waters Canoe Area Wilderness is designated as an International Dark Sky Sanctuary by the International Dark-Sky Association, which means the wilderness provides an exceptional dark-sky resource (figure 13). Due to the exceptional quality of starry nights, the nocturnal environment is protected for its scientific, natural, and educational value, its cultural heritage and public enjoyment.

Within the withdrawal application area, there are no significant industrial developments at present. The principal artificial light sources for the lands requested for withdrawal are found on private lands in the Ely, Minnesota area (population is about 3,400) and other private lands concentrated around Birch, White Iron, Burntside, Shagwa, and Farm Lakes.

The soundscape of the wilderness and the withdrawal application area is composed of a mix of natural and human-generated sounds. However, the withdrawal application area and the wilderness provides a predominantly natural soundscape where a very quiet environment may be enjoyed by the public.



Figure 13 . Night sky at Poplar Lake. Photo credit: Ryan Pennesi

Air Quality

Overall, air quality is good in Minnesota and the withdrawal application area. Statewide, Minnesota meets all federal standards and nearly all health benchmarks. Pollution levels have been going down and this trend is expected to continue (MPCA 2021b).

Climate Change and Greenhouse Gas Emissions

Climate change projections can help provide a better sense of the range of possible futures that could be expected in northern Minnesota. Projected changes in temperature and precipitation can have cascading impacts on other ecosystem processes that are important in the project area. Within Minnesota, the state has seen an increase in average temperatures over the last century (about 1.3°F to 2.9°F), with northern Minnesota experiencing a much higher rate of warming (NOAA 2021). The Superior National Forest, under representative concentration pathway 8.5 (a climate change projection), is projected to see an average annual temperature increase of 3.2°F to 3.3°F by late-century relative to the 1975–2005 annual average (USDA Forest Service 2019). The Superior National Forest is also projected to experience an overall increase in average annual precipitation (relative to 1975–2005) from 8 percent to 16 percent by late-century (USDA Forest Service 2019). Under representative concentration pathway 8.5, the number of extreme events is projected to more than double by late century in the Midwest (USGCRP 2018). In Minnesota, the intensity of severe rainstorms is likely to increase over the next century along with annual precipitation, increasing flood risk (EPA 2016). Heavy rainfall events may increase in both frequency and severity, potentially resulting in increased runoff and increased soil erosion (Angel et al. 2018, Janowiak et al. 2014). A greater proportion of precipitation in winter may come in the form of rain (decreased snowpack) (Janowiak et al. 2014). Shifting precipitation patterns and decreases in snowpack can alter freshwater temperatures, making low-flow streams particularly vulnerable to rising atmospheric temperatures. Increasing atmospheric carbon dioxide concentrations will likely favor invasive plant species over native species, facilitating a potential decrease in tree regeneration (USGCRP 2018). The susceptibility of individual trees to invasive plants, insect pests, and disease is likely to increase from increasing temperatures and drought (Janowiak et al. 2014). Warmer temperatures in winter may increase the risk of disease transmission by extending the active season for insects (EPA 2016).

Compared to 1990, annual greenhouse gas emissions in the United States have increased by about 1.79 percent, based on 2019 reported data (EPA 2021). Greenhouse gas emissions in the United States were partly offset by carbon sequestration in managed forests, trees in urban areas, agricultural soils, landfilled yard trimmings, and coastal wetlands. In recent years, there has been a general nationwide trend of declining greenhouse gas emissions across most sectors (EPA 2021).

Wildlife

Around the lakes and rivers, a mix of wetlands, boreal forest, and temperate hardwoods provides habitat for iconic north woods species such as wolves, black bears, bobcats, lynx, moose, beavers, loons, bald eagles, and peregrine falcons (figure 14 and figure 15). Northern Minnesota is one of the few places in the continental United States where visitors can see moose (figure 16).

Lands within the withdrawal application area and the adjacent Boundary Waters Canoe Area Wilderness provide diverse habitat for thousands of breeding, wintering, and migratory species of terrestrial wildlife including over 350 species of birds, mammals, reptiles, amphibians, and thousands of species of invertebrates. Canada lynx, gray wolf, and the northern long-eared bat, species designated as “threatened” under the Endangered Species Act, are known to occur within the withdrawal area. Critical habitat for Canada lynx and gray wolf overlaps the entire withdrawal application area.



Figure 14. Loons in a row. Photo credit: briandjan607



Figure 15. Canada lynx. Photo credit: Superior National Forest



Figure 16. Moose. Photo credit: Tim Schleicher

Chapter 4 Environmental Consequences

This section of the environmental assessment summarizes the potential effects associated with the proposed action and no action alternatives. A report has been prepared for each resource and is incorporated by reference in each resource section below. References cited in the environmental assessment may be found in each corresponding resource report.

Analysis Framework

The interdisciplinary team examined and analyzed data to estimate the effects of each alternative. The data and level of analysis were commensurate with the importance of the possible impacts. The effects are generally qualitative, though some quantitative discussions may also be included. Acreage figures are estimates based on information from Superior National Forest geographic information system (GIS) data. Acres identified in the GIS database may vary slightly from acreage identified in legal descriptions of parcels included within the withdrawal application. The accuracy of the estimated acreage has been found sufficient for the analysis.

The interdisciplinary team is aware of possible inaccuracies and limitations of the data. Forest resources are highly variable and constantly changing and not all data are current. However, the interdisciplinary team concluded it is the best available forest information and adequate for analysis and drawing conclusions. Additional data and accuracy would add precision to estimates or better define a relationship; however, the basic data and central relationships are sufficiently well-established in the respective sciences such that additional accuracy is unlikely to reverse or nullify understood relationships. Thus, additional information would be welcomed and add precision, but it is not considered essential for the decision maker to make a reasoned choice among alternatives.

When estimating the effects of each alternative, the interdisciplinary team considered reasonable mitigations and protections that would avoid or minimize potential impacts. These mitigations could be developed as part of lease or permit stipulations, or operating plan requirements. These requirements come from best management practices, industry standards, regulatory requirements, forest plan standards and guidelines, and oversight by responsible regulatory authorities.

This analysis tiers to the 2004 Forest Plan Revision Final Environmental Impact Statement for Chippewa and Superior National Forests.¹⁸ For the portion of this analysis that addresses minerals exploration, the 2012 Federal Hardrock Minerals Prospecting Permits Final Environmental Impact Statement¹⁹ is incorporated by reference.

18.U.S. Department of Agriculture, Forest Service. 2004. Forest Plan Revision Final Environmental Impact Statement for Chippewa and Superior National Forests. Eastern Region, Milwaukee, WI. https://www.fs.usda.gov/detail/superior/landmanagement/planning/?cid=fsm91_049717.

19.U.S. Department of Agriculture, Forest Service. 2012. Federal Hardrock Mineral Prospecting Permits Final Environmental Impact Statement. Superior National Forest, Duluth, MN. https://www.fs.usda.gov/nfs/11558/www/nepa/31175_FSPLT2_126749.pdf.

Reasonably Foreseeable Development

A withdrawal such as that requested does not involve any ground disturbing activities. The Forest Service prepared a Reasonably Foreseeable Development report outlining forecasted future mineral activities under the no action alternative to support an analysis that evaluates and compares the proposed action's impacts on the natural and physical environment and the relationship of people within that environment. The reasonably foreseeable development scenario, which takes into account the potential for mineral occurrence and discusses the likelihood of exploration or development over the next 20 years, helps demonstrate the relative levels of estimated activity between the alternatives.

The actual future level of mineral activity in the area is unknown and could be considerably less or more than what is described in the reasonably foreseeable development scenario. Very few exploration projects result in a permitted mine, which takes years to develop. Previously submitted mining studies and plans, such as the Twin Metals Minnesota Project mine plan of operations, could ultimately change design, if such plans were to be submitted on the lands of the withdrawal application in the future. There are many reasons why proposals may change: new information is acquired about the deposit, market demand shifts up or down, production capacity changes, new technologies become available, prices for mineral commodities shifts unpredictably, investment in companies change, regulatory requirements change, permitting is costly and can take years during which other factors may shift, lawsuits can delay or stop projects, companies may go bankrupt, or different companies can take over as holders of the leases and change the mine design. Therefore, the effects of minerals exploration and development assumed to occur for analysis purposes could be greater or less than what is described in the reasonably foreseeable development scenario.

Interdisciplinary team member's analyses have made no assumptions about the specifics of any future mineral management activities beyond what is described in the reasonably foreseeable development scenario (site-specific location, timing, nature, intensity, site-specific mitigations, project design criteria, or viable alternatives), as any such assumptions would be speculative. Given the speculative nature of analyzing any specific project design, the analysis in this environmental assessment is typically qualitative and evaluates risk and potential effects associated with minerals management under each alternative as informed by the reasonably foreseeable development scenario. Regardless of the alternative selected, future mineral activities would be subject to environmental analysis, as appropriate, to examine specific impacts of specific proposed exploration or development projects. For a description of Forest Service consent and processing of prospecting permit and lease applications, see Appendix C – Forest Service Consent.

Alternative A (Withdrawal)

If the Secretary of the Interior withdraws the lands as requested by the Forest Service, exploration and development on the application lands would halt for up to 20 years. Aside from any activities on valid existing rights and non-federal minerals, no further exploration or mining would occur within the 20-year timeframe due to the withdrawal. No additional roads or drilling pads would be created for exploration related activities on National Forest System lands within the withdrawal area.

Reasonably Foreseeable Development Scenario – Alternative B (No Action)

Should the withdrawal application be denied by the Secretary of the Interior, the Forest Service is likely to exercise its consent role in a manner protective of the resources when it comes to evaluating a new lease or prospecting permit application in the Rainy River watershed. Under the "no action" alternative, for applications concerning new prospecting permits and leases located

within the Rainy River watershed, the mechanism to do so would be for the Forest Service, on a case-by-case basis, to consent with conditions designed to ensure that there would be no unacceptable adverse impacts to the Rainy River watershed, including the Boundary Waters Canoe Area Wilderness, the Mining Protection Area and 1854 Ceded Territory, or to decline consent. Here, even if the withdrawal application is denied, the Forest Service has the discretion to prevent mining or apply stipulations and conditions to mineral exploration and mining activities to protect National Forest System land and resources. Prior to the granting of any consent to issue new permits or leases, the Forest Service would complete the environmental analysis process to evaluate potential impacts from the proposed lease, permit, exploration or development plan as well as the effectiveness of any protective stipulations that might be considered as conditions of consent. For a description of Forest Service consent and processing of prospecting permit and lease applications, see Appendix C – Forest Service Consent.

As discussed in the 2021 withdrawal application and further examined in the resource reports, existing literature suggests that hardrock mineral mining of sulfide-bearing rock, no matter how it is conducted, poses a risk of environmental contamination due to the potential failure over time of engineered mitigation technology. Assessing that risk with respect to any future case-specific lease proposal in need of Forest Service consent would be integral to any future Forest Service consent determination, upon review of any environmental analysis conducted at the time.

That risk assessment cannot, and should not, be prejudged in this environmental assessment. However, leasing applications to which the Forest Service consents, even subject to protective stipulations, pose some risk of potential failure of mitigation technology. Such a risk of adverse effects is more than that resulting from either denial of consent or establishment of a withdrawal, where mining is wholly precluded. The analysis for alternative B evaluates risk and potential effects of these kinds of projects that might occur under the no action alternative, including with potential protective stipulations considered.

The reasonably foreseeable development scenario for alternative B assumes that up to 24 prospecting permits could be granted within the withdrawal application area, resulting in exploration activities. Leases encompassing up to four deposits could be issued, and under those lease authorizations, exploration and development activities could be approved. It is assumed that up to three mines could occur. Mine facilities are projected to be located within the “area of highest potential for mine infrastructure” denoted in figure 1. This area roughly coincides with the areas of mineral deposits, recognizing that facilities could be built some reasonable distance from a given deposit. The estimated footprint for all three mine facilities ranges from 2,600 to 5,700 acres.²⁰ An actual mine footprint on the lands of the withdrawal application could be higher or lower than these estimates, however these estimates were developed to provide a reasonable upper range of potential disturbance. The low estimate assumes that up to three underground mines would be authorized that would use a “dry stack” tailings technology. The high estimate assumes three mines using conventional tailings storage. Mine infrastructure may be located on federal or non-federal lands.

20. The Rainy River Headwaters (Minnesota only) is approximately 1,890,689 acres and the Superior National Forest is approximately 3,900,000 acres. The estimated mining disturbance would equate to 1.4 to 3.0 percent of the subwatershed, and 0.07 to 0.15 percent of the Superior National Forest. The direct disturbance does not however reflect the entire footprint of all potential effects, which has not been quantified in the analysis.

Mining activities in the alternative B reasonably foreseeable development scenario may include underground mining; processing ore; transportation of materials; aboveground dry stack tailing storage; aboveground wet tailings storage; aboveground waste rock storage; water withdrawals; water diversion, collection, storage, and treatment; waste and stormwater management facilities; and use of heavy equipment, utilities, and vehicles. Surface mining is not assumed to occur in the alternative B reasonably foreseeable development scenario because it is assumed that any future mineral leases would contain restrictions from surface mining methods. See Reasonably Foreseeable Development report for details on the projected minerals exploration and development activities under alternative B. Projected minerals exploration and development activities, including potential design features to avoid and minimize adverse effects, are accounted for under alternative B.

Because alternative B would not authorize any action, the act of selecting alternative B would not, in and of itself, cause any environmental effects. However, under alternative B there may be effects from future mineral exploration or development that could occur in the absence of a withdrawal, as projected in the reasonably foreseeable development scenario. The possible effects from any future mineral exploration or development are qualitatively described under alternative B in this environmental assessment as well as in the resource reports; however, any future federal actions would be subject to future decision-making and environmental review.

While this environmental assessment contemplates potential outcomes and risks associated with future mineral exploration and development as projected in the reasonably foreseeable development scenario, the federal agencies are neither taking any action nor making any decision on future mining proposals. The discussion of effects associated with activities that might occur under the no action alternative is necessarily high-level in nature and is intended to inform the reader in a qualitative manner regarding impacts associated with potential exploration and mining that could occur absent a withdrawal.

Summary of Effects by Resource

Socioeconomics

This section summarizes the effects of the alternatives on social and economic resources. The Socioeconomics Report was prepared to satisfy the requirements outlined at 43 CFR Section 2310.3–2. The analysis also complies with Executive Orders 12898 and 13045. See the Socioeconomics Report for more information on this analysis.

Alternative A – Proposed Action (Withdrawal)

The effects of the proposed action would result in forgoing economic contributions, in terms of jobs, income, tax and nontax revenues, stemming from potential new mining activity on the withdrawn lands, as outlined under the no action alternative, for up to 20 years. This outcome would be similar to the existing condition because no economic activity from hardrock mineral development is currently occurring in the analysis area. There are other proposed and operational mines in northern Minnesota, such as taconite mines and the Northmet Mining project (a copper-nickel mining proposal located outside the withdrawal application area), which may provide new or continued opportunities for employment supported by mining activities. Alternatively, existing mines outside the withdrawal application area may become inactive or close. As such, the current structure of local economies would not be impacted, leaving existing economic trends to continue.

If alternative A were to be approved by the Secretary of the Interior, federal mineral interests within the area would become unavailable to new exploration and development through Bureau of Land Management leasing actions (that is, prospecting permits and preference right mineral leases) for up to 20 years. Any new applications submitted to the Bureau of Land Management for prospecting permits or preference right mineral leases would be denied.

Estimated metals contained within the federal lands in the withdrawal application area that would be unavailable under the proposed action are shown in table 1, along with corresponding percentages of domestic and world reserves the estimated commodities represent (Burger et al. 2018). The proposed action would not affect taconite mining since taconite resources do not exist on the proposed parcels. See the Mineral Potential Report for more information about mineral commodities within the withdrawal application area.

Table 1. Approximate contained metals found within the withdrawal application area. Data is displayed in metric tons unless otherwise noted.

Commodity ¹	Contained Metals within Subject Lands	Domestic Reserves ² (percentage within subject lands)	World Reserves ² (percentage within subject lands)
Platinum-group metals (platinum and palladium)	279,923 kg	900,000 kg (31%)	100,000,000 kg (0.4%)
Copper	5,599,407	48,000,000 (12%)	2,100,000,000 (0.6%)
Gold	46	33,000 (0.1%)	54,000 (<0.1%)
Nickel	1,836,804	340,000 (540%) ³	95,000,000 (2%)
Cobalt	12,376	1,000,000 (1.2%)	25,000,000 (<0.1%)
Silver	1,209	26,000 (5%)	530,000 (0.2%)

- Information on contained metals not available for all commodities within identified deposits.
- Definition of reserves: That part of the reserve base that could be economically extracted or produced at the time of determination. The term "reserves" need not signify that extraction facilities are in place and operative. Reserves include only recoverable materials (U.S. Geological Survey 2022). Domestic and World reserves statistics from U.S. Geologic Survey Mineral commodity summaries 2022.
- The U.S. Geologic Survey Mineral Commodity Summaries (2022) notes that domestic reserves data for nickel includes three projects, though acknowledges three additional projects without defined reserves. It is unclear which projects are identified and included in the domestic reserves estimate.

Hardrock leasable minerals from the withdrawal area that are not associated with valid existing rights would not contribute to the national or international supply chain during the withdrawal period or stemming from authorizations that may have otherwise occurred during the withdrawal period and resulted in development beyond that time. As shown in table 1, a substantial portion of domestic reserves²¹ of platinum-group metals, copper, and nickel are located within the withdrawal application area. Accordingly, supply of these metals from the withdrawal application area, a domestic United States location, would be made unavailable for up to 20 years by the requested withdrawal. A relatively small fraction of world reserves of these metals are located within the withdrawal application area (table 1).

21. Only a portion of mineral reserves (domestic and foreign) are technically or economically recoverable. It is not possible to estimate the recoverable resources because it would require assumptions about ore recovery and metal recovery rates that can vary wildly depending on mining and benefaction techniques.

As discussed in the “Mineral Commodities and Potential Market Demand” section of the Socioeconomics Report, extracted minerals are a fungible (essentially interchangeable) commodity sold in a world market. Future demand for critical minerals is anticipated to substantially increase due to emerging and low-carbon technologies and national and international interest in advancing the use of these technologies (IEA 2022). Actual future demand for minerals is dependent on technology advances and developments. Critical minerals for U.S. manufacturing, defense and other domestic uses including production of renewable energy technologies would continue to be supplied through contracts with national and international corporations who supply mineral and mineral products based on the availability of these minerals and their prices in the world market. And while alternative A could have effects on the availability of minerals for renewable energy technologies and defense technologies, because of lengthy and uncertain causal chains in geographically diverse global locations over long timeframes, such effects are not reasonably foreseeable at this time. Whether a withdrawal could indirectly impact technological innovation, both in the mining industry and others, is not reasonably foreseeable.

Increasing domestic production of raw minerals is one strategy put forth by the White House for building a resilient supply chain to meet future U.S. demand for critical minerals (White House 2021). The recently passed Inflation Reduction Act of 2022 provides several incentives to increase the comparative advantage of domestic production, such as offering a production tax credit equal to 10 percent of production costs to mining companies excavating “applicable critical minerals,” which includes cobalt, nickel, and platinum-group metals (Inflation Reduction Act 2022). As noted above, supply of these metals from the withdrawal application area, a domestic U.S. location, would be made unavailable for up to 20 years by the requested withdrawal that could otherwise make use of this incentive. However, alternative A’s effects to overall policy outcomes are not reasonably foreseeable, as other strategies for meeting policy goals, such as recycling, diversifying global trade partners, and various manufacturing and technological advances will continue to be available during the withdrawal period.

The withdrawal would not apply to valid existing rights or state-owned minerals estates managed for the School Trust. However, given the intermingled land ownership patterns, restricting activities on federal lands may affect future activities on neighboring lands, as mineralized deposits may not be economically viable in such a spatially limited scenario. Therefore, potential future uses and revenues on state and private lands stemming from authorizations that may have otherwise occurred during the withdrawal period and result in development during or beyond that period may be reduced or not realized.

The amenity-based economy driven by local and seasonal residents, recreation, tourism, and immigration for the lifestyle and quality of life could continue its current growth trend due to certainty in recreation experience and environmental quality provided by the requested withdrawal for up to 20 years. Lorah and Southwick (2003) find that environmental regulations limiting extractive activities on protected lands is correlated with relatively rapid population, income, and employment growth. The requested withdrawal would provide additional protection to benefits provided to humans by nature (Bowker et al. 2014, Holmes et al. 2016, Hjerpe 2018). Holmes et al. (2016) concludes the aggregate value of wilderness recreation and preservation would continue to grow. As such, the current structure of the amenity-based local economies would remain unchanged, leaving existing economic trends to continue or accelerate.

Distributional Health Risks to At-Risk Populations

Adverse disproportionate risks to low-income and minority communities, children, and children in utero would not result from the proposed action as it would not lead to any surface disturbance and would not create or change toxic exposure pathways.

Alternative B – No Action (No Withdrawal)

Mineral Development

A mining operation has the potential to support hundreds of jobs in the local region during the construction and operation phases (for example see Alaska Miners Association 2022, Impala Canada 2022, U.S. Forest Service 2021). While the actual number and timing of any jobs supported by new mining operations is unknown, resource extraction supports jobs which are generally higher paying and offer greater non-wage benefits than other sectors of the regional economy. In addition to direct employment, mining operations require substantial capital investments, some of that investment is spent in the local and regional economy. Direct expenditures and employment from mine operations generate additional indirect and induced economic effects, also known as multiplier effects. Multiplier effects are generated as businesses buy supplies from other businesses and the employees of these firms spend their earnings on a variety of goods and services throughout the economy. Local, state and national tax revenues would also be collected. Numerous studies have documented the job creation and economic impacts of natural resource extraction industries, including those specific to Minnesota (Orr et al. 2018, University of Minnesota-Duluth 2006, Haynes et al. 2020). The actual number of jobs supported by mining operations would be based on future proposals, technological and market conditions, and the structure of the regional economy. For example, increasing automation of mine operations will impact how many and where these jobs are located.

Mine development and operations would generate rents and royalties from mineral leases. Because ownership is intermingled, these royalties could be paid on federal, state, and privately owned lands, including State Trust Lands which are managed to support Minnesota public schools through the Permanent School Fund. Actual future payments would be based on the terms and conditions of any new leases, acreage held under leases, volume of minerals extracted and the market value of mineral production. These non-tax revenues would be available to support local, state, and federal government.

Following the closure of a hardrock mine, any jobs previously created at a mine would no longer be supported, leaving a potential economic vulnerability most heavily felt within northern Lake and St. Louis counties. Any potential for a boom-bust economic cycle (Jacobsen and Parker 2016, Allcott and Keniston 2018) to replicate in a northern Minnesota hardrock mining economy could potentially be exacerbated by the harm done to the unique amenity-based economy surrounding the Boundary Waters Canoe Area Wilderness and the potential for mineral extraction to negatively impact amenities that attract residents and visitors to the region. Conversely, Lorah and Southwick (2003) discuss that some regions most able to rebound from the losses of income and population after the loss of extractive industries are those with the unique environmental amenities needed to support growth in other areas of the economy and attract new residents (Lorah and Southwick 2003).

Mine operations have the potential to impact the existing and growing amenity-based economy in the region. As recreation patterns adjust due to mining activity, effects to the amenity and recreation-economy could be localized to those areas experiencing these changes. Some individuals and business would experience negative economic consequences of visitors relocating their

activities and spending. Were sulfide-ore copper mining to proceed within the withdrawal application area, a contraction in tourism and amenity-based economic activity could plausibly occur, depending on the extent of mining effects that diminish the real or anticipated recreation experience as well as the severity or expectation of spills, breaches, and/or drainage. Findings from a survey by Sungur et al. (2014) of residents within four townships surrounding Ely, Minnesota suggests mine development and operation may slow amenity-driven in-migration and has the potential to encourage out-migration. Amenity driven housing markets may also be impacted by beliefs about the perceived changes in the quality of natural resources and recreation opportunities. The exact timing or magnitude of any impacts is uncertain.

Mineral Commodities

Mineral resources could be developed, and minerals could be removed, supplying raw materials to the national and international economy. Future demand for critical minerals found within the withdrawal application area is expected to increase due to emerging and low-carbon technologies and national and international interest in advancing the use of these technologies (IEA 2022). Increasing domestic primary production is one of several strategies identified to improve the comparative advantage of domestic mineral supply chains and mitigate the risk of supply chain disruptions (Nassar et al. 2020). The development of mining projects could have incremental impacts on new mining technologies developed to address potential environmental risks and impacts through innovation.

The destination of the minerals extracted in the future is unknowable at this time. Hardrock minerals found within the withdrawal application area are traded on commodity markets and are therefore assumed to be fungible commodities sold into an international market. No assumptions are made as to the refining, intermediary or final manufacturing destinations of potential minerals extracted from the withdrawal application area. Critical minerals for U.S. manufacturing, defense and other domestic uses including production of renewable energy technologies such as batteries would continue to be supplied through contracts with national and international corporations who supply mineral and mineral products based on the availability of these minerals and their prices in the world market.

Distributional Health Risks to At-Risk Populations

Mining of hardrock minerals within the withdrawal application area would result in increased risk of exposure to acid mine drainage pollution by Native American populations of the Arrowhead Region who are cultural practitioners or who consume traditional foods, such as wild rice, fish and fowl harvested in the region (Sarkar et al. 2022, Bouayad 2020, Glick and Han 2015). Native American populations in Cook and St. Louis Counties and low-income communities identified in this analysis within the Arrowhead Region would experience a disproportionate level of adverse risk from the potential for acid mine drainage pollution to the Rainy River watershed from hardrock mineral mining due to cultural practices associated with the harvesting and consumption of wild rice, fish and fowl from the region (Bouayad 2020). In addition, low-income communities, many of which are located within the withdrawal application area, have a long-standing tradition of subsistence harvest and consumption (see historical overview) and may also be more likely to consume self-caught fish (Smith et al. 2009, Stackleberg et al. 2017), a known source of risk in exposure to methylmercury in the region (Sakar et al. 2022, Pearson et al. 2020). These risks to environmental justice communities would persist indefinitely. Regulation, mine design, and monitoring may reduce risk, but this risk cannot be eliminated.

Employment opportunities offered through mining often include non-wage benefits, such as health insurance, which may increase access to healthcare for individuals employed by the mining company and their families.

Mineral Exploration

The 2012 Federal Hardrock Mineral Prospecting Permits Final Environmental Impact Statement reviewed and assessed the potential impacts to economic resources from activities associated with minerals prospecting (USDA Forest Service 2012). The impacts were measured by estimating the employment (full- and part-time jobs) and labor income generated by geophysical activities and exploratory drilling activities for a 20-year analysis period.

The “Recreation” and “Culture” sections of this environmental assessment describe potential shifts in recreation patterns due to exploration and prospecting. These could have localized impacts to the amenity and recreation-driven economy as recreation patterns change. Communities or businesses which are reliant in part on recreation expenditures, may experience a decline in visitation and related expenditures.

Distributional Health Risks to At-Risk Populations

Adverse disproportionate risks to low-income and minority communities, children and children in utero are not anticipated from mineral exploration as there are no exposure pathways anticipated to be created or changed by minerals exploration or related activities.

Tribal Traditional Needs and Values

This section summarizes the effects of the alternatives on tribal traditional needs and values. The Tribal Traditional Needs and Values Report was prepared to satisfy the withdrawal regulation requirements for a case file outlined at 43 CFR 2310.3-2(b)(1), that requires “A report identifying the present users of the lands involved, explaining how the users will be affected by the proposed use and analyzing the manner in which existing and potential resource uses are incompatible with or conflict with the proposed use of the lands and resources that would be affected by the requested action. See the Tribal and Traditional Needs and Values Report for more information on this analysis.

Tribal or treaty resources include both natural and cultural resources of significance to tribes that retain reserved rights under the Treaty of 1854 which do not fit the definition of historic properties or sacred sites per 36 CFR 800 or Executive Order 13007. These resources are valued by the tribes for traditional purposes and are considered vital for cultural survival.

Alternative A – Proposed Action (Withdrawal)

Under alternative A there would be no direct or indirect effects to tribal traditional needs and values because the withdrawal would provide certainty that no new prospecting permits or mineral leases would be authorized for the duration of the withdrawal, aside from those on valid existing rights. Alternative A would avoid the potential effects and risk to tribal traditional needs and values described under alternative B.

Alternative B – No Action (No Withdrawal)

Mineral Development

The natural and cultural resources used for the exercise of treaty rights located on land directly used for mining activities is likely to be adversely affected or permanently removed, depending on

the mining activity. Given the mining activities in the reasonably foreseeable development scenario, the greatest potential sources of impact are aboveground tailings facilities, waste rock storage facilities, and plant facilities. Wildlife habitat, plants, wetlands, and associated cultural resources of value to the tribes that are located within the footprint of these features may be permanently lost, given the removal of surface resources associated with these features (see the botany, water and aquatic species, and terrestrial wildlife reports for details). The area directly impacted is estimated at 2,600 to 5,700 acres in the reasonably foreseeable development scenario. Post mining reclamation may restore a vegetation community to these areas; however, it is unlikely the original ecosystem or resources would be completely restored.

Mitigation and avoidance measures would be required by the Forest Service in consultation with the tribes on a project-specific basis. While these may reduce effects, they would not be eliminated because surface disturbance, including permanent removal of surface resources, is unavoidable with mining operations. This includes underground mining because surface use is generally needed for permanent tailings or waste rock storage.

In addition to the effects to access and treaty resources at the location of mining activities, there is the risk of effects from pollution and habitat fragmentation to additional nearby and downstream lands and resources containing treaty resources. These include risk of acid mine drainage and other water and air pollution from mines, which has the potential to adversely affect fish and other aquatic species used by band members, affect the health of people who eat the fish, and adversely affect wild rice.

Effects may also include noise and light pollution. Noise and light pollution may adversely affect the sense of place and cultural value the bands hold for ceded territory lands. Wildlife habitat in the broader landscape would be fragmented to some degree by areas directly impacted by mining activities. Overall, mining activities may disproportionately affect the bands, as discussed in the Socioeconomics Report.

See the water and aquatic species, wild rice, socioeconomics, and terrestrial wildlife reports for more information.

Mineral Exploration

The effects of minerals exploration were analyzed in the 2012 Federal Hardrock Mineral Prospecting Permits Final Environmental Impact Statement (2012 prospecting permits EIS), which is incorporated by reference into this analysis. While a full analysis of minerals exploration can be found in chapter 3 of the 2012 prospecting permits EIS, section 1.8.1 of that document summarizes effects related to issues of tribal concern raised in the minerals exploration analysis. Points of concern raised by tribal government were for access to treaty resources, effects to harvest of traditional plants, effects to game species with a priority on moose, effects to wild rice, effects to water quality and fisheries, and effects to heritage sites.

As described in section 1.8.1 of the 2012 prospecting permits EIS, there would be no change to tribal access from minerals exploration because no existing roads would be closed. Habitat for plants would be impacted in the short term by temporary road and drill pad construction associated with minerals exploration, which could disturb small patches of plants such as blueberries, raspberries, birch and other species. There could be a limited benefit to some game species favoring young trees or shrubs for forage based on creating young forest in drill pad areas. There may be limited adverse effects from temporary road construction associated with minerals

exploration to some wildlife species. Resource stipulations would adequately protect wild rice lakes from impacts of minerals exploration and stipulations and project design would result in minimal effects to water and aquatic resources from minerals exploration. Impacts to heritage sites would be avoided with stipulations in permits (e.g., buffering sites).

Wild Rice

This section summarizes the effects of the alternatives on wild rice. See the Wild Rice Report and Water and Aquatic Species Report for more information on this analysis.

Alternative A – Proposed Action (Withdrawal)

Under alternative A there would be no direct or indirect effects to wild rice because the withdrawal would provide certainty that no new prospecting permits or mineral leases would be authorized for the duration of the withdrawal, aside from those on valid existing rights. Alternative A would avoid the potential effects and risk to wild rice described under alternative B.

Alternative B – No Action (No Withdrawal)

Minerals Development

The effects analysis for wild rice considers the risk of impacts from normal mining operations as well as the risk in the event of an accident or failure. The greatest risk to wild rice from mine development is that sulfate could enter surface water, either from a smaller release associated with normal mine operation, or from a large release such as might be associated with a catastrophic tailings dam failure. Sulfate could enter sediments where wild rice grows, and when reduced to sulfide, adversely impact wild rice seedling emergence, seedling survival, biomass growth (Myrbo et al. 2017, Pastor et al. 2017) or possibly extirpate wild rice from Birch Lake or downstream.

The Water and Aquatic Species Report describes how contaminated water, such as water containing sulfates created by exposure in oxygenated conditions to sulfide-bearing mine waste or ores, can be generated from mining within the withdrawal application area. Some of these are listed briefly below; for more detail, see the Water and Aquatic Species Report.

- Groundwater contacting sulfide ores in an underground mine and being pumped to the surface during dewatering
- Water used to process ore
- Water seepage from a tailings basin
- Rain or snow contacting waste rock piles
- Deposition of fugitive dust containing sulfates

During routine mining operations, this contaminated water is collected, may be stored in a tank or containment pond, placed in a wet tailings storage facility, used in mining processes, or treated and ultimately discharged to a regulated water body under an effluent discharge permit; see Kolka et al. 2022 for description of water treatment options for sulfate mitigation. The contaminated water may also be transported by truck or pipeline around a mine site. During any of these processes, there is a risk that an accidental small-scale release of contaminated water could occur. However, as described in the Water and Aquatic Species Report, the risk that any minor release would continue unabated is unlikely during mine operations.

The Water and Aquatic Species Report describes water impacts from unintended failures and accidents. A catastrophic event with the greatest risk of causing water contamination is failure of a tailings basin storage dam. The water resources section describes this risk as low and not inevitable, but that if it did happen, could transport large amounts of contaminated sediment or contaminated water to a waterbody in or adjacent to the withdrawal application area.

If an unintended release of contaminants occurred from a failed tailings basin dam and contaminated water and tailings were deposited in a waterbody, contaminated water would be flushed downstream, and the contaminated sediments would most likely gradually move downstream until they encountered a dam like Birch Lake dam. Sediments would remain as a continuing source of contamination until they were dredged, or the site remediated. Contaminated water would flow downstream to Newton Lake and the Boundary Waters Canoe Area Wilderness and Mining Protection Area, although contaminants would be diluted along the way.

In addition to adverse effects from high sulfate levels, wild rice is also sensitive to changing water depth (MNDNR 2022) and could be directly impacted (buried) if tailings were directly released into wild rice beds. For example, if a catastrophic tailings failure happened adjacent to a wild rice population, the tailings could knock over or bury that season's crop or could extirpate wild rice from that location unless remediation could restore the bed.

The adverse effects could conceivably be short term (several growing seasons) if the release of contaminated water was small, or longer term if contaminated tailings entered the waterbody. Similarly, the magnitude of effects could be small to large depending on the scale of sulfate released. Effects to wild rice could include reduced seedling emergence, seedling survival, biomass growth or possibly extirpation of wild rice from bodies of water with elevated sulfate. Impacts would most likely be greatest in Birch Lake because that is the closest large waterbody to the area of highest potential mine infrastructure, and would decrease downstream in White Iron Lake, Farm Lake, and subsequent lakes.

Finally, if other constituents such as lead, mercury, and arsenic were in the water or sediments, wild rice seed could contain elevated levels of those toxic metals.

Mineral Exploration

The effects of mineral prospecting on wild rice were analyzed in the 2012 Federal Hardrock Mineral Prospecting Permits Final Environmental Impact Statement (2012 prospecting permits EIS), and the effects described below are a summary of that analysis.

The primary risk to wild rice analyzed in the 2012 prospecting permits EIS is the risk of introduction of sediment to surface waters as a result of run off from drill pads, access roads, and landings. The use of sumps and holding tanks to contain drill cuttings would help keep that material from entering surface waters, as would water quality stipulations requiring a 100-foot setback for drill pads from lakes, streams, and open water wetlands. The 2012 prospecting permits EIS concludes that water quality impacts from mineral exploration would be localized and small.

Cultural Resources

This section summarizes the effects of the alternatives on cultural resources and Native American sacred sites. A Cultural Resources Report was prepared to satisfy the withdrawal regulation requirements for a case file outlined at 43 CFR 2310.3-2(a)(3)(i), that requires “[a] report on the identification of cultural resources prepared in accordance with the requirements of 36 CFR part 800, and other applicable regulations.” See the Cultural Resources Report for additional information about this analysis.

Alternative A – Proposed Action (Withdrawal)

Alternative A would result in no direct or indirect effects to cultural resources as defined in the National Historic Preservation Act (as amended), as no ground disturbing activities would occur that could adversely affect the integrity of a historic property. The withdrawal would have no effect to the physical integrity or use of sacred sites under Executive Order 13007. The proposed action is the type of activity that does not have the potential to cause effects on historic properties under 36 CFR 800.3(a)(1), as amended. As such, the Forest Service has not initiated formal consultation under 36 CFR 800 (note that Section 106 consultation is not a replacement for, nor does it serve as the required government-to-government tribal consultation).

Alternative B – No Action (No Withdrawal)

Prior to authorizing any action that is subject to the National Historic Preservation Act for prospecting permits and lease applications or mining related development, the Forest Service would conduct cultural resource inventories to identify and evaluate all cultural resources located within the area of potential effect from the proposed action. Tribal consultation would be conducted to identify any specific traditional cultural properties and sacred sites that may exist within the area of potential effect.

If cultural resources and sacred sites were located within the area of potential effect, the effects would be analyzed and taken into consideration in compliance with 36 CFR Part 800 and Executive Order 13007. If the proposed action was determined to have an adverse effect to cultural resources listed on or eligible for nomination to the National Register of Historic Places as defined in 36 CFR Part 800, and avoidance could not be accomplished, the adverse effects would be minimized, mitigated, or resolved following the procedures in 36 CFR 800.6. Note that protection or preservation of historic and cultural sites is not guaranteed under the National Historic Preservation Act or Executive Order 13007, and adverse effects for future mining related activities could occur within the withdrawal area under alternative B.

Mineral Development

Mining activities that cause ground disturbance have the potential to physically alter cultural and historic sites where they exist. These activities include road construction, pipelines, processing facilities, storage of waste rock and tailings, earthworks such as water diversion and collection, wastewater, and stormwater storage. If avoidance measures could not be implemented, these activities could destroy, displace, or otherwise physically alter aspects of integrity that qualify the site for listing on the National Register of Historic Places.

Mining features and mining associated activities can also indirectly affect cultural and historic sites, even when the features and activities occur outside of the cultural resource site boundary. The introduction of visual, atmospheric, or audible elements that diminish the integrity of the property’s significant historic features could adversely affect the setting, feeling, or association of the site, and

compromise the integrity of the site such that it is no longer eligible for listing on the National Register. An example could be the introduction of a mining stockpile within the viewshed of a historic period cabin, such that the setting and feeling of the cabin are diminished.

Traditional cultural properties are districts, sites, buildings, structures, or objects that are valued by a living community for the role they play in sustaining the community's cultural integrity (King 2004, NPS 1992). An example of a traditional cultural property could be a wild rice stand or sugar maple stand which has been harvested on a regular basis by a distinct, living community for the past 100 years. The introduction of auditory or atmospheric effects from a mine could potentially diminish aspects of integrity at a traditional cultural property location, such that the relationship of the site to traditional cultural practices or beliefs is severed.

Mineral Exploration

Mineral prospecting would also potentially affect cultural resources in alternative B. The effects of mineral prospecting to cultural resources were analyzed in the 2012 Federal Hardrock Mineral Prospecting Permits Final Environmental Impact Statement, and the effects described below are a summary of that analysis.

The primary risk to cultural resources analyzed in the environmental impact statement is the risk from ground disturbing activities from drill pads, access roads, landings, and sumps. However, short-term auditory effects can also affect cultural resource sites, if present. Stipulations requiring survey, consultation and avoidance measures minimize risk to cultural sites.

Water and Aquatic Species

This section summarizes the effects of the alternatives on water and aquatic species. A biological evaluation was prepared in accordance with Forest Service Manual 2670. The biological evaluation includes a complete list of all Regional Forester sensitive aquatic species known or expected to occur on the Superior National Forest. Species that do not have potential habitat present or are not known to occur within the withdrawal boundary were identified, but not analyzed in the biological evaluation. There are no known threatened, endangered, or proposed plant species on the Superior National Forest. See the Water and Aquatic Species Report and the aquatic species biological evaluation for additional information about this analysis.

Alternative A – Proposed Action (Withdrawal)

Under alternative A there would be no direct or indirect effects to water and aquatic species because the withdrawal would provide certainty that no new prospecting permits or mineral leases would be authorized while the withdrawal is effective, aside from those on valid existing rights. Alternative A would avoid the potential effects to water and aquatic species described under alternative B.

Alternative B – No Action (No Withdrawal)

Mineral Development

Routine operational discharge from mining operations may have impacts on the health of aquatic systems, including from both the physical (volume, change in flow) and chemical makeup (addition of chemical constituents such as nutrients, salts, or metals) of discharge water. Direct and indirect impact to aquatic wildlife can include reduced structure (number and types of aquatic species) and function (how aquatic organisms relate to the abiotic and biotic environment) of an aquatic

environment. These impacts are measured by a reduction in biological integrity, loss of diversity, and reduced fitness. Sensitive taxa may be diminished or replaced by more tolerant taxa. Routine operational discharge may result in a “low to moderate” effect to biological integrity at a scale of several lakes or streams that would be “possible to likely” in occurrence.

The primary risk from accidents and failures is the potential impact to water quality by emitting metals, sulfate, acid drainage, suspended solids, and other chemicals. As noted above, water quality and habitat effects would change between a mine site and the downstream watersheds, becoming undetectable at some point downstream. The two most catastrophic risks analyzed for water resources are wet tailings storage failure and failures of water collection, treatment and discharge.

Wet basin tailings storage poses the risk of dam failure. The impounded water within the storage facility increases the potential volume and transport of contaminated sediment (tailings) and water to nearby water bodies and their receptors. While such events are relatively infrequent, avoidable, and not inevitable, dam failures may still occur including for modern mining projects with engineered design (Davies et al. 2000). The most common causes of tailings dam failures, in order of prevalence, are slope instability, earthquake loading, overtopping, inadequate foundations, and seepage (Clarkson and Williams 2020). Failure could lead to downstream chronic exposure and bioaccumulation of metals constituents (e.g., copper, cadmium, cobalt, lead, mercury, nickel, zinc), decreases in pH, and increases in other chemical constituents in water (e.g., sulfates) that can increase the availability of metals (e.g., methylmercury) which bioaccumulate in aquatic organisms and lead to reduced fitness and fish consumption and public health concerns.

Failures of water collection, treatment and discharge system components could result in exceedance of water quality standards to receiving waters, likely Birch Lake and one of its tributaries. Through discharge, fish and other aquatic organisms could be exposed to toxic metals (e.g., copper, cadmium, cobalt, lead, mercury, nickel, zinc), some of which can bioaccumulate, impair function, reproduction, foraging, and survival; other chemical constituents in water (e.g., sulfates) can increase the availability of metals (e.g., methylmercury) to bioaccumulate in aquatic organisms and lead to reduced fitness and fish consumption and public health concerns. If significant changes to water quality occurred, it could result in the loss of invertebrates, fish, and wildlife habitat downstream as well as increase bioaccumulation of metals in aquatic organisms and lead to reduced fitness and fish consumption and public health concerns.

It is likely that hardrock mining would contribute sulfate to Birch Lake and downstream, which may be a small load under routine operations, but would be a much larger load in the event of an accident or failure. Birch Lake currently has elevated sulfate levels in the southern portion of the lake. Increases in sulfate would also likely increase methylation of mercury. Total maximum daily loads for methylmercury in fish already exist in the area of potential impact. Any increase in sulfate is likely to exacerbate this problem, however it is not possible to quantify this effect and determine its impact in this analysis.

While any activity involving a water soluble or transportable contaminant poses a potential risk to water resources, this risk would be mitigated by compliance with a mine plan of operations and other plans, best management practices, industry standards, regulatory requirements, and oversight by responsible regulatory authorities. These are designed and intended to prevent unacceptable releases to water resources. Current industry and regulatory standards require continuous monitoring, identification, and correction of unacceptable releases from mine site activities. Although these requirements and standards do not eliminate the potential for a release of contaminated water (engineered systems do not always perform as predicted), compliance with and

enforcement of them may reduce potential for such releases to continue unchecked. After mining is complete and a mine is closed and remediated, the risk of leaks, accidents and failures may increase because there is more uncertainty on whether the resources and capacity will be available for long-term monitoring and corrective action (USEPA 2014). These risks would be most likely for any facilities or infrastructure that require long-term treatment or monitoring over the course of decades to centuries or more (USEPA 2014).

Promulgation and enforcement of rules protecting water quality in Minnesota is delegated to the State of Minnesota under the Clean Water Act. The Minnesota Pollution Control Agency is responsible for implementing and enforcing rules governing any potential releases of contaminants from mining activities to waters of the state such as those in the potential mining effects area. Minnesota Rules Chapter 7050.0335 recognize the Boundary Waters Canoe Area Wilderness surface waters as “prohibited outstanding resource value waters”. The regulation of discharges includes antidegradation criteria under Minnesota Rules Chapter 7050 which requires the Minnesota Pollution Control Agency to manage the waters of the wilderness area “*to achieve and maintain the highest possible quality in surface waters of the state..... and preserve the exceptional characteristics of outstanding resource value waters shall be maintained and protected.*” The purpose of these rules is to prevent further degradation from current conditions, such as an increase in the concentration of a contaminant in water entering the Boundary Waters Canoe Area Wilderness.

The distance downstream of measurable effects and the rate of decrease is a function of the pollutant loading and the hydrologic and hydraulic setting of the project. The results of mine monitoring at Canadian mines located in the Canadian Shield indicate that effluent releases are generally of limited frequency, quantity, and concentration (Thompson 2022). Monitoring information of water quality impacts of mining in the Canadian Shield indicates that effects of releases decrease downstream. Evidence of fish effects were observed ranging from 0.6 mile to 37 miles downstream (stream miles) from effluent discharge considered operating under routine conditions, while most sites (15) were 6 miles or less (Thompson 2022). Generally, the further downstream of a source, the more the effects are diminished. There is evidence that mining operations with accidents and failures can affect water chemistry and biota tens to hundreds of miles downstream (Kossoff et al. 2014, Lewin and Macklin 1987, Macklin et al. 2006, Moore et al. 1991).

There are approximately 5,236 acres of floodplains within the area that have a potential for impact. No long-term changes to water levels are anticipated, however if a tailings site failed near floodplains it would have the potential to impact them directly filling them with tailings. There is a total of 30,944 acres of wetlands within the 69,597 acres area of highest potential mine infrastructure. Under the no action alternative, wetlands would be directly impacted by construction of a mine and ancillary facilities on some portion of approximately 2,600 to 5,700 acres estimated in the reasonably foreseeable development scenario. Additional impacts could occur resulting from accidents and failures that change water quantity or through direct fill. Wetlands could be impacted by changes in water quality from effluent or dust deposition.

Where implemented, any of the described routine operations could impact wetlands through direct destruction or disturbance from mining features and operations and indirect impacts from fragmentation and changes in hydrology, water quality, and atmospheric deposition of fugitive dust (MNDNR 2015, National Research Council 1999). Land clearing could directly impact water resources through removal of vegetation, removal of peat and topsoil, and leveling and compacting the ground for construction. This could result in changes in water flow patterns and increased

sediment and nutrients to water sources. Direct impacts to wetlands would be avoided, minimized, or compensated. Given the likely footprint of a future mining operation, and the prevalence of wetlands, direct wetland impacts may be unavoidable. Compensation for wetland and stream loss may offset some impacts, however there are insufficient mitigation credits within the local bank area to offset ecological losses. This risk is mitigated by compliance with a mine plan of operations and other plans, best management practices, industry standards, regulatory requirements, and oversight by responsible regulatory authorities and would likely limit indirect impacts to wetlands. Wetlands and high-carbon northern peatlands are sinks of inorganic mercury and are sources of methylmercury to downstream surface waters (Grigal 2003). Dewatering of wetlands could alter methylation rates in wetlands and may mobilize additional mercury into downstream water resources. No impacts to floodplains could be expected under routine operations, as they would not alter water levels or fill/alter them physically.

Mineral Exploration

This analysis incorporates by reference analysis in the 2012 Federal Hardrock Mineral Prospecting Permits Final Environmental Impact Statement (2012 prospecting permits EIS). That EIS anticipated effects to water and aquatic resources is minimal based upon the analysis in chapter 3 which considers the stipulations, forest plan standards and guidelines, existing State and federal regulations, design elements, anticipated operating conditions, and resource characteristics. Drilling activity with the prescribed project design features described in section 2.4.3.9 of the 2012 prospecting permits EIS is not anticipated to have a noticeable effect on the quality or quantity of the groundwater resource. The activity should not impact the potability of the groundwater or the production capacity of existing water supply wells. For aquatic wildlife species, the project may impact individuals but is not likely to cause a trend to federal listing or loss of viability.

Soil

This section summarizes the effects of the alternatives on soil resources. See the Soil Report for more information on this analysis.

Alternative A – Proposed Action (Withdrawal)

Under alternative A there would be no direct or indirect effects to soil resources because the withdrawal would provide certainty that no new prospecting permits or mineral leases would be authorized. Alternative A would avoid the potential effects and risk to soil resources described under alternative B.

Alternative B – No Action (No Withdrawal)

Mineral Development

Productive soils currently support the ecosystem above and below ground. However, should mining activities occur, the soil resource would be altered due to soil removal, leveling, and compaction within a mine footprint and possibly surrounding area so ancillary facilities such as roads, ore processing site, settling ponds, stockpile areas, buildings, staging areas, and working spaces can be constructed. The area directly impacted is estimated at 2,600 to 5,700 acres in the reasonably foreseeable development scenario.

Initial removal of the soil resource occurs when the necessary roads and staging areas to access a new mine site are constructed. Road and staging area construction create soil displacement and reduces soil hydrologic and biologic function along the corridor where these disturbances previously did not exist. The loss of soil functions and the soil itself occur during construction of the road and staging area. The potential for erosion and sedimentation can be expected along the road corridor until the road and staging area are closed.

Clearcut of trees and other vegetation to create mine access and open space for construction activities removes the overstory canopy, understory, and forest floor litter (i.e., needles, leaves twigs) leaving the soil bare. Operations remove biomass and site organic matter affecting future nutrient inputs into the soil. Nutrients are lost by removing the stored nutrients in trees, and additional nutrients are lost if the litter layer and woody debris are removed. Removal of the canopy increases impacts from rain drop splash and concentrated flow of water. This results in increased erosion runoff during rainfall and snowmelt events which can affect other resource values such as water quality and aquatic habitat due to erosion and sediment transport into nearby water bodies.

Major and minor trace elements exist in the soil. However, high concentrations introduced through mining processes, of some elements can become toxic and cause contamination of the soil. Soils can become contaminated when acid drainage or metal bearing water leaches into the soil profile. If the metal concentrations are too high, they become toxic to soil organisms that are necessary to perform nutrient cycling processes to turn nutrients into available forms for plant uptake.

Water in contact with tailings, waste rock, or ore could leach minerals from these materials into the soil. In addition, chemicals are added to the water used in ore processing. While most of the water used would be reused or be stored in a storage facility, leachate can still escape. Soil contaminants can be toxic to organisms in the soil and, without the proper organisms to perform their processes, puts soil quality into jeopardy.

Transportation of water, such as a tailing slurry, would require a system of containment. Accidents during the transport of these materials can occur and may lead to spills impacting soil due to seeping into the ground and possibly the groundwater. Due to the shallowness, acidic nature, and/or the coarseness of the soils, if a spill were to occur, these conditions would likely allow the contaminants to seep into bedrock fractures and groundwater. These spills would generally be relatively limited in extent and are not considered catastrophic or large-scale for the purposes of this analysis.

A potential risk to soil quality within the withdrawal area comes from catastrophic failure of a wet basin tailings storage dam. While such events are relatively infrequent, they may occur including for modern mining projects with engineered design. Dam failure events may cause releases of tailings and contaminated wastewater to waterbodies (Water and Aquatic Species Report). If tailings or contaminated wastewater is on the surface, it also has the possibility of seeping into the soil profile and either getting transmitted to groundwater or adsorbed onto soil particles depending on soil characteristics.

Dry stack tailings storage reduces the risk of dam failure posed by wet basin tailings storage. Tailings are partially dewatered prior to placement in the tailings basin. The tailings are then spread and compacted. Other potential effects and risks exist for dry stack tailings storage. Fugitive dust from dry stack tailings storage could potentially leave the site and impact nearby areas and enter the soil. They also pose a risk due to slope failures.

Waste rock piles pose long-term problems for soil functions, productivity, and therefore soil quality. In addition to high concentrations of toxic elements, plant establishment on these piles is often inhibited. Contamination can occur through leaching into the soil or through wind or water erosion. Contamination can occur through water infiltration of the waste rock resulting in oxidation of sulfide-rich materials. Spills and leaks of hazardous materials and the deposition of contaminated windblown dust can lead to soil contamination. If not properly managed, erosion of mineralized waste rock into surface drainage may lead to concentrations of metals in stream sediments and it may also result in deposits on the soil that leach into and get adsorbed by the soil.

The length of time the effects of mining to the soil resource lasts depend on soil characteristics, how much soil was removed, how long the mining activities occurred, and whether the area is rehabilitated or left to regenerate on its own. For example, if a waste rock storage area is left on site permanently then most likely loss of long-term soil productivity at the location will remain until the rock has weathered and the soil is able to buffer the elements to an historical background level. If waste rock storage is removed immediately and the site is rehabilitated soil productivity could return when the site is revegetated and is returned to previous soil quality levels, possibly in a few decades once soil functions have been restored. If the soil has been removed down to bedrock or even the soil is removed down to the subsoil a return to pre-mine levels of productivity would not occur.

Mineral Exploration

Resource stipulations outlined in section 2.4.3.7 (Soils) of the 2012 Federal Hardrock Mineral Prospecting Permits Final Environmental Impact Statement (2012 prospecting permits EIS) would also apply to the potential activities outlined in this analysis. These stipulations are meant to minimize unnecessary damage to the soil resource by keeping road footprints to only a necessary length and width for use; protecting future nutrient inputs so soil organisms can perform nutrient cycling; determining season of use so saturated or shallow soils are not rutted, compacted or eroded; using commercially available products such as mud mats, or temporary structures to minimize resource damage. These are meant to protect soil functions and thereby long-term soil productivity. As analyzed in the 2012 prospecting permits EIS, there would be limited and temporary impacts to soil from minerals exploration.

Wilderness

This section summarizes the effects of the alternatives on the Boundary Waters Canoe Area Wilderness. See the Wilderness Resource Report for more information on this analysis.

Alternative A – Proposed Action (Withdrawal)

Under alternative A there would be no direct or indirect effects to wilderness because the withdrawal would provide certainty that no new prospecting permits or mineral leases would be authorized. Alternative A would avoid the potential effects and risk to wilderness described under alternative B.

Alternative B – No Action (No Withdrawal)

Potential impacts to the Boundary Waters Canoe Area Wilderness depend on the proximity of development and the density of mining activity near the boundary that could occur. For example, several facilities located directly adjacent to the boundary would likely have more of an effect than one structure several miles away.

The Boundary Waters Canoe Area Wilderness is divided into four management areas as described in the Wilderness Resources Report. The majority of the wilderness directly adjacent to the withdrawal boundary falls within the semi-primitive motorized and semi-primitive non-motorized management areas. The predominately unmodified landscape desired for semi-primitive non-motorized and slightly modified environment (semi-primitive motorized) would likely be impacted if there was a dam failure or mine drainage into the waters flowing into the wilderness. Should this occur, long-term changes to lake and stream acidity and decline in aquatic species would result in a highly modified environment and would be in conflict with the standards and desired conditions for that management area.

Desired conditions for these directly adjacent wilderness management areas prescribe low to moderate opportunities for solitude (forest plan, 3-45 and 3-46). Desired conditions for semi-primitive non-motorized areas include the probability of motorboat noise, but not more constant and frequent noise and light sources from mining operations. Depending on the type and location of the adjacent mining operation, desired conditions for these management areas may not be met.

Mineral Development

Untrammelled Quality

This quality refers to wilderness being essentially unhindered and free from modern human control or manipulation. Trammeling is an action that intentionally manipulates “the earth and its community of life” inside a designated wilderness or inside an area that by agency policy is managed as wilderness.

Because no mineral development would occur within the wilderness, there would be no effect to the untrammelled quality.

Natural Quality

This quality refers to the intended and unintended effects of modern people on ecological systems inside wilderness since the time of designation. Managing to preserve this quality means that managers should strive to maintain the desired condition of ecological natural processes.

Long term effects could occur to this quality, with the most potential related to water quality. Development of these mineral resources could ultimately result in the creation of permanently stored waste materials upstream of the Boundary Waters Canoe Area Wilderness with the potential to generate and release water with elevated levels of acidity, metals, and other potential contaminants. The greatest potential risk to water quality of the wilderness area and lands within the withdrawal areas comes from catastrophic failure of a wet basin tailings storage (impoundment) dam. Wet basin tailings storage poses the risk of dam failure and the potential release of a large volume of contaminated sediment (tailings) and water to a nearby water body with potential transport of it to downstream water bodies and receptors. Dam failures have the greatest potential of traveling downstream in a volume that could impact receiving wilderness area water resources. Impacts would be most severe for streams, wetlands, and lakes most adjacent to the failure. Failure would be highly likely to result in increases of total dissolved solids, sulfate, metals and other constituents, exceedance of water quality standards and observable impacts to aquatic biota and habitat in Birch Lake, becoming successively less severe for other water bodies located downstream, but risk of effects to Boundary Waters Canoe Area Wilderness would not be eliminated. (Water and Aquatic Species Report).

There is also the risk of longer-term effects from wastewater and leaks. There is the potential to generate and release water with elevated levels of acidity, metals, and other potential contaminants. Current wastewater management design may include measures to reduce these risks. These measures can substantially reduce the release of contaminants to the environment (see the Water and Aquatic Species Report). In addition, compliance requirements would likely be subject to higher standards in the withdrawal application area due to its proximity to the Boundary Waters Canoe Area Wilderness. However, as facilities age the risk of longer-term effects from wastewater and leaks would also increase.

If mine facilities were located adjacent to the wilderness boundary in the area of highest potential for mine infrastructure, it is possible that wind dispersed non-native invasive plant seeds could move from a mine area into the Boundary Waters Canoe Area Wilderness where they could establish and grow, and thus degrade the natural quality of wilderness character. The risk depends on species type, the location of the mine, stipulations associated with permits, and reclamation efforts (see the Non-Native Invasive Species Report).

Light and noise pollution from mining activities may adversely affect wildlife and ecological processes within the wilderness, and thus adversely affect the natural quality. See the dark skies, soundscapes, and terrestrial wildlife resource reports for more information.

Impacts to air quality from underground mining, processing of ore, and dry tailings storage and materials transport would be possible, including emissions and dust. The relative risk to air quality to the wilderness area from a mining operation is proportional to the emissions from the mining and processing activities. Emissions could include pollutants such as: mercury, lead, arsenic, particulate air pollution, asbestos, and cadmium. Depending on the specific operations present at any particular mine, emissions and air quality effects from these separate activities can range from minimal to severe, though impacts to the Boundary Waters Canoe Area Wilderness are difficult to predict. The presence of airborne pollutants in soil and water within wilderness can have direct adverse effects on sensitive plant and animal species and can directly impact essential ecosystem functions, such as nutrient cycling. Certain air pollutants also can reduce visibility (Landres et al. 2021). Mitigations would reduce this risk (Air Quality Report). Impacts to the Class I airshed would be dependent on the amount of emissions and the source location.

Undeveloped Quality

The undeveloped quality refers to the presence of structures, construction, habitations, and other evidence of modern human presence or occupation. The undeveloped quality also refers to the absence of mechanical transport and motorized equipment.

Because no new non-recreational developments nor new motorized or mechanized activity would occur within the wilderness, there would be no effect to the undeveloped quality.

Solitude or Primitive and Unconfined Recreation

This quality includes the values of inspiration and physical and mental challenge. Primitive recreation in wilderness has largely been interpreted as travel by nonmotorized and nonmechanical means. It also encompasses reliance on personal skills to travel and camp in an area. Unconfined recreation encompasses attributes such as self-discovery, exploration, and freedom from societal and managerial controls.

Underground mining, and associated activities, in particular the construction and management of tailings facilities and waste rock piles on the surface, processing of ore, and materials transport could affect opportunities for solitude and the ability for users to avoid the sights, sounds, and evidence of other people while visiting designated wilderness depending on how close these activities occurred to the wilderness boundary, the amount of vegetative screening and the intensity of the activities. This would be both short and long term. Soundscape research in Rocky Mountain National Park suggests visitors travel an average of at least a half mile from common noise factors in order to reach natural quiet (Park et. al. 2009). In the wilderness character mapping exercise (Tricker et al. 2017), utilitarian noise (vehicles and chainsaws) was determined to affect 114,904 wilderness acres and timber harvest units an additional 31 acres. Any new industrial noise would add to the existing disturbance. The area of highest potential for mine infrastructure (figure 1) at its northern point is directly adjacent to the wilderness boundary and the entry points at Gabbro and Little Gabbro lakes. The intensity of the impact of new mining development would depend on the distance a person is from the mining activity and the sound dispersive/absorptive characteristics of the terrain in the area.

Mining-related construction and operation adjacent to the Boundary Waters Canoe Area Wilderness could also include an increase in dust and noise levels within these areas during the life of a mine. Depending on a mine plan and intensity of operations, this impact could occur from mines directly next to the wilderness boundary or several miles away. This could impact solitude and primitive and unconfined recreation due to potential displacement from people wishing to avoid the sights and sounds of these activities and those who wish to experience natural quiet. This would have a direct impact on wilderness area entry points and wilderness area near and including Gabbro and Little Gabbro lakes. In the long term, visitors may begin to choose other locations of travel, resulting in unnatural changes in travel patterns, increasing congestion and competition over quota permits in the rest of the wilderness area.

There may be moderate to high impacts to opportunities for solitude or a primitive and unconfined type of recreation for areas of the wilderness near a mine. This is because of the consistency and long duration of operation from minerals development activities, the expectation of natural quiet in the wilderness, and because very low ambient sound levels in the Boundary Waters Canoe Area Wilderness increase the likelihood of audible noise from minerals development activities being heard in the wilderness. While mitigation such as an electric mining fleet would reduce these impacts, impacts may still occur depending on mine location. Depending on the location of mining activities, noise may be more constant and more frequent than existing motorized sources affecting the area of the wilderness adjacent to the area of likely mining development for a period of 30 years or more (see Soundscapes Report).

Night sky obscuration is included in this quality. Operations lighting would result in some degree of changes to the nighttime wilderness character on lands surrounding the area of highest potential for mine infrastructure by increasing sky glow and possibly direct visible glare both from facilities and vehicles. Design features would likely reduce the impact but would not eliminate it (Dark Skies Report).

Based on modelling results described in the Dark Skies Report, wilderness entry points likely to be impacted by this include Farm Lake, Little Gabbro Lake, Little Isabella River, Snake River, South Farm Lake, and South Kawishiwi River. Correspondingly, campsites along Gabbro and Little Gabbro Lakes, the South Kawishiwi and Isabella rivers, South Farm Lake, Bruin, and Cigar Lakes may experience increased night sky brightness as a result of mining operations. Impacts to the night sky brightness may also impact the dark sky certification.

Other Features of Value

The Wilderness Act states that wildernesses “may also contain ecological, geological, or other features of scientific, educational, scenic, or historical use” that reflect the character of this wilderness. Some of these features, such as the presence of threatened and endangered species, are also part of the Natural quality of a wilderness. Other features, however, such as the presence of important geological formations, cultural resources, historical sites, or paleontological localities, do not fit easily into one of the other four qualities. While many different types of features could be included, the intent is to include those that are significant or integral to the wilderness. The other features of value for the wilderness have been identified as “prehistoric cultural resources integral to wilderness” and “historic cultural resources integral to wilderness” (Tricker 2017). No direct impacts are anticipated to these other features of value because no ground disturbing events would occur within the wilderness. However, mining features and mining associated activities can affect cultural and historic sites, even when the features and activities occur outside of the cultural resource site boundary. The introduction of visual, atmospheric or audible elements that diminish the integrity of the property’s significant historic features could adversely affect the setting, feeling, and/or association of the site and compromise the integrity of the site such that it is no longer eligible for listing on the National Register of Historic Places (Cultural Resource Report).

Loss to Science

The Boundary Waters Canoe Area Wilderness is frequently used for scientific research in a largely unmodified landscape. Any long-term changes to wilderness ecological processes could preclude this wilderness from this type of research, in particular the portion of the wilderness closest to the area of highest potential for mine infrastructure.

Mineral Exploration

There would be no effects to the untrammeled and undeveloped qualities, or the other features of value.

Natural Quality

There is a risk that project activities could cause the spread of non-native invasive plants. There is a much lower risk that these infestations would lead to new infestations in the Boundary Waters Canoe Area Wilderness due to the challenge of dispersal and establishment of these species and the small area of disturbance from minerals exploration. Resource stipulations requiring treatment of non-native invasive plant infestations at these sites would be implemented as invasives are found and would keep impacts from invasives at a relatively low level. Such treatments at currently existing drill pads and access roads have been occurring annually since 2016 and they have maintained low non-native invasive plants abundance at existing drill pads (see the sensitive species and non-native invasive species reports).

The 2012 Federal Hardrock Mineral Prospecting Permits Final Environmental Impact Statement (2012 prospecting permits EIS) found that surface water impacts, if any, would be localized to the area of the well pad and would be small. It concluded “(t)here would be few, if any anticipated adverse effects to surface water quantity or water quality in the analysis area, including relevant portions of the Boundary Waters Canoe Area Wilderness and Voyageur’s National Park from proposed activities including new temporary water crossings.” (2012 prospecting permits EIS; Water and Aquatic Species Report).

The 2012 prospecting permits EIS also concluded that air quality effects to the wilderness area's Type I airshed from prospecting would be minimal.

Solitude or Primitive and Unconfined Recreation

Effects to this quality were expected to be minor, because drilling normally occurs during winter months and stipulations would reduce sound emissions affecting the wilderness (see the Soundscapes Report). Drilling would typically occur on a continual basis for several weeks and depending on the level of visitation during that time, visitors participating in outdoor recreation could be impacted. The level of impact would be largely dependent on their proximity to drilling sites. Impacts would be temporary during drilling and prior to reclamation. Drilling activities would be adjusted away from recreation sites and bodies of water. Visibility of drill pads and equipment may have temporary impacts within the wilderness during leaf-off conditions in deciduous forest. Depending on the type of vegetation and where the drill pads would be located, it could be possible for visitors to see equipment from the Boundary Waters Canoe Area Wilderness. Forest openings created for prospecting would generally re-vegetate within one to two years and would also be similar in size, shape and edge characteristics to natural openings in the landscape. Effects to scenery would be minimal (see the Scenery Report).

Dark Skies

Exploratory drilling does have the potential to operate during nighttime hours (2012 Federal Hardrock Mineral Prospecting Permits Record of Decision). Previous analysis applied mitigations to such activities. These stipulated that a reduction in light pollution generated at drill sites by pointing lighting sources for drill rigs downwards and/or shielding lighting as feasible while completing safe drilling operations. Using the estimates from the prior analysis, up to 10 light sources might be present from drilling operations at a given time. Because drilling operations would be temporary, impacts from artificial lighting would also be temporary and end with the completion of operations (see the 2012 prospecting permits EIS and ROD). Prospecting and exploration would not result in long-term impacts on the night sky brightness in the Boundary Waters Canoe Area Wilderness (see the Dark Skies Report).

Recreation

This section summarizes the effects of the alternatives on recreation resources. See the Recreation Report for more information on this analysis. Potential effects to recreation in the Boundary Waters Canoe Area Wilderness are discussed briefly. For information on potential effects on wilderness, see the "Wilderness" section of this environmental assessment and the corresponding resource report.

Alternative A – Proposed Action (Withdrawal)

Under alternative A there would be no direct or indirect effects to recreation because the withdrawal would provide certainty that no new prospecting permits or mineral leases would be authorized. Alternative A would avoid the potential effects and risk to recreation resources described under alternative B.

Alternative B – No Action (No Withdrawal)

In many areas of the withdrawal application area, individual opportunities for recreation activities would continue without changes. However, in areas where mineral development was occurring, changes in recreational opportunities would also occur. The effects are not expected to be distributed evenly across the analysis area. For mining, it is anticipated that the most intense effect

would occur within the western portion of the withdrawal application area within and near the area of highest potential for mine infrastructure. This would include recreational activities near Birch Lake, South Kawishiwi River, and the Boundary Waters Canoe Wilderness Area entry points near Gabbro and Little Gabbro lakes. Prospecting could occur anywhere within the withdrawal application area.

Mineral Development

Most opportunities for dispersed recreation would not be directly impacted; however, visitors may choose to avoid areas during mineral development, leading to short term and long-term displacement of recreation use. There is a potential for mineral development to impact the remote recreation experience currently available, due to the increased presence of people and equipment and the associated noise related to the development. Of all the potential mining activities discussed below, the transportation of materials, the visual aspect, and the noise associated with operations are likely to affect recreation patterns the most. Other potential impacts that could indirectly affect recreation would include any long-term degradation of wildlife habitat or aquatic resources.

Transportation of materials and use of heavy equipment would impact recreational activities in both the short and long term due to noise, dust, and congestion. Research on the impact of noise pollution on landscapes suggests sounds from mineral development could impact people recreating a short distance from the actual project activities. Soundscape research in Rocky Mountain National Park suggests visitors travel an average of at least a half mile from common noise factors in order to reach natural quiet (Park et. al. 2009). The intensity of the impact would depend on the distance a person is from the mining activity and the sound dispersive/absorptive characteristics of the terrain in the area. While the specific mitigations, location, area of audibility, and sound levels produced by minerals development are uncertain for this analysis, effects are likely to occur within and adjacent to the area of highest potential for mine infrastructure. Where these effects occur, the more constant and longer-term noise that reaches receptors²² is likely to adversely affect the recreation experience. This is because of the 24 hours a day, 365 days a year, multi decade duration of noise from minerals development activities, the potential for receptors to be located very close to noise sources, and the low ambient sound levels in the area. While mitigation such as an electric mining fleet would reduce these impacts, and it is likely projects could be designed to meet Minnesota Rules on noise, it would still be audible depending on location. Noise from mining may be more constant and more frequent than existing motorized sources affecting some of these receptors for a period of 30 years or more. This is most likely in the Birch Lake and South Kawishiwi River area, which includes campgrounds, resorts, trails, dispersed recreation, water-based recreation, and private residences. Refer to the Soundscapes Report for additional information.

Processing ore and on-site activities, including underground mining, could displace dispersed users or these users could have a lower quality experience due to noise, equipment activity, and dust. The presence of work trucks, additional people in the area, helicopter overflights, staging of mining equipment, or an increased frequency of traffic in a specific area could discourage use of that area. This could cause long term changes in recreation use patterns, lasting as long as the life of a mine. The most intense long-term effects would be to campers at the dispersed, developed rustic sites, depending on where the mining activities were located and how much terrain and vegetation screened or muffled noise from these activities. Trail access would likely not be affected, unless a

22. Receptors of potential relevance in the analysis area include but are not limited to residences, resorts and group camps, and designated campsites and campgrounds.

specific mining activity such as a temporary road crossed the trail tread or if there were temporary closures associated with initial development. However, impacts to visual resources as well as any dust, noise, or traffic could degrade trail users' experiences.

Birch Lake and South Kawishiwi developed campgrounds are located in the area of highest potential mine infrastructure (figure 1). These are popular sites for both overnight and day use. While mining activities would not occur within the recreation site boundaries, users could be affected in the short and long term by associated noise, traffic and equipment activity, depending on where a mine footprint was located and stipulations.

Aboveground tailings and rock storage pose the risk of acid mine drainage into water. Acid mine drainage can increase lake and stream acidity, with potential risks to aquatic life including sport fisheries. A decline in water quality and aquatic species would also have an adverse indirect effect on recreational visitors. These effects could include impacts from consuming contaminated water and a decline in fisheries, decreasing fishing opportunities and threats to human health from fish consumption.

Aboveground waste and water storage and facilities for waste and storm water could adversely impact aesthetics when viewed by people recreating in the area. This impact would be confined to the site-specific area where the facilities were located and would likely affect people wishing to use dispersed camping sites. Other users may avoid that area and choose other places to recreate. The level of impact would depend on how many of these facilities were constructed and their footprint. The area used by mining infrastructure is estimated at 2,600 to 5,700 acres in the reasonably foreseeable development scenario and would be located within the area of highest potential for mine infrastructure displayed in figure 1. This could cause long term changes in use of the specific area from where these facilities can be seen.

Water withdrawal is not likely to affect recreation patterns in the locations where it would likely occur, however, project activities associated with withdrawal would introduce additional noise and traffic in the area of withdrawal, including water truck traffic, pumps, and the visual intrusion of pipelines. Though Birch Lake is a popular recreation site, the expected water withdrawal is not expected to be noticeable to visitors, should this water source be used for mineral development.

Alternative B would not change current permitted uses by outfitters and guides. Permit users could be displaced to other areas inside or outside the withdrawal application area, but that potential displacement would depend upon timing, intensity, location, and other site-specific disturbance caused by mining and stipulations to mitigate the impacts.

There are several examples in the region where recreation opportunities such as swimming beaches, campgrounds, hiking and biking trails, fishing piers, docks and boat ramps, and interpretive or historical sites were developed around or adjacent to past open pit mining sites. While this is a potential for future mines after reclamation, the timing and safety is unknown depending on mine type, mining longevity, and site safety.

Boundary Waters Canoe Area Wilderness

Potential impacts to recreation for wilderness users include sights and sounds of equipment, particularly at the wilderness entry points located in the area of highest potential mine infrastructure and near the wilderness boundary directly adjacent to this area. In addition, if water quality in the wilderness is adversely affected, it could also adversely affect the recreation experience and fishing opportunities in this water-based wilderness. In the long term, visitors may

begin to choose other locations of travel, resulting in unnatural changes in travel patterns, increasing congestion and competition over quota permits in the rest of the wilderness. Refer to the wilderness, water and aquatic species, and soundscapes reports for additional information.

Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum setting may change in the area of highest potential mine infrastructure, though this is largely dependent on the intensity and amount of mining development and stipulations associated with each permit. The majority of the withdrawal application area is classified semi-primitive motorized (78 percent). In this class, motorized use is expected to be visible and audible. However, the theme of natural appearing landscape and lower encounters could be compromised, depending on the location and development associated with each proposal. To maintain consistency with the forest plan, any future minerals developments could need mitigations if the Recreation Opportunity Spectrum classifications were likely to be altered. These mitigations could include placement of facilities, prohibitions on new roads, and requirements around timing of operations. However, restrictions on timing of operations are unlikely to be economically feasible, as discussed in the Soundscapes Report.

Mineral Exploration

The 2012 Federal Mineral Prospecting Permit Final Environmental Impact Statement disclosed potential impacts to recreation that are applicable to this analysis. The main impacts to recreation would be noise from operations, location of drill sites if these were near trail corridors or in dispersed recreation areas, traffic on existing roads, and development of temporary roads that could cross existing trail systems. Developed recreation would not be directly affected because prospecting would not occur within campgrounds, parking areas, or boat launches during the managed use season, but noise could carry to these locations. Because drilling would typically occur on a continual basis for several weeks, visitors participating in outdoor recreation could be impacted by ongoing drilling noise and choose to recreate elsewhere. The level of impact would be largely dependent on their proximity to drilling sites and sound reduction stipulations. See the Soundscapes Report for more information.

Dark Skies

This section summarizes the effects of the alternatives on dark skies. See the Dark Skies Report for more information on this analysis. For information on potential effects on wilderness character as it relates to dark skies, see the “Wilderness” section of this environmental assessment and the corresponding resource report.

Alternative A – Proposed Action (Withdrawal)

Under alternative A there would be no direct or indirect effects to dark skies because the withdrawal would provide certainty that no new prospecting permits or mineral leases would be authorized. Alternative A would avoid the potential effects and risk to night sky brightness described under alternative B. With no new minerals management authorizations, there would be no mining related introduction of light sources capable of increasing sky glow (indirect glow in night sky from unseen light sources) or direct glare from visible light sources. No change in International Dark Sky Sanctuary certification would occur.

Alternative B – No Action (No Withdrawal)

Mineral Development

Anthropogenic Light Ratio

The impact of light pollution on dark skies is calculated via a measure termed anthropogenic (human activity generated) light ratio. Anthropogenic light ratio is the proportion of artificial light compared to the brightness of the night sky. The withdrawal area is already affected by some light pollution as measured by anthropogenic light ratio and satellite imagery of the area. Most of the area falls into the “good” or “moderate” condition classification per Moore et al. 2013. The bordering wilderness area lands fall into the “good” condition classification per Moore et al. 2013, meaning an anthropogenic light ratio of less than 0.33 for lands in the Boundary Waters Canoe Area Wilderness.

Potential sources of light pollution associated with infrastructure necessary for processing ore, tailings, transportation, and the like include but would not be limited to vehicle traffic around the plant site and tailings management site, safety lighting for walkways or driving corridors, and entry and exit lighting for infrastructure. The amount of lighting emitted by these developments would vary based on specific design elements such as facility layout, number and placement of lighting fixtures, as well as the chosen method of illumination (for example, metal-halide fixtures versus high or low-pressure sodium, white LEDs versus amber LEDs, etc.). Operations lighting would result in some degree of changes to the dark skies by increasing sky glow and possibly direct visible glare both from facilities and vehicles. Design features would likely reduce but not eliminate the impact.

Current operating mines with underground operations extracting minerals similar to those likely to be mined in the withdrawal application area were used to measure and predict potential changes to anthropogenic light ratios around mine infrastructure. In each of the comparisons, the simplified all-sky light pollution ratio model demonstrated higher anthropogenic light ratios around mine infrastructure. The distribution and intensity of the light emission appears to vary with the topography, location, and size of the facilities.

The model for the most directly comparable facility and the only one with directly comparable vegetation and topography, Eagle Mine in Michigan’s Upper Peninsula, was superimposed over the area of likely highest potential mine development. The result of this GIS analysis was an increase in the anthropogenic light ratio of the area of highest potential mine development from the 0.08 to 0.16 category to the 0.16 to 0.32 category for the bulk of the area, and an increase of the anthropogenic light ratio above 0.33 for a small portion of the withdrawal application area. These are relatively coarse comparisons but do indicate that the development of mine infrastructure in the area is likely to increase the brightness of the area of highest potential mine development and neighboring sections of the wilderness. With up to three mines, there would be a compounding effect from anthropogenic light, but the degree of the compounding effect would depend on how much brightness is introduced by each mine’s design and the spatial relationship between the three mines.

Sky Quality

The Boundary Waters Canoe Area Wilderness is certified as an International Dark Sky Sanctuary. Sky quality measures the brightness of the night sky in magnitudes per square arc. In order to meet the criteria for an international dark sky certification, an area must routinely have a night sky

brightness at the zenith equal to or darker than 21.5 magnitudes per square arc second²³ in the visual band and significant light domes are not present toward the local horizon in any direction. The average from all sky quality meter readings in the Boundary Waters Canoe Area Wilderness is 21.64 mag_v/arcsec².

Anthropogenic light ratio and sky quality meter readings are positively correlated. In other words, brightening the night sky will increase the anthropogenic light ratio value and have the potential to increase the zenith brightness measured by the sky quality meter used to support the dark sky sanctuary status. The increase in anthropogenic light ratio would need to consistently approach 0.5000 to correspond roughly to a sky quality meter reading of 21.4981, with this number in turn corresponding to a reading of the night sky zenith brighter than 21.5 mag_v/arcsec², which is the cut-off threshold for dark sky sanctuary certification.

The modeling done for this analysis and review of anthropogenic light ratio around other underground mines selected for comparison indicates that the areas around mining infrastructure can display anthropogenic light ratio values corresponding to night sky zenith readings brighter than 21.5 mag_v/arcsec², though this varies between different mines and areas. With up to three mines, there could be a compounding effect, which could impact the dark sky certification.

Efforts would likely be made to mitigate and monitor those possible light pollution sources. Possible mitigation might include actions related to any part of the proposed project that includes a lighting plan. Mitigation would likely reduce but would not eliminate impacts.

Mineral Exploration

Mineral exploration generally would have a smaller impact than a full mining operation because of the smaller footprint size and shorter timeframe. Exploratory drilling does have the potential to operate during nighttime hours (2012 Federal Hardrock Mineral Prospecting Permits Record of Decision). Previous analysis applied mitigations to such activities, and these or similar mitigations are assumed here. These stipulated that a reduction in light pollution generated at drill sites by pointing lighting sources for drill rigs downwards or shielding lighting as feasible while completing safe drilling operations. Using the estimates from the prior analysis, up to 10 light sources might be present from drilling operations at a given time. Because drilling operations would be temporary, impacts from artificial lighting would also be temporary and end with the completion of operations (see the 2012 prospecting permits EIS and ROD). Based on the above, and implementation of best lighting practices, it is unlikely that infrastructure associated with prospecting and exploration within years 0 to 20 of the reasonably foreseeable development scenarios would exhibit long-term impacts on the night sky brightness in the Boundary Waters Canoe Area Wilderness.

Soundscapes

This section summarizes the effects of the alternatives on soundscapes. See the Soundscapes Report for more information on this analysis. For information on potential effects from noise on wilderness character and receptors outside the wilderness, see the “Wilderness,” “Recreation,” and “Terrestrial Wildlife” sections of this environmental assessment and corresponding resource reports.

23. The higher the number, the darker the night sky (less light pollution).

Alternative A – Proposed Action (Withdrawal)

Under alternative A there would be no direct or indirect effects to the soundscape because the withdrawal would provide certainty that no new prospecting permits or mineral leases would be authorized. Alternative A would avoid the potential effects to soundscapes described under alternative B.

Alternative B – No Action (No Withdrawal)

An extensive monitoring effort for ambient sound levels in Northeastern Minnesota, including in the analysis area, was made as a part of the Minnesota Environmental Quality Board Regional Copper-Nickel Study (Sipson 1978). The general technical report “Mapping Wilderness Character in the Boundary Waters Canoe Area Wilderness” identifies the median (L50) ambient sound level during the day in the Boundary Waters Canoe Area Wilderness as 34 A-weighted decibels (dBA). Taking these available data into account, and giving greatest weight to the Copper-Nickel Study, it is assumed that the median (L50) ambient sound level in the analysis area is 34 dBA during the day and 25 dBA at night. The L90 ambient sound level is assumed to be 15 dBA at night.

Mineral Development

Noise from mineral development activities was analyzed by evaluating the indicators of type of sound, duration of sound, sound levels, and area of audibility. The analysis considers potential mitigations of an electrified mining fleet along with other sound reducing measures such as locating air intake fans underground. See the Soundscapes Report for more information.

Impacts to receptors outside the wilderness would depend on the location of mining activities. While mitigation such as an electric mining fleet would reduce these impacts, and it is likely projects could be designed to meet State of Minnesota noise regulations, it would still be audible depending on location. Noise from mining may be more constant and more frequent than existing motorized sources affecting some of these receptors for a period of 30 years or more. This is most likely in the Birch Lake and South Kawishiwi River area, which includes campgrounds, resorts, trails, dispersed recreation, water-based recreation, and private residences. See the “Recreation” section of this environmental assessment and resource report for more information.

Impacts to the wilderness would depend on the location of mining activities. While mitigation such as an electric mining fleet would reduce these impacts, impacts may still occur depending on mine location. Depending on the location of mining activities, noise is likely to be more constant and more frequent than existing motorized sources affecting the wilderness adjacent to the area of highest potential mine infrastructure for a period of 30 years or more. See the “Wilderness” section and resource report for more information.

Mineral Exploration

The 2012 Federal Mineral Prospecting Permit Final Environmental Impact Statement (2012 prospecting permits EIS) contains a thorough analysis of sound from minerals exploration and covers the potential effects of prospecting under alternative B in this analysis. Exploratory drilling is the minerals exploration activity with the greatest potential effects on soundscape, and thus will be focused on this section.

The alternatives analyzed in the 2012 prospecting permits EIS represent potential mitigations that could be applied under alternative B of this analysis. Minerals exploration under alternative B of this analysis in may result in the following impacts, as stated in the 2012 prospecting permits EIS:

- There would be minor to moderate impacts in areas outside the wilderness. Moderate impacts would be more likely under alternatives 2 and 4 for people located outside buildings, particularly for tent campers located near drill sites. Alternatives 3 and 5 would usually cause minor impacts, although moderate impacts may still occur for receptors very close to a drill site.
- There would be minor impacts to opportunities for solitude for alternatives 3, 4 and 5 due to mitigations that reduce sound levels reaching the wilderness. There would be minor to moderate impacts to opportunities for solitude for alternative 2.

Scenery

This section summarizes the effects of the alternatives on scenic resources. See the Scenery Report for more information on this analysis.

Alternative A – Proposed Action (Withdrawal)

Under alternative A there would be no direct or indirect effects to scenery resources because the withdrawal would provide certainty that no new prospecting permits or mineral leases would be authorized. Alternative A would avoid the potential effects and risk to scenery resources described under alternative B.

Alternative B – No Action (No Withdrawal)

Mineral Development

Mining infrastructure, including tailings facilities, buildings, conveyors, utilities, and ore processing poses a risk to scenery resources through clearing of vegetation and landform alterations. If the footprint of mining operations is a geometric pattern, that would have a high impact to the scenic character impacting form, line, color and textures of the adjacent landscape.

To support mining activities, a variety of transportation methods could be used such as railways, pipelines, and access roads. Utility corridors may also be necessary to support mining operations. Transportation and utility corridors are inherently linear features that pose risks to scenic resources. New linear corridors could greatly contrast with natural scenic characteristics of the area impacting form, line, colors and textures of the landscapes. These corridors would be very evident to forest visitors depending on the viewing location and duration of view.

Risks to scenic resources from dry stack tailings storage and waste rock storage are the contrast of the unnatural vertical tailings piles with the natural scenic characteristics. New vertical tailings piles would contrast with natural lines, colors and forms of the surrounding landscape. The level of impact is related to the frequency of viewing locations a tailings pile can be seen and the duration a visitor can see the tailings pile. Risks to scenic resources from aboveground wet basin tailings storage and impoundment storage of mine tailing activities are the contrast of these structures and facilities with the surrounding natural landscape. Basins or dams built with geometric shapes would have the greatest contrast to surrounding natural landscape characteristics, which could be mitigated through stipulations.

Risks to scenic resources from water withdrawals, diversions, collection, storage, treatment and related facilities are the contrast of the treatment facilities and noticeable changes to the natural waterbody shape and size along with impacts of clearing vegetation and landform alterations.

Risks to scenic resources from heavy equipment operations are the sight and duration of viewing the equipment. If heavy equipment can frequently be seen from roads, developed recreation sites and trails in the High scenic integrity objective areas, observing heavy equipment is not part of the natural landscape characteristics. Operations at night would create artificial light that would impact the surrounding landscape characteristics. Refer to the dark skies analysis for additional information on impacts of artificial light.

Depending on the proximity to Boundary Waters Canoe Area Wilderness, if any of the mineral development infrastructure identified above is visible within four miles into the wilderness area, the sites may appear unnatural to wilderness visitors.

Impacts to scenery resources from mining, prospecting, and associated infrastructure described above could impact scenery for decades during operations. While mitigations described in the Scenery Report would likely reduce impacts during mining operations, it would be very challenging to meet high and moderate scenic integrity objectives. Upon closure and restoration of the mining operations area, effects would be minimized if scenic design features and stipulations are implemented. One exception may be long-term aboveground storage of waste rock and tailings.

Mineral Exploration

This analysis incorporates by reference the 2012 Federal Hardrock Mineral Prospecting Permits Environmental Impact Statement (2012 prospecting permits EIS), which states “Some drill sites may be located within the High scenic integrity objective areas along main travelways or on lakes and the drilling activity and machinery would be visible for the duration of the operation. Forest openings created for prospecting would generally re-vegetate within one to two years and would also be similar in size, shape and edge characteristics to natural openings in the landscape.”

The 2012 prospecting permits EIS includes stipulations to protect scenic resources and visual integrity by minimizing evidence of management activities, ensuring cleanup is concurrent with project completion, and restoring roads and trails to a natural appearance. Stipulations to protect scenery include a requirement for no surface occupancy in developed recreation facilities (e.g., campgrounds and trailheads), removal of flagging and other equipment upon completion of project activities, and to adjust the location of drill sites up to 100 feet if the mechanized activities can be viewed from travelways, recreation sites, and bodies of water with access. Reclamation requirements would also reduce impacts by requiring actions to return disturbed areas to a natural condition.

Terrestrial Wildlife

This section summarizes the effects of the alternatives on special status terrestrial wildlife species. Special status species include federally threatened, endangered and proposed species and their critical habitats listed under the Endangered Species Act of 1973, as amended; U.S. Forest Service Region 9 Regional Forester sensitive species (USDA FS 2021b); and management indicator species as designated in the 2004 Superior National Forest Land and Resource Management Plan (USDA FS 2004a). See the Terrestrial Wildlife Report for a complete list of all special status species and more information on this analysis.

Alternative A – Proposed Action (Withdrawal)

Under alternative A there would be no direct or indirect effects to special status terrestrial wildlife or their habitat because the withdrawal would provide certainty that no new prospecting permits or mineral leases would be authorized.

Alternative A is administrative in nature and does not involve any specific ground disturbance or other actions that may cause environmental changes to wildlife resources. Thus, there will be no effect to any special status wildlife species or habitat from alternative A.

Alternative B – No Action (No Withdrawal)

Any new mines or prospecting permits would undergo project-level NEPA analysis including a detailed analysis of effects to special status terrestrial wildlife species and would also be subject to forest plan standards and guidelines and relevant laws and policies. Analysis could include site-specific surveys to increase knowledge of species occurrence as well as protective measures. Special use permits and operating plans issued for prospecting would also include a list of stipulations. For example, see stipulations in the Federal Hardrock Mineral Prospecting Permits Final Environmental Impact Statement (USDA FS 2012). All of these requirements would serve to reduce, but not eliminate, adverse effects on wildlife and wildlife habitat.

Habitat

Habitat effects include alteration and removal of habitat, including removal of vegetation and disturbance to soils or substrates in aquatic, riparian, and upland habitats. Such disturbance can also cause direct mortality to individuals and impacts to populations by affecting the breeding, feeding, and sheltering habitats for species or result in fatalities of individuals (for instance when a tree is cut down containing a nest with young or a roosting bat).

Mineral Development

The installation of mining infrastructure, including facilities, roads, and storage areas would alter or remove habitat both temporarily and permanently for many species. The potential three mines would remove from 2,600 to 5,700 acres of management indicator habitat. There is a total of 27,344 acres of management indicator habitat in the area of highest potential for mine infrastructure thus proportion of management indicator habitat affected could range from 10 percent to 21 percent. Due to the uncertainty of the spatial location of future mines within the area and the extent of indirect effects, it is not feasible to know what proportion of each individual habitat could be affected, nor the magnitude of effect on the Regional Forester sensitive species. While habitat alteration and/or removal would impact many sensitive species, it would likely not be to the level of causing a trend toward federal listing. None of the Regional Forester sensitive species are endemic to just the area of highest potential for mine infrastructure and there is sufficient habitat throughout the remainder of the analysis area.

Several Minnesota Biological Survey areas of high biodiversity significance are located within the area of highest potential for mine infrastructure: Babbitt Fen-St. Louis Co., Gabbro August, Kawishiwi Triangle, and Stony Mosaic. In addition, much of the Rainy River watershed is identified as “far above average resilience” to climate change in a Nature Conservancy climate resiliency landscape assessment²⁴ because of its connected, diverse climatic conditions and relatively low levels of human modification. Due to the uncertainty of the spatial location of future

24. The Nature Conservancy Resilient Land Mapping Tool, <https://maps.tnc.org/resilientland>.

mines within the area and the extent of indirect effects, it is not feasible to know what proportion of each individual high biodiversity area or connectivity could be affected. A portion of the wildlife habitat in these areas may be eliminated or impacted in the long term if mining infrastructure (estimated at 2,600 to 5,700 acres in the reasonably foreseeable development scenario) is located within or indirectly impacts these areas.

Threatened species' federally designated critical habitat for both Canada lynx and gray wolf could be adversely modified by such extensive habitat alteration and permanent removal of critical habitat. Additionally, suitable habitat for lynx, wolf, and northern long-eared bat could be adversely affected. The area of highest potential for mine infrastructure is overlapped by Lynx Analysis Units 9 and 10. Lynx Analysis Units approximate a lynx home range and are a unit of measure for analyzing impacts to lynx per the forest plan. While neither of these Lynx Analysis Units currently exceed thresholds for lynx foraging, denning, unsuitable habitat, percent connectivity, or road and trail densities, the construction of a mine(s) and connected activities would cause a negative trajectory for these measures and indicators. The potential for developing up to three mines would result in removing 2,600 to 5,700 acres of critical habitat for wolf and lynx for at least the life of the mine; and in some cases, permanently. Depending on the location of the mines, it is likely that lynx and wolf foraging and denning habitat would be removed. Road densities would increase for the life of the mines, and perhaps beyond. Both the mine-related roads and the mines would increase habitat fragmentation and reduce connectivity. Northern long-eared bat roosting habitat would be lost as well. All of these impacts would adversely affect these species.

Mineral Exploration

Under alternative B, the construction of temporary roads and well pads may alter or temporarily remove habitat on approximately 60 acres of the requested withdrawal lands. The impact to special status species is discountable because the presence and impact of the well pads and temporary roads will be spread out in time and space over a 20-year period. Temporary roads and well pads for prospecting permits are temporary and often only utilized for a few years thus would not all be in use at the same time. Final reclamation of well pads and decommissioning of temporary roads occurs after drilling, and testing has been completed and will usually occur within ten years, thus these habitat impacts are negligible, particularly at the scale of the analysis area.

Disturbance

Disturbances effects include those activities that may impact species and individuals during critical times of their life cycles, including breeding seasons, typically during the spring. Activities conducted at these times can impact all species of concern. Activities that create elevated sound levels or result in close visual proximity of human activities at sensitive locations (e.g., nest trees) have the potential to disrupt normal behavior patterns (USDI FWS 1992, Ruediger et al. 2000, USDI FWS 2015). Studies of the effects of human disturbance upon wildlife have revealed that the immediate postnatal period in mammals and the breeding period in birds are periods when individuals are most vulnerable to disturbance (USDI FWS 1992, Ruediger et al. 2000, USDI FWS 2015).

Mineral Development

Under alternative B, mining operations involving noise, lighting, and vehicle and heavy equipment use is likely to disrupt wildlife. The Regional Forester sensitive species present in the area of highest potential for mine infrastructure are well distributed and mobile species. However, all three threatened species present in the analysis area and area of highest potential for mine infrastructure are likely to be adversely disturbed by the scope and scale of mines and connected mining activities.

Mineral Exploration

Under alternative B, drilling and temporary road construction and reconstruction related noise could occur from a few days to a few weeks surrounding each prospecting location. Rough estimates of scale include 168 drill pads and 13 miles of temporary road which could be installed in the 20-year analysis timeframe. These noise-related impacts would not all overlap in space or time and would be spread out over 20 years. The short duration of noise disturbance could affect some species but is dependent on the season, noise levels, distance to animal, as well as the behavioral tolerance of the individual. The analysis area already contains numerous sources of noise such as vehicles travelling on roads, logging activities, private land residences and associated activities such as chainsaws for processing firewood, small communities with commercial operations, etc. Thus, while the prospecting permit noise intrusion may affect species, it is considered speculative, insignificant and discountable.

Mortality

Mineral Development

Under alternative B, there could be mortality of individuals of a species from mining operations and connected actions. Examples include tree/shrub removal during mine facility and/or road construction which results in a roosting bat or nesting young bird fatality; wolf or butterfly mortality from vehicle collision; a lynx poached due to displacement and/or facilitated road access (even if only foot traffic which would be allowed on admin use roads). For Regional Forester sensitive species, individuals may suffer project-related mortality but not to the point of causing a loss of viability or a trend towards federal listing. A loss of viability or trend towards federal listing would only occur if a large portion of the species' population was eliminated. All the Regional Forester sensitive species present in the area of highest potential for mine infrastructure are well distributed and mobile species. All three threatened species present in the analysis area and area of highest potential for mine infrastructure are likely to be adversely affected via mortality by the construction of mines, direct habitat loss and the connected mining activities such as increased vehicle traffic and toxic chemicals which may enter the environment via routes such as fugitive dust (USEPA 1997) or spills and leaks into water bodies. The release of contaminants such as heavy metals into the environment may adversely affect wildlife and wildlife habitat (USEPA 1997, Ali et al. 2019). The magnitude, duration, and severity of effects would depend on the characteristics of a release.

Mineral Exploration

Under alternative B, there could be mortality of individuals of a species from prospecting permit connected actions. Examples include tree and shrub removal during well pad or temporary road construction that results in a roosting bat or nesting young bird fatality; wolf or butterfly mortality from vehicle collision on one of the temporary roads; a lynx poached due to facilitated road access (even if only foot traffic which would be allowed on admin use roads). While individuals could be impacted, none of the terrestrial wildlife species would be affected at the population level within the analysis area, thus the impacts are discountable and insignificant.

Botany

This section summarizes the effects of the alternatives on Region 9 Regional Forester sensitive species plants. A biological evaluation was prepared in accordance with Forest Service Manual sections 2670.3, 2670.5 (3), 2672.4. The biological evaluation includes a complete list of all Regional Forester sensitive plants known or expected to occur on the Superior National Forest.

Species that do not have potential habitat present or are not known to occur within the withdrawal boundary were identified, but not analyzed in the biological evaluation. There are no known threatened, endangered, or proposed plant species on the Superior National Forest.

Alternative A – Proposed Action (Withdrawal)

Under alternative A there would be no direct or indirect effects to Regional Forester sensitive plants because the withdrawal would provide certainty that no new prospecting permits or mineral leases would be authorized. Alternative A would avoid the potential effects and risk to sensitive plants described in alternative B.

Alternative B – No Action (No Withdrawal)

Habitat groups were used to help evaluate the potential effects of this project on Regional Forester sensitive plants. Grouping plants by habitat reduces the amount of repetition in the analysis.

Habitats in the biological evaluation are grouped as follows:

- Group 1 – Plants of Shallow Water, Non-Forested Wetlands, and Riparian Areas
- Group 2 – Plants of Cliffs and Talus Slopes
- Group 3 – Plants of Upland Disturbed Areas
- Group 4 – Plants of Forested Wetlands
- Group 5 – Plants of Northern Hardwood Forests
- Group 6 – Plants of Dry to Mesic Upland Forests

Mineral Development

Groups 1 and 4

Ground disturbance directly impacts suitable habitat, and while any potential mine development would most likely attempt to avoid impacts to wetlands, some impacts would likely occur. Wetlands could be filled if they were in the footprint of some mining infrastructure such as a road, waste rock storage area, dry stack tailings pile, or processing plant; filling would permanently destroy suitable habitat. Wetlands could also be impacted by construction activities if a water pipeline or transmission corridor were built across them. This type of damage would likely cause short term impacts to habitat associated with rutting. Wetlands could also be impacted by dewatering the mine, reducing water levels if there was a hydraulic connection between the wetlands and mine.

Suitable habitat in group 1 could be adversely affected by mining-related water pollutants. Water at a typical mine would be reused in mining processes, but some could be discharged under an effluent discharge permit. This discharge would be treated and would likely cause no issues for Regional Forester sensitive plant suitable habitat. However, if the water treatment fails for some reason, such as a tailings basin dam failure, and a large discharge of untreated water enters the waterbody, it could result in impacts to sensitive species plant suitable habitat.

If a water pipeline or transmission corridor were built across habitats in group 4, they could be harvested and kept as a young age class which would make this would make the habitat unsuitable for as long as the infrastructure was kept in place.

Groups 2, 3, and 6

Ground disturbance directly impacts suitable habitat, and many mining activities could cause such disturbances, including creating an opening for an underground mine, building a processing plant, building a linear corridor such as for a water pipeline or power transmission corridor, building and operating a dry stack or wet basin tailings storage area, building and operating a waste rock storage area, or building and operating a waste or stormwater management facility. All these activities could alter or remove habitat for sensitive species in these groups.

While some areas would become unsuitable, other areas impacted by ground disturbance could actually turn into suitable habitat for species in group 3 as the vegetation recovers. The species in this group like somewhat weedy, healed-over disturbed areas. The creation of new early seral habitats through project activities would likely perpetuate suitable habitat for species in group 3.

Groups 1 through 4, and 6

Both ground disturbance and transportation activities would increase the chances of non-native invasive plant infestation in suitable habitat for these. Non-native invasive plants can indirectly degrade suitable habitat and thus cause further impacts for species in these habitat groups. See the “Non-Native Invasive Species” section of this environmental assessment and the associated report for additional information.

Group 5

There is no suitable northern hardwoods forest habitat for these species within the area of highest potential mine development, so there would likely be no impacts from mine development to these species.

Mineral Exploration

The effects of mineral prospecting on Regional Forester sensitive plants were analyzed in the biological evaluation for the 2012 Federal Hardrock Mineral Prospecting Permits Final Environmental Impact Statement; those effects are summarized below and in the biological evaluation for this environmental assessment.

Groups 1 and 4

Mineral exploration would cause minor impacts to suitable habitat for these species. Drill pads may be constructed in wetlands, and access roads may cross wetlands. Despite stipulations requiring such uses to be in frozen conditions, some minor impacts to suitable habitat for these species would occur. Frozen wetland soils could be slightly compacted by these activities, thus impacting habitat, or hydrologic changes such as localized ponding could occur. Another potential activity that could impact wetlands is removal of water from lakes, ponds, or streams for drill operations. The quantity of water used would be small enough that only minor potential impacts to aquatic Regional Forester sensitive plant habitat would be expected.

Group 2

Both the direct impacts of creating drill pads and access roads could cause surface disturbance on rock outcrops and thus adversely affect suitable habitat. Surface disturbance of the thin soil on rock outcrops could also create conditions that favor the spread of non-native invasive plants.

Group 3

Mineral prospecting would be likely to impact suitable habitat in the short term but in the long term be neutral for these species in alternative B. Reconstruction of pre-existing roads for drill pad access could impact habitat for these species. Old roadbeds that do not receive a lot of use are a common habitat for these plants. While these plants seem able to tolerate infrequent disturbance (for example, being driven over for a portion of a year), grading a road would destroy suitable habitat in the short term. At the same time, creation of new temporary roads for this project, would over the long term, probably create suitable habitat for these species. Similar types of effects could be expected from using existing forest openings for drill pads. Despite short term impacts that would impact suitable habitat, over the longer term, this project would probably create suitable habitat and thus have an overall neutral effect on this suite of plants.

Groups 5 and 6

Mineral prospecting activities could have direct adverse effects on suitable habitat for rare plants in this habitat group. The ground disturbance associated with both road and drill pad construction could degrade suitable habitat and make it unsuitable for species in this habitat group over the short term. After temporary roads are decommissioned and drill pads are abandoned, they may gradually become suitable habitat again as succession takes place. Mineral exploration activities could lead to the spread of non-native invasive plants.

Air Quality

This section summarizes the effects of the alternatives on air quality. See the Air Quality Report for more information on this analysis.

Alternative A – Proposed Action (Withdrawal)

Under alternative A there would be no direct or indirect effects to air quality because the withdrawal would provide certainty that no new prospecting permits or mineral leases would be authorized. Alternative A would avoid the potential effects and risk to air quality described under alternative B.

Alternative B – No Action (No Withdrawal)

The relative risk to air quality from a mining operation is proportional to the emissions from the mining and processing activities. Depending on the specific operations present at any particular mine, emissions and air quality effects from these separate activities can range from minimal to severe (Dillon 1986). Prior to commencement of mining operations, a mining facility must apply for and receive all relevant federal and state air quality permits, thereby demonstrating the proposed operations would be in compliance with state and federal air quality regulations. Once operating, a mining facility must provide regular reporting to state and federal agencies as required in permits. Enforcement of rules protecting air quality in Minnesota is delegated to the State of Minnesota under the Clean Air Act. The Minnesota Pollution Control Agency is responsible for implementing and enforcing rules governing any potential releases of point source or fugitive emissions from mining activities.

Mineral Development

Point source emissions associated with this type of mineral development typically includes combustion related emission sources from mining equipment, generators, heaters, and/or vehicles used above and below ground. Point source emission may contain nitrogen oxides, sulfur dioxide,

carbon monoxide, and particulate matter. Building and mine heating can be a minor source of emissions that can be mitigated with clean burner technology or electrification. Reducing tailpipe emissions originating from vehicles can be reduced by using the best performing engine emission reduction technology available at the time (for example Tier 4 engines) or implementing electric vehicle fleets.

Fugitive sources of emissions (i.e., dust) associated with mining operations typically occur during drilling or blasting, handling and transport of waste rock, ore and overburden, traffic on unpaved surfaces, and wind erosion of open areas and tailing storage areas. Fugitive emissions are generally emitted near the ground and settle quickly. Fugitive dust from transport and conveying can be controlled through water sprays and hoods to capture and route the dust through pollution control equipment.

Dry stack tailings storage has a risk of creating fugitive dust during dry and windy conditions. Windy conditions could result in wind erosion that would transport the tailings and deposit them in the surrounding area. The distance traveled would depend primarily on the particle size of the tailings, height of the tailings basin, and wind speed. Fugitive dust from dry stack tailings can be minimized with techniques such as hydroseeding, snow fences, watering the tailings, and minimizing the area of tailings exposed. Fugitive dust may also be generated by traffic on unpaved roads. Water sprays applied would increase moisture content and reduce the likelihood of dust becoming airborne. Chemical dust suppressants may also be used. Further vehicle restrictions, such as limiting vehicle speed, could be used as necessary to control fugitive dust from road travel.

Class I Airshed

The Clean Air Act classified national parks and wildernesses managed by the National Park Service, U.S. Fish and Wildlife Service, and U.S. Forest Service that were of a certain minimum size (5,000 acres for wildernesses) in 1977 as “Class I” areas. Class I areas have the greatest regulatory protection against man-made degradation of air quality. The significance thresholds have been defined by federal land managers with jurisdiction over Class I areas. Significance of a specific project typically depends on several factors, which are considered by the federal land managers on a case-by-case basis. The Boundary Waters Canoe Area Wilderness is classified as a Class I area. Should mineral development ever occur within the area of highest potential for mine infrastructure, a federal new source review permit may be required during the air quality permitting process depending on the level of emissions of the project. If completed, the new source review analysis is intended to ensure a proposed source of emissions would not have adverse effects (as defined under the Clean Air Act) on visibility and air quality related values assigned to the wilderness. This permitting process would reduce but may not eliminate effects to the Class I area. The Minnesota regional haze plan has a section called the “Northeast Minnesota Plan” that also addresses potential new source growth through emission targets.

Mineral Exploration

This report incorporates by reference the analysis in the 2012 Federal Hardrock Mineral Prospecting Permits Final Environmental Impact Statement. The air quality effects from that EIS were found to be minimal. The activities included in the project description are not expected to generate enough particulate matter to threaten the National Ambient Air Quality Standards or threaten sensitive receptors. Drilling activity only affects air quality over a short distance downwind and for only a few days or weeks depending on the phase of the drilling project. After the drilling is complete there is no longer any effect on air quality.

Climate Change

This section summarizes the effects of the alternatives on climate change. See the Climate Change Report for more information on this analysis.

Alternative A – Proposed Action (Withdrawal)

Under alternative A, the analysis area would continue to be impacted by current climate change trends. There would be no direct or indirect effects to climate change because the withdrawal would provide certainty that no new prospecting permits or mineral leases would be authorized. Alternative A would avoid the potential effects and risk related to climate change described under alternative B.

When considering whether the withdrawal alternative would result in a change or increase in greenhouse gas emissions as a result of critical minerals from the withdrawal application area not being available for up to 20 years, there is a lengthy causal chain over long timeframes and multiple global locations outside the withdrawal application area that may or may not be mined, processed, and distributed that influence the amount and timing of minerals availability on the global market. See the Mineral Potential Report for information on the global distribution of these minerals and the Socioeconomics Report for more information on the fungibility of these minerals on a global market. Further, additional variables such as changing technologies used for renewable energy would factor into whether the minerals rendered unavailable for up to 20 years by a withdrawal would result in an increase or change in greenhouse gas emissions, and if so, how much. Given these variables and the small changes in availability of minerals globally caused by the withdrawal, potential indirect effects to greenhouse gas emissions as a result of alternative A are not reasonably foreseeable.

Alternative B – No Action (No Withdrawal)

Mineral Development

The effect of alternative B on climate change is assessed by greenhouse gas emissions it may potentially generate. Assuming an economically viable deposit, sources of greenhouse gas emissions from mineral development include heavy equipment, pipelines, rail, trucks, conveyors, and refining of raw ore (crushing milling, flotation, etc.). Greenhouse gas emissions would be primarily from two energy sources: petroleum and natural gas-derived fuels such as diesel, gasoline, and propane (direct emissions) and off-site electricity use (indirect emissions). While it is speculative to predict specific emissions for this analysis, mining activities could warrant greenhouse gas analysis at the project level. Electrification of heavy equipment may reduce greenhouse gas emissions as compared to diesel powered equipment, depending on the mix of power grid sources.

Maintaining forested areas on the Superior National Forest facilitates the continuation of carbon sequestration and long-term carbon storage. Disturbance activities, specifically land conversion, can lead to substantial carbon losses.

The effects of climate change are not localized. They occur on a global scale and over multiple decades. The Council on Environmental Quality treats climate change as an inherently cumulative issue. On a global scale, climate change is suspected to cause changes in regional temperature cycles, rainfall amounts, and seasonal distribution or precipitation that can result in flooding, droughts, or more frequent and severe heat waves. Forest Service guidance from 2009 states that,

“it is not currently feasible to quantify the indirect effects of individual or multiple projects on global climate change and therefore determining significant effects of those projects or project alternatives on global climate change cannot be made at any scale.”

The effects of observable, ongoing climate change trends to the analysis area are not likely to differ from alternative A; however, mining activity in the area could introduce additional stress to an already stressed system.

For example:

- Increasing temperatures combined with air pollutant emissions from mining operations and employee commuting may increase ground-level ozone concentrations in the analysis area. This presents a health hazard to both personnel and vegetation. The relationship between increasing temperatures and ozone formation remains uncertain (Jacob and Winner 2009).
- Potential drought events combined with vehicle traffic and mining operations may cause an increase in particulate matter. Traffic could be minimized by carpooling or bussing and by application of dust suppressants to roadways.
- Heavy rainfall and flooding have the potential to impact mining infrastructure such as tailing dams, process ponds, and tailings pipelines. This infrastructure may not retain structural integrity, increasing the likelihood of spills and metal leaching. This may result in degraded water and soil quality.
- Increases in erosion and runoff from increasing precipitation and extreme events in combination with warmer temperatures and mine drainage may result in algal blooms, adversely impacting aquatic species by reducing oxygen availability.
- Changes in freshwater temperature in combination with increases in mine drainage from increasing precipitation and extreme events may accelerate biogeochemical (dissolved organic carbon, nitrate, soluble reactive phosphorus, sulfate, etc.) fluxes from sediments to streams, significantly altering water chemistry and impacting aquatic species (Corrales et al. 2011, Duan and Kaushal 2013, Myrbo et al. 2017).
- Changing precipitation patterns and decreased snowpack may decrease the quantity and quality of groundwater available for mining operations.

Revegetation coupled with climate change of the mining site may require both intensive and extensive effort depending on the level of soil degradation. Soil enrichment, weed treatment, and climate-informed seeding may be necessary. Impacts could be lessened by development of a climate-informed reclamation and closure plan.

Mineral Exploration

This analysis incorporates by reference the 2012 Federal Hardrock Mineral Prospecting Permits Final Environmental Impact Statement. Prospecting has negligible contribution to worldwide greenhouse gas emissions based on the level of anticipated activity described in the Reasonably Foreseeable Development report and the amount of net greenhouse gas emissions produced from transportation, drilling equipment, and the expected rate of revegetation.

Non-Native Invasive Species

This section summarizes the effects of the alternatives for non-native invasive plants and non-native invasive earthworms. See the Non-Native Invasive Species Report for more information on this analysis.

Alternative A – Proposed Action (Withdrawal)

Under alternative A there would be no direct or indirect effects to non-native invasive species because the withdrawal would provide certainty that no new prospecting permits or mineral leases would be authorized. Alternative A would avoid the potential effects and risk to native plant communities and wildlife habitat described under alternative B.

Alternative B – No Action (No Withdrawal)

Mineral Development

In alternative B, non-native invasive plants and earthworms would likely spread if mine development occurs. Using assumptions described in the Reasonably Foreseeable Development report, it is likely that many of the activities associated with mining would lead to an increased risk of non-native invasive species spread and subsequent degradation of native plant communities and wildlife habitat, especially given the high level of invasive species in the area. Ground disturbance plays a key role in non-native invasive species spread, and many mining activities would cause such disturbances, including: creating an opening for an underground mine, building a processing plant, building a linear corridor such as for a water pipeline or power transmission corridor, building and operating a dry stack or wet basin tailings storage area, building and operating a waste rock storage area, or building and operating a waste- or stormwater management facility. All these activities remove native vegetation, move dirt, move weed seeds and earthworm eggs, and create bare ground at some point, which would lead to non-native invasive species spread.

The other risk factor is use of vehicles on which seeds, earthworm eggs, and soil can “hitchhike.” Vehicles include heavy equipment, maintenance trucks, trucks to transport mine products off site, supply trucks, and so forth. These vehicles can bring invasives into a mining area, move them around a mining area, and carry them away from a mining area to elsewhere.

The ecological consequences for non-native invasive plant spread depends on the weeds involved and where they are found. The acreage of new infestations would be uncertain, but it is likely that mine development would cause non-native invasive plants to spread and cause degradation to native plant communities and wildlife habitat.

There is also a risk that non-native invasive plants could spread to the Boundary Waters Canoe Area Wilderness and degrade wilderness character. If mine facilities were located adjacent to the wilderness boundary in the area of highest potential mine infrastructure it is possible that wind dispersed invasive plant seeds could move from a mine area into the wilderness area where they could establish and grow, and thus degrade wilderness character. Research suggests that Canada thistle seeds can travel up to several kilometers (Wood and del Moral 2000), so it is plausible that weed seed dispersal to the Boundary Waters Canoe Area Wilderness could occur.

Mining activities in uninvaded northern hardwoods would potentially cause non-native earthworms to spread to, or within, these areas. However, no northern hardwood forests occur within the area of highest potential mine infrastructure.

Several factors would most likely mitigate the risk of non-native invasive species impacts to some degree. Any mine development would include a reclamation plan; revegetation measures would provide for establishing competing vegetation to help minimize impacts of invasive species. Mine plans would also be required to have a weed management plan, which would also reduce the impacts of non-native invasive species. The effectiveness of such measures can vary depending on how they are implemented and funded. Thus, the range of outcomes for non-native invasive species impacts from mining would likely vary from moderate impacts to high impacts to native vegetation and wildlife habitat, with effects focused in the area of highest potential mine infrastructure.

Mineral Exploration

Mineral exploration would also contribute to non-native invasive species spread in alternative B. The effects of mineral prospecting on non-native invasive species were analyzed in the 2012 Federal Hardrock Mineral Prospecting Permits Final Environmental Impact Statement, and the effects described below are a summary of that analysis.

Non-native invasive species spread associated with mineral exploration would be concentrated at drill pads and access roads. During the time that drill pads and access roads are open and in use, non-native invasive species described in the existing condition could colonize these sites and cause localized impacts. Some of these invasive species could spread to adjacent native vegetation and become established. However, resource stipulations requiring treatment of non-native invasive plant infestations at these sites would be required as invasives are found and would keep impacts from invasives at a relatively low level. Such treatments at currently existing drill pads and access roads have been occurring annually since 2016 and they have maintained low non-native invasive plant abundance at existing drill pads (J. Greenlee, ecologist, personal observation). Over the longer timeframe, as drill pads and access roads are closed, succession would occur. Shrub and tree establishment would gradually suppress most remaining invasive plants, thus further limiting their impact resulting from mineral exploration. No effective treatments exist for earthworms.

Roadless and Other Designated Areas

This section summarizes the effects of the alternatives on roadless areas and other designated areas. Roadless areas include 2001 Roadless Area Conservation Rule areas and forest plan inventoried roadless areas. Other designated areas include unique biological areas, research natural areas, candidate research natural areas, and the mining protection area.

A report was prepared to satisfy the withdrawal regulation requirements for a case file outlined at 43 CFR 2310.3-2(b)(3)(ii), that requires “[a] report on the identification of the roadless areas or roadless islands having wilderness characteristics, as described in the Wilderness Act of 1964 (16 U.S.C. 1131, et seq.), which exist within the area covered by the requested withdrawal action. See the Roadless and Other Designated Areas Report for additional information.

Alternative A – Proposed Action (Withdrawal)

Under alternative A there would be no direct and indirect effects to roadless areas or other designated areas because no new minerals management authorizations would occur as described in chapter 1.

Alternative B – No Action (No Withdrawal)

Mineral Development

2001 Roadless Area Conservation Rule Areas and Forest Plan Inventoried Roadless Areas

Permits and leases for areas within Roadless Area Conservation Rule inventoried roadless areas may not be leased or may be leased with a no surface occupancy²⁵ stipulation (USFS 2000). Given the minimal acreage of Roadless Area Conservation Rule inventoried roadless area within the area of highest potential for mine infrastructure, it is reasonable to anticipate that such a stipulation would be feasible, avoiding direct effects. There is the risk of indirect effects from fugitive dust and water pollution from mining activity affecting the South Kawishiwi River roadless area. If failures or accidents resulted in long-term effects, it could affect the ability of the South Kawishiwi River roadless area for being inventoried and evaluated under criteria at FSH 1909.12 by affecting the natural quality of the area. The roadless characteristic at 36 CFR 294.11 of “high quality or undisturbed soil, water and air” and other ecosystem characteristics may also be adversely affected. The likelihood, magnitude, and duration of adverse effects would depend on distance from mining infrastructure, mitigations used for minerals development, and the characteristics of accidents or failures. For more information on these risks, see the air quality, water and aquatic species, and terrestrial wildlife reports.

The South Kawishiwi River roadless area is a Roadless Area Conservation Rule inventoried roadless area and a forest plan inventoried roadless area, and effects would be the same as described above. Other Roadless Area Conservation Rule inventoried roadless areas and forest plan inventoried roadless areas are located distant and upstream from the area of high mining potential, so effects from minerals development are unlikely to occur.

Unique Biological Areas and Research Natural Areas

Keeley Creek Research Natural Area and a portion of Harris Lake Unique Biological Area are located in the area of highest potential for mine infrastructure. A no surface occupancy requirement would avoid direct effects from minerals development on these areas (forest plan standards S-UB-6 and S-RNA-13). If minerals development were located upstream of these areas, the risk of accidents or failures, as described in the Water and Aquatic Species Report, present the risk of adverse effects. However, given their location, Keely Creek Research Natural Area and Harris Lake Unique Biological Area would likely be located upstream of mining development. Fugitive dust from tailings facilities may travel by wind into Keeley Creek Research Natural Area and Harris Lake Unique Biological Area. Distance from a tailings facility and mitigations used to manage fugitive dust would influence the likelihood, magnitude, and duration of deposition. Fugitive dust may result in adverse effects to the ecosystems in the research natural area and unique biological area through deposition of contaminants such as metals. For more information on these risks, see the air quality, water and aquatic species, and terrestrial wildlife reports.

25.No surface occupancy stipulations prohibit use or occupancy of the land surface for mineral exploration or development. To protect identified resource values, no surface occupancy stipulations allow subsurface resources to be legally accessed by means other than occupying the surface. Any surface infrastructure must be developed outside the no surface occupancy area.

Mining Protection Area

There is the risk of indirect effects from fugitive dust and water pollution from mining activity affecting the portion of the mining protection area shown in figure 1. This portion of the mining protection area contains water resources in the flowpath of potential effects analyzed in the Water and Aquatic Species Report. If failures or accidents resulted in long-term effects, it could result in resource conditions that do not meet the purposes of the 1978 Boundary Waters Canoe Area Wilderness Act for the mining protection area, in particular for water resources in the area. The likelihood, magnitude and duration of adverse effects would depend on distance from mining infrastructure, mitigations used for minerals development, and the characteristics of accidents or failures.

Mineral Exploration

As analyzed in the 2012 prospecting permit EIS, the effects from exploration would be limited and would not preclude Roadless Area Conservation Rule inventoried roadless and forest plan inventoried roadless areas from inventory and evaluation under criteria at FSH 1909.12. In addition, roadless characteristics at 36 CFR 294.11 would not be substantially affected.

As analyzed in the 2012 prospecting permit EIS, a no-surface occupancy stipulation may be applied to unique biological areas, research natural areas, and candidate research natural areas, avoiding direct effects. Any indirect effects would be temporary and limited. Forest plan direction for these areas would be met.

In the mining protection area, direct effects from minerals exploration are avoided because exploration of federally owned minerals within the area is prohibited by the 1978 Boundary Waters Canoe Area Wilderness Act. Indirect effects to the mining protection area would be minimal based on the temporary nature of minerals exploration and the distance from likely minerals exploration locations (such as within the area of highest potential for mine infrastructure) and the mining protection area. The 2012 prospecting permit EIS documents potential effects from minerals exploration further.

Lands

This section summarizes the effects of the alternatives on the lands program area, including land exchanges, special uses, including long-term leases, permits and easements. A report was prepared to satisfy the withdrawal regulation requirements for a case file outlined at 43 CFR 2310.3-2(b)(1), that requires “[a] report identifying the present users of the lands involved, explaining how the users will be affected by the proposed use and analyzing the manner in which existing and potential resource uses are incompatible with or conflict with the proposed use of the lands and resources that would be affected by the requested withdrawal. The report shall also specify the provisions that are to be made for, and an economic analysis of, the continuation, alteration or termination of existing uses.” See the Lands Report and Recreation Report for more information on this analysis.

Alternative A – Proposed Action (Withdrawal)

No existing special uses, leases, or easements would be altered or terminated as a result of the requested withdrawal. The withdrawal may preclude the need for future special use authorizations, which would allow access across federal lands lying outside of otherwise future prospecting permit or lease areas, for the purposes of exploration and development of federal minerals. Other than for the exploration and development of federal minerals, a withdrawal would not impact special uses or other authorizations.

Alternative B – No Action (No Withdrawal)

Under the alternative B, no existing special uses, leases, or easements would be altered or terminated. New lands special use authorizations related to activities on potential future prospecting permits and leases may occur, however, the Forest Service reserves the right to require common use of the land or to authorize the use by others only when consistent with a holder's existing rights and privileges after consultation with all parties involved.

Cumulative Effects

The agencies have considered the cumulative impacts from the requested withdrawal. That is, the incremental impact from the proposed action considered cumulatively with past, present, and reasonably foreseeable future actions, regardless of the identity of the actor. Relevant actions are those that similarly restrict development of mineral resources. The requested withdrawal, if approved, would add approximately 225,504 acres to two previous withdrawals in the immediate vicinity. The 1978 Boundary Waters Canoe Area Wilderness Act (PL 95-495), established the Boundary Waters Canoe Area Wilderness and the associated mining protection area, compromising approximately 1,098,000 acres and 222,000 acres respectively. If the requested withdrawal is approved, together, these three withdrawals would prohibit mineral exploration and mining on a total of approximately 1,535,504 acres of the Superior National Forest. In addition, Voyagers National Park (218,055 acres), located about 35 miles to the northwest of the withdrawal application area, also does not allow mining of federal minerals. No other actions that would add to total area withdrawn in northeastern Minnesota are reasonably foreseeable at this time; however, the State of Minnesota legislature has introduced bills (HF 840 and SF 763), which would prevent new mineral leases on state lands within the Boundary Waters Canoe Area Wilderness and the Rainy River Headwaters (HUC 09030001) subwatershed, except for mining of sand, gravel, granite, taconite, or iron ore.

The total amount of critical minerals that are affected by the withdrawal as compared to reserves within the United States and globally is displayed in table 1 of the Socioeconomics section above and further discussed in the Mineral Potential Report and Socioeconomics Report. There are no other reasonably foreseeable withdrawals within the United States affecting the minerals displayed in table 1.

Agencies and Persons Consulted

Tribal Government Consultation

The Superior National Forest sent letters inviting consultation with the three resident Bands of Chippewa, including Fond du Lac Band of Lake Superior Chippewa, Grand Portage Band of Lake Superior Chippewa, and Bois Forte Band of Chippewa in 2017 and 2021. A consultation package that included information about the Forest Service withdrawal applications and an invitation to provide input was distributed to the Bands on January 11, 2017, and November 29, 2021. The Bands have received updates on the withdrawal applications at annual and quarterly consultation meetings. Additionally, Bands have been invited to participate in public meetings, review specialist reports, and provide information regarding water quality standards and traditional Tribal needs and values.

The BLM also invited government-to-government consultation to 28 Tribes via certified letter January 18, 2022. In addition to the three resident Bands noted above, invitations were sent to the following governments: Bad River Band of Lake Superior Chippewa, Cheyenne River Sioux Tribe, Crow Creek Sioux Tribe, Fandreau-Santee Sioux Tribe, Keweenaw Bay Indian Community, Lac Court Oreilles Band of Lake Superior Chippewa, Lac du Flambeau Band of Lake Superior Chippewa, Lac Vieux Desert Band of Lake Superior Chippewa, Leech Lake Band of Ojibwe, Lower Sioux Indian Community, Mille Lacs Band of Ojibwe, Prairie Island Indian Community, Red Cliff Band of Lake Superior Chippewa, Red Lake Nation, Santee Sioux Nation, Sisseton-Wahpeton Oyate, Shakopee Mdewakanton Sioux Community, Sokaogon Chippewa Community, Spirit Lake Nation, Standing Rock Sioux Tribe, St. Croix Chippewa Indians of Wisconsin, Turtle Mountain Band of Chippewa Indians, Upper Sioux Community, White Earth Nation, and Yankton Sioux Tribe. The Fond du Lac Band of Lake Superior Chippewa accepted the invitation and requested formal government-to-government consultation with the BLM and consultation meetings were held on February 14, 2022, and June 2, 2022, with Superior National Forest leadership participating.

Public Participation

An extensive public scoping effort was conducted for both the 2017 withdrawal application and the current withdrawal application. Several hundred thousand comment letters were received. Scoping comments were analyzed to identify public concerns. For a summary of the public involvement process, the identified public concerns, and disposition of public concerns for this analysis see the Scoping Public Comment Disposition document. For a narrative summary of public comments, see the Scoping Public Comment Executive Summary.

2017 Withdrawal Application

The Forest Service previously filed a withdrawal application in 2017 that included the lands identified in the Forest Service's 2021 application, as well as lands that were not included in the 2021 application. The BLM published a notice in the *Federal Register* on January 19, 2017, announcing its receipt and acceptance of the application, initiating a 90-day comment period as required by BLM regulations (43 CFR 2310.3-2(b)). A public listening session was held in Duluth, Minnesota on March 16, 2017.

On January 13, 2017, the Forest Service published a notice in the *Federal Register* announcing its intent to prepare an environmental impact statement for the withdrawal application, also initiating a 90-day comment period. The Forest Service issued a press release, published a legal notice in the *Duluth News Tribune*, and sent a scoping letter to interested parties. The project was posted on the Superior National Forest website and in the Schedule of Proposed Actions. A public listening session was held in Duluth, Minnesota (coincident with the BLM hearing on March 16, 2017).

Due to the high level of public interest, the Forest Service held additional listening sessions on July 18 and July 25, 2017, in St. Paul and Virginia, Minnesota and extended the comment period to August 17, 2017 (210 days). More than 3,000 people attended the public listening sessions. Over 80,000 letters were received from individuals, organizations, businesses, local, state, and federal government agencies during the BLM and Forest Service comment periods, including several petitions with multiple signatories and postcard campaigns with more than 100,000 people represented.

After considering comments from federal, local, and tribal governments, public scoping letters, and internal resource specialist, the BLM and Forest Service decided that an environmental assessment would be a more appropriate level of analysis. A press release was issued on January 26, 2018, announcing the change to an environmental assessment and an additional 30-day comment period. An additional 1,600 comment letters were received during the second 30-day comment period.

On September 6, 2018, the Forest Service submitted a letter to BLM cancelling the withdrawal application and associated environmental assessment.

2021 Withdrawal Application

On September 29, 2021, the Forest Service submitted a new withdrawal application to the BLM. The BLM published a notice in the *Federal Register* on October 21, 2021, announcing its receipt and acceptance of the application, initiating a 90-day comment period as required by BLM regulations (43 CFR 2310.3-2(b)). On December 13, 2021, the BLM published a notice in the *Federal Register* and the *Duluth News Tribune* announcing the dates and instructions for three virtual public meetings. The Forest Service issued a press release and published information on the agency's website about the public meetings and how and where to comment. Approximately 40,900 interested parties were sent a scoping letter requesting that comments be submitted to the BLM. The project was posted on the Superior National Forest website and in the Schedule of Proposed Actions. The BLM and the Forest Service held online public meetings on January 12, 15, and 18, 2022. Approximately 788 people attended the public meetings and 198,111 letters were received.

All comments received by the BLM were reviewed, considered by the Forest Service, and a summary of the scoping public comments was prepared. The summary described the process used by the Forest Service to review and analyze public comments and provided a narrative summary of the comments received. The Forest Service also prepared a scoping comment disposition table to identify public concerns and how the concerns were addressed.

On June 23, 2022, the Forest Service published the draft environmental assessment and all of the supporting resource reports on the agency website. The Forest Service also published a notice in the *Federal Register* on June 28, 2022, requesting public comment on the draft environmental assessment for a 30-day period. During the public comment period, several requests were made to extend the comment period. On July 21, 2022, the Forest Service published an extension of the comment period to August 12, 2022, allowing for 50 days in total to receive public comment letters. The Forest Service received approximately 26,642 responses, including 12 petitions; the total count of people who signed petitions was 101,963. The Forest Service prepared a summary of the public comments received and a comment disposition table to help explain how comments were considered.

The Forest Service made changes to the environmental assessment based on the public comments received. There were minor clarifying edits throughout the document. Several additional alternatives were considered in chapter 2 of the environmental assessment, and updates were made to the effects analysis for minerals, socioeconomics, climate change, and water resources.

A complete list of agencies and individuals contacted and consulted is contained within the project record.

Agency and Government Consultation

Counties

During public comment periods in 2017 and 2021–2022, various counties submitted comment letters. Meetings with Cook, Lake, and St. Louis County commissioners was held on January 31, 2018, and April 25, 2022, to provide information about the process and analysis, and to understand any concerns or issues about the withdrawal application. County representatives stated their concerns, which included:

- Loss of revenue to state, counties, and school trust
- Loss of community heritage and autonomy
- Loss of jobs and indirect economic effects
- Loss of critical minerals that could be produced from deposits that are needed for green energy infrastructure
- The need to consider dependence on foreign mineral commodities
- Ability to meet demands from recycling
- Ability to address mining impacts through remediation and bonding
- The long-term national needs for clean water

Minnesota Department of Natural Resources

The Forest Service received letters from the Minnesota Department of Natural Resources during the previously canceled 2017 withdrawal application public comment periods in 2017–2018 and the new current withdrawal application public comment period during 2021–2022. The comment letters offered assistance and provided information for consideration in the analysis. These letters were reviewed, and information incorporated as appropriate. A meeting with representatives from the Minnesota Department of Natural Resources concerning the 2017 withdrawal application was held on January 31, 2018, and a meeting concerning the 2021 withdrawal application was held on April 25, 2022.

State Historic Preservation Office

No historic properties or sacred sites will be affected by alternative A. This project is in compliance with the terms of the 2015 Superior National Forest Programmatic Agreement Stipulation 5(G) as substitution for 36 CFR 800 regulations under 36 CFR 800.14(a). Further, the Forest Service has determined under 36 CFR 800.3(a)(1) that the requested withdrawal, while an undertaking, is the type of activity that does not have the potential to cause effects on historic properties, assuming such historic properties were present, and that therefore, the agency official has no further obligations under Section 106 [of the National Historic Preservation Act] or the regulations at 36 CFR Part 800. As such, the Forest Service has not initiated formal consultation with the State Historic Preservation Office under 36 CFR 800 (note that Section 106 consultation is not a replacement for, nor does it serve as the required government-to-government tribal consultation).

United States Department of the Interior – Bureau of Land Management

The Forest Service designated the BLM as a cooperating agency in development of this environmental assessment in accordance with 43 CFR 2310.3-2(b)(3). The BLM formally agreed in a memorandum of understanding, signed April 7, 2022, to participate as a cooperating agency in development of this environmental assessment pursuant to 40 CFR. 1501.8. Under these regulations, the U.S. Forest Service recognizes that BLM has regulatory and statutory responsibilities and expertise and will coordinate analysis, review, public involvement and consultation.

United States Environmental Protection Agency

During public comment periods on the 2017 withdrawal application and the 2021 withdrawal application, the U.S. Environmental Protection Agency submitted comment letters that included a list of recommendations for analysis. The Forest Service reviewed these letters and the recommendations were incorporated as appropriate.

United States Fish and Wildlife Service

The biological evaluation prepared for the project found that the requested withdrawal (alternative A) would have “no effect” on the northern long-eared bat, Canada lynx and Canada lynx critical habitat, or gray wolf and gray wolf critical habitat. As such, there was no requirement to formally consult and gain concurrence from the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act. The wildlife biologist that prepared the analysis informally discussed the withdrawal application with the Minnesota-Wisconsin Field Office of the U.S. Fish and Wildlife Service and they agreed the project does not require consultation via a biological assessment submitted to U.S. Fish and Wildlife Service for concurrence (D. Marsh, U.S. Fish and Wildlife Service, pers. comm. November 2021).

United States National Park Service

The U.S. National Park Service, Natural Sounds and Night Skies Division was consulted to provide expert advice and review of the soundscapes and dark skies reports.

Government of Canada

During public comment periods on the 2017 and the 2021 withdrawal application, the Government of Canada submitted comment letters that included a list of recommendations for analysis. The Forest Service reviewed these letters, and the recommendations were incorporated as appropriate.

Preparers, Contributors, and Reviewers

Agency*	Name	Position	Qualifications
FS	Allison Borchers	Economist	PhD Economics; 12 years of experience
FS	Alison Koopman	Landscape Architect	BS Landscape Architecture; 18 years of experience
FS	Amanda Kunzmann	Regional Fisheries Program Manager	BS Biology, Fish and Wildlife Management; 20 years of experience
FS	Andrew Tilman	Research Economist	BA Mathematics, PhD Ecology and Evolutionary Biology; 10 years of experience
FS	Ann Schwaller	Forest Wilderness Program Manager	BS Photojournalism, Forest Resources and Conservation, MS Forestry, Recreation Management; 30 years of experience
BLM	Chad Meister	Senior Air Quality Specialist	BS Environmental Science; 22 years of experience
FS	Cheron Ferland	Forest Wildlife Biologist	BS Forestry and Wildlife, MS Wildlife Science; 30 years of experience
BLM	Chris Hite	Branch Chief, Energy and Minerals Operations	BS and MS Geology; 28 years of experience
FS	Christy Prescott	Social Scientist	BS Environmental Science, MA Environment and Community; 18 years of experience
NPS	Davyd Betchkal	Biologist in Natural Sounds and Night Skies Division	BS Biochemistry; 14 years of experience
BLM	Derek Strohl	Assistant District Manager – Minerals Division	BA Geology and Economics, MS Land Resources; 13 years of experience
FS	Elysia Retzlaff	Environmental Coordinator	BS Geography and GIS, MNR (Natural Resources), Graduate Certificate in GIS and NEPA; 13 years of experience
FS	Eric Gdula	Forest GIS Coordinator	BS Forestry, MS Forestry/GIS/Remote Sensing; 28 years of experience.
FS	Eric Wirz	Forest Geologist	BS Geology; 21 years of experience
BLM	Frank Quamen	Supervisory Ecologist	BS Wildlife and Fisheries, MS Natural Resources, PhD Fish and Wildlife Biology; 23 years of experience
FS	Greg Nowacki	Regional Ecologist and Acting Regional Soils Program Manager	PhD Forestry; 32 years of experience
FS	Jack Greenlee	Forest Botanist	BS Biology, MS Plant Ecology; 22 years of experience
FS	Jacob Deal	Regional Air Quality Specialist	PhD Systems Engineering; 4 years of experience
FS	James Davis	Lands Program Manager	BS Natural Resource Management; 14 years of experience
FS	Jan Spencer	Landscape Architect	BLA of Landscape Architecture; Associate of Science; 32 years of experience

Agency*	Name	Position	Qualifications
FS	Jason Butcher	Forest Aquatic Biologist	BS environmental Science, MS Biology; 20 years of experience
BLM	Jenn Dobb	Economist	BS Economics, MS Agriculture and Resource Economics; 9 years of experience
FS	Jon Van Alstine	Realty Specialist	BS Geology and Geophysics, MS Geology; 3 years of experience as realty specialist and 14 years of experience in geology and geophysics
FS	Juan Martinez	Tribal Liaison	9 years of experience
BLM	Karlee Yurek	Project Manager	BA Biology, MA Environmental/Conservation Education; 19 years of experience
FS	Kathleen Schnider	Writer/Editor	BA English, MS Public Communication; 20 years of experience
FS	Lee Johnson	Forest Archaeologist	BA Anthropology, MA Anthropology; 20 years of experience
NPS	Li-Wei Hung	Night Skies Research Scientist	PhD Astronomy; 6 years of experience
FS	Marty Rye	Forest Hydrologist	BS Agricultural Engineering, BS Civil Engineering; 33 years of experience
FS	Mary Ellen Emerick	Natural Resource Specialist	BA English/Writing, minor in natural resources; 33 years of experience
FS	Matthew Judd	Minerals Project Coordinator	BA Mathematics, MS Forestry; 17 years of experience
FS	Megan Impson	Forest Recreation Program Manager	BS Parks and Recreation Management; 21 years of experience
FS	Orry Hatcher	NEPA Planner	BA Political Science, MPA (Public Administration); Graduate Certificate in Environmental Policy; 5 years of experience
FS	Peter Taylor	Forest Environmental Coordinator	MS Environmental Management and Forestry; 15 years of experience
FS	Ralph Perron	Regional Air Quality Specialist	BS Water Resources Management; 30 years of experience
BLM	Sabry Hanna	Solid Minerals Lead	PhD Geology; 22 years of experience
BLM	Scott Davis	Senior Soil Scientist	BS Forestry, MS Soils and Hydrology; 47 years of experience
FS	Sheela Johnson	Regional Hydrologist	BS Zoology, MS Environmental Science, MPA (Public Affairs); 15 years of experience
FS	Sierra Dawkins	Regional Botanist	BS Biology, MS Forest Ecology; 11 years of experience
FS	Stacey Weems	Soil Scientist	BS Hydrogeology, MS Soil Science; 15 years of experience
BLM	Steve Rice	Hydrogeologist	BA and MS Geology; 20 years of experience

Agency*	Name	Position	Qualifications
BLM	Stephanie Carman	District Manager	BS Biology, MS Aquatic Ecology; 20 years of experience
FS	Theresa Davidson	TES Biologist	BS Natural Resources Management; 30 years of experience
FS	Tracy Grazia	Regional Wildlife Program Leader	BS Environmental Science, MS Wildlife; 25 years of experience
FS	Trent Wickman	Regional Air Quality Specialist	BS Biology, BS Environmental Engineering, MS Environmental Engineering; Registered Professional Engineer in Minnesota; 26 years of experience
FS	Troy Thompson	Regional Hydrogeologist	BS Geology, MS Geology; 30 years of experience
BLM	Wes Willoughby	District Archaeologist and Tribal Liaison	BA Sociology and Anthropology, MA and PhD Anthropology; 25 years of experience
BLM	Zach Siegert	Planning and NEPA Specialist	BA Political Science, MPA Environmental Policy and Natural Resource Management; 1 year of experience

* BLM = Bureau of Land Management; FS = Forest Service; NPS = National Park Service.

Finding of No Significant Impact

UNITED STATES DEPARTMENT OF THE INTERIOR

Bureau of Land Management
Northeastern States District
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FINDING OF NO SIGNIFICANT IMPACT for Rainy River Withdrawal

Introduction

The U.S. Department of Agriculture Forest Service (Forest Service), as the applicant, prepared this environmental assessment to analyze the effects of the application to withdraw approximately 225,504 acres of National Forest System lands in the Rainy River watershed from disposition under the United States mineral and geothermal leasing laws, for a 20-year term, subject to valid existing rights. The purpose of the requested withdrawal is to protect and preserve the air quality, water quality, aquatic and terrestrial wildlife habitat, night skies, soundscape, treaty resources, high-quality recreation and wilderness values, and other resources and values described in the environmental assessment that are contained in those lands.

These areas provide a unique combination of special places and outstanding resource values directly south of and including the Boundary Waters Canoe Area Wilderness, the Boundary Waters Canoe Area Mining Protection Area, and the 1854 Ceded Territory, within the Superior National Forest. The Boundary Waters Canoe Area Wilderness is a complex and interconnected ecosystem and offers recreational opportunities for true solitude, outstanding primitive recreation in an unconfined and undeveloped natural setting, and a connection with untrammeled nature. It includes nearly 1,175 pristine lakes ranging in size from 10 acres to 10,000 acres, and nearly 1,200 miles of canoe routes. It is the only large-scale protected sub-boreal forest in the lower 48 states. Maintenance of water quality and high value aquatic resources are important economic values for local recreational fisheries and uses. Abundant and healthy wild rice, fish, and other treaty resources in the 1854 Ceded Territory allows the Ojibwe people to continue spiritual and cultural practices that are important to their identity.

This environmental assessment analyzed two alternatives: a proposed action and a no action alternative. Under the proposed action, the Secretary of the Interior would withdraw up to approximately 225,504 acres of National Forest System lands from disposition under the United States mineral and geothermal leasing laws, for up to 20 years, subject to valid existing rights. Under the no action alternative, the Secretary of the Interior would not establish such a withdrawal. If approved by the Secretary of the Interior, the withdrawal would restrict the Bureau of Land Management (BLM) from processing or issuing new hardrock prospecting permits and mineral leases on National Forest System lands within the withdrawal application area boundary. Lands or interests in lands within the boundary of the withdrawal application area that are private or other non-federal lands, or National Forest System lands with the non-federal mineral estate, would not be subject to any withdrawal established by the Secretary of the Interior. However, if these lands or interests were acquired by the federal government through means such as donation, sale, or exchange, such lands or interests with a federal mineral estate would be subject to the withdrawal and closed to mineral exploration and development, if the withdrawal were in effect at that time.

The Forest Service prepared this environmental assessment and finding of no significant impact to be submitted in support of its withdrawal application in conformance with the Federal Land Policy and Management Act (FLPMA) and the regulations at 43 CFR Part 2300 pertaining to withdrawals. The Forest Service designated the BLM as a cooperating agency in development of this environmental assessment in accordance with 43 CFR 2310.3-2(b)(3). The BLM formally agreed in a memorandum of understanding, signed April 7, 2022, to participate as a cooperating agency in development of this environmental assessment pursuant to 40 CFR. 1501.8. A description of each requirement for the applicant (Forest Service) and the location of the required information and reports can be found in Appendix B – Withdrawal Regulatory Requirements.

Finding of No Significant Impact

Based on my review of the attached environmental assessment, the resource reports, other reports, studies, and information prepared in conjunction with the environmental assessment, all of which is herein incorporated by reference, I have determined that the withdrawal requested by the Forest Service will not significantly affect the quality of the human environment. Therefore, preparation of an environmental impact statement is not required. This finding is based on the degree of the effects described in the following sections within the identified affected environment.

Potentially Affected Environment (40 CFR 1501.3(b)(1))

The requested withdrawal (proposed action) would not authorize any ground disturbing activities. It would prevent the authorization of future prospecting permits and leases on federal lands, subject to valid existing rights. It would not alter access to non-federal ownerships.

As required by BLM withdrawal regulations in 43 CFR. 2310.3-2, the environmental assessment and the Socioeconomics Report considered economic impacts on individuals, local communities, state and local government interests, the regional economy, and the Nation as a whole.

Degree of Effects (40 CFR 1501.3(b)(2))

The following effects have been considered in my evaluation of the proposed action:

i. Short- and long-term effects

The proposed action would prohibit new federal minerals exploration and development actions within the withdrawal application area for up to a 20-year period, subject to valid existing rights. The effects of such an action are not significant because no ground disturbance would occur, nor would any other management activities caused by the requested withdrawal occur that may result in environmental effects.

The proposed action would not authorize any ground disturbing activities and therefore, will have no effect to wetlands or floodplains (pursuant to Executive Order 11990 Protection of Wetlands and Executive Order 11988 Floodplain Management). The Boundary Waters Canoe Area Wilderness, Voyageurs National Park, and Quetico Provincial Park are adjacent to or downstream of the withdrawal application area. Because the proposed action does not authorize any ground disturbing activities, there would no effect to these areas or research natural areas; candidate research natural areas; unique biological areas; and eligible wild, scenic, and recreational rivers.

The proposed action would not involve any ground disturbance or other actions that may cause environmental changes to wildlife resources. Thus, there will be no effect to any special status wildlife species or habitat and consultation with U.S. Fish and Wildlife Service is not required. The

proposed action will have no adverse impact on Regional Forester sensitive species (wildlife, botanical, or aquatic); will have no adverse effect on the viability of wildlife or aquatic management indicator species; and would not result in take of migratory birds.

The proposed action would not affect structures or objects listed in or potentially eligible for listing in the National Register of Historic Places. Nor would the proposed action cause a loss or destruction of significant scientific, cultural, or historical resources.

This action does not represent potential cumulative adverse impacts when considered in combination with other actions. Chapter 4 of the environmental assessment discloses direct, indirect, and cumulative impacts of the proposed action. Based on the information presented in the environmental assessment, there is no indication that the requested withdrawal would result in a cumulatively significant impact to the environment.

ii. Beneficial and adverse effects

Both beneficial and adverse effects have been taken into consideration when making this determination of significance. Implementation of the requested 20-year withdrawal would include no ground disturbing activities that might result in environmental effects. Therefore, there would be no significant adverse impacts to the quality of the human environment. The requested withdrawal is feasible and reasonable and would meet the forest plan's overall direction and applicable standards and guidelines.

In comparison to the no action alternative, under the proposed action, new jobs and other economic benefits including the availability of critical minerals resulting from mining on these federal lands would not be possible for up to a 20-year period, subject to valid existing rights. These minerals are fungible and traded globally and could be obtained from other sources globally. As described in the "Climate Change" section of the environmental assessment, whether the proposed action will result in an increase or change in greenhouse gas emissions is not reasonably foreseeable. While exploration and development of non-federal minerals would not be prohibited by the requested withdrawal, it is possible some of these activities may be uneconomic without availability of federal minerals. While this lack of availability of critical minerals and mining jobs can be considered an adverse effect of the proposed action, Council for Environmental Quality regulations state that "[e]conomic or social effects by themselves do not require preparation of an environmental impact statement" (40 CFR 1502.16 (b)).

In comparison to the no action alternative, the proposed action (withdrawal) would have the beneficial effect of being wholly protective of the environment because it would prevent adverse impacts from mining activity to the natural and physical environment. The proposed action would not prohibit other access or use of lands within the withdrawal area such as for gravel extraction, timber harvest, recreation, or access to land under other ownerships. Jobs supported by a unique recreational wilderness experience would likely continue and could be enhanced. The proposed action would allow current social and economic trends to continue and there would be no significant adverse effects.

iii. Effects on public health and safety

The proposed action would not authorize any ground disturbing activities or result in any adverse impact to public health and safety.

- iv. Effects that would violate federal, state, tribal, or local laws protecting the environment

The proposed action is consistent with the Superior National Forest Land and Resource Management Plan (see Appendix A – Statutory Context and Forest Plan Consistency in the environmental assessment). The proposed action meets all federal, state, and local laws and requirements imposed for the protection of the environment. The environmental assessment meets the disclosure requirements of the National Environmental Policy Act.

District Manager
Bureau of Land Management
Northeastern States District Office

Date

Appendix A – Statutory Context and Forest Plan Consistency

Statutory Context

The 1964 Wilderness Act highlights the importance of preserving the wilderness character of the area:

SEC. 4. (b): “Except as otherwise provided in this chapter, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use.” (Pub. L. 88-577, 78 Stat 890 (September 3, 1964) as amended; 16 U.S.C. 1131)

The 1978 Boundary Waters Canoe Area Wilderness Act, which defines the wilderness area and the mining protection area, highlights the importance of maintaining high water quality within these areas:

“SECTION 1. *The Congress finds that it is necessary and desirable to provide for the protection, enhancement, and preservation of the natural values of the lakes, waterways, and associated forested areas known (before the date of enactment of this Act) as the Boundary Waters Canoe Area, and for the orderly management of public use and enjoyment of that area as wilderness, and of certain contiguous lands and waters, while at the same time protecting the special qualities of the area as a natural forest-lakeland wilderness ecosystem of major esthetic, cultural, scientific, recreational and educational value to the Nation.*

SEC. 2. It is *the purpose of this Act to provide for such measures* respecting the areas designated by this Act as the Boundary Waters Canoe Area Wilderness and Boundary Waters Canoe Area Mining Protection Area as will:

- (1) provide for the protection and management of the fish and wildlife of the wilderness so as to enhance public enjoyment and appreciation of the unique biotic resources of the region,
- (2) *protect and enhance the natural values and environmental quality of the lakes, streams, shorelines and associated forest areas of the wilderness,*
- (3) *maintain high water quality in such areas,*
- (4) *minimize to the maximum extent possible, the environmental impacts associated with mineral development affecting such areas....”* (emphasis added) Pub. L. 95-495, 92 Stat 1649 (October 21, 1978).

With such concerns foremost as its purpose, the Boundary Waters Canoe Area Wilderness Act prohibits the “exploration for, or mining of, minerals owned by the United States within the Boundary Waters Canoe Area Wilderness and the Boundary Waters Canoe Area Mining Protection Area.” Section 11(a)(1) of Pub. L. 95-495. It also prohibits: authorizations from any federal agency for non-federal mineral rights’ exploration or mining “within such areas *if such activities may affect navigable waters*” (Emphasis added; Section 11 (a)(2) of Pub. L. 95-495); and the use of federal land “in relation to any mining of or exploration for minerals in such areas *which may materially impair the wilderness qualities of the wilderness area or which may materially impair the natural values and environmental quality of the mining protection area*” (Emphasis added; Section 11(a)(3) of Pub. L. 95-495).

Finally, there is nothing in the Boundary Waters Canoe Area Wilderness Act which would preclude additional protections available under other law, as Section 11(a) mining restrictions are “[i]n addition to any other applicable prohibition or withdrawal from entry or appropriation under any provision of the Wilderness Act or under any other provision of law.” Section 11(a) of Pub. L. 95-495.

Forest Plan Consistency

The Forest Service develops land and resource management plans to provide a framework that protects renewable surface resources. This framework balances both economic and environmental considerations to provide for multiple uses and sustained yield of National Forest System renewable surface resources.

This environmental assessment tiers to and incorporates by reference the 2004 Superior National Forest Land and Resource Management Plan (forest plan), Final Environmental Impact Statement, and Record of Decision, and follows forest plan direction.

The 2004 forest plan at D-MN-1 states: “Exploration and development of mineral and mineral material resources is allowed on National Forest System land, except for federally owned minerals in designated wilderness and the mining protection area.” The plan also provides that the Forest Service will manage the Boundary Waters Canoe Area Wilderness in a manner that perpetuates and preserves the integrity of the natural ecosystems, provides an enduring wilderness resource for future generations, and provides opportunities for a primitive and unconfined recreation experience.

Although forest plans provide a framework, they do “not authorize projects or activities or commit the Forest Service to take action” (36 CFR Section 219.2(b)(2)). Instead, forest plans provide broad management guidance and ensure all program elements and legal requirements are considered prior to critical project level decisions, such as a decision to authorize timber harvesting, grazing or mining operations. As the Supreme Court has determined, forest plans:

... do not command anyone to do anything or to refrain from doing anything; they do not grant, withhold, or modify any formal legal license, power, or authority; they do not subject anyone to any civil or criminal liability; they create no legal rights or obligations. Thus, for example, the Plan does not give anyone a legal right to cut trees, nor does it abolish anyone's legal authority to object to trees being cut. *Ohio Forestry Ass'n v. Sierra Club*, 523 U.S. 726, 733 (1998).

Following forest plan approval, proposals are evaluated on a case-by-case basis. Proposals inconsistent with plan direction may not be authorized (16 U.S.C. Section I 604(i)). However, a proposal might reveal the need to amend plan direction that would otherwise stand as an impediment to a proposal. Yet a proposal's consistency with applicable plan standards and guidelines is not an assurance that the proposal will be authorized. The Forest Service retains discretionary judgment concerning overall multiple use, sustained yield management of National Forest System lands. Further, not allowing certain uses even though they are consistent with applicable plan standards and guidelines does not require the alternation of the applicable direction.

The Superior National Forest Land and Resource Management Plan (forest plan) does not prohibit mineral development within the withdrawal application area, but the Forest Service is not bound to approve prospecting permits or leases either. Neither the statute nor regulations governing forest plans mandate the approval of proposals consistent with a forest plan.

The resource reports evaluate consistency of the alternatives with the forest plan as related to the analyzed resource. Overall, the resource reports determined that the requested withdrawal would be consistent with the forest plan, while the no action alternative carries the risk that the effects of minerals development may be inconsistent. No forest plan amendment is planned at this time as a part of the requested withdrawal.

Other Environmental Analysis

This analysis incorporates by reference analysis in the 2012 Federal Mineral Prospecting Permits Final Environmental Impact Statement and Record of Decision. That EIS analyzed impacts of authorizing 29 prospecting permits and developed protective stipulations and monitoring requirements. It did not consider impacts or authorize leasing applications or mining operations.

This analysis tiers to the 2004 Forest Plan Revision Final Environmental Impact Statement for Chippewa and Superior National Forests. That EIS did not consider impacts of minerals exploration or development.

Appendix B – Withdrawal Regulatory Requirements

43 Code of Federal Regulation 2301.3-2

Specific requirements for processing withdrawals for the applicant agency are detailed within 43 CFR 2310.3-2. Below is a summary of the regulations with information on where within this environmental assessment or in the corresponding project record the required information may be obtained. 43 CFR 2301.3-2 lists:

(a) The qualifications of all specialists utilized by either the authorized officer or the applicant to prepare the information, studies, analyses, and reports shall be provided.

- ◆ See “Preparers, Contributors, and Reviewers” in the environmental assessment.

(b)(1) A report identifying the present users of the lands involved, explaining how the users will be affected by the proposed use and analyzing the manner in which existing and potential resource uses are incompatible with or conflict with the proposed use of the lands and resources that would be affected by the requested action.

- ◆ See “Chapter 3 Affected Environment and Environmental Trends” in the environmental assessment.
- ◆ See “Chapter 4 Environmental Consequences” in the environmental assessment.
- ◆ See the following resource reports: recreation, wilderness, lands, socioeconomics, and tribal traditional needs and values.
- ◆ Provisions of sections 2310.3–5 (compensation for improvements) do not apply because there are no improvements on lands impacted.

(b)(2) If the application states that the use of water in any State will be necessary to fulfill the purposes of the requested withdrawal, extension or modification, a report specifying that the applicant or using agency has acquired, or proposes to acquire, rights to the use of the water in conformity with applicable State laws and procedures relating to the control, appropriation, use and distribution of water, or whether the withdrawal is intended to reserve, pursuant to federal law, sufficient unappropriated water to fulfill the purposes of the withdrawal.

- ◆ The withdrawal application states:

No water rights will be needed to fulfill the purpose of this withdrawal request.

The unique and irreplaceable resource this withdrawal seeks to protect is the 1.1-million-acre Boundary Waters Canoe Area Wilderness located in the northern third of the Superior National Forest, extending nearly 200 miles along the international boundary with Canada. The Boundary Waters Canoe Area Wilderness includes nearly 2,000 pristine lakes ranging in size from 10 acres to 10,000 acres, and nearly 1,200 miles of canoe routes. It is the only large-scale protected sub-boreal forest in the lower 48 states. There is a need to maintain and improve healthy forests and water quality to provide a host of watershed benefits, such as purifying water, sustaining surface water and ground water flow, maintaining fish habitats, and stabilizing streambanks.

- ◆ No water use or withdrawal is requested for the purposes of the withdrawal. For no action, water use for exploration is documented in the 2012 Federal Hardrock Mineral Prospecting Permits Final Environmental Impact Statement.
- ◆ Future prospecting permits or mining would likely require future water withdrawal; these are considered in the Water and Aquatic Species Report.

(b)(3) An environmental assessment, an environmental impact statement, or any other documents as are needed to meet the requirements of the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)(C)), and the regulations applicable thereto.

- ◆ Environmental assessment states on page 1, “This environmental assessment is a component of that case file and is written in accordance with Council for Environmental Quality regulations implementing the National Environmental Policy Act (NEPA), found at 40 CFR Parts 1500-1508 and the Department of the Interior’s NEPA regulatory requirements found at 43 CFR Part 46.”

(b)(3)(i) A report on the identification of cultural resources prepared in accordance with the requirements of 36 CFR part 800, and other applicable regulations.

- ◆ A cultural resources report has been prepared.
- ◆ See “Cultural Resources” in chapters 3 and 4 of the environmental assessment.
- ◆ See “Agencies and Persons Consulted” in the environmental assessment, regarding tribal and historic resource consultation.

(b)(3)(ii) An identification of the roadless areas or roadless islands having wilderness characteristics, as described in the Wilderness Act of 1964 (16 U.S.C. 1131, et seq.), which exist within the area covered by the requested withdrawal action.

- ◆ See the Roadless and Other Designated Areas Report for a description of roadless areas within the withdrawal boundary.

(b)(3)(iii) A mineral resource analysis prepared with information on: General geology, known mineral deposits, past and present mineral production, mining claims, mineral leases, evaluation of future mineral potential and present and potential market demands.

- ◆ See the Mineral Potential Report and the Reasonably Foreseeable Development report.

(b)(3)(iv) A biological assessment of any listed or proposed endangered or threatened species, and their critical habitat, which may occur on or in the vicinity of the involved lands, prepared in accordance with the provisions of Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1536), and regulations applicable thereto, if the secretary determines that assessment is required by law.

- ◆ See the Terrestrial Wildlife Report.

(b)(3)(v) An analysis of the economic impact of the proposed uses and changes in use associated with the requested action on individuals, local communities, State and local government interests, the regional economy and the Nation as a whole.

- ◆ See the Socioeconomics Report.

(b)(3)(vi) A statement as to the extent and manner in which the public participated in the environmental review process.

- ◆ See “Agencies and Persons Consulted” in the environmental assessment.
- ◆ See the Scoping Public Comment Executive Summary document.
- ◆ See the Scoping Comment Disposition document.
- ◆ See the Environmental Assessment Comment Executive Summary document.
- ◆ See the Environmental Assessment Comment Disposition document.

(b)(4)(i) Whether the lands involved are floodplains or are considered wetlands.

- ◆ See chapter 4 of the environmental assessment.
- ◆ See the Water and Aquatic Species Report.

(b)(4)(ii) Whether the existing and proposed uses would affect or be affected by such floodplains or wetlands and, if so, to what degree and in what manner.

- ◆ The requested withdrawal would have no effect on wetlands or floodplains. For more information see the Water and Aquatic Species Report.

(c) Prior to final action being taken in connection with an application, the applicant shall prepare, with the guidance and participation of the authorized officer, and subject to the approval of the authorized officer, the Secretary and other affected departments, agencies or offices, a resource management plan and implementation program regarding the use and management of any public lands with their related resources uses. Consideration shall be given to the impact of the proposed reservation on access to and the use of the land areas that are located in the vicinity of the lands proposed to be withdrawn. Where appropriate, the plan and program will be implemented by means of a memorandum of understanding between the affected agencies. Any allocation of jurisdiction between the agencies shall be effected in the public land order or legislation. In those cases where the Secretary, acting through the BLM, would continue to exercise partial jurisdiction, resource management of withdrawn areas may be governed by the issuance of management decisions by the BLM to implement land use plans developed or revised under the land use planning requirements of Section 202 of the Act (43 U.S.C. 1712).

- ◆ The Forest Service has prepared the [2004 Superior National Forest Land and Resource Management Plan](#) in compliance with the National Forest Management Act of 1976.
- ◆ The BLM has prepared the Eastern States Resource Management Plan Environmental Impact Statement and Minnesota Management Framework Plan in compliance with FLPMA.
- ◆ No change to access for withdrawn lands is proposed. The requested withdrawal would allow for continued access to lands for in-holdings and private property, recreation, and land management. If the no action alternative was selected, access may be restricted to areas used for exploration and mining for health and safety.
- ◆ No new or additional memorandum of understanding is necessary for implementation for the plan or program.
- ◆ All lands are under the jurisdiction of the U.S. Department of Agriculture Forest Service, on the Superior National Forest.

Supporting Project Documentation

Table 2. Applicable project file documentation to support analysis

File Name (if applicable or needed)	Documentation Type
Withdrawal application	Description of the request and reasons for the request.
Legal description of the lands requested for withdrawal	List of fee title federal lands within the withdrawal boundary. A final version of this document will accompany transmittal to BLM.
Rainy River Withdrawal Environmental Assessment	Analysis of environmental effects per NEPA regulations.
Mineral Potential Report	Description of the geologic and mineral resources within the withdrawal area.
Reasonably Foreseeable Development report	Description of potential mineral activities on federal lands in the next 20 years, based on the mineral potential, market trends, and other factors, if Forest Service grants consent.
Recreation Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Wilderness Resource Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Soil Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Water and Aquatic Species Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Air Quality Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Climate Change Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Lands Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Roadless and Other Designated Areas Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Socioeconomics Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Terrestrial Wildlife Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Wild Rice Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.

File Name (if applicable or needed)	Documentation Type
Non-Native Invasive Species Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Dark Skies Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Soundscapes Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Scenery Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Cultural Resources Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Tribal Traditional Needs and Values Report	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Sensitive species plants report (biological evaluation)	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Sensitive species aquatic wildlife report (biological evaluation)	Resource report describing relevant law, regulation and policy, affected environment, environmental consequences, and references.
Scoping public involvement summary	Description of public involvement and outreach efforts during scoping comment period and a summary of the concerns raised.
Scoping comment disposition	A list of public concerns, and disposition of the concerns for the analysis.
Environmental assessment public involvement summary	Description of public involvement and outreach efforts during draft environmental assessment comment period and a summary of the concerns raised.
Environmental assessment comment disposition	A list of public concerns, and disposition of the concerns for the analysis.
Mining case studies report	Review of mining projects with similar characteristics to those that may be proposed within the withdrawal and a review of their operations and performance.
Superior National Forest Land and Resource Management Plan, Final EIS and Record of Decision	The "forest plan" provides management direction and analysis is incorporated by reference in this analysis.
Federal Hardrock Mineral Prospecting Permit Final EIS and Record of Decision	The "2012 prospecting permits EIS" provides analysis and is incorporated by reference in this analysis.
BLM Minnesota Management Framework Plan	The BLM Eastern States Resource Management Plan EIS and Minnesota Management Framework Plan DOI-BLM-Eastern States-0030-1982-0001-RMP-EIS

Appendix C – Forest Service Consent

Forest Service Consent

Though the Forest Service has filed the withdrawal application with the BLM, the Forest Service does not, nor may it, relinquish the existing legal authorities that it must utilize to protect National Forest System land, in the event its withdrawal application is denied by the Secretary of the Interior. Indeed, the statutory framework for the disposition of federal hardrock minerals on National Forest System land recognizes the Forest Service's decisive role in federal mineral exploration and development authorization decisions, for the purpose of protecting National Forest System land and resources.

In particular, the disposition authority for federal hardrock minerals found on reserved public domain in Minnesota is the Act of June 30, 1950 (16 U.S.C. 508b). 43 CFR 3501.1(b)(3). For Weeks Act acquired land, the disposition authority is Section 402 of Reorganization Plan No. 3 of 1946 (60 Stat. 1099; 5 USCA Appendix I) and the Act of March 4, 1917 (16 U.S.C. 520). 43 CFR 3501.1(b)(1(i)).

In pertinent part, 16 U.S.C. 508b states:

[T]he Secretary of the Interior is authorized, under general regulations to be prescribed by him and upon such terms and for specified periods or otherwise as he may deem to be for the best interests of the United States, to permit the prospecting for and the development and utilization of such mineral resources: ***Provided, That the development and utilization of such mineral deposits shall not be permitted by the Secretary of the Interior except with the consent of the Secretary of Agriculture.*** (Emphasis added)

Similarly, with respect to Weeks Act acquired National Forest System Lands, 16 U.S.C. 520 states:

The Secretary of Agriculture is authorized, under general regulations to be prescribed by him, to permit the prospecting, development, and utilization of the mineral resources of the lands acquired under the Act of March first, nineteen hundred and eleven, known as the Weeks law, upon such terms and for specified periods or otherwise, as he may deem to be for the best interests of the United States

Section 402 of Plan No. 3 of the 1946 Reorganization Act then transfers the authority to permit the prospecting and development of minerals on Weeks Act acquired lands to the Secretary of the Interior, stating:

The functions of the Secretary of Agriculture and the Department of Agriculture with respect to the uses of mineral deposits in certain lands pursuant to the provisions of the Act of March 4, 1917 [codified at 16 U.S.C. 520] . . . are hereby transferred to the Secretary of the Interior and shall be performed by him or, subject to his direction and control, by such officers and agencies of the Department of the Interior as he may designate: ***Provided, That mineral development on such lands shall be authorized by the Secretary of the Interior only when he is advised by the Secretary of Agriculture that such development will not interfere with the primary purposes for which the land was acquired*** and only in accordance with such conditions as may be specified by the Secretary of Agriculture in order to protect such purposes. (Emphasis added)

BLM regulations, at 43 CFR Part 3500, clearly recognize that the consent of the Secretary of Agriculture is a condition precedent prior to BLM's issuance of any lease or prospecting permit concerning federal hardrock minerals located on National Forest System land, for both Weeks Act acquired and reserved public domain land located in Minnesota. Additionally, those regulatory provisions also provide that any conditions, or stipulations, of that consent must be included as requirements of any lease, or prospecting permit, issued by BLM.²⁶

Under current policy, reflecting the professional land management judgment of highest level in the Forest Service, it is reasonable to expect that the Forest Service will continue to act in accord with its Rainy River watershed mining concerns. That is, it is reasonable to expect the Forest Service to utilize existing and available legal authorities (i.e., consent role) to protect the Boundary Waters Canoe Area Wilderness and the associated mining protection area from unacceptable exploration or mining impacts within the Rainy River watershed. Under the no action alternative, then, for applications concerning new prospecting permits and leases located within the Rainy River watershed, the mechanism to do so would be for the Forest Service, on a case-by-case basis, to consent with conditions which were designed to ensure that there would be no unacceptable adverse impacts to the Rainy River watershed, including the Boundary Waters Canoe Area Wilderness, the Boundary Waters Canoe Area Mining Protection Area, and the 1854 Ceded Territory.

26. See: **43 CFR 3501.1(b)** (Authority for hardrock disposal regulations, includes lands subject to section 402 of Reorganization Plan No. 3 of 1946, as related to Weeks Act acquired land, 3501.1(b)(1), and 16 U.S.C. 508b, 3501.1(b)(3)); **43 CFR 3501.17** (“(a) BLM will not issue you a permit or lease unless it conforms with the decisions, terms and conditions of an applicable comprehensive land use plan. (b) BLM or the surface management agency will comply with any applicable environmental requirements before issuing you a permit or lease. This may result in conditions on your permit or lease”); **43 CFR 3503.13** (“Subject to the consent of the surface managing agency, you may obtain hardrock mineral permits and leases only in the following areas: (a) Lands identified in Reorganization Plan No. 3 of 1946, for which jurisdiction for mineral leasing was transferred to the Secretary of the Interior. These include lands originally acquired under the following acts: (1) 16 U.S.C. 520 (Weeks Act);... (c) Public Domain Lands within the National Forests in Minnesota (16 U.S.C. 508 (b));”); **43 CFR 3503.20** (“(a) Public domain lands. BLM will issue a permit or lease for public domain lands where the surface is administered by another Federal agency only after consulting with the surface management agency. Some laws applicable to public domain lands require us to obtain the consent of the surface management agency before we issue a lease or permit. (b) Acquired lands. For all lands not subject to paragraph (a) of this section where the surface is managed by another Federal agency, we must have written consent from the surface management agency before we issue permits or leases”); **43 CFR 3503.28** (“BLM will specify permit or lease stipulations to adequately use and protect the lands and their resources. This may include stipulations which are required by the surface managing agency, or which are recommended by the surface managing agency or non-federal surface owner and accepted by BLM. (See also part 3580 of this chapter.)”); **43 CFR 3505.55** (“You must:... (b) Comply with all permit terms and stipulations the surface management agency attached to the permit;”); **43 CFR 3507.11(d)** (“Prospecting permits for minerals BLM administers under the authority of Reorganization Plan No. 3 of 1946 do not entitle you to a preference right lease. We may grant you a noncompetitive lease if you discover a valuable deposit during the permit term”); and **43 CFR 3507.19** (“(b) If you applied for a lease for minerals BLM administers under the authority of Reorganization Plan No. 3 of 1946, BLM may also reject your application if we determine that mining is not the preferred use of the lands in the application. In making this determination, we will consider: (1) The land use plan; (3) Any environmental impacts; and (4) The purposes of the statute under which the lands were acquired. (c) We will also reject your application if the surface managing agency does not consent to the lease”).

Again, under alternative B (the no action alternative), case-by-case consideration by the Forest Service, exercising its consent role, would continue for new federal prospecting permit and lease applications. To the extent required, this would include the need to develop supporting NEPA documentation. In that context, and specific to the application being considered, the Forest Service would determine whether conditions of consent are available which would ensure that there would be no unacceptable adverse impacts to the Rainy River watershed, including the Boundary Waters Canoe Area Wilderness, the Boundary Waters Canoe Area Mining Protection Area, and the 1854 Ceded Territory. If not, then the Forest Service would deny consent. However, identification or evaluation of such possible consent conditions for particular applications is beyond the scope of this environmental assessment.

If the Forest Service were to deny consent, that would prevent BLM from authorizing the requests for prospecting permits and leases. As a result, such consent denial would result in effects that are equivalent to those identified in alternative A. That is, a prohibition on exploration or development from denial of consent would prevent those same effects that would also be prevented due to a withdrawal order.

If the Forest Service were to give consent, it would rely on conditions of consent (i.e., stipulations) imposed on prospecting permits or lease stipulations to protect National Forest interests. Such conditions would be developed in consideration of NEPA-related effects disclosure, including the reliable efficacy of such conditions in protecting National Forest interests. Stated differently, when giving consent subject to conditions, the Forest Service would be concluding that sufficient protection of the Boundary Waters Canoe Area Wilderness, the mining protection area, and other National Forest System lands will be accomplished via limitations or operational mitigations, imposed via consent, whether on exploration or development activities.

Should the Forest Service consent with conditions to the issuance of a new lease, then mineral development could occur, if the lessee submitted a mine plan of operations that met all the required standards, and was approved by the agencies, subject to conditions that the Forest Service finds to be sufficiently protective of the Boundary Waters Canoe Area Wilderness, the mining protection area, and other National Forest System lands.

Assessing environmental risk with respect to any future case-specific lease proposal in need of Forest Service consent would be part and parcel of any future Forest Service consent determination, resulting from the then effects disclosure in compliance with NEPA. However, that risk assessment cannot, and should not, be prejudged in this environmental assessment. But consent, even if given with protective stipulations, likely poses, to a certain extent, the risk of the potential failure of mitigation technology. Such a risk of adverse effects is more than that resulting from either consent denial or a withdrawal order, where mining is wholly precluded.