United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Washington, D.C. 20240
http://www.blm.gov

December 30, 2019

In Reply Refer To:
1278-FOIA (640)
FOIA# 2019-00938
1:19-CV-01857

Austin R. Evers
American Oversight
1030 15th Street NW, Suite B255
Washington, DC 20005

Dear Mr. Evers:

This letter is an interim response to your Freedom of Information Act (FOIA) requests, dated March 5, 2019 and April 23, 2019 and assigned tracking numbers 2019-00938 and 2019-00952. In your letter, you asked for the following:

All records reflecting communications (including email messages, email attachments, calendar invitations or entries, and any handwritten or typed notes from meetings) between the custodians listed below and the following individuals and entities:

a. Any employee or representative of Antofagasta PLC, including anyone with an email address ending in antofagasta.co.uk;
b. Andronico Luksic, and anyone acting on his behalf such as a chief of staff, scheduler, or assistant;
c. Ivan Arriagada, and anyone acting on his behalf such as a chief of staff, scheduler, or assistant;
d. Any employee or representative of Twin Metals Minnesota (TMM), including anyone with an email address ending in twin-metals.com;
e. Robert Lehman (including but not limited to the email address rob.lehman@wilmerhale.com); and/or
f. Timothy Martin (including but not limited to the email address timothy.martin@wilmerhale.com).

All communications (including email messages, email attachments, calendar invitations or entries, and any handwritten or typed notes from meetings) between the custodians listed below and the following individuals and entities, regarding the mining leases of Twin Metals in Minnesota:

a. Representative Tom Emmer, and anyone acting on his behalf or serving on his

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staff, including but not limited to Christopher Maneval (Christopher.Maneval@mail.house.gov), David Fitzsimmons (David.fitzsimmons@mail.house.gov), Alyssa Anderson (alyssa.anderson@mail.house.gov), Landon Zinda (landon.zinda@mail.house.gov), and Catherine Lenz (Catherine.lenz@mail.house.gov).

b. Representative Paul Gosar, and anyone acting on his behalf or serving on his staff, including but not limited to Thomas Van Flein (tom.vanflein@mail.house.gov), Leslie Foti (leslie.foti@mail.house.gov), Rory Burke (rory.burke@mail.house.gov), and Jeff Small (jeff.small@mail.house.gov).

We are providing via email a PDF file consisting of 211 pages, which is being released in part. Of these, 3 pages are being partially withheld. We reasonably foresee that disclosure would harm an interest protected by one or more of the nine exemptions to the FOIA's general rule of disclosure.

Exemption 6 of the FOIA allows an agency to withhold "personnel and medical files and similar files the disclosure of which would constitute a clearly unwarranted invasion of personal privacy." 5 U.S.C. § 552(b) (6).

The phrase "similar files" covers any agency records containing information about a particular individual that can be identified as applying to that individual. *See United States Dept of State v. Washington Post Co.*, 456 U.S. 595, 602 (1982). To determine whether releasing records containing information about a particular individual would constitute a clearly unwarranted invasion of personal privacy, we are required to balance the privacy interest that would be affected by disclosure against any public interest in the information. *See United States Dep't of Justice v. Reporters Comm. for Freedom of Press*, 489 U.S. 749, 773-75 (1989).

Under the FOIA, "the only relevant public interest" to consider under the exemption is "the extent to which the information sought would 'shed light on an agency's performance of its statutory duties' or otherwise let citizens 'know what their government is up to.'" *United States Dept. of Def. v. Fed. Labor Relations Auth.*, 510 U.S. 487, 495-96 (1994) (*quoting Reporters Comm.*, 489 U.S. at 775). The burden is on the requester to establish that disclosure would serve the public interest. *See National Archives and Records Admin. v. Favish*, 541 U.S. 157, 171-72 (2004). When the privacy interest at stake and the public interest in disclosure have been determined, the two competing interests must be weighed against one another to determine which the greater result of disclosure is: the harm to personal privacy or the benefit to the public. The purposes for which the request for information is made do not impact this balancing test, as a release of information requested under the FOIA constitutes a release to the general public. *See Reporters Comm.*, 489 U.S. at 771.

The information that has been withheld under Exemption 6 consists of personal information including: buyer's cities and states, and phone numbers.

Keiosha Alexander, Bureau of Land Management (BLM) FOIA Officer, is responsible for this release. Ryan Sklar, Attorney Advisor in the Office of the Solicitor, was consulted.

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If you have any questions regarding this request, please contact Sheriff Oladepo, BLM WO FOIA Specialist, at (202) 912-7650 or via email at BLM_WO_FOIA@blm.gov.

Sincerely,

For Ryan Witt, Acting Chief
Division of Intergovernmental and
External Affairs

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From: ymackthompson@blm.gov
To: BLM-WO MIB RM5653 Conference Room; kbenedetto@blm.gov
Cc: umassey@blm.gov
Subject: Invitat on: HOLD Ext. Meeting on Twin Metals with Timothy Mart n @ Mon Apr 2, 2018 5pm - 5:30pm (EDT) (kbenedetto@blm.gov)
Attachments: invite ics

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Your attendance is optional.
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To: bmcfarlin@twin-metals.com; kbenedetto@blm.gov; ymackthompson@blm.gov
Subject: Invitation: Twin Metals - Br ef update on project ssues and activit es @ Mon Jul 23, 2018 8pm - 8:30pm (UTC) (bmcfarl n@tw n-metals.com)
Attachments: invite.ics

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Twin Metals - Brief update on project issues and activities
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From: gareth_rees@ios.doi.gov
To: james_cason@ios.doi.gov; richard_cardinale@ios.doi.gov; katharine_macgregor@ os.doi.gov
Cc: tracie_lassiter@ios.doi.gov; michael_anderson@ios.doi.gov; kathleen_benedetto@ios.doi.gov; lthurn@blm.gov
Subject: Invitation: Twin Metals Minnesota @ Tue May 2, 2017 1pm - 1:45pm (lthurn@blm.gov)
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Twin Metals Minnesota
POC: Raya Tresize
Confirmed Attendees:
Ivan Arriagada, CEO, Antofagasta plc.
Daniel Altikes, Executive Director, Antofagasta plc.
Rob Lehman, Chair of the WilmerHale Public Policy Practice
Andy Spielman, Chair of the WilmerHale Energy and Natural Resources Practice
When Tue May 2, 2017 1pm – 1:45pm Eastern Time
Video call https://plus.google.com/hangouts/_/doi.gov/gareth-rees-jam <https://plus.google.com/hangouts/_/doi.gov/gareth-rees-jam?hceid Z2FyZXRoX3JlZXNAaW9zLmRvaS5nb3Y.siko80dvas35kba1vnn6o1p4n8>
Calendar lthurn@blm.gov
Who • gareth_rees@ios.doi.gov - organizer
• catherine_gulac@ios.doi.gov - creator
• james_cason@ios.doi.gov
• richard_cardinale@ios.doi.gov
• katharine_macgregor@ios.doi.gov
• tracie_lassiter@ios.doi.gov - optional
• michael_anderson@ios.doi.gov - optional
• kathleen_benedetto@ios.doi.gov - optional
• lthurn@blm.gov - optional

Your attendance is optional.
Going? Yes <https://www.google.com/calendar/event?
action RESPOND&eid c2lrbzgwZHZhczM1a2JhMXZubjZvMXA0bjggbHRodXJuQGJsbS5nb3Y&rst 1&tok MjMjZ2FyZXRoX3JlZXNAaW9zLmRvaS5nb3Y2MTI1MWQwMDgzMWQ1ODg3YmUwNWY0ODIzYWQ3ODBkZDE0MDJkYWQ0&ctz America/New_York&hl en>
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Invitation from Google Calendar <https://www.google.com/calendar/>
You are receiving this email at the account lthurn@blm.gov because you are subscribed for invitations on calendar lthurn@blm.gov.
To stop receiving these emails, please log in to https://www.google.com/calendar/ and change your notification settings for this calendar.
Forwarding this invitation could allow any recipient to modify your RSVP response. Learn More <https://support.google.com/calendar/answer/37135#forwarding> .

AMERICAN OVERSIGHT

From: Bob McFarlin
To: kbenedetto@blm.gov
Subject: Meeting on Friday?
Date: Wednesday, December 13, 2017 12:45:25 PM

Hi Kathy,

I hope this finds you well. Wondering if you would be available for a short visit this Friday (12/15). I am coming to DC for a quick meeting with USFS Chief Tooke and would love to touch base. I will be traveling with Twin Metals' VP of Environment and Sustainability, Anne Williamson, who you met in Minnesota this past summer. Might you be available after noon on Friday? Also wondering if Mitch Leverette might also be available. (I don't have his direct e-mail.) Thanks for your consideration.

Bob McFarlin
Government Affairs Advisor
Twin Metals Minnesota
380 St. Peter St., Suite 705
St. Paul, MN 55102
612-655-2099 (c)

www.Twin-Metals.com

AMERICAN OVERSIGHT

From: Mack-Thompson, Yolando
To: Timothy.Martin@wilmerhale.com
Subject: Meeting Request
Date: Tuesday, March 21, 2017 11:05:55 AM

Good Morning,

Kathleen Benedetto is available on Thursday, March 24 at 10:00am, will this work for you?

--

Thanks,

Yolando Mack-Thompson

Executive Assistant

BLM Director's Office

1849 C Street NW Suite 5662

Washington, DC 20240

202-208-4294 (Direct Line)

202-208-5242 (Fax)

ymackthompson@blm.gov

AMERICAN OVERSIGHT

From: Bob McFarlin
To: kbenedetto@blm.gov
Subject: Mining Controversy in Minnesota
Date: Monday, October 16, 2017 12:26:14 PM

Dear Kathy,

I hope this finds you well. Congratulations on last week's official announcement about your senior position within BLM. I look forward to continuing to work with you.

Wanted to make you aware of the storm of criticism leaders of two of Minnesota's anti-labor, anti-mining organizations received over the last few days following comments made in a story published by New York Times Magazine about the mining issues in NE Minnesota. "Campaign to Save the Boundary Waters" and "Northeastern Minnesotans for Wilderness" leaders Becky Rom and Reid Carron, both of whom you likely have met with, made highly disparaging remarks about miners and the working men and women of NE Minnesota in the article, which have drawn rebukes from a multitude of sources, including Cong. Emmer, labor union leaders, mining industry leaders, Democrat legislators, GOP gubernatorial candidates, the chairman of the Minnesota Democrat (DFL) Party, etc. Below is a sampling of the news coverage.

Remarks About Mine Workers Stir Political Uproar
Minnesota Public Radio
Brian Bakst
Oct. 13, 2017
https://blogs.mprnews.org/capitol-view/2017/10/remarks-about-mine-workers-stir-political-uproar/

A rift between factions for and against a mining expansion in northeastern Minnesota got deeper this week over condescending quotes in an extensive New York Times Magazine piece that also touched off a new round of political squabbling.

One passage in a nearly 5,000-word feature on tensions over mining produced a firestorm of criticism from the moment it was posted online Thursday, and on Friday led to an apology.

Reid Carron, who is active in the Save The Boundary Waters effort to resist a proposed copper-nickel mine, had criticized people supportive of the project for elevating the promise of new jobs over environmental concerns near the pristine wilderness area.

"Resentment is the primary driver of the pro-mining crowd here — they are resentful that other people have come here and been successful while they were sitting around waiting for a big mining company," Carron told the Times. "They want somebody to just give them a job so they can all drink beer with their buddies and go four-wheeling and snowmobiling with their buddies, not have to think about anything except punching a clock."

His wife, Becky Rom, was quoted suggesting a mine worker also featured in the article didn't care about the area's natural beauty because he "drives to the mine in his truck, comes home and watches TV, and he doesn't know this world exists."

Union leaders pounced, with International Union of Operating Engineers political director Jason George saying the remarks feed into "a war on American workers in this country."

The political reaction soon followed, with Republicans blaming Democrats for the sentiment and many

AMERICAN OVERSIGHT

Democrats working to distance themselves from it. The area is crucial political turf heading into 2018 because it has long been a Democratic stronghold but shifted into President Trump's column in the last election.

Republican U.S. Rep. Tom Emmer called out Save The Boundary Waters as disparaging.

"The next time Save the Boundary Waters leaders voice their opposition, I hope they take a minute to realize all they have thanks to the mining industry and the incredible workers who provided it to them," Emmer said in a statement. "I urge my fellow Minnesota colleagues to join me in condemning these unnecessary mean-spirted attacks on our hardworking citizens."

DFL Party Chairman Ken Martin was among the leaders in his party to say there was no room, in his words, "for the sharp-tongued attack on Minnesotans who work hard every day to provide for their families and support our state's economy."

St. Paul Mayor Chris Coleman, one of several DFL governor hopefuls, chimed in, too, by saying the insults won't help bridge the divide over the proposed Twin Metals project or the environmental concerns over mining in general.

"We can continue to support the mining economy that has been central to towns like Ely for generations while also preserving the wilderness that has also been so important," Coleman wrote in a statement, adding, "Minnesotans are known for working together to advance the common good. As the debate over Twin Metals continues, let us all remember to treat one another with the dignity and respect that our common humanity demands."

By Friday afternoon, the Save The Boundary Waters group issued an apology on behalf of Carron and Rom.

"Those who disagree with us care about our community every bit as much as we do. Our politics are divided enough and we believe we can all do better — starting with ourselves — at considering other perspectives respectfully even as we fiercely advocate for our values and beliefs," the group's statement read. "People who go to work in mines are some of the hardest workers in Minnesota. They rise before the sun, work long hours, and take pride and accomplishment that comes from having produced something of value. That is a not a life to be mocked or derided. For any comments that did so, we are truly sorry."

Environmentalist's Comments About Miners in New York Times Magazine Story Cause Uproar on Iron Range
Star Tribune (Daily)
J. Patrick Coolican
Oct. 14, 2017
http://www.startribune.com/environmentalists-comments-about-miners-cause-uproar-on-iron-range/450820383/

A story in this Sunday's New York Times Magazine has exploded already simmering tensions between environmentalists and mining advocates on the Iron Range.

Reid Carron, a clean water advocate who lives in Ely, is quoted in the lengthy article — about the conflict over copper-nickel mining — disparaging mining advocates: "They want somebody to just give them a job so they can all drink beer with their buddies and go four-wheeling and snowmobiling with their buddies, not have to think about anything except punching a clock."

Mining and building trades unions were quick to fire back at Carron's incendiary comments.

"The sentiments expressed by Carron very accurately reflect the way most anti-mining, anti-pipeline, anti-development groups really feel about the hardworking people of northern Minnesota. It disgusts me," said

AMERICAN OVERSIGHT

Jason George, political director for the International Union of Operating Engineers Local 49, which represents more than 13,500 heavy equipment operators.

U.S. Rep. Tom Emmer, R-Minnesota, said in a news release: “I am embarrassed to hear fellow Minnesotans speak so disparagingly about our neighbors.”

This open rift between two groups important to the DFL coalition — environmentalists and the building trades unions — threatened to hurt the party’s chances in next year’s elections.

DFL Chair Ken Martin tried to contain the damage: “These judgmental comments wrongfully disparage thousands of hardworking Minnesotans. There’s no room in the debate for sharp-tongued attacks on Minnesotans who work hard every day to provide for their families and support our state’s economy.”

Save the Boundary Waters, an environmental group of which Carron is a leader, apologized in a news release: “People who go to work in mines are some of the hardest workers in Minnesota. They rise before the sun, work long hours, and take pride and accomplishment that comes from having produced something of value. That is a not a life to be mocked or derided. For any comments that did so, we are truly sorry.”

Carron also apologized in his own, separate statement in which he characterized his remark as “disrespectful and untrue.”

“The people and the communities in northeastern Minnesota are treasures that deserve to prosper,” he said.

Magazine Article on Iron Range Dilemma Will Leave a Scar
Star Tribune (Daily)
J. Patrick Coolican
Oct. 14, 2017
http://www.startribune.com/magazine-article-on-iron-range-dilemma-will-leave-a-scar/450917953/?section=politics

The last thing DFL Chair Ken Martin needed was this: a story in this Sunday’s New York Times Magazine that exploded already simmering tensions between two key groups in the DFL coalition — environmentalists and miners on the Iron Range.

Reid Carron, a clean-water advocate who lives in Ely, is quoted in the lengthy article — about the conflict over copper-nickel mining — disparaging mining advocates: “They want somebody to just give them a job so they can all drink beer with their buddies and go four-wheeling and snowmobiling with their buddies, not have to think about anything except punching a clock.”

Mining and building trades unions were quick to fire back at Carron’s incendiary comments.

“The sentiments expressed by Carron very accurately reflect the way most anti-mining, anti-pipeline, anti-development groups really feel about the hardworking people of northern Minnesota. It disgusts me,” said Jason George, political director for the International Union of Operating Engineers Local 49, which represents more than 13,500 heavy-equipment operators.

This open rift between two groups important to the DFL coalition — environmentalists and the building trades unions — could allow Republicans to peel off rural votes.

Martin tried to contain the damage: “These judgmental comments wrongfully disparage thousands of hardworking Minnesotans. There’s no room in the debate for sharp-tongued attacks on Minnesotans who work hard every day to provide for their families and support our state’s economy.”

AMERICAN OVERSIGHT

Save the Boundary Waters, an environmental group of which Carron is a leader, apologized in its own news release: “People who go to work in mines are some of the hardest workers in Minnesota. They rise before the sun, work long hours, and take pride and accomplishment that comes from having produced something of value. That is a not a life to be mocked or derided. For any comments that did so, we are truly sorry.”

Carron himself also put out a statement of apology, calling his own comments “disrespectful and untrue,” adding that “the people and the communities in northeastern Minnesota are treasures that deserve to prosper.”

But the damage is done.

The Carron comments show the peculiar form of trouble that can arise for public or semipublic officials who speak their mind a little too freely on an issue they care deeply about.

The DFL may hope this will go away. But for Iron Rangers, what they long suspected is now confirmed. And they are known to have long memories.

Environmentalists’ Comments on Miners Draw Fire From Iron Range
Mesabi Daily News (Daily)
Jerry Burnes
Oct. 13, 2017
http://www.virginiamn.com/news/local/environmentalists-comments-on-miners-draw-fire-from-iron-range/article_b25f6eb2-b079-11e7-809c-eb750df615c6.html
**Coverage was also syndicated in 12 additional publications, including INFORUM and the Duluth News Tribune*

Comments made to The New York Times Magazine by environmental leaders Becky Rom and Reid Carron were condemned by Iron Range and statewide leaders Friday, who called their depiction of miners disrespectful to the working class.

Rom and Carron were interviewed as part of a story on the intense copper-nickel debate in Ely, which published online Thursday ahead of its Sunday print issue.

“Resentment is the primary driver of the pro-mining crowd here — they are resentful that other people have come here and been successful while they were sitting around waiting for a big mining company,” Carron told Times reporter Reid Forgrave, a correspondent from Minneapolis. “They want somebody to just give them a job so they can all drink beer with their buddies and go four-wheeling and snowmobiling with their buddies, not have to think about anything except punching a clock.”
Rom added: “Danny Forsman drives to the mine in his truck, comes home and watches TV, and he doesn’t know this world exists.”

The comments struck the ire of the Range, sparking several rebukes early Friday.

“These are dedicated, responsible, innovative people who certainly ‘know the world exists’ and work every day — including in their spare time — to make our world a better place,” said Kelsey Johnson, president of the Iron Mining Association.

Rom, a leader in the Campaign to Save the Boundary Waters, has been an outspoken critic of a plan to install an underground copper-nickel mine in the Superior National Forest near the Boundary Waters Canoe Area Wilderness.

The subject is a hot debate between environmental groups in opposition over the potential it could taint the Boundary Waters, and the pro-mining forces that support a potentially large jobs creator for Ely and the surrounding communities.

AMERICAN OVERSIGHT

“These judgmental comments wrongfully disparage thousands of hard-working Minnesotans,” said Minnesota DFL Chair Ken Martin. “There’s no question that the issue of mining in Northern Minnesota is a contentious one. But there’s no room in the debate for sharp-tongued attacks on Minnesotans who work hard everyday to provide for their families and support our state’s economy.”

Rom and Carron issued an apology late Friday morning.

“Living in the Ely community, we depend on people all the time who we know hold a different view than we do on whether copper mining would be a good thing,” Rom and Carron wrote. “When we do business with them, they are helpful and generous, and we treat each other with mutual respect. For Reid to say that people like that are sitting around waiting for a big mining company to give them a job or Becky to question if Dan has been into the Boundary Waters is disrespectful.”

Congressman Rick Nolan, D-Minn., who represents the Iron Range and is a strong supporter of the Twin Metals mining project, said his office also received an apology from Rom and Carron, who acknowledged their comments were “disrespectful to these hardworking 8th District constituents,” Nolan said.

Both Rom and Forsman have found themselves under scrutiny for comments made in the last year.
Rom was quoted in May by The Progressive, a grassroots publication that champions progressive politics, that the environmental groups would win the copper-nickel fight “one funeral at a time.”

Forsman also faced backlash in December over a Facebook post on a pro-Hillary Clinton group, in which he suggested its members commit suicide. Rom was among those suggesting Forsman resign from the Ely City Council over the comment.

WDIO's Renee Passal contributed to this report.

Leaders, Groups, and Unions Upset with Comments About Miners in Magazine Article
WDIO-TV
Staff
Oct. 13, 2017
http://www.wdio.com/TWIM/mining-boundary-waters-becky-rom-nyt-article/4634176/?cat=10335
**Click link to view video*

Union leaders, DFL officials, and environmental groups are upset after two well-known advocates were quoted with some disdainful comments about miners in a piece to be published in Sunday's New York Times Magazine.

Becky Rom and Reid Carron are leaders in the Save the Boundary Waters Campaign. They are quoted by many news media about the issue of potential precious metals mining in the region.

In the latest article, written by Reid Forgrave for the New York Times Magazine, they comment on the mining community. Rom said, "Danny Forsman drives to the mine in his truck, comes home and watches TV, and doesn't know this world exists."

Carron said, "They just want somebody to just give them a job so they can all drink beer with their buddies and go four-wheeling and snowmobiling with their buddies, not having to think about anything except punching a clock."

Those comments were met with disgust by the political director of the International Union of Operating Engineers Local 49, Minnesota's largest construction union. Jason George wrote, "There is a war on American workers in this country. Enough is enough. The disdain for Minnesota workers, and the belittlement of highly skilled work exhibited by environmental activists and low wage conservatives alike must be rejected by a majority of us."

AMERICAN OVERSIGHT

The couple has since apologized for the comments. **In a statement made to Eyewitness News,** Reid Carron and Becky Rom of Ely said: *The New York Times Magazine article about the conflict over proposed copper mines near the Boundary Waters quotes a statement by Reid regarding the mindset of what he called the "pro-mining crowd." The statement was disrespectful and untrue."*

Dave Lislegard, a third generation Iron Ranger, former steelworker, and now an Aurora City Councilor, sat down with Eyewitness News and shared his perspective on the comments.

"These comments and statements are extremely disheartening for people on the Iron Range. They are uncalled for and unwarranted. We can agree to disagree. But attacking our way of life, for the Range, it's very disappointing."

He added that it makes it more difficult to have conversations about the topic. "I'm sure Becky and Reid are sorry. But it seems to be kind of a pattern of comments."

Other groups are now weighing in as well, including the Campaign to Save the Boundary Waters . Their statement said, "We can be strong and passionate advocates for protecting this place that we love without denigrating other people who may disagree with us. In comments made....certain campaign leaders fell far short of that standard. And for that we truly apologize."

The Minnesota DFL also sent a statement from their chairman, Ken Martin. "These judgmental comments wrongfully disparage thousands of hardworking Minnesotans. There's no question that the issue of mining in Northern Minnesota is a contentious one. But there's no room in the debate for sharp-tongued attacks on Minnesotans who work hard every day to provide for their families and support our state's economy."

8th Congressional District DFL Chair Justin Perpich said, "These statements were cruel, excessive, and do not reflect the community values we hold dear on the Iron Range. Iron Rangers are among the hardest working men and women in this country. Our resilience and work ethic is unparalleled. We are miners and mill workers, hunters and hikers, mothers and fathers. Our community does not need the petty name-calling that plagued this story."

The Iron Mining Association President Kelsey Johnson added, "These folks work long hours regardless of weather conditions in order for Americans, even those who go out of their way to disparage them and their jobs, to have vehicles, infrastructure, appliances, and so many other things we use every day."

The article was posted to the New York Times website Thursday ahead of its publication on page 32 of Sunday's New York Times Magazine. It was the first article that that Forgrave, a Minneapolis-based writer, has written for the magazine.

Comments About Miners in New York Times Magazine Article Draw Fire, Prompt Apology
Duluth News Tribune (Daily)
Staff
Oct. 13, 2017
http://www.duluthnewstribune.com/news/4343298-comments-about-miners-new-york-times-magazine-article-draw-fire-prompt-apology

Two prominent Northland environmental activists on Friday issued an apology regarding comments they made about miners in a New York Times Magazine article published online the day before.

The article by Minneapolis writer Reid Forgrave covers the ongoing battle over proposed copper-nickel mining projects near the Boundary Waters Canoe Area Wilderness. It includes interviews with Dan Forsman, a fourth-generation miner from Ely who supports the proposed mining projects, as well as Becky Rom and Reid Carron, an Ely couple who have been vocal in their opposition to the proposals. Rom is chairwoman of the Campaign to Save the Boundary Waters.

In the article, which runs more than 4,600 words, Rom is quoted as saying that Forsman "drives to the

AMERICAN OVERSIGHT

mine in his truck, comes home and watches TV, and he doesn't know this world exists," referring to the BWCAW.

Carron is quoted as saying that pro-mining individuals are "resentful that other people have come here and been successful while they were sitting around waiting for a big mining company. They want somebody to just give them a job so they can all drink beer with their buddies and go four-wheeling and snowmobiling with their buddies."

Those comments drew a sharp response from union, mining industry and political officials on the Iron Range.

Justin Perpich, 8th Congressional District DFL chair, said in a news release that "these statements were cruel, excessive, and do not reflect the community values we hold dear on the Iron Range. Iron Rangers are among the hardest-working men and women in this country. ... Our community does not need the petty name-calling that plagued this story.

"What the Iron Range needs are good-paying jobs. Jobs that support entire families. ... We need a diverse economy, one where miners, the creative class, and environmentalists can live together and thrive."

Miners "work long hours regardless of weather conditions in order for Americans — even those who go out of their way to disparage them and their jobs — to have vehicles, infrastructure, appliances, and so many other things we use every day," said Iron Mining Association of Minnesota President Kelsey Johnson in a news release, calling the remarks in the article "egregious."

In a statement provided to WDIO-TV on Friday, Rom and Carron said the statements in the article were "disrespectful and untrue."

"Living in the Ely community, we depend on people all the time who we know hold a different view than we do on whether copper mining would be a good thing. When we do business with them, they are helpful and generous, and we treat each other with mutual respect," they wrote in the statement. "For Reid to say that people like that are sitting around waiting for a big mining company to give them a job or Becky to question if Dan has been into the Boundary Waters is disrespectful. We apologize for these statements."

A statement issued by the Campaign to Save the Boundary Waters on Friday said "we can be strong and passionate advocates for protecting this place that we love without denigrating other people who may disagree with us. ... Certain campaign leaders fell far short of that standard. And for that we truly apologize."

While noting that the group still firmly believes that copper mining has no place near the Boundary Waters, and will work toward that end, the campaign's statement acknowledged that "people who go to work in mines are some of the hardest workers in Minnesota. They rise before the sun, work long hours, and take pride and accomplishment that comes from having produced something of value. That is a not a life to be mocked or derided. For any comments that did so, we are truly sorry."

Emmer Condemns Disparaging Comments from Save the Boundary Waters Leaders
Office of Rep. Tom Emmer
Staff
Oct. 13, 2017
https://emmer.house.gov/media-center/press-releases/emmer-condemns-disparaging-comments-save-boundary-waters-leaders

Congressman Tom Emmer (MN-06) released the following statement in regards to recent disparaging comments from leaders of Save the Boundary Waters against miners and union workers in Northern Minnesota:

AMERICAN OVERSIGHT

“This nation was built on the backs of the American worker, and Minnesota was built on the backs of Minnesota miners. For some Minnesota families, mining is in their blood going back to the beginning of Minnesota’s statehood. These men and women are responsible for keeping our towns, our state, and our country alive. They are the ones we have to thank for providing the precious metals needed for our cell phones, computers, vehicles and wind turbines.

“Apparently, Save the Boundary Waters’ leaders think rather differently telling the New York Times, ‘They want somebody to just give them a job so they can all drink beer with their buddies and go four-wheeling and snowmobiling with their buddies, not have to think about anything except punching a clock.’

“All Americans, and all Minnesotans, have the right to say or believe what they will, but that is not the Minnesota Nice we are known for, and I am embarrassed to hear fellow Minnesotans speak so disparagingly about our neighbors. The next time Save the Boundary Waters leaders voice their opposition, I hope they take a minute to realize all they have thanks to the mining industry and the incredible workers who provided it to them.

“I urge my fellow Minnesota colleagues to join me in condemning these unnecessary mean-spirted attacks on our hardworking citizens.”

DFL Chairman Statement on Disrespectful Comments about Minnesota Workers in New York Times
Minnesota Democratic-Farmer-Laborer Party
Staff
Oct. 13, 2017
https://www.dfl.org/blog/dfl-news/2017/10/dfl-chairman-statement-on-disrespectful-comments-about-minnesota-workers-in-new-york-times/

Minnesota Democratic-Farmer-Labor (DFL) Chairman Ken Martin released the following statement today in response to disparaging comments made about Minnesota workers in a recent New York Times Magazine story on mining:

“My brother, Trevor, is a hardworking carpenter. Every morning before the sun comes up, he wakes up, packs up his tools in his truck, and drives through Minnesota to a job site. He works long hours performing back-breaking work to put bread on his table for his family. When I read the disrespectful remarks made about workers in the New York Times article on mining, I immediately thought of Trevor.”

“These judgmental comments wrongfully disparage thousands of hard-working Minnesotans. There’s no question that the issue of mining in Northern Minnesota is a contentious one. But there’s no room in the debate for sharp-tongued attacks on Minnesotans who work hard every day to provide for their families and support our state’s economy.”

“As the campaign manager for the landmark Clean Water, Land, and Legacy Amendment in 2008, I know firsthand how important it is to protect our natural resources for future generations. I also know that there are few people who value the environment more than the men and women who hunt, fish, and hike outside their homes on the Iron Range.”

“Here in Minnesota, we value civility. We treat each other with respect. We must keep this debate healthy, productive, and focused on the issue at hand. Because at the end of the day, we all want the same thing: a better life for our family and a brighter future for our state.”

Bob McFarlin
Government Affairs Advisor
Twin Metals Minnesota

AMERICAN OVERSIGHT

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AMERICAN OVERSIGHT

From: Bob McFarlin
To: kbenedetto@blm.gov
Subject: Mining Controversy in Minnesota
Date: Monday, October 16, 2017 12:26:14 PM

Dear Kathy,

I hope this finds you well. Congratulations on last week's official announcement about your senior position within BLM. I look forward to continuing to work with you.

Wanted to make you aware of the storm of criticism leaders of two of Minnesota's anti-labor, anti-mining organizations received over the last few days following comments made in a story published by New York Times Magazine about the mining issues in NE Minnesota. "Campaign to Save the Boundary Waters" and "Northeastern Minnesotans for Wilderness" leaders Becky Rom and Reid Carron, both of whom you likely have met with, made highly disparaging remarks about miners and the working men and women of NE Minnesota in the article, which have drawn rebukes from a multitude of sources, including Cong. Emmer, labor union leaders, mining industry leaders, Democrat legislators, GOP gubernatorial candidates, the chairman of the Minnesota Democrat (DFL) Party, etc. Below is a sampling of the news coverage.

Remarks About Mine Workers Stir Political Uproar
Minnesota Public Radio
Brian Bakst
Oct. 13, 2017
https://blogs.mprnews.org/capitol-view/2017/10/remarks-about-mine-workers-stir-political-uproar/

A rift between factions for and against a mining expansion in northeastern Minnesota got deeper this week over condescending quotes in an extensive New York Times Magazine piece that also touched off a new round of political squabbling.

One passage in a nearly 5,000-word feature on tensions over mining produced a firestorm of criticism from the moment it was posted online Thursday, and on Friday led to an apology.

Reid Carron, who is active in the Save The Boundary Waters effort to resist a proposed copper-nickel mine, had criticized people supportive of the project for elevating the promise of new jobs over environmental concerns near the pristine wilderness area.

"Resentment is the primary driver of the pro-mining crowd here — they are resentful that other people have come here and been successful while they were sitting around waiting for a big mining company," Carron told the Times. "They want somebody to just give them a job so they can all drink beer with their buddies and go four-wheeling and snowmobiling with their buddies, not have to think about anything except punching a clock."

His wife, Becky Rom, was quoted suggesting a mine worker also featured in the article didn't care about the area's natural beauty because he "drives to the mine in his truck, comes home and watches TV, and he doesn't know this world exists."

Union leaders pounced, with International Union of Operating Engineers political director Jason George saying the remarks feed into "a war on American workers in this country."

The political reaction soon followed, with Republicans blaming Democrats for the sentiment and many

AMERICAN OVERSIGHT

Democrats working to distance themselves from it. The area is crucial political turf heading into 2018 because it has long been a Democratic stronghold but shifted into President Trump's column in the last election.

Republican U.S. Rep. Tom Emmer called out Save The Boundary Waters as disparaging.

"The next time Save the Boundary Waters leaders voice their opposition, I hope they take a minute to realize all they have thanks to the mining industry and the incredible workers who provided it to them," Emmer said in a statement. "I urge my fellow Minnesota colleagues to join me in condemning these unnecessary mean-spirted attacks on our hardworking citizens."

DFL Party Chairman Ken Martin was among the leaders in his party to say there was no room, in his words, "for the sharp-tongued attack on Minnesotans who work hard every day to provide for their families and support our state's economy."

St. Paul Mayor Chris Coleman, one of several DFL governor hopefuls, chimed in, too, by saying the insults won't help bridge the divide over the proposed Twin Metals project or the environmental concerns over mining in general.

"We can continue to support the mining economy that has been central to towns like Ely for generations while also preserving the wilderness that has also been so important," Coleman wrote in a statement, adding, "Minnesotans are known for working together to advance the common good. As the debate over Twin Metals continues, let us all remember to treat one another with the dignity and respect that our common humanity demands."

By Friday afternoon, the Save The Boundary Waters group issued an apology on behalf of Carron and Rom.

"Those who disagree with us care about our community every bit as much as we do. Our politics are divided enough and we believe we can all do better — starting with ourselves — at considering other perspectives respectfully even as we fiercely advocate for our values and beliefs," the group's statement read. "People who go to work in mines are some of the hardest workers in Minnesota. They rise before the sun, work long hours, and take pride and accomplishment that comes from having produced something of value. That is a not a life to be mocked or derided. For any comments that did so, we are truly sorry."

Environmentalist's Comments About Miners in New York Times Magazine Story Cause Uproar on Iron Range
Star Tribune (Daily)
J. Patrick Coolican
Oct. 14, 2017
http://www.startribune.com/environmentalists-comments-about-miners-cause-uproar-on-iron-range/450820383/

A story in this Sunday's New York Times Magazine has exploded already simmering tensions between environmentalists and mining advocates on the Iron Range.

Reid Carron, a clean water advocate who lives in Ely, is quoted in the lengthy article — about the conflict over copper-nickel mining — disparaging mining advocates: "They want somebody to just give them a job so they can all drink beer with their buddies and go four-wheeling and snowmobiling with their buddies, not have to think about anything except punching a clock."

Mining and building trades unions were quick to fire back at Carron's incendiary comments.

"The sentiments expressed by Carron very accurately reflect the way most anti-mining, anti-pipeline, anti-development groups really feel about the hardworking people of northern Minnesota. It disgusts me," said

AMERICAN OVERSIGHT

Jason George, political director for the International Union of Operating Engineers Local 49, which represents more than 13,500 heavy equipment operators.

U.S. Rep. Tom Emmer, R-Minnesota, said in a news release: “I am embarrassed to hear fellow Minnesotans speak so disparagingly about our neighbors.”

This open rift between two groups important to the DFL coalition — environmentalists and the building trades unions — threatened to hurt the party’s chances in next year’s elections.

DFL Chair Ken Martin tried to contain the damage: “These judgmental comments wrongfully disparage thousands of hardworking Minnesotans. There’s no room in the debate for sharp-tongued attacks on Minnesotans who work hard every day to provide for their families and support our state’s economy.”

Save the Boundary Waters, an environmental group of which Carron is a leader, apologized in a news release: “People who go to work in mines are some of the hardest workers in Minnesota. They rise before the sun, work long hours, and take pride and accomplishment that comes from having produced something of value. That is a not a life to be mocked or derided. For any comments that did so, we are truly sorry.”

Carron also apologized in his own, separate statement in which he characterized his remark as “disrespectful and untrue.”

“The people and the communities in northeastern Minnesota are treasures that deserve to prosper,” he said.

Magazine Article on Iron Range Dilemma Will Leave a Scar
Star Tribune (Daily)
J. Patrick Coolican
Oct. 14, 2017
http://www.startribune.com/magazine-article-on-iron-range-dilemma-will-leave-a-scar/450917953/?section=politics

The last thing DFL Chair Ken Martin needed was this: a story in this Sunday’s New York Times Magazine that exploded already simmering tensions between two key groups in the DFL coalition — environmentalists and miners on the Iron Range.

Reid Carron, a clean-water advocate who lives in Ely, is quoted in the lengthy article — about the conflict over copper-nickel mining — disparaging mining advocates: “They want somebody to just give them a job so they can all drink beer with their buddies and go four-wheeling and snowmobiling with their buddies, not have to think about anything except punching a clock.”

Mining and building trades unions were quick to fire back at Carron’s incendiary comments.

“The sentiments expressed by Carron very accurately reflect the way most anti-mining, anti-pipeline, anti-development groups really feel about the hardworking people of northern Minnesota. It disgusts me,” said Jason George, political director for the International Union of Operating Engineers Local 49, which represents more than 13,500 heavy-equipment operators.

This open rift between two groups important to the DFL coalition — environmentalists and the building trades unions — could allow Republicans to peel off rural votes.

Martin tried to contain the damage: “These judgmental comments wrongfully disparage thousands of hardworking Minnesotans. There’s no room in the debate for sharp-tongued attacks on Minnesotans who work hard every day to provide for their families and support our state’s economy.”

AMERICAN OVERSIGHT

Save the Boundary Waters, an environmental group of which Carron is a leader, apologized in its own news release: “People who go to work in mines are some of the hardest workers in Minnesota. They rise before the sun, work long hours, and take pride and accomplishment that comes from having produced something of value. That is a not a life to be mocked or derided. For any comments that did so, we are truly sorry.”

Carron himself also put out a statement of apology, calling his own comments “disrespectful and untrue,” adding that “the people and the communities in northeastern Minnesota are treasures that deserve to prosper.”

But the damage is done.

The Carron comments show the peculiar form of trouble that can arise for public or semipublic officials who speak their mind a little too freely on an issue they care deeply about.

The DFL may hope this will go away. But for Iron Rangers, what they long suspected is now confirmed. And they are known to have long memories.

Environmentalists’ Comments on Miners Draw Fire From Iron Range
Mesabi Daily News (Daily)
Jerry Burnes
Oct. 13, 2017
http://www.virginiamn.com/news/local/environmentalists-comments-on-miners-draw-fire-from-iron-range/article_b25f6eb2-b079-11e7-809c-eb750df615c6.html
**Coverage was also syndicated in 12 additional publications, including INFORUM and the Duluth News Tribune*

Comments made to The New York Times Magazine by environmental leaders Becky Rom and Reid Carron were condemned by Iron Range and statewide leaders Friday, who called their depiction of miners disrespectful to the working class.

Rom and Carron were interviewed as part of a story on the intense copper-nickel debate in Ely, which published online Thursday ahead of its Sunday print issue.

“Resentment is the primary driver of the pro-mining crowd here — they are resentful that other people have come here and been successful while they were sitting around waiting for a big mining company,” Carron told Times reporter Reid Forgrave, a correspondent from Minneapolis. “They want somebody to just give them a job so they can all drink beer with their buddies and go four-wheeling and snowmobiling with their buddies, not have to think about anything except punching a clock.”
Rom added: “Danny Forsman drives to the mine in his truck, comes home and watches TV, and he doesn’t know this world exists.”

The comments struck the ire of the Range, sparking several rebukes early Friday.

“These are dedicated, responsible, innovative people who certainly ‘know the world exists’ and work every day — including in their spare time — to make our world a better place,” said Kelsey Johnson, president of the Iron Mining Association.

Rom, a leader in the Campaign to Save the Boundary Waters, has been an outspoken critic of a plan to install an underground copper-nickel mine in the Superior National Forest near the Boundary Waters Canoe Area Wilderness.

The subject is a hot debate between environmental groups in opposition over the potential it could taint the Boundary Waters, and the pro-mining forces that support a potentially large jobs creator for Ely and the surrounding communities.

AMERICAN OVERSIGHT

“These judgmental comments wrongfully disparage thousands of hard-working Minnesotans,” said Minnesota DFL Chair Ken Martin. “There’s no question that the issue of mining in Northern Minnesota is a contentious one. But there’s no room in the debate for sharp-tongued attacks on Minnesotans who work hard everyday to provide for their families and support our state’s economy.”

Rom and Carron issued an apology late Friday morning.

“Living in the Ely community, we depend on people all the time who we know hold a different view than we do on whether copper mining would be a good thing,” Rom and Carron wrote. “When we do business with them, they are helpful and generous, and we treat each other with mutual respect. For Reid to say that people like that are sitting around waiting for a big mining company to give them a job or Becky to question if Dan has been into the Boundary Waters is disrespectful.”

Congressman Rick Nolan, D-Minn., who represents the Iron Range and is a strong supporter of the Twin Metals mining project, said his office also received an apology from Rom and Carron, who acknowledged their comments were “disrespectful to these hardworking 8th District constituents,” Nolan said.

Both Rom and Forsman have found themselves under scrutiny for comments made in the last year.
Rom was quoted in May by The Progressive, a grassroots publication that champions progressive politics, that the environmental groups would win the copper-nickel fight “one funeral at a time.”

Forsman also faced backlash in December over a Facebook post on a pro-Hillary Clinton group, in which he suggested its members commit suicide. Rom was among those suggesting Forsman resign from the Ely City Council over the comment.

WDIO's Renee Passal contributed to this report.

Leaders, Groups, and Unions Upset with Comments About Miners in Magazine Article
WDIO-TV
Staff
Oct. 13, 2017
http://www.wdio.com/TWIM/mining-boundary-waters-becky-rom-nyt-article/4634176/?cat=10335
**Click link to view video*

Union leaders, DFL officials, and environmental groups are upset after two well-known advocates were quoted with some disdainful comments about miners in a piece to be published in Sunday's New York Times Magazine.

Becky Rom and Reid Carron are leaders in the Save the Boundary Waters Campaign. They are quoted by many news media about the issue of potential precious metals mining in the region.

In the latest article, written by Reid Forgrave for the New York Times Magazine, they comment on the mining community. Rom said, "Danny Forsman drives to the mine in his truck, comes home and watches TV, and doesn't know this world exists."

Carron said, "They just want somebody to just give them a job so they can all drink beer with their buddies and go four-wheeling and snowmobiling with their buddies, not having to think about anything except punching a clock."

Those comments were met with disgust by the political director of the International Union of Operating Engineers Local 49, Minnesota's largest construction union. Jason George wrote, "There is a war on American workers in this country. Enough is enough. The disdain for Minnesota workers, and the belittlement of highly skilled work exhibited by environmental activists and low wage conservatives alike must be rejected by a majority of us."

AMERICAN OVERSIGHT

The couple has since apologized for the comments. **In a statement made to Eyewitness News,** Reid Carron and Becky Rom of Ely said: *The New York Times Magazine article about the conflict over proposed copper mines near the Boundary Waters quotes a statement by Reid regarding the mindset of what he called the "pro-mining crowd." The statement was disrespectful and untrue."*

Dave Lislegard, a third generation Iron Ranger, former steelworker, and now an Aurora City Councilor, sat down with Eyewitness News and shared his perspective on the comments.

"These comments and statements are extremely disheartening for people on the Iron Range. They are uncalled for and unwarranted. We can agree to disagree. But attacking our way of life, for the Range, it's very disappointing."

He added that it makes it more difficult to have conversations about the topic. "I'm sure Becky and Reid are sorry. But it seems to be kind of a pattern of comments."

Other groups are now weighing in as well, including the Campaign to Save the Boundary Waters . Their statement said, "We can be strong and passionate advocates for protecting this place that we love without denigrating other people who may disagree with us. In comments made....certain campaign leaders fell far short of that standard. And for that we truly apologize."

The Minnesota DFL also sent a statement from their chairman, Ken Martin. "These judgmental comments wrongfully disparage thousands of hardworking Minnesotans. There's no question that the issue of mining in Northern Minnesota is a contentious one. But there's no room in the debate for sharp-tongued attacks on Minnesotans who work hard every day to provide for their families and support our state's economy."

8th Congressional District DFL Chair Justin Perpich said, "These statements were cruel, excessive, and do not reflect the community values we hold dear on the Iron Range. Iron Rangers are among the hardest working men and women in this country. Our resilience and work ethic is unparalleled. We are miners and mill workers, hunters and hikers, mothers and fathers. Our community does not need the petty name-calling that plagued this story."

The Iron Mining Association President Kelsey Johnson added, "These folks work long hours regardless of weather conditions in order for Americans, even those who go out of their way to disparage them and their jobs, to have vehicles, infrastructure, appliances, and so many other things we use every day."

The article was posted to the New York Times website Thursday ahead of its publication on page 32 of Sunday's New York Times Magazine. It was the first article that that Forgrave, a Minneapolis-based writer, has written for the magazine.

Comments About Miners in New York Times Magazine Article Draw Fire, Prompt Apology
Duluth News Tribune (Daily)
Staff
Oct. 13, 2017
http://www.duluthnewstribune.com/news/4343298-comments-about-miners-new-york-times-magazine-article-draw-fire-prompt-apology

Two prominent Northland environmental activists on Friday issued an apology regarding comments they made about miners in a New York Times Magazine article published online the day before.

The article by Minneapolis writer Reid Forgrave covers the ongoing battle over proposed copper-nickel mining projects near the Boundary Waters Canoe Area Wilderness. It includes interviews with Dan Forsman, a fourth-generation miner from Ely who supports the proposed mining projects, as well as Becky Rom and Reid Carron, an Ely couple who have been vocal in their opposition to the proposals. Rom is chairwoman of the Campaign to Save the Boundary Waters.

In the article, which runs more than 4,600 words, Rom is quoted as saying that Forsman "drives to the

AMERICAN OVERSIGHT

mine in his truck, comes home and watches TV, and he doesn't know this world exists," referring to the BWCAW.

Carron is quoted as saying that pro-mining individuals are "resentful that other people have come here and been successful while they were sitting around waiting for a big mining company. They want somebody to just give them a job so they can all drink beer with their buddies and go four-wheeling and snowmobiling with their buddies."

Those comments drew a sharp response from union, mining industry and political officials on the Iron Range.

Justin Perpich, 8th Congressional District DFL chair, said in a news release that "these statements were cruel, excessive, and do not reflect the community values we hold dear on the Iron Range. Iron Rangers are among the hardest-working men and women in this country. ... Our community does not need the petty name-calling that plagued this story.

"What the Iron Range needs are good-paying jobs. Jobs that support entire families. ... We need a diverse economy, one where miners, the creative class, and environmentalists can live together and thrive."

Miners "work long hours regardless of weather conditions in order for Americans — even those who go out of their way to disparage them and their jobs — to have vehicles, infrastructure, appliances, and so many other things we use every day," said Iron Mining Association of Minnesota President Kelsey Johnson in a news release, calling the remarks in the article "egregious."

In a statement provided to WDIO-TV on Friday, Rom and Carron said the statements in the article were "disrespectful and untrue."

"Living in the Ely community, we depend on people all the time who we know hold a different view than we do on whether copper mining would be a good thing. When we do business with them, they are helpful and generous, and we treat each other with mutual respect," they wrote in the statement. "For Reid to say that people like that are sitting around waiting for a big mining company to give them a job or Becky to question if Dan has been into the Boundary Waters is disrespectful. We apologize for these statements."

A statement issued by the Campaign to Save the Boundary Waters on Friday said "we can be strong and passionate advocates for protecting this place that we love without denigrating other people who may disagree with us. ... Certain campaign leaders fell far short of that standard. And for that we truly apologize."

While noting that the group still firmly believes that copper mining has no place near the Boundary Waters, and will work toward that end, the campaign's statement acknowledged that "people who go to work in mines are some of the hardest workers in Minnesota. They rise before the sun, work long hours, and take pride and accomplishment that comes from having produced something of value. That is a not a life to be mocked or derided. For any comments that did so, we are truly sorry."

Emmer Condemns Disparaging Comments from Save the Boundary Waters Leaders
Office of Rep. Tom Emmer
Staff
Oct. 13, 2017
https://emmer.house.gov/media-center/press-releases/emmer-condemns-disparaging-comments-save-boundary-waters-leaders

Congressman Tom Emmer (MN-06) released the following statement in regards to recent disparaging comments from leaders of Save the Boundary Waters against miners and union workers in Northern Minnesota:

AMERICAN OVERSIGHT

“This nation was built on the backs of the American worker, and Minnesota was built on the backs of Minnesota miners. For some Minnesota families, mining is in their blood going back to the beginning of Minnesota’s statehood. These men and women are responsible for keeping our towns, our state, and our country alive. They are the ones we have to thank for providing the precious metals needed for our cell phones, computers, vehicles and wind turbines.

“Apparently, Save the Boundary Waters’ leaders think rather differently telling the New York Times, ‘They want somebody to just give them a job so they can all drink beer with their buddies and go four-wheeling and snowmobiling with their buddies, not have to think about anything except punching a clock.’

“All Americans, and all Minnesotans, have the right to say or believe what they will, but that is not the Minnesota Nice we are known for, and I am embarrassed to hear fellow Minnesotans speak so disparagingly about our neighbors. The next time Save the Boundary Waters leaders voice their opposition, I hope they take a minute to realize all they have thanks to the mining industry and the incredible workers who provided it to them.

“I urge my fellow Minnesota colleagues to join me in condemning these unnecessary mean-spirted attacks on our hardworking citizens.”

DFL Chairman Statement on Disrespectful Comments about Minnesota Workers in New York Times
Minnesota Democratic-Farmer-Laborer Party
Staff
Oct. 13, 2017
https://www.dfl.org/blog/dfl-news/2017/10/dfl-chairman-statement-on-disrespectful-comments-about-minnesota-workers-in-new-york-times/

Minnesota Democratic-Farmer-Labor (DFL) Chairman Ken Martin released the following statement today in response to disparaging comments made about Minnesota workers in a recent New York Times Magazine story on mining:

“My brother, Trevor, is a hardworking carpenter. Every morning before the sun comes up, he wakes up, packs up his tools in his truck, and drives through Minnesota to a job site. He works long hours performing back-breaking work to put bread on his table for his family. When I read the disrespectful remarks made about workers in the New York Times article on mining, I immediately thought of Trevor.”

“These judgmental comments wrongfully disparage thousands of hard-working Minnesotans. There’s no question that the issue of mining in Northern Minnesota is a contentious one. But there’s no room in the debate for sharp-tongued attacks on Minnesotans who work hard every day to provide for their families and support our state’s economy.”

“As the campaign manager for the landmark Clean Water, Land, and Legacy Amendment in 2008, I know firsthand how important it is to protect our natural resources for future generations. I also know that there are few people who value the environment more than the men and women who hunt, fish, and hike outside their homes on the Iron Range.”

“Here in Minnesota, we value civility. We treat each other with respect. We must keep this debate healthy, productive, and focused on the issue at hand. Because at the end of the day, we all want the same thing: a better life for our family and a brighter future for our state.”

Bob McFarlin
Government Affairs Advisor
Twin Metals Minnesota

AMERICAN OVERSIGHT

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AMERICAN OVERSIGHT

From:	Rebecca Rom
To:	David Bernhardt; James Cason; Joe Balash
Cc:	Gareth Rees; bstead@blm.gov; Michael Nedd; Karen Mouritsen; Dean Gettinger; Strohl, Derek; James Hubbard; Doug Crandall; Vicki Christiansen; Chris French; Jennifer Eberlien; Robert Harper; Nick Douglas; Kathleen Atkinson; Shawn Olson; Connie Cummins; Matt Judd; bsteed@blm.gov
Subject:	Re: Twin Metals Lease Renewal EA - Boundary Waters Canoe Area Wilderness
Date:	Tuesday, January 22, 2019 4:09:10 PM
Attachments:	1-21-2019 Comment Letter of NMW, TWS, CBD, NPCA, SFBW, VNPA and Earthjustice on DOI-BLM-ES-030-2018-0002-EA - Renewal of Leases MNES-001352 and -001353.pdf

Good Afternoon - I write once again to request an extension of the extremely short and inadequate comment period for the Twin Metals Lease Renewal EA. Today is the last day of the comment period. The BLM e-comment portal has continued to be problematic throughout the day. For example, we are unable to submit the comment letter from conservation groups via the portal. Moreover, delivery to the Milwaukee BLM office has been unsuccessful. Federal Express informed us today that it cannot deliver our comments because the Milwaukee office is closed. As an alternative, we are today mailing a complete set of our comments from the conservation community to Brian Steed at 1849 C Street NW, Washington, DC. A copy of these comments is attached to this email. The mailed comments include an appendix of additional submittals that are not attached to this email because of size limitations. Our comments include not only the attached letter but also the appendix being delivered to Mr. Steed. Finally, we are also attempting personal delivery on Mr. Steed.

As a consequence of the failure of the BLM to allow for either electronic or physical delivery of comments from citizens who are rightly gravely concerned about renewal of mineral leases in the watershed of the Boundary Waters, we again request an extension of the comment period. More than 181.000 citizens submitted comments during two comment periods on the now-cancelled FLPMA mineral withdrawal study for the Superior National Forest. It is likely that tens of thousands of citizens have been denied the opportunity to submit comments to the BLM on this rushed and clearly questionable attempt to renew cancelled mineral leases near the Boundary Waters.

Thank you for considering this request.

Becky Rom

> On Jan 22, 2019, at 9:15 AM, Rebecca Rom <(b) (6) [redacted]> wrote:
>
> Good Morning - I write to reiterate my request for an extension of the comment period for the Twin Metals Lease Renewal EA. The BLM e-planning page has been down since Sunday, January 20th, the last three days of what is already an extremely short and inadequate comment period for a major decision that affects the fate of the Boundary Waters Canoe Area Widerness, the nation's most visited national wilderness, and millions of Americans. Attached are screen shots of the e-planning page for yesterday and today, showing that the e-comment page is down. The page was also down on Sunday, Jan. 20th. We appreciate your consideration of the numerous requests for extension.
>
> Becky Rom

AMERICAN OVERSIGHT

<BLM_eplanning_page_Screen Shot 2019-01-22 at 8.43.52 AM.pdf>
<BLM_eplanning_page_Screen Shot 2019-01-21 at 3.43.26 PM.pdf>

On Jan 21, 2019, at 3:51 PM, Rebecca Rom
<(b) (6) [redacted] > wrote:

Dear Acting Secretary Bernhardt, Associate Deputy Secretary Cason, and Assistant Secretary Balash:

I write to you today with an urgent request to extend the 30-day comment period for the Environmental Assessment on Twin Metals Lease Renewals. The comment period is currently scheduled to end tomorrow, Tuesday, January 22nd. Today, January 21, is the second to the last day of the comment period. Comments are directed to the BLM e-planning page. **The BLM e-planning page is down today and comments cannot be inputed into the BLM e-comment page. This is at least the seventh day during the 30-day comment period during which the BLM e-planning page for the Twin Metals Lease Renewal EA has been down and comments were not allowed. Citizens who are attempting to comment are being blocked by the BLM from submitting their comments.**

I believe that the BLM and the Department of Interior has received many requests from citizens requesting a longer comment period on this EA for reasons of the gravity of the proposed BLM action, the difficulties of providing comments over the holidays, the barriers to providing comments because of the periodic shutdown of the BLM e-planning page over the comment period, and the difficulties resulting from the partial federal government shutdown.

We respectfully request an extension of the comment period for an additional 60-days plus an additional day for every day of the partial federal government shutdown.

Attached to this email are requests from members of Congress and the Minnesota Attorney General, as well as groups that represent over 18 million people.

Attached here are two requests for a 60-day comment period from U.S. Senators Klobuchar and Smith:

<2018 12 13 Klobuchar Smith BLM EA Public Comment Letter.pdf>
<20190118 Klobuchar_Smith_BLM Comment Period Extension Letter.pdf>
Attached here is a letter from Members of the U.S. House of Representatives:
<19 0118 DOI Bernhardt on TMM lease draft EA comments.pdf>
Attached here is a letter from Minnesota's Attorney General:

AMERICAN OVERSIGHT

<Ellsion 2019-1-18 letter Bernhardt - Jan 18 2019 - 12-17.pdf>
Attached here are two letters from the conservation community:
<Twin Metals Lease Renewal Public Comment Extension Request_final.pdf>
<Twin Metals Lease Renewal Gov Shutdown Impacts Letter_final.pdf>
Attached here is a letter from groups representing hunters and anglers:
<BWCA BLM lease comment period FINAL.pdf>

We would appreciate your urgent consideration of the requests to extend the comment period and a notice of your decision at your earliest opportunity.

Thank you.

Becky Rom
National Chair, Campaign to Save the Boundary Waters
Ely, MN
(b) (6)
[redacted]

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JANUARY 21, 2019 COMMENT LETTER OF
NORTHEASTERN MINNESOTANS FOR WILDERNESS, THE WILDERNESS SOCIETY, CENTER FOR BIOLOGICAL DIVERSITY, NATIONAL PARKS CONSERVATION ASSOCIATION, SPORTSMEN FOR THE BOUNDARY WATERS, VOYAGEURS NATIONAL PARK ASSOCIATION, AND EARTHJUSTICE

ON

DOI-BLM-EASTERN STATES-0030-2018-0002-EA (ADDITION OF TERMS AND CONDITIONS FOR RENEWAL OF HARDROCK LEASES, MNES 001352 AND MNES 001353).

SUBMITTED
MONDAY, JANUARY 21, 2019
BY FEDEX AND BLM COMMENT PORTAL;
AND
TUESDAY, JANUARY 22, 2019
BY U.S. MAIL

These comments include all materials in the Appendix on the labeled thumb drives delivered by both FedEx and U.S. Mail. Due to the 20 MB size limit on uploads via the BLM comment portal, a hardcopy of the comment letter and the complete Appendix (on a labeled thumb drive) are submitted together only by FedEx and U.S. Mail.

AMERICAN OVERSIGHT

AMERICAN OVERSIGHT

TABLE OF CONTENTS

I. INTRODUCTION 1
A. LEAD-UP TO THE LEASE RENEWAL EA 2
B. SUMMARY OF DEFICIENCIES 5
C. INTERESTS OF SIGNATORIES 6

II. BLM'S ENVIRONMENTAL ASSESSMENT FAILS TO COMPLY WITH THE NATIONAL ENVIRONMENTAL POLICY ACT 8
A. INADEQUATE PUBLIC PROCESS 8
B. INADEQUATE SCOPE OF ANALYSIS 11
C. INADEQUATE BASELINE & RANGE OF ALTERNATIVES 14
D. BLM CANNOT SUPPORT A FONSI AND MUST PREPARE AN EIS 16
E. FAILURE TO TAKE A HARD LOOK AT REASONABLY FORESEEABLE DIRECT, INDIRECT, AND CUMULATIVE IMPACTS TO UNIQUE AND IRREPLACEABLE RESOURCES 34
1. RESOURCE IMPACTS INCLUDED IN THE EA BUT INADEQUATELY ANALYZED 35
a. WATER RESOURCES 35
b. CULTURAL RESOURCES 38
c. NOISE 39
d. RECREATION 40
e. VEGETATION 41
f. SOILS 42
g. AIR QUALITY 42
h. WILDLIFE 43
2. RESOURCE IMPACTS IMPROPERLY EXCLUDED FROM THE EA 44
a. ECONOMICS 44
b. PUBLIC HEALTH 46
c. WILDERNESS VALUES 49
d. IMPACTS TO VOYAGEURS NATIONAL PARK 50
e. CLIMATE CHANGE 51
f. TRANSBOUNDARY IMPACTS 52
g. CUMULATIVE IMPACTS 53
F. INADEQUATE STIPULATIONS 54
G. IMPROPER PRE-DETERMINATION 56
H. FOREST SERVICE ROLE IN THE NEPA PROCESS 57
I. NATIONAL PARK SERVICE ROLE IN THE NEPA PROCESS 59

III. FOREST SERVICE ROLE 59
A. THE FOREST SERVICE IS CHARGED WITH

AMERICAN OVERSIGHT

PROTECTING THE BOUNDARY WATERS AND MANAGING THE LEASED LAND, AND HAS THE FINAL SAY ON MINERAL LEASING 60
B. THE FOREST SERVICE MUST PLAY A CENTRAL ROLE IN ANY LEASE RENEWAL DECISION 61
C. AS THE FOREST SERVICE ALREADY FOUND, LEASE RENEWAL IS INCONSISTENT WITH THE FOREST SERVICE'S OBLIGATIONS TO PROTECT THE BOUNDARY WATERS 61
D. THE BLM IS REQUIRED TO OBTAIN FOREST SERVICE CONSENT 62
E. LEASE RENEWAL IS INCONSISTENT WITH THE 2004 SUPERIOR NATIONAL FOREST PLAN 63

IV. LEASE RENEWAL IS INCONSISTENT WITH OTHER LEGAL OBLIGATIONS 65
A. LEASE RENEWAL IS INCONSISTENT WITH AND VIOLATES THE WILDERNESS ACT OF 1964 AND THE BOUNDARY WATERS CANOE AREA WILDERNESS ACT OF 1978 65
1. REQUIREMENTS OF THE WILDERNESS ACT OF 1964 AND THE BOUNDARY WATERS CANOE AREA WILDERNESS ACT OF 1978 65
2. THE U.S. FOREST SERVICE HAS CONCLUDED THAT RENEWAL OF THE LEASES IS INCOMPATIBLE WITH FEDERAL RESPONSIBILITIES UNDER THE 1964 AND 1978 ACTS, AND THE EVIDENCE SUPPORTS THAT CONCLUSION 67
a. WATER QUALITY 68
b. NOISE POLLUTION 69
c. AIR POLLUTION 70
d. DESTRUCTION OF DISPERSED WATER-ACCESS BACKCOUNTRY CAMPSITES IN A LIGHTLY-DEVELOPED SCENIC LAKE SETTING 71
e. DEGRADATION OF ONE OF THE MOST POPULAR BOUNDARY WATERS WILDERNESS GATEWAYS 71
B. BLM'S EA DEMONSTRATES THAT RENEWAL OF THE LEASES THREATENS TO VIOLATE THE CLEAN WATER ACT 71
C. RENEWAL OF THE LEASES THREATENS TO VIOLATE THE BOUNDARY WATERS TREATY OF 1909 BETWEEN THE UNITED STATES AND CANADA 78
D. LEASE RENEWAL VIOLATES THE WEEKS ACT AND § 402 OF THE REORGANIZATION PLAN NO. 3 OF 1946 80
E. BLM'S EA DEMONSTRATES THAT RENEWAL

AMERICAN OVERSIGHT

OF THE LEASES THREATENS TO VIOLATE THE ENDANGERED SPECIES ACT 82
F. BLM'S EA DEMONSTRATES THAT RENEWAL OF THE LEASES THREATENS TO VIOLATE THE CLEAN AIR ACT 86
G. RENEWAL OF THE LEASES THREATENS TO VIOLATE THE MINNESOTA WETLANDS CONSERVATION ACT 87
H. BLM'S EA DEMONSTRATES THAT RENEWAL OF THE LEASES THREATENS TO VIOLATE THE NATIONAL HISTORIC PRESERVATION ACT 88
I. THE SECRETARY OF THE INTERIOR CANNOT PERMIT ACTIONS BY ONE DEPARTMENTAL BUREAU (BLM) TO PRECLUDE THE ABILITY OF ANOTHER DEPARTMENTAL BUREAU (THE NATIONAL PARK SERVICE) TO COMPLY WITH ITS MANDATE 90

V. ECOLOGICAL AND SOCIO-ECONOMIC IMPACTS OF SULFIDE-ORE COPPER MINING IN THE BOUNDARY WATERS WATERSHED 91

A. THE ECOLOGICAL, HUMAN, AND ECONOMIC HEALTH OF THE SUPERIOR NATIONAL FOREST AND THE ARROWHEAD REGION WOULD BE HARMED BY SULFIDE-ORE COPPER MINING IN THE BOUNDARY WATERS WATERSHED 91

1. THE PROXIMITY OF A SULFIDE-ORE COPPER MINE TO HISTORIC AND CULTURALLY SIGNIFICANT RESOURCES, FEDERALLY PROTECTED PARK LANDS, WETLANDS, AND ECOLOGICALLY CRITICAL AREAS IN THE BOUNDARY WATERS WATERSHED WOULD THREATEN THE UNIQUE CHARACTERISTICS OF THE AREA 92

a. THE BOUNDARY WATERS WATERSHED AND ITS RESOURCES ARE UNIQUE AND IRREPLACEABLE 93

b. THE SCIENTIFIC EVIDENCE THAT SULFIDE-ORE COPPER MINING WOULD HARM THE SUPERIOR NATIONAL FOREST, THE BOUNDARY WATERS, THE MINING PROTECTION AREA, QUETICO PROVINCIAL PARK, VOYAGEURS NATIONAL PARK, AND LOCAL COMMUNITIES IS OVERWHELMING AND NOT DISPUTED 106

c. SULFIDE-ORE COPPER MINING IS INHERENTLY DANGEROUS, REGIONALLY UNTESTED INDUSTRY, AND HAS A TERRIBLE TRACK RECORD 121

d. MODERN TECHNOLOGY AND MINING OPERATIONS CONSISTENTLY FAIL TO ACCURATELY PREDICT AND PREVENT POLLUTION 129

AMERICAN OVERSIGHT

e. POLLUTION OF THE BOUNDARY WATERS CANNOT BE MITIGATED OR REMEDIATED, AND ATTEMPTS TO DO SO WOULD DESTROY THE WILD AND NATURAL CHARACTER OF THE BOUNDARY WATERS 131
f. THE POPULARITY OF THE REGION AND THE CERTAINTY OF ENVIRONMENTAL CONTAMINATION PUT RESIDENT AND VISITOR POPULATIONS AT RISK OF HARM FROM SULFIDE-ORE COPPER MINING IN THE BOUNDARY WATERS WATERSHED....132
g. PREDICTED IMPACTS OF WATER POLLUTION ON HUMAN HEALTH 134
h. PREDICTED IMPACTS OF AIR POLLUTION ON HUMAN HEALTH....137
i. PREDICTED IMPACTS OF THE BOOM-BUST CYCLE OF MINING ON COMMUNITY HEALTH AND RESOURCES....138
2. PREDICTED ECONOMIC IMPACTS OF SULFIDE-ORE COPPER MINING ON THE BOUNDARY WATERS REGION....139
3. THE STATE OF MINNESOTA CANNOT BE COUNTED ON TO REGULATE MINING OR MINING-CAUSED POLLUTIO 142
B. RENEWAL OF MINERAL LEASES FOR SULFIDE-ORE COPPER MINING IN THE BOUNDARY WATERS WATERSHED IS A HIGHLY CONTROVERSIAL ACTION WITH OVERWHELMING LOCAL AND NATIONAL OPPOSITION....145
1. THERE IS CONSISTENTLY STRONG PUBLIC SUPPORT ACROSS THE NATION AND MINNESOTA FOR PROTECTING THE BOUNDARY WATERS WATERSHED FROM THE INHERENT RISKS OF SULFIDE-ORE COPPER MINING 147
a. NEW POLLING RESULTS SHOW THERE IS NO SOCIAL LICENSE FOR SULFIDE-ORE COPPER MINING IN THE BOUNDARY WATERS WATERSHED 147
b. PUBLIC RESPONSE TO AGENCY DECISIONS AND DECISION REVERSALS REGARDING SULFIDE-ORE COPPER MINING IN THE BOUNDARY WATERS WATERSHED 148
2. SULFIDE-ORE COPPER MINING NEAR THE BOUNDARY WATERS, INCLUDING THE PROPOSED TWIN METALS MINE, IS STRONGLY OPPOSED BY ELECTED LEADERS, LOCAL BUSINESSES, AND MANY SEGMENTS OF SOCIETY....149
3. PAST AGENCY DECISIONS 153

BIBLIOGRAPHY 155

AMERICAN OVERSIGHT

Northeastern Minnesotans for Wilderness, The Wilderness Society, Center for Biological Diversity, National Parks Conservation Association, Sportsmen for the Boundary Waters, Voyageurs National Park Association, and Earthjustice submit on 1-21-2019 the following comments on DOI-BLM-Eastern States-0030-2018-0002-EA (Addition of Terms and Conditions for Renewal of Hardrock Leases, MNES 001352 and MNES 001353).

I. INTRODUCTION

There is no basis for the Bureau of Land Management (BLM) to conduct an environmental assessment (EA) of an application by Twin Metals Minnesota (Twin Metals or TMM) to renew two federal mineral leases, MNES 01352 and 01353 (collectively, leases), located on Superior National Forest (SNF) lands in the headwaters of the Boundary Waters Canoe Area Wilderness (Boundary Waters or BWCAW) and upstream of Voyageurs National Park (VNP) in northeastern Minnesota. On December 14, 2016, the U.S. Forest Service denied its consent to renewal of the leases because of the overwhelming science that development of a sulfide-ore copper mine on the leases would result in significant and irreparable contamination of the Boundary Waters and other SNF resources and prevent the Forest Service from satisfying its legal obligations to manage and protect those resources. On December 15, 2016 the BLM notified Twin Metals that it had denied TMM's applications to renew the leases. Thus, the leases expired in December 2016 and there is nothing left to renew.

Even if renewal was theoretically possible, BLM's current process and EA are woefully inadequate and violate numerous laws. Most fundamentally, the EA fails to consider the numerous significant and reasonably foreseeable impacts of mine development and operation on the leases. Instead, the EA focuses on a pre-determined and legally invalid outcome that the leases must be renewed and then fails to conduct any meaningful analysis of the result. Moreover, in preparing the EA, BLM usurped the Forest Service's proper role as the lead agency for National Environmental Policy Act (NEPA) review of this proposed action on SNF lands and ignored and omitted the best available scientific information that informed the Forest Service's decision to deny its consent to lease renewal. As a final insult, BLM offered the public only an inadequate 30-day comment period over the winter holidays and during a government shutdown. These and other deficiencies are described in detail throughout this comment letter.

The leases cover roughly 5,000 acres of SNF lands and federal minerals located along and beneath Birch Lake and the South Kawishiwi River, just to the south of the Boundary Waters. The area is within the 1854 Treaty Ceded Territory, where the Grand Portage, Bois Forte, and Fond du Lac Bands of Lake Superior Chippewa retain treaty rights to hunt, fish, gather, and conduct cultural and spiritual practices, all of which depend on protecting the land and existing water quality.

The Boundary Waters is the most heavily visited Wilderness in America's National Wilderness Preservation System, a distinction it has held every year since the Wilderness Act passed in 1964. At 1.1 million acres, it is the largest Wilderness east of the Rocky Mountains and north of the Everglades. The Boundary Waters is the only large lakeland Wilderness, and the most

AMERICAN OVERSIGHT

family-friendly Wilderness, in America. This irreplaceable public treasure offers unmatched fishing, hunting, and year-round recreational opportunities.

The area's massive interconnected network of lakes, wetlands, rivers, and streams contains some of the cleanest water in America, low in sulfates and lacking in buffering capacity. The combination leaves these waters uniquely vulnerable to pollutants found in mine drainage from the Duluth Complex ore that Twin Metals intends to mine. Pollution from the leases would flow through the watershed and contaminate four large protected areas – the Boundary Waters, Ontario's Quetico Provincial Park, Voyageurs National Park, and the Superior National Forest – which together form the largest trans-national canoe country wilderness in North America. These protected areas are the driver of a diverse, stable, and growing economy in northeastern Minnesota.

The unique and irreplaceable resources of the Boundary Waters and surrounding canoe country – and the devastating impacts that sulfide-ore copper mining in the watershed would have on those resources and the local and regional economy – are described in detail in the Forest Service's December 14, 2016 decision withholding its consent to lease renewal and in Section V of these comments. By renewing the expired leases, BLM would set the stage for a mine that Forest Service experts, the scientific community, and an overwhelming majority of the public have already rejected. The agency cannot do so, if at all, based on a shallow 34-page EA that does not even consider the impacts of a mine. At the very least, a full environmental impact statement (EIS) is required.

BLM should withdraw the lease renewal EA and suspend all action related to the leases pending resolution of the litigation in *Voyageur Outward Bound School v. United States*, No. 1:18-cv-01463 (D.D.C.) over their legal status. To act now and without authority wastes taxpayer dollars, misleads the public, and violates or threatens to violate numerous laws. If Twin Metals wishes to develop a mine on the lands it previously leased, it must follow the procedures for obtaining a new preference right lease, which will require, among other things, full compliance with NEPA and consent by the Forest Service. In the meantime, BLM and the Forest Service should resume consideration and associated NEPA analysis of a proposed 20-year withdrawal of approximately 234,000 acres of the Rainy River Watershed from mineral leasing.

A. LEAD-UP TO THE LEASE RENEWAL EA

BLM's proposal to renew the leases must be placed in the context of the long and complex history that led to this point. Public domain lands in Minnesota were withdrawn from the General Mining Law in 1873 – more than 35 years before the SNF was established in 1909. It was not until 1950 that Congress – contemplating granite, gravel, and iron ore mining that would not interfere with recreational uses – authorized mineral leasing on those lands, but only upon consent by the Forest Service. The remainder of SNF lands are acquired lands, most of which subject to the Weeks Act, where mineral leasing is permitted only with consent by the Forest Service after it has determined that the mineral activities will not interfere with the primary purposes for which the land was acquired.

AMERICAN OVERSIGHT

Congress designated the Boundary Waters Canoe Area Wilderness in the 1964 Wilderness Act, making it an original component of the National Wilderness Preservation System. Fourteen years later, Congress further protected the BWCAW in the Boundary Waters Canoe Area Wilderness Act of 1978, including banning mining within the wilderness and a 220,000-acre Mining Protection Zone in the Superior National Forest along entry corridors and providing additional protections for the Wilderness' network of pristine, interconnected waterways.

In 1966, BLM issued the International Nickel Company (Twin Metals' predecessor) two federal preference right mineral leases (MNES 1352 and 1353) for a primary term of twenty years, with the possibility of three ten-year renewals at the discretion of the BLM. The agency renewed the leases in 1989 and 2004. In 2012, Twin Metals' predecessor in interest applied for the third discretionary lease renewal – the same application that BLM now purports to be acting upon, seven years later. Also in 2012, the Forest Service completed an EIS-level NEPA process that resulted in BLM issuing 28 prospecting permits covering more than 38,000 acres of the SNF in the Boundary Waters watershed. The prospecting EIS was limited in scope to prospecting activities and explicitly did not address the impacts of leasing or mine development.

On March 8, 2016, Solicitor of the Interior Hilary Tomkins issued a legal opinion that the BLM had discretion to grant or deny Twin Metals' lease renewal application. The BLM asked the U.S. Forest Service whether it would consent to the renewal of the leases. On December 14, 2016, following a 30-day public input period, two public meetings, and more than six months of reviewing available science, Forest Service Chief Tom Tidwell issued a carefully-reasoned and well-supported decision withholding its consent to renewal of the leases. Among other things, the Chief's decision found that, given given the logically foreseen likelihood of mineral development if leases were renewed, and the significant risk that acid mine drainage would contaminate the BWCAW in violation of the Forest Service's legal obligation to protect and enhance the special qualities of the Wilderness, "it is incumbent upon the FS to withhold consent to renewal of TMM's leases . . . ."[1] The following day, December 15, 2016, the BLM informed Twin Metals by letter that its application for renewal of the leases was denied, and the leases therefore expired and canceled.[2]

Given the inherent and irreparable risks that sulfide-ore copper mining pose to the Boundary Waters watershed and other SNF resources, the Forest Service, on January 13, 2017, filed an application to withdraw from mineral leasing approximately 234,000 acres of SNF land in the watershed for twenty years. The application triggered a two-year segregation, and the Forest Service issued a notice of intent to prepare an EIS to analyze the impacts of the proposed twenty-year withdrawal versus allowing mineral leasing and development to proceed. During spring and summer 2017, the Forest Service held three public meetings on the proposed withdrawal, with approximately 2,700 people attending and 101 out of 157 randomly selected speakers supporting the withdrawal. The Forest Service received more than 125,000 comments and petition signatures during the comment period that ended in August 2017, with more than 98% of the over 81,000 unique comments and 94% of the over 44,000 form comments in favor of withdrawal.

[1] USDA Forest Service December 14, 2016 decision letter to USDOI BLM, withholding USFS consent, p. 21
[2] USDOI BLM December 15, 2016 Letter to TMM rejecting application for renewal of leases MNES-001352 and -001353

AMERICAN OVERSIGHT

Then, in an about-face, Acting Principal Deputy Solicitor of the Department of the Interior, Daniel Jorjani, issued a new legal opinion on December 22, 2017 withdrawing and replacing the earlier Tomkins opinion and concluding that BLM in fact lacked discretion to deny Twin Metals' lease renewal application. A month later, the Forest Service downgraded its withdrawal study from an EIS to an EA and initiated a second public comment period. During that comment period, the agency received an additional nearly 56,000 comments in favor of withdrawal, bringing the total to more than 180,000 comments, with approximately 98% supporting the withdrawal.

Then, on May 2, 2018, as the Forest Service continued preparation of its EA on the proposed withdrawal, BLM purported to rescind its December 2016 rejection of the lease renewal application and to reinstate the expired leases and Twin Metals' renewal application. A group of businesses and conservation groups, including some of the undersigned, challenged BLM's action as arbitrary and in excess of statutory authority in three June 2018 lawsuits consolidated under *Voyageur Outward Bound School v. United States*, No. 1:18-cv-01463 (D.D.C.).

On September 6, 2018, the Secretary of the Department of Agriculture cancelled the Forest Service's mineral withdrawal application and halted work on the EA, public release of which had been expected imminently. Termination of the withdrawal study followed statements by President Trump and Vice President Pence at rallies in Duluth in June and August that they would "rescind the withdrawal" and are "rolling back the ban." While the press release accompanying the termination of the withdrawal study claimed that the decision was based on "an extensive review of environmental information," no information or analysis has been released to the public, despite requests by Congress and under the Freedom of Information Act.

The Forest Service's terminated proposed withdrawal EA (even if in draft form) and associated reports, statements, data, and analyses – including those required under 43 C.F.R. § 2310.3-2(b) – contain important information regarding the Boundary Waters watershed, the unavoidable risks and dangers associated with sulfide-ore copper mining, and whether future mining, mineral leasing, and prospecting permits should be authorized on any federal land in the watershed. Those documents and the information therein are directly relevant to this EA on renewal of the leases. Public comment – both written and oral – received during the robust public process that the Forest Service facilitated are also directly relevant. In short, ***BLM should consider all records and materials from the terminated withdrawal study process and include them in the project record for the lease renewals.*** The undersigned hereby incorporate by reference the Forest Service's EA in its most complete form, along with all reports, statements, data, and analyses required under 43 C.F.R. § 2310.3-2(b). These materials are not attached in the appendices to these comments, solely because the federal agencies in possession of the materials have thus far refused to produce them. The appendix does include, however, comments and information submitted by the Campaign to Save the Boundary Waters to the Forest Service as part of the withdrawal study process.

AMERICAN OVERSIGHT

B. SUMMARY OF DEFICIENCIES

BLM's EA was flawed from its inception because the agency has no authority to reinstate or renew the expired leases MNES 01352 and MNES 01353 and its rationale for proposing to do so is arbitrary. The leases expired in December 2016, after the Forest Service decided further renewal would be inconsistent with protecting the BWCAW and withheld its consent and the BLM rejected the applications to renew. If BLM wishes to lease the land for mining now, the agency must comply with the applicable statutory and regulatory framework. That framework provides no means of reviving or renewing expired leases, only the means to initiate a new leasing process.

Despite this framework, BLM purported to reinstate the expired leases on May 2, 2018. If the court reviewing the action vacates BLM's reinstatement decision, there will be nothing to renew. Therefore, BLM should defer any decision regarding renewal while the litigation is pending. To act now wastes public dollars, misleads the public, and would violate multiple laws.

Like BLM's decision to reinstate the leases, this renewal EA is based on the false premise that BLM not only has authority to renew the expired leases and to do so even though the Forest Service has withheld its consent, but that BLM has no discretion to do otherwise. As a result, the EA fails to analyze the reasonable no action alternative of not renewing the leases, contrary to NEPA. That failure breeds others, such as the EA's failure to disclose that renewing the leases would likely be inconsistent with BLM and Forest Service obligations under the Wilderness Act, Boundary Waters Canoe Area Wilderness Act, Clean Water Act, Endangered Species Act, National Historic Preservation Act, and Boundary Waters Treaty of 1909. Omitting the no-renewal alternative also misconstrues BLM's statutory obligation to obtain Forest Service consent for leases in the SNF, not just as to the terms of renewal but whether or not renewal should occur. And, with both alternatives considering a pre-determined outcome of lease renewal (albeit under slightly different stipulations), the failure to include a true no-action alternative renders the impacts analysis meaningless.

Even if BLM were correct that it has no discretion to deny renewal, the EA fails to consider a reasonable range of alternative stipulations, fails to meaningfully analyze the alternatives considered, fails to meaningfully analyze the foreseeable environmental effects of mine development, operation, and closure on the leases, and fails to incorporate or acknowledge the best available scientific information that overwhelmingly shows that sulfide-ore copper mining will result in devastating and irreparable harm to the Boundary Waters, to other downstream protected areas and SNF resources, and to the sustainable amenity based economy of northeastern Minnesota. The leases, which were originally issued in 1966 before the passage of NEPA and other foundational environmental laws, have never been subject to NEPA analysis, and BLM's paltry EA in no way satisfies the agency's obligations under that statute. The host of reasonably foreseeable significant impacts means that BLM cannot support a Finding of No Significant Impact and must prepare a full EIS that includes a true no-action/no-lease-renewal alternative and takes the required hard look – based on science and facts – at the reasonably foreseeable impacts of mine development, operation, and closure on the leases.

AMERICAN OVERSIGHT

C. INTERESTS OF SIGNATORIES

Northeastern Minnesotans for Wilderness (NMW) is the region-based wilderness advocacy organization created by area residents to protect the BWCAW and other wild places. NMW was formed in 1996 to continue the local tradition of working to protect our wild places against ever-increasing public and commercial pressures so that area's existing natural resources will remain intact for future generations. NMW leads the Campaign to Save the Boundary Waters, a national movement dedicated to achieving permanent protection of the clean air, water, and forest landscape of the BWCAW and its watershed from toxic sulfide-ore copper mining. Headquartered in Ely, Minnesota, NMW and the Campaign have helped educate and organize tens of thousands of local, national, and international supporters of the cause including business owners, youth, healthcare professionals, scientists, elected officials, military veterans, sportsmen and women, and more.

The Wilderness Society (TWS) is the leading conservation organization working to protect wilderness and inspire Americans to care for our wild places. Founded in 1935, and with more than one million members and supporters, including thousands in Minnesota, TWS has led the effort to permanently protect 109 million acres of wilderness and to ensure sound management of our shared national lands. TWS has worked since its founding to protect the Boundary Waters and the Superior National Forest, and TWS members regularly visit the area to paddle, hunt, fish, harvest wild rice, and enjoy the splendor and solitude of the areas' pristine lakes, rivers, and forests.

The Center for Biological Diversity is a national, nonprofit conservation organization with more than 1.4 million members and online activists dedicated to the protection of endangered species and wild places. The Center works to ensure the long-term health and viability of animal and plant species across the United States and elsewhere, and to protect the habitat these species need to survive. The Center believes that the health and vigor of human societies and the integrity and wildness of the natural environment are closely linked. The Center has an office in Duluth, Minnesota and has long advocated for the protection of the Boundary Waters and Superior National Forest from the severe threat of sulfide-ore copper mining. The Center has also advocated for the wildlife species that depend on the Boundary Waters and Superior National Forest, including petitioning for Endangered Species Act protections for the Minnesota moose population.

National Parks Conservation Association is the independent, nonpartisan voice working to strengthen and protect America's national parks. Founded in 1919, NPCA works with its 1.3 million members and supporters nationwide, including over 20,000 in Minnesota, to protect and preserve our nation's most iconic and inspirational places for present and future generations. NPCA is headquartered in Washington, D.C. and has 27 local and regional offices across the country.

Sportsmen for the Boundary Waters since its inception in 2014 has worked to permanently protect the Boundary Waters Canoe Area Wilderness from sulfide-ore copper mining in its watershed by organizing hunters, anglers, conservation organizations and a bipartisan group of state and federal politicians into an existing coalition of supporters of permanent protection for

AMERICAN OVERSIGHT

the BWCA. Sportsmen for the Boundary Waters conveys the value of our outdoor heritage across political/social boundaries as a need to protect public lands, waters, wildlife habitat and world-class fishing and hunting opportunities

Voyageurs National Park Association (VNPA) is a 501(c)(3) nonprofit organization headquartered in Minneapolis, Minnesota. Founded in 1965, VNPA's mission is to connect people to Voyageurs National Park, enhance the visitor experience, and protect the park for present and future generations. VNPA works in partnership with over 500 Minnesota families and businesses, and serves the park's 230,000 annual visitors by advocating for the ongoing protection of Voyageurs' wild character and pristine natural resources, raising funds for conservation and recreation projects, and increasing community engagement and outreach.

Earthjustice is the nation's largest nonprofit environmental law organization. For more than 45 years, Earthjustice has wielded the power of the law and the strength of partnership to protect people's health, to preserve magnificent places and wildlife, to advance clean energy, to combat climate change, and to enforce our laws when government will not. Earthjustice is headquartered in San Francisco, CA, and has regional offices across the country.

AMERICAN OVERSIGHT

II. BLM'S ENVIRONMENTAL ASSESSMENT FAILS TO COMPLY WITH THE NATIONAL ENVIRONMENTAL POLICY ACT

For nearly a half-century, the National Environmental Policy Act (NEPA) has enshrined fundamental democratic values into government decision-making. It is designed to foster informed and transparent decision-making through the use of high-quality information, accurate scientific analysis, public scrutiny, and a "hard look" at the reasonably foreseeable environmental and socio-economic consequences of a proposed action.[3] Given the intense public interest, controversy, and numerous significant impacts associated with this high-profile federal action, it is crucial that the BLM ensure a robust and comprehensive NEPA process. This is especially so given that the Twin Metals leases, which were originally issued in 1966, have never been subject to NEPA analysis. This will require preparation of a full environmental impact statement (EIS) that addresses all the reasonably foreseeable direct, indirect, and cumulative impacts associated with lease renewal and resulting sulfide-ore copper mining activity in the Boundary Waters watershed, based on the significant body of available scientific information and a robust public process. The current environmental assessment (EA) and public process is woefully inadequate and violates NEPA in numerous respects, as addressed below.

A. INADEQUATE PUBLIC PROCESS

NEPA is designed to foster informed and transparent decision-making.[4] To that end, BLM is required to "[e]ncourage and facilitate public involvement in decisions which affect the quality of the human environment."[5] "Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA."[6] Here, given the robust and overwhelming scientific record, the intense public interest and controversy, and the fact that the Twin Metals leases have never been subject to NEPA analysis,[7] the BLM has a heavy burden to ensure that its analysis takes a "hard look" at impacts and facilitates robust public dialogue, as NEPA prescribes.

As an initial matter, the Interior Department's current NEPA implementation policies frustrate BLM's compliance with the statute. Secretarial Order 3355 and associated guidance memoranda seek to speed up and slim down the NEPA process. Specifically, an August 6, 2018 memorandum from Deputy Secretary David Bernhardt entitled "Additional Direction for Implementing Secretary's Order 3355 Regarding Environmental Assessments" prescribes limits of 75 pages or less and completion of EA review within 180 calendar days. These arbitrary, one-size-fits-all page and time limits have the practical effect of resulting in inadequate public engagement and analysis, particularly as applied to a controversial and complex proposed action like renewal of the Twin Metals leases. Indeed, the Council on Environmental Quality (CEQ) recognizes that "universal time limits for the entire NEPA process are too inflexible," and

[3] *See* 42 U.S.C. § 4332(2)(C); 40 C.F.R. §§ 1500.1, 1508.8; *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348–50 (1989).
[4] *See* 40 C.F.R. § 1500.1; *Robertson*, 490 U.S. at 349.
[5] 40 C.F.R. § 1500.2(d); *see also id.* § 1506.6 (directing agencies to provide for robust public involvement).
[6] *Id.* § 1500.1(b).
[7] *See generally* Section V (issue narrative).

AMERICAN OVERSIGHT

agencies should base timing for NEPA analysis as "appropriate to individual actions."[8] A rushed process is insufficient to understand the impacts of lease renewal on one of our nation's most cherished public lands. Instead, BLM should proceed cautiously and take adequate time to fully engage the public, the Forest Service, the scientific community, Native American tribes, and others who will be affected by the decision.

In this case, the rushed process has already taken a severe toll on the quality of analysis and public process. The BLM's barebones 34-page (including the appendix) EA is deficient in numerous respects, as addressed in the following sections.[9] And a 30-day public comment period falling over the Christmas and New Year holidays is woefully insufficient – particularly where the significant deficiencies in the EA place an additional and time-consuming burden on the public to identify and attempt to fill gaps in information and analysis.

Moreover, all but the first day-and-a-half of the comment period spanned the longest partial federal government shut-down in history. During that time, BLM's e-planning page and commenting portal were unavailable for at least 6 days (December 22-26 and 28) and agency staff were generally unavailable to answer questions and respond to requests for information that is critical to the public's ability to review and comment on the proposed action and EA. Past BLM and Forest Service practice has been to automatically extend the duration of open comment periods for an equivalent number of days as the shutdown. Nevertheless, as of January 21, 2019, the BLM had failed to respond to numerous requests by stakeholders – including both U.S. Senators from Minnesota and the Campaign – to extend the public comment period by at least 60 days.[10] BLM also did not respond to the Campaign's request for public hearings in Duluth, Minneapolis-St. Paul, and Washington DC. Nor did BLM meaningfully respond to a January 15, 2019 letter by the Campaign outlining the many hardships that the shut-down has caused for members of the public, other agencies, and tribes and asking that the comment period be extended accordingly, or to similar requests by the House Natural Resources Committee, U.S. Senators from Minnesota, or the Minnesota Attorney General's Office.[11] Rather than encouraging and facilitating public involvement and scrutiny, as NEPA requires, BLM has demonstrated a clear intent to suppress public engagement. Indeed, we suspect that the government shut-down has generated significant public confusion about the public comment process for the EA, as the shut-down lasted all but the first day-and-a-half of the comment period. It is likely that some potential commenters withstood from commenting due to the shut-down given the confusion about the EA generally and/or whether their comments would be accepted at all during the shut-down.

Nor has BLM provided the public with a draft Finding of No Significant Impact (FONSI) for the 30-day public review prescribed by CEQ regulations. Under 40 C.F.R. § 1501.4(e)(2), public

[8] 40 C.F.R. § 1501.8.

[9] By contrast, the Superior National Forest's 2012 EIS addressing issuance of prospecting permits – which have dramatically less impact than mining leases – was 336 pages and took six years to complete. A 2018 EA addressing mining impacts near Yellowstone National Park was 110 pages in length and took nearly two years to complete.

[10] *See* NMW-TWS-NPCA Letter dated 12-20-2018 to BLM requesting 62-day comment period extension; *and see, e.g.,* Senators Smith and Klobuchar Letter dated 12-13-2018 to BLM requesting at least a 60-day comment period; CBD Letter dated 12-26-2018 requesting comment period extensions matching the duration of the federal government shut-down.

[11] *See* NMW-TWS-NPCA-CBD Letter dated 1-15-2019 to BLM renewing request for comment period extension.

AMERICAN OVERSIGHT

review of a draft FONSI is required where the proposed action "is closely similar to [] one which normally requires the preparation of an [EIS]" under agency procedures and/or is of a precedential nature. Both of these circumstances are satisfied. Under BLM NEPA procedures, mineral leasing decisions and approvals of large-scale mining operations normally require preparation of an EIS.[12,13] Similarly, under Forest Service NEPA procedures, proposals "that would substantially alter the undeveloped character of" wilderness-quality lands are a class of action normally requiring an EIS.[14] Moreover, lease renewal will facilitate continued exploration and eventual development of a large-scale sulfide-ore copper mine with numerous significant, irremediable impacts and so is undoubtedly similar to those requiring an EIS. At the very least, it represents "a borderline case . . . when there is a reasonable argument for preparation of an EIS."[15] Because the lease renewal EA constitutes the first NEPA analysis of the numerous significant impacts associated with large-scale sulfide-ore mining operations on the Superior National Forest and in the BWCAW watershed, it is also an "unusual" and "precedent-setting case," with "scientific [and] public controversy over the effects of the proposal."[16] In short, the action unquestionably triggers the 30-day public review period prior to public release of the final EA and any signed FONSI and decision notice.

In addition to providing a draft FONSI for public review, the BLM must provide other documents and information necessary to facilitate public transparency and meaningful review. Most critically, BLM must post for public review the draft lease renewal language being contemplated. The EA contains confusing and conflicting statements about the proposed stipulations and related efforts to "modernize" the leases.[17] It also includes a statement incorrectly suggesting that "BLM may issue additional ten-year renewals beyond this third renewal."[18] Absent an opportunity to review the governing contractual language, the public is unable to assess if and how the proposed stipulations are being incorporated into the renewed leases, whether they purport to permit additional renewals, and/or if they include other provisions that warrant public scrutiny prior to being enshrined in the lease documents. Due to the government shut-down, BLM's project manager did not respond to a January 11, 2019 request for the lease language.[19]

The BLM should also meaningfully consider and respond to all substantive comments received on the EA – as well as to substantive information and comments submitted to and produced by the Forest Service during the now-terminated withdrawal study process. The BLM should exercise its discretion to affirmatively respond to substantive comments, given the high degree of

[12] BLM. (2008). Bureau of Land Management - National Environmental Policy Act Handbook (H-1790-1). BLM. NEPA Handbook. 184p.
[13] BLM. (2008). Bureau of Land Management - National Environmental Policy Act Handbook (H-1790-1). BLM. NEPA Handbook. 184p.
[14] 36 C.F.R. § 220.5(a)(2)(iii) (listing approval of mining activities that would cause considerable surface disturbance in wilderness-eligible lands as an example).
[15] BLM NEPA Handbook 8.4.2.
[16] *Id.* (listing example of "a first intrusion of even a minor development into a pristine area").
[17] *See* Section II.F., below (addressing lack of clarity around proposed stipulations).
[18] EA at 7.
[19] *See* NMW-TWS-NPCA-CBD Letter dated 1-15-2019 to BLM renewing request for comment period extension.

AMERICAN OVERSIGHT

public interest, the complexity of the issues, and the necessity of preparing an EIS. BLM policies encourage this approach.[20]

The statements in the EA suggesting that previous public participation opportunities somehow absolve BLM of ensuring a robust public process now are misleading and disingenuous. BLM claims that the lease renewal process in 1987 (during a time with no exploration activity or real prospect of mine development) is comparable to the current process, which has been the subject of intense public scrutiny and controversy.[21] BLM also claims that it "elected to adopt the comments [received by the Forest Service in 2016 regarding lease renewal] to inform the analysis within the EA."[22] While we wholeheartedly agree that BLM can and should consider those comments, there is no evidence in the current record to support a claim that the agency utilized them to inform its analysis. Indeed, such a conclusion is directly contrary to the record, where those comments overwhelmingly voiced concern about the significant adverse environmental and socio-economic impacts of lease renewal – eventually culminating in the Forest Service's well-reasoned and scientifically-based December 14, 2016 decision to withhold its consent to lease renewal.

BLM must significantly improve the public process to ensure compliance with NEPA. At a minimum, this includes extending the public comment period, holding public hearings, ensuring the public has access to critical documents and information including the draft renewed leases, meaningfully responding to comments, and providing a 30-day review period on any draft FONSI.

B. INADEQUATE SCOPE OF ANALYSIS

The EA is inadequate because it does not consider the impacts of mine development on the leases. In the long history of the leases, neither the BLM nor the Forest Service has ever conducted a NEPA analysis that addresses those impacts. BLM must conduct such an analysis now because 1) mine development is a connected action; 2) mine development is reasonably foreseeable and its impacts will be cumulative to the impacts of renewing the leases – as the EA recognizes; and 3) if BLM renews the leases, the agency's discretion to preclude mine development will be narrowed.

NEPA regulations provide that actions are "connected" and must be evaluated in a single EIS where one cannot proceed without the other or where they are "interdependent parts of a larger action and depend on the larger action for their justification."[23] Both tests are satisfied here. Mine development cannot proceed on the leases unless they are renewed, and their renewal has

[20] *See* BLM NEPA Handbook 6.9.2, 8.3.7, 8.4.2 (recommending a response to all substantive and timely comments made on an EA and unsigned FONSI and, more generally, that the agency evaluate, summarize, and demonstrate that it considered substantive comments).
[21] *See* EA at 7-8.
[22] *Id.* at 8.
[23] 40 C.F.R. § 1508.25(a)(1).

AMERICAN OVERSIGHT

no justification independent of facilitating potential mine development.[24] Mine development and renewal of the leases are therefore connected actions that must be addressed in a single EIS.

NEPA regulations also require that that an analysis include cumulative impacts, or the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions.[25] Mine development impacts are cumulative impacts here. They would take place in the same area and affect the same resources as Twin Metals' pre-mine-development activity on the renewed leases. As the EA recognizes,[26] mining on the leased land and adjoining parcels is a reasonably foreseeable consequence of granting renewal at this stage. Twin Metals has completed a pre-feasibility study, conducted extensive and ongoing exploration, and is actively working on a mine plan. While the EA claims to include the mining plan of operation in its cumulative effects analysis,[27] the EA does not actually analyze any of those reasonably foreseeable cumulative impacts. Instead, the cumulative impacts analysis consists of a generalized statement that future mineral actions – presumably including a Twin Metals mine – could result in:

> Negative environmental effects to resource areas relevant to this analysis includ[ing] forest and vegetation removal, loss of wildlife habitat, potential impacts to water quality, additional air emissions, loss of recreational ability within the project footprint, and additional noise to the project area and its surroundings.[28]

This is utterly inadequate to meet the BLM's obligation to take a hard look at the reasonably foreseeable cumulative impacts of a Twin Metals mine.

BLM may not wait until a later stage to analyze the impacts of mine development. NEPA analysis should proceed "at the earliest possible" time.[29] At the very latest, however, NEPA analysis must take place before the agency takes action that will irreversibly narrow its discretion to preclude harmful impacts. In the leasing context, appellate courts have held that unless a lease preserves the federal government's full authority to preclude mining, BLM must consider the foreseeable consequences of mining as part of the lease renewal decision. As the D.C. Circuit explained, in such a circumstance, "the decision to lease is itself the point of irreversible, irretrievable commitment of resources—the point at which NEPA mandates that an environmental impact statement be prepared."[30]

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[24] *See* Section 1(a) of Federal Mineral Lease MNES-001352 (1966) and Federal Mineral Leases MNES-001353 (1966) (purporting to grant the lessee the "right to mine, remove, and dispose of" certain minerals on the leased lands).
[25] 40 C.F.R. §§ 1508.7, 1508.25(a)(2) & (c).
[26] EA at 22.
[27] EA at 22.
[28] *Id.*
[29] 40 C.F.R. § 1501.2.
[30] *Sierra Club v. Peterson*, 717 F.2d 1409, 1412 (D.C. Cir. 1983); *see also Conner v. Burford*, 848 F.2d 1441, 1449-50 (9th Cir. 1988) (holding NEPA requires an EIS unless leases "reserve to the government the absolute right to prevent all" activities that "are likely, if not certain, to significantly affect the environment").

AMERICAN OVERSIGHT

Here, as in those cases, BLM may not wait to analyze the impacts of mine development because renewing the leases would narrow the agency's discretion to prohibit mining.[31] The fact that a project-specific analysis will be required later if Twin Metals submits a mine plan does not absolve BLM of the obligation to evaluate the impacts of mining as part of the current lease renewal decision.[32] Thus, BLM may not rely on statements like that on page 22 of the EA, where BLM suggests that future project-level NEPA analysis will "disclose and mitigate impacts [of mining] to fish, wildlife, and cultural resources." As documented throughout these comments, there is significant and robust scientific information readily available to evaluate those impacts now. Indeed, the Forest Service's December 14, 2016 decision withholding consent to lease renewal and its January 2017 withdrawal application articulated some of that science and information and the Forest Service's informed view that sulfide-ore mining in the Boundary Waters watershed would pose significant risks to the wilderness and other downstream resources. The BLM EA must fully analyze the risks and effects identified in those Forest Service documents. Those risks have not changed in the intervening two years, and the body of science demonstrating the extent, severity, and foreseeability of those risks has only grown more voluminous and unassailable during that time. To provide just a few examples, a 2018 independent study by Harvard economist James Stock analyzed the longer-term dynamic economic effects of a 20-year mining ban in the Boundary Waters watershed and concluded that protecting the Boundary Waters from a Twin Metals mine would result in dramatically more jobs and income over a 20-year period.[33] In a 2018 paper submitted for publication, Dr. Lee Frelich identified numerous individual and cumulative impacts to the terrestrial ecosystem from mining in the Boundary Waters watershed and concluded "it is reasonable to state that most (25 of 39…) will impact the wilderness."[34] Moreover, project-specific reviews regularly fail to accurately predict violations of water quality standards and pollution limits that in fact occur.[35, 36] And regulatory agencies routinely fail to address ongoing water contamination associated with acid mine drainage.[37]

BLM has sufficient information to evaluate the impacts of a Twin Metals mine now, and the agency must do so before signing away any of its discretion by renewing the leases. In doing so, BLM must analyze the significant effects identified in the Forest Service's December 14, 2016 decision denying its consent to lease renewal and January 2017 withdrawal application, as well as the significant and highly foreseeable risk that measures designed to prevent and mitigate contamination and other impacts of a sulfide-ore copper mine will fail.

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[31] *See* Section 1(a) of Federal Mineral Lease MNES-001352 (1966) and Federal Mineral Leases MNES-001353 (1966) (purporting to grant lessee the "right to mine, remove, and dispose of" certain minerals on the leased lands).
[32] *See Sierra Club*, 717 F.2d at 1414-15.
[33] Stock, J.H. & J.T. Bradt. (2018) Economic Impact of Superior National Forest Withdrawal. University of Harvard Department of Economics. (Stock & Brandt, 2018).
[34] Frelich, L. (2018). Terrestrial ecosystem impacts of sulfide mining: scope of issues for the Boundary Waters Canoe Area Wilderness, Minnesota, USA. (Frelich, 2018).
[35] Kuipers, J. and A. Maest. (2006). Comparison of Predicted and Actual Water Quality at Hardrock Mines. 228 pp. (Kuipers & Maest, 2006).
[36] *See, e.g.*, Kuipers & Maest, 2006 (Environmental review for hardrock mines sited near ground and/or surface water failed to accurately predict water quality standard violations roughly 9 times out of 10 – 85% near surface water and 93% near groundwater in areas of high acid mine drainage or contaminant leaching potential).
[37] *E.g.*, Spruce Road bulk sample site and Dunka Mine have been generating acid mine drainage since the 1970s.

AMERICAN OVERSIGHT

C. INADEQUATE BASELINE & RANGE OF ALTERNATIVES

NEPA requires federal agencies to "study, develop, and describe appropriate alternatives to recommend courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."[38] CEQ regulations refer to the alternatives analysis as the "heart" of an EIS.[39] NEPA "requires that alternatives . . . be given full and meaningful consideration" for EAs as well.[40] Relatedly, NEPA requires agencies to "describe the environment of the areas to be affected . . . by the alternatives under consideration" and identify a "no action alternative."[41] Together, these requirements establish a "baseline" that "allows policymakers and the public to compare the environmental consequences of the status quo to the consequences of the proposed action" and other alternatives.[42] As one federal court explained, "without establishing the baseline conditions . . . , there is simply no way to determine what effect the proposed [action] will have on the environment and, consequently, no way to comply with NEPA."[43] BLM's NEPA Handbook acknowledges that "the CEQ has interpreted [its] regulations generally to require some consideration of a No Action alternative in an EA."[44]

The lease renewal EA is deficient because it does not include an accurate and adequate no action alternative to provide a baseline for the NEPA analysis. BLM defines its currently proposed no action alternative as lease renewal subject to the same terms and conditions as the 2004 lease renewal.[45] This approach fails to accurately represent the status quo – where the leases expired in December 2016 – and instead reflects the Interior Department's faulty December 2017 legal interpretation and associated May 2018 lease reinstatement decision. Federal courts have invalidated NEPA analyses where agencies similarly attempted to define their no action alternative based on an illegal interpretation of the status quo.[46] By assuming that lease renewal is mandatory under the no action and action alternatives, BLM skews the entire NEPA analysis. The practical result is that BLM does not analyze – and has never analyzed – an alternative that represents expiration of the leases and maintenance of the healthy ecosystem and associated amenity-based economy of the Superior National Forest and nearby protected areas.[47] This is highlighted by the numerous statements in Chapter 3 of the EA that there would be no meaningful difference in impacts between the action and no-action alternatives. Only by defining

[38] 42 U.S.C. § 4332(2)(E); *see also* 40 C.F.R. § 1502.14(a) (an EIS must "[r]igorously explore and objectively evaluate all reasonable alternatives" to a proposed action); *id.* § 1508.9(b) (an EA must include a discussion "of alternatives as required by section 102(2)(E)").
[39] 40 C.F.R. § 1502.14.
[40] *Native Ecosystems Council v. U.S. Forest Serv.*, 428 F.3d 1233, 1245 (9th Cir. 2005) (citing *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1229 (9th Cir.1988)).
[41] 40 C.F.R. §§ 1502.14(d), 1502.15.
[42] *Ctr. for Biological Diversity v. U.S. Dep't of Interior*, 623 F.3d 633, 642 (9th Cir. 2010).
[43] *Half Moon Bay Fisherman's Marketing Ass'n v. Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988).
[44] BLM NEPA Handbook 8.3.4.2.
[45] EA at 9.
[46] *See, e.g.*, *Friends of Yosemite Valley v. Kempthorne*, 520 F.3d 1024, 1038 (9th Cir. 2008) (agency may not define no action alternative based on deficient management plan).
[47] To the extent BLM's purpose and need statement mandates only lease-renewal alternatives, in reliance on the faulty December 2017 Solicitor's opinion, it is overly narrow and deficient. *See* EA at 5; BLM NEPA Handbook, § 8.3.2 (EA "purpose and need statement frames the range of alternatives" and defines "the focus of the NEPA analysis"); *League of Wilderness Defenders-Blue Mountains Biodiversity Project v. U.S. Forest Serv.*, 689 F.3d 1060, 1069 (9th Cir. 2012) ("Because they determine the range of reasonable alternatives, an agency cannot define the purpose and need of a project in unreasonably narrow terms.").

AMERICAN OVERSIGHT

the no action alternative to accurately reflect the lease-expiration status quo and the baseline conditions associated with no additional hardrock mining exploration or development activities can BLM ensure the meaningful analysis that NEPA requires.

The no action alternative is deficient in another respect. While the EA describes it as renewing the leases "under the same terms and conditions as approved in 2004,"[48] the stipulations identified in Table 1 of the EA in fact are those included in the original 1966 leases, not the 2004 leases. Moreover, many of the proposed action stipulations included in Table 1 already appear in the 2004 leases and therefore represent no change from the terms and conditions approved in 2004. For instance, the Table 1 proposed action stipulation to "[c]onduct all operations to minimize impacts to land, air, water and to cultural, biological, visual, and other resources and other uses and users" is nearly verbatim to the requirement articulated in section 6, paragraph 3 of the 2004 leases.

Even assuming, as BLM does, that lease renewal is mandatory (which it is not), the EA must still include a no-renewal alternative to facilitate an adequate impacts analysis. Indeed, in similar contexts BLM has included a true no action alternative that accurately represents the status quo, even where the agency's position is that such an alternative would not satisfy the purpose and need for the proposed action. For instance, BLM released a draft EIS for its oil and gas leasing program for the Coastal Plain of the Arctic National Wildlife Refuge on the same day as the Twin Metals lease renewal EA and included in that EIS a no-leasing no-action alternative "to provide a baseline for comparing impacts under the action alternatives, as required by the CEQ NEPA regulations."[49] Absent a similar baseline for comparison, BLM cannot adequately analyze the impacts of lease renewal and comply with NEPA.

BLM's range of alternatives is also deficient because neither the proposed action nor no-action alternative provides adequate protection for the unique and sensitive resources of the Superior National Forest. As described in Section II(F), below, the proposed stipulations are unlikely to prevent irremediable water contamination and other significant adverse impacts associated with sulfide-ore copper mining in the Boundary Waters watershed. Thus, in addition to meaningful consideration of a no-lease-renewal alternative, BLM should work with the Forest Service to develop and analyze at least one more heavily stipulated lease renewal alternative. While we do not believe that any lease renewal decision and associated sulfide-ore mining activity can ensure adequate protection of the Boundary Waters, should BLM proceed with lease renewal, the agency is obligated under NEPA to prepare a full EIS that "rigorously explore[s] and objectively evaluate[s]" other reasonable alternatives that would provide more protection for the Boundary Waters and other public resources. Even under a more heavily stipulated lease renewal alternative, BLM's analysis would need to fully acknowledge the significant risks of mining-related contamination.

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[48] EA at 9.

[49] USDOI BLM. (2018, December). Coastal Plain Oil and Gas Leasing Program Draft Environmental Impact Statement, vol. 1, available a*t* https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=152109. *See also* BLM NEPA Handbook 8.3.4.2 (BLM should analyze a stand-alone no action alternative in an EA where it will assist with decision-making by facilitating comparison of effects across alternatives and "demonstrat[ing] the consequences of not meeting the need for the action").

AMERICAN OVERSIGHT

BLM must ensure an accurate and adequate no action alternative and baseline by analyzing a no-lease-renewal alternative that reflects the current healthy ecosystem and amenity-based economy of the Superior National Forest and nearby protected areas. It should also identify and analyze other more heavily stipulated lease renewal alternatives that would provide better protection for the unique and sensitive resources of the Superior National Forest.

D. BLM CANNOT SUPPORT A FONSI AND MUST PREPARE AN EIS

NEPA requires preparation of an EIS for all "major Federal actions significantly affecting the quality of the human environment."[50] In determining whether an EIS is required, agencies must consider both the context and intensity of the proposed action.[51] Context refers to analysis of the action in several contexts such as the nation, the affected region, the affected locality, and in the short and long term.[52] Intensity refers to the severity of the impact, considering factors and circumstances such as those enumerated below.[53] Reasonably foreseeable mining activity associated with lease renewal would have numerous significant environmental impacts. Indeed, nearly all of the enumerated "significance" factors articulated in the CEQ regulations apply to lease renewal, as summarized below, with additional best available scientific information included in Section V:

- **The degree to which the proposed action affects public health or safety (40 C.F.R. § 1508.27(b)(2))**

Sulfide-ore copper mining in the Boundary Waters watershed would harm human health and impose significant costs on society. Groups and individuals representing over 30,000 healthcare professionals have voiced an unprecedented level of concern over the undeniable likelihood of toxicants entering the environment and contaminating vital resources including but not limited to water, air, fish, and wild rice in a highly visited and heavily used region.[54] As numerous reports and comments by medical professionals submitted during this comment period and the now-terminated withdrawal study process point out, sulfide-ore copper mining releases six of the World Health Organization's (WHO) list[55] of the top ten environmental toxins with greatest concern to human health. Those six – mercury, lead, arsenic, particulate air pollution, asbestiform fibers, and cadmium – have known harmful effects on human health that include cancer, lung disease, heart disease, and neuro-developmental disease. The short- and long-term direct, indirect, and cumulative effects on human mental and physical health from exposure to

[50] 42 U.S.C. § 4332(2)(C).
[51] 40 C.F.R. § 1508.27.
[52] *Id.* § 1508.27(a).
[53] *Id.* § 1508.27(b).
[54] (2018, February 19). Physician Comment Letter to USFS Re: Mineral Withdrawal. "The Minnesota Medical Association, Minnesota Academy of Family Physicians, Minnesota Nurses Association, Minnesota Public Health Organization, along with hundreds of individual providers and non-profit groups with ties to human health all submitted letters in response to the one prior Environmental Impact Statement (EIS) done for sulfide-ore copper mining in Minnesota. The consensus by all of these groups representing over 30,000 healthcare professionals and health advocates, is that a comprehensive Health Risk Assessment (HRA) and a Health Impact Statement (HIA) be mandated as part of an EIS necessary for decisions regarding sulfide-ore copper mining."
[55] World Health Organization. (2010). 10 chemicals of major public health concern. https://www.who.int/ipcs/features/10chemicals_en.pdf?ua=1.

AMERICAN OVERSIGHT

these substances can be significantly harmful and, in some cases, irreversible, as documented in government reports, medical professional opinions, peer-reviewed and published scientific journal articles, and peer-reviewed studies.

Sulfide-ore copper mining is an inherently dangerous and regionally untested industry with a terrible track record. Peer-reviewed science shows that all sulfide-ore copper mines experience spills, pipeline ruptures, and other releases of mining pollutants whether through the normal course of operation and closure or from accidents or failures.[56] The risk of contaminating ground and surface water is heightened when mines are located in water-rich environments such as the Boundary Waters watershed.[57] Mining companies consistently and inaccurately predict that they will not create the acid, heavy-metal, and sulfate leachate known as acid mine drainage (AMD).[58] Once AMD is released into the environment, mitigation measures have proven to be ineffective at meeting the performance expectations promised in mine project-specific review documents.[59] There are no mine design, pollution control, or mitigation technologies in existence or on the horizon that can eliminate the risk of sulfide-ore copper mining polluting surrounding surface waters and groundwater.[60] The state of Minnesota has also failed in its regulatory responsibilities by allowing discharge limits that exceed the standard necessary to maintain aquatic life, failed to address permit backlogs and violations, and generally worked to prevent the application of good science to water quality permits as discussed in detail in Section V.

The recreational popularity of the lakes and rivers in and around the leases – and their inevitable contamination in the event mining activity proceeds – indicates a high likelihood of significant human health impacts. The Birch Lake and South Kawishiwi region is adjacent to and immediately downstream of the Twin Metals leases. This region is heavily used for sport fishing, outdoor recreation, and entry to the most heavily visited Wilderness Area in the country – the Boundary Waters. Peer-reviewed scientific modeling demonstrates both the likelihood and pathway that mining-caused pollution would take through this heavily used area.[61, 62] Pollution of these waters, whether originating in surface or groundwater, would make its way into the waters people use for drinking, cooking, bathing and recreating, and would pose potential health threats.[63] Given the extreme risk of perpetual and irremediable contamination, coupled with Minnesota's failure to regulate or remove existing toxicants released by previous exploration and

[56] Earthworks. (2012). U.S. Copper Porphyry Mines: The Track Record of Water Quality Impacts Resulting from Pipeline Spills, Tailings Failures and Water Collection and Treatment Failures. (Earthworks, 2012, US Copper Porphyry Mines).
[57] Kuipers & Maest, 2006.
[58] Chambers, D. (2018). The Potential for Acid Mine Drainage in the Duluth Complex Magmatic PGE Deposits. Center for Science in Public Participation. (Chambers, 2018).
[59] Kuipers & Maest, 2006.
[60] Levit, S. (2018). Follow-Up Report: Acid Mine Drainage and other Water Quality Problems at Modern Copper Mines Using State-of-the-Art Prevention, Treatment, and Mitigation Methods. Center for Science in Public Participation. (Levit, 2018b, Follow-up Report).
[61] Myers, T. (2016). Acid mine drainage risks - A modeling approach to siting mine facilities in Northern Minnesota USA. *Journal of Hydrology,* 533, 277-290, dx.doi.org/10.1016/j.jhydrol.2015.12.020 (Myers 2016b).
[62] Myers T. (2014). Technical Memorandum. Twin Metals Mining and the Boundary Waters Canoe Area Wilderness, Risk Assessment for Underground Metals Mining. (Myers 2014)
[63] Myers, Tom. (2015). "Potential Metals Mining and the Voyageurs National Park: Risk Assessment for Upstream Metals Mining," (Myers, 2015).

AMERICAN OVERSIGHT

removal of Duluth Complex ore in the watershed (Section V), the health of individuals and communities exposed to these toxicants is threatened to a significant degree.

Mining-caused increases in sulfates and heavy metals may harm human health by adversely affecting nutritionally and culturally important components of the human diet in northeastern Minnesota and Ontario such as fish and wild rice. Sulfates released by sulfide-ore copper mining fuel the production of methylmercury, a potent neurotoxin stored in fatty tissue and nerves that increases in concentration as it moves up the food chain, affecting fish, humans, and other mammals.[64, 65, 66, 67] Heavy metal contamination of fish tissue already a public health threat in Minnesota's Lake Superior region.[68] Sulfates also inhibit growth and/or eradicate wild rice[69, 70] while arsenic, a toxic heavy metal, is readily taken up by and stored in the plant.[71] Consuming methylmercury poses risks to human health outlined in a comment letter written by Minnesota physicians to the USFS in 2016 including neurological and learning disorders; anxiety and depression; intellectual disabilities; ADHD; Autism; Cerebral Palsy; increased rates of aggression and criminal behavior; and higher rates of early cognitive decline and dementia among others.[72] Long-term exposure to arsenic can cause cardiovascular disease, diabetes, and cancer (lung, skin, and bladder).[73] Those most vulnerable to the effects of mercury and/or arsenic poisoning include anglers who consume the sportfish they catch; low-income communities who rely on fish and gathering for subsistence; and Tribal communities[74] who rely on these foods for subsistence and/or cultural traditions. Human fetuses, nursing babies, and young children are most vulnerable to the effects of methylmercury and even small amounts of mercury damage their developing brains.[75]

Sulfide-ore copper mining's health risks from pollution of water will be accompanied by health risks from mining-operation-caused air pollution. Mining operations will create fine particulates that are difficult to contain and are known to cause lung and heart disease at low levels, even

[64] Baker, L. (2013). Potential Ecological Impacts of the Twin Metals Mine. University of Minnesota. (Baker, 2013).
[65] Myrbo, A., E.B. Swain, D.R. Engstrom, J. Coleman Wasik, J. Brenner, M. Dykhuizen Shore, E.B. Peters, and G. Blaha. (2017). Sulfide generated by sulfate reduction is a primary controller of the occurrence of wild rice (*Zizania palustris*) in shallow aquatic ecosystems. *Journal of Geophysical Research: Biogeosciences.* (Myrbo, et al, 2017a).
[66] Powell, R.A. (2017). Mammals and mining in sulfur-bearing rock formations in northeastern Minnesota. Prepared for Northeastern Minnesotans for Wilderness. (Powell, 2017).
[67] Onello, E., D. Allert, S. Bauer,.J. Ipsen, M. Saracino, K. Wegerson, D. Wendland, J. Pearson. (2016). Sulfide Mining and Human Health in Minnesota. *Minnesota Medicine* (6) 51-55. (Onello, et al, 2016).
[68] *Id.*
[69] Myrbo, et al, 2017a.
[70]. Pastor, J., B. Dewey, N. W. Johnson, E. B. Swain, P. Monson, E. B. Peters, and A. Myrbo Effects of sulfate and sulfide on the life cycle of *Zizania palustris* in hydroponic and mesocosm experiments. *Ecological Applications*, Vol. 27, Issue 1 (2017): 321-336. (Pastor, et al. 2017).
[71] US Food and Drug Administration (2016) Arsenic in Rice and Rice Products Risk Assessment Report.
[72] (2018, February 19). Physician Comment Letter to USFS Re: Mineral Withdrawal.
[73] *Id.*
[74] Great Lakes Indian Fish and Wildlife Commission. (2016). Metallic Mineral Mining: The Process & the Price. (GLIFWC, 2016).
[75] Trasande, L., P. J. Landrigan, C. Schechter. (2005). Public Health and Economic Consequences of Methyl Mercury Toxicity to the Developing Brain. *Environmental Health Perspectives,* Vol. 113, no 5: 590-596. (Trasande, et al, 2005).

AMERICAN OVERSIGHT

below EPA standards.[76,77] The ore identified by Twin Metals contains "occupational," i.e. elongated mineral fibers that bear similarities to asbestos and are active in animal models for lung cancer.[78,79,80] The Boundary Waters is a Class I airshed, yet is degraded now by regional haze from coal-fired power generation and other industry, and the particulates and significant energy needs of a massive sulfide-ore copper mining operation adjacent to the Boundary Waters would add to the air pollution burden in the Boundary Waters watershed.

The introduction of sulfide-ore copper mining to the Boundary Waters watershed would also result in the following reasonably foreseeable indirect impacts to human health and wellbeing: economic turmoil and displacement associated with loss of regional status and the pollution of prized areas; social upheaval following the conversion of wilderness gateways to boom-and-bust mining communities; and the intellectual damage and economic impairment from increased concentrations of heavy metals, like mercury, in popular fish species and the blood of people who practice sport and subsistence fishing.[81]

Thus, renewal of the Twin Metals leases is likely to have significant impacts on public health, warranting an EIS.

- **Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas (40 C.F.R. § 1508.27(b)(3))**

The Superior National Forest in general and the Rainy River watershed (where the Twin Metals leases are located) in particular encompass numerous irreplaceable and unique characteristics such as the proximity to historic and cultural resources, park lands, wetlands, and ecologically critical areas. The Superior is the most freshwater-rich National Forest in the National Forest System, with 20% of the freshwater in the entire system located on the forest.[82] This enormous and complex network of high-quality lakes, rivers, and streams dissects a predominantly natural landscape also comprised of upland forests, woodlands, and forested and open peatlands. Congress protected the core of the ecosystem in 1964 by designating the over-1-million-acre Boundary Waters Canoe Area Wilderness – the largest Wilderness area east of the Rocky Mountains and north of the Everglades, and the only significant lake-land Wilderness area in the

[76] Shi L, A. Zanobetti, I. Kloog, B.A. Coull, P. Koutrakis, S.J. Melly, J.D. Schwartz. (2016). Low concentration PM2.5 and mortality: estimating acute and chronic effects in a population-based study. *Environmental Health Perspectives* 124:46–52; http://dx.doi.org/10.1289/ehp.1409111. (Shi, et al, 2016).
[77] Franklin, B.A, R. Brook, and C.A. Pope. (2015). Air Pollution and Cardiovascular Disease. Current Problems in Cardiology 40:207–238. (Franklin, et al, 2015).
[78] Ring, S.J. Expert Opinion of Steven J Ring. Roseville, MN.
[79] Cook, P.M., J. Swintek, T.D. Dawson, D. Chapman, M.A. Etterson, D. Hoff. (2016). Quantitative structure-mesothelioma potency model optimization for complex mixtures of elongated particles in rat pleura: A retrospective study. *Journal of Toxicology and Environmental Health*, Part B. 19:5-6, 266-288. (Cook, *et al*, 2016).
[80] Duluth Metals Twin Metals Minnesota Project NI 43-101 Technical Report on Pre-Feasibility Study, Amended October 6, 2014 (TMM NI 43-101) at pdf page 374 [a.k.a. Page 18-12, top bullet point]
[81] *See* (2018, February 19). Physician Comment Letter to USFS Re: Mineral Withdrawal.; *see also* Save the Boundary Waters. (n.d.). Fact Sheet: Sulfide-ore copper mining near the Boundary Waters would harm human health and impose significant costs on society.
[82] USDA-Forest Service, Superior National Forest. (2018). Water Resources of the Superior National Forest. Available at: https://www.fs.usda.gov/detail/superior/about-forest/?cid=fsm91_049844.

AMERICAN OVERSIGHT

National Wilderness Preservation System. Given its unsurpassed recreational values and relative accessibility, the Boundary Waters is our nation's most visited wilderness area. While it accounts for only 1% of the acreage of the National Wilderness Preservation System, it hosts 10% of the System's visitors. The surrounding Superior National Forest is the 8th most visited national forest in the country.

Other nearby protected areas, including the adjacent Quetico Provincial Park (Quetico) and downstream Voyageurs National Park (VNP), also make the region unique. Quetico is a large (1,180,000-acre) wilderness park in northwestern Ontario, Canada, immediately north of and adjacent to the BWCAW, that features more than 2,000 unimproved campsites scattered through more than 600 lakes and offers excellent canoeing and fishing. The two areas are separated only by the largely-unmarked US-Canada international border – a line that runs from point-to-point through the middle of a chain of lakes and portage trails known as the Border Route or Voyageur's Highway. The Voyageurs National Park covers 218,000 acres, including 134,000 acres of forest and 84,000 acres of lakes, and features more than 800 islands and 645 miles of shoreline. VNP protects a wealth of biological diversity, scenic beauty, and natural resources and forms the western edge of the Quetico-Superior region's core protected area. More than half of VNP maintains the qualities to qualify for wilderness designation, and is managed by the National Park Service to protect those values.[83] The park was named for the famed French-Canadian canoe-men who were the principal European elements in the trade of furs and other natural resources with American Indians that connected the continental interior of North America with Atlantic ports and European consumers from the 1600s to 1800s. The routes they followed were the basis for the modern border between the U.S. and Canada. Many American Indian tribes have cultural connections to the VNP and larger region, including the Cree, Assiniboine, and for nearly 400 years, the Ojibwe.[84] Visitors today – some 240,000 each year – come to fish, camp, bird watch, paddle, and tour on the National Park Service (NPS) tour boats or tour independently for day trips and overnight or weeks-long stays.

Together, the Boundary Waters and surrounding public lands provide important ecosystem and cultural services to the Arrowhead region, the state of Minnesota, and the Nation. Watershed benefits include regulating services like the cleaning of air and soil of pollutants, purifying water, and sustaining surface water and ground water flows; maintaining habitats for fish and other aquatic life; controlling erosion; and stabilizing stream banks. Provisioning services include the supply of clean water for drinking and industrial uses; the production of raw materials such as timber; and the food harvested through hunting, gathering, and fishing. Unsurpassed recreational opportunities abound in the SNF and Boundary Waters region including canoeing, boating, hiking, camping, dogsledding, cross-country skiing, birdwatching, snowmobiling, hunting and fishing, and more. Cultural services of the ecosystem are difficult to measure but include the inherent value of the area's contributions to human well-being, measured by recreational experience, character development, happiness and mental health, scientific knowledge, and artistic inspiration.[85] Together, all of these high-quality resources of measurable and immeasurable value are the foundation of the stable, sustainable, and growing natural amenity-

[83] NPS. (2016 August) Foundation Document- Voyageurs National Park, Minnesota. 70p.
[84] *Id.*
[85] Philips, S. 2015. "The Boundary Waters Canoe Area – Wealth Generator."

AMERICAN OVERSIGHT

based economy in the Arrowhead region and their protection is imperative to the long-term socioeconomic vitality of the region.

In addition to the critical ecological functions and cultural services supported by the Boundary Waters, Superior National Forest, and nearby protected areas, this vast region of high-quality water and forest provides a one-of-a-kind, landscape-scale science laboratory and location for long-term ecological research. The region also is home to a vast number of irreplaceable cultural and traditional resources, many of which have yet to be uncovered.[86] The Laurel Indian site is known to exist at the southernmost point of land at the confluence of the South Kawishiwi River and Birch Lake.[87] Other historic sites in the Boundary Waters watershed include Ojibwe village sites, American Indian pictograph sites, French and British period fur trade sites, and Paleoindian sites dating back up to 10,000 years.[88] Wild rice is an important emergent aquatic plant for wildlife, and it has social, cultural, and nutritional importance for people, especially the Anishinaabe in northern Minnesota.[89] Many waters within the Boundary Waters watershed including but not limited to the South Kawishiwi River and Birch, White Iron, Farm, Garden, and Fall Lakes (which are all on the flow-path downstream from the leased land in question) are on Minnesota Department of Natural Resource's list of wild rice waters.[90]

Twin Metals Minnesota's recently re-instated mineral leases, MNES 01352 and MNES 01353, lie directly adjacent to and upstream of Boundary Waters Canoe Area Wilderness while 01353 adjoins the Wilderness border in two places.[91] TMM's copper-nickel processing site is proposed along the Maturi deposit within 6 miles of the Wilderness border.[92] From the proposed mine site and processing facility, groundwater and surface waters flow into and through the Boundary Waters and on along its northern border lakes (the southern lakes of the Quetico), and into VNP.[93] The Birch Lake and South Kawishiwi River region is directly adjacent to the leases and is the most popular non-wilderness recreation region on the forest and a heavily used gateway to the Boundary Waters. As described elsewhere in these comments, sulfide-ore copper mining in the heart of this extremely popular, uniquely vulnerable, water-rich environment will severely

[86] USDA Forest Service December 14, 2016 decision letter to USDOI BLM. P. 3 "There are approximately 1,500 cultural resources sites identified on National Forest System (NSF) lands within the BWCAW. Many more cultural resources are believed to exist within the wilderness; as of 2015 only about 3 percent of the landscape has been intensively surveyed."

[87] Harrison, C. BLM. (1985). The Archaeology of Two Lakes in Minnesota. Bureau of Land Management Eastern States Cultural Resource Publication #2. Kuizon, L. 2008. (Harrison, 1985).

[88] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.

[89] *See* (2016, April 29). Letter from Norman W. Deschampe, Chairman of the Grand Portage Reservation Tribal Council, to the U.S. Departments of Agriculture and the Interior, and to the Director of the Council on Environmental Quality. 2 p.; also see (2014, April 3). Letter from Karen R. Diver, Chairwoman of the Fond du Lac Band of Lake Superior Chippewa Reservation Business Committee, to the U.S. Department of Agriculture, 2 p.

[90] MN Department of Natural Resources. (2008). Wild Rice Distribution and Abundance in Minnesota.

[91] *See* Federal Mineral Lease Distinctions, in Appendix (folder "Maps")

[92] *See* NMW_Map_TMM – new facilities footprint, in Appendix (folder "Maps")

[93] *See* NMW_Map – Waters at risk of pollution from sulfide-ore mining in the Rainy River Basin, in Appendix, (folder "Maps"). Note that this map depicts the path of contaminants flowing from the Twin Metals lease sites as well as from additional Federal prospecting permit sites; BWCAW & VNP Watershed Area at Risk, with mining-exploration-district, in Appendix (folder "Maps"); Myers, 2016b; Myers, 2014; Myers, T. (2016). "Technical Memorandum: Twin Metals Mine and the Peter Mitchell Pit – Simulation of the Development of the Peter Mitchell Pit and its Effects on the Proposed Twin Metals Tailings Impoundment." Prepared for Northeastern Minnesotans for Wilderness. (Myers, 2016a); and Myers, 2015.

AMERICAN OVERSIGHT

and permanently degrade the area's unique and irreplaceable ecological, social, and cultural resources.

- **The degree to which the effects on the quality of the human environment are likely to be highly controversial (40 C.F.R. § 1508.27(b)(4))**

The Twin Metals leases and proposed sulfide-ore copper mining in the Rainy River watershed have unquestionably been highly controversial, with significant public dialogue about the permanent and irremediable effects of mining activity on the Boundary Waters and other irreplaceable and sensitive Superior National Forest resources. As described above, the Boundary Waters and surrounding Superior National Forest are uniquely popular and ecologically significant. Any activity that would pollute or otherwise harm this crown jewel of the National Wilderness Preservation System and the pride of Minnesota is highly controversial, and introducing one of the world's most toxic industries – sulfide-ore copper mining – into this uniquely valuable and vulnerable landscape is doubly controversial.

As described throughout these comments, a robust body of science demonstrates that sulfide-ore copper mining would present an unacceptable risk to the Wilderness and surrounding Superior National Forest lands, as well as to the area's sustainable and vibrant economy that depends on world-class recreational opportunities and pristine waters and forests. For instance, advancement of a single-use and toxic industrial mining complex in the Boundary Waters watershed would prompt 23% of residents and a host of natural resource and amenity-reliant businesses to leave the region.[94] In short, the stakes – and corresponding level of controversy – are high. The history of robust public engagement and concern over the Twin Metals leases and the issue of sulfide-ore copper mining in the Boundary Waters watershed further highlights the level of controversy and need for an EIS.

2018 polling by FabrizioWard shows that a super-majority of Minnesotans (70%) oppose, and a majority strongly oppose, sulfide-ore copper mining in the Boundary Waters watershed.[95] Three out of five Minnesotans oppose renewal of the Twin Metals leases.[96] Responding to public outcry, Governor Mark Dayton issued a ban on state approvals for a Twin Metals mine, with two-thirds of Minnesotans in support of the state ban, including a majority in the 8th Congressional District, a historic mining district and location of the proposed mine site.[97] Voters further demonstrated their opposition to sulfide-ore copper mining in the 2018 mid-term election by electing candidates who prioritize protecting the Boundary waters and, as such, have been certified by the Boundary Waters Action Fund (BWAF) as "Boundary Waters Champions." Governor Tim Walz, Attorney General Keith Ellison, and four of the eight Minnesota congressional race winners – House Representatives Angie Craig, Dean Phillips, Betty McCollum, and Ilhan Omar - are all certified Boundary Waters Champions.

[94] Phillips, S. and C. Alkire. (2017). Sulfide-Ore Copper Mining and/or A Sustainable Boundary Waters Economy: The Need to Consider Tradeoffs (Phillips & Alkire, 2017); *see also* Stock & Brandt, 2018 (independent study showing that protecting the Boundary Waters from a Twin Metals mine would result in dramatically more jobs and income over a 20-year period).
[95] *See* FabrizoWard. LLC Memorandum dated 2-27-2018, conveying polling results re: sulfide ore copper mining near the Boundary Waters, in Appendix.
[96] *Id.*
[97] *Id.*

AMERICAN OVERSIGHT

Public participation in related Forest Service decision-making processes, including the now-terminated withdrawal study process, also shows a high degree of public concern and controversy. Indeed, participation was at a record high for Minnesotans during Forest Service comment periods and public hearings in 2016, 2017, and 2018 on renewal of the Twin Metals leases and the proposed withdrawal of 234,328 acres of Superior National Forest lands in the watershed of the Boundary Waters. A key Log Economics analysis found that 177,488 out of 181,398 comments the Forest Service received in 2017 and 2018 favored the proposed withdrawal, including 98.2 percent of the unique comments received.[98] In five public hearings held by the Forest Service in 2016 and 2017, more than 5,600 people turned out to voice their concerns, with a nearly two-to-one ratio of randomly selected speakers in favor of protecting the Boundary Waters watershed from sulfide-ore copper mining. Diverse interests, including tribes, health professionals, business owners, sportsmen, military veterans, youth, the International Joint Commission, and more have weighed in and voiced their opposition to sulfide-ore copper mining in watershed.

Elected leaders have been similarly vocal. In a June 14, 2018 bipartisan letter, over a dozen members of the U.S. House of Representatives urged the Department of the Interior and the Department of Agriculture "to conduct a rigorous review of the proposed twenty-year mineral withdrawal" and "to bear in mind the extremely high value and importance of the Boundary Waters to Minnesota and the nation."[99] Former Governor Mark Dayton, Senator Amy Klobuchar, Congresswoman Betty McCullum, Congressman and Governor Tim Walz, Congressman and Attorney General Keith Ellison, as well as former Congressman Erik Paulsen all supported the Forest Service's proposed withdrawal and associated environmental review. Additional detail is included in Section V. The history of public concern and engagement clearly demonstrates that a decision renewing the Twin Metals leases would be wildly unpopular and controversial.

Moreover, particular reasonably foreseeable impacts of lease renewal and associated mine development are in and of themselves highly controversial. For instance, contamination of popular recreational lakes and rivers, sport and subsistence fisheries, and wild rice areas would have serious public health effects (see Public Health Factor above) and violate requirements to preserve existing outstanding water quality (see Federal, State, and Local Law Factor below). The corresponding and serious neurological health effects and necessary restrictions on fish and wild rice consumption would be highly controversial. This along with other impacts of sulfide-ore copper mining to the ecologically, socially, and economically valuable and uniquely vulnerable Boundary Waters watershed would represent a substantial and highly controversial loss to society, clearly warranting an EIS.

Finally, the significant controversy over the potential impacts of sulfide-ore copper-nickel mining within the same watershed as the Boundary Waters is readily apparent by comparing the BLM's paltry EA with the December 14, 2016 detailed and scientifically supported letter from

[98] *See* Key-Log Economics, LLC. (2018. February 27). Memorandum: Full results from the review of comments on the proposed withdrawal of lands from mineral leasing in the Boundary Waters, in Appendix
[99] *See* (2018, June 14). US Rep Betty McCullum, *et al*, Letter to Secretaries Perdue and Zinke regarding cancelled study.

AMERICAN OVERSIGHT

Forest Service Chief Thomas Tidwell to the BLM. The Forest Service found the inherent risk of a regionally-untested copper-nickel mine in this watershed to be so severe that the agency refused its consent to the renewal of these same leases. Thus the Forest Service went well above and beyond calling for a full-blown EIS for these leases, to instead withholding the agency's consent to insure that these leases do not move forward. At the very least, the Forest Service's refusal to consent to these same leases due to the risk of severe and irreversible environmental impacts demonstrates that there is a significant controversy over the impacts of these leases, requiring an EIS.

- **The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks (40 C.F.R. § 1508.27(b)(5))**

The best available scientific information shows that sulfide-ore mining in the Boundary Waters watershed will have permanent and irremediable damaging effects on the Boundary Waters and other Superior National Forest resources. Particularly in the context of the world-class watershed, wilderness, and recreation values of the Superior National Forest, these risks are even more "unique" and unjustifiable. While there may be disagreement over the degree of risk at the lease renewal stage, any reasonable review of the best available science and historic and current projects demonstrates that the risk of contamination through seepage over time or catastrophic failure is significant.

Comprehensive review of the hardrock mining industry track record of leaks, spills, and failures under ordinary operation and closure demonstrates the high degree of likelihood that mining of the sulfide-bearing Duluth Complex ore would contaminate surrounding ecosystems and require perpetual remediation. Peer-reviewed studies, government analyses, and expert modeling has irrevocably demonstrated the path of the near-certain pollution through an environment uniquely vulnerable to the acids, heavy metals, and sulfate released by sulfide-ore copper mining. Enumerated below are several characteristics of sulfide-ore copper mining, a type of hardrock mining, that demonstrate its unique and unjustifiable risk to the human environment.

- Data from the U.S. Environmental Protection Agency (EPA) Toxic Release Inventory show hardrock mining, including copper mining, to be the nation's largest toxic polluter. In 2000, the industry released 3.4 billion pounds of toxics, or 47 percent of all toxic waste released by all U.S. industries for the year, combined.[100]
- Many hardrock mine sites carry high or medium human health risks. How many is not clear, however, because the EPA databases are not complete with respect to abandoned mines' human health risks.[101]
- The EPA estimates that hardrock mining is responsible for the contamination of streams in the headwaters of more than 40% of watersheds in the western United States.[102]

[100] EPA, Office of Inspector General. (2004). Nationwide Identification of Hardrock Mining Sites. Report No. 2004-P-00005. (EPA, 2004).
[101] *Id.* At i.
[102] EPA, Office of Water. (2000). Liquid Assets 2000: America's Water Resources at a Turning Point. EPA-840-B-00-001. (EPA, 2000).

AMERICAN OVERSIGHT

- Most sulfide-ore copper mining in the United States and elsewhere is conducted in drier locations, such as the arid southwestern U.S. and the Atacama desert of northern Chile.[103]
- A review of hardrock mining projects (52% operating, 48% closed) and their EIS documents found a majority (77%) in violation of groundwater or surface water standards despite the majority predictions of "no impact" in their EISs. For mines in close proximity to surface water or groundwater and with high acid drainage or contaminant leaching potential, 93% near groundwater had exceedances of water quality standards, and 85% near surface water had "exceedances of standards or permit limits in surface water as a result of mining activity." This is with mitigation factored in.[104]
- Even in arid places, sulfide-ore copper mining has a record of long-lasting water pollution, despite environmental review document predictions to the contrary.[105,106,107,108,109,110,111,112]
- No sulfide-ore copper mines have operated and closed without polluting surrounding surface and groundwater. A careful look at the examples the industry has offered of non-polluting mines reveals 1) documented evidence that they have in fact polluted ground and/or surface water[113, 114, 115, 116, 117]; 2) they are still operating; and/or 3) they are incomparable to mining that could be developed in the Duluth Complex within the Rainy River watershed.
- Sulfide-ore copper mining industry as a whole is turning more often to larger, lower-grade deposits. This trend is significant because waste material in larger volumes is left behind ever-larger tailings dams, which creates greater risks and more catastrophic consequences of failure. These hazards endure for centuries after the mining ends.[118, 119]

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[103] USGS. (n.d.) Mineral Resources in Deserts. Available at: https://pubs.usgs.gov/gip/deserts/minerals/.
[104] Kuipers & Maest. 2006.
[105] *Id.*
[106] Earthworks, 2012, US Copper Porphyry Mines.
[107] Earthworks. (2006). Predicting Water Quality Problems at Hardrock Mines- A Failure of Science, Oversight, and Good Practice. (Earthworks, 2006, Predicting Water Quality Problems at Hardrock Mines).
[108] Robertson, A. M. (2011). Mine Waste Management in the 21st Century: Challenges & Solutions Beyond Incremental Changes. (Robertson, 2011).
[109] Earthworks. (n.d.) False Promises: Water Quality Predictions Gone Wrong; Large Mines and Water Pollution. (Earthworks, n.d.).
[110] Earthworks. (2004). Hardrock Mining: Risks to Community Health.
[111] Earthworks. (2013). Polluting The Future – How mining companies are contaminating our nation's water in perpetuity. (Earthworks, 2013. Polluting the Future.).
[112] CBC News. (2014, August 6). Mount Polley mine tailings spill- Imperial Metals could face $1M fine. Available at: http://www.cbc.ca/news/canada/british-columbia/mount-polley-mine-tailings-spill-imperial-metals-could-face-1m-fine-1.2728832. (CBC News, 2014, Aug 6.).
[113] Wisconsin DNR. (2012). Surface Water Quality Assessment of the Flambeau Mine Site
[114] Chambers, D. (2012). Supplemental Expert Report of Dr. David M. Chambers.
[115] EPA. (2014, June 25). Approval letter of Wisconsin's 2012 303d list. *See* p. 66, at bottom.
[116] Kuipers & Maest, 2006.
[117] *See* Stillwater Mining Company form 10-K Feb. 2-2011 and Stillwater Mining Company form 10-K Feb. 16-2017.
[118] Robertson, 2011.
[119] Bowker, L.N. and D.M. Chambers. (2015). The Risk, Public Liability, & Economics of Tailings Storage Facility Failures. Bowker Associates, Science and Research in the Public Interest, Stonington, ME, and Center for Science in Public Participation, Bozeman, MT. (Bowker & Chambers, 2015).

AMERICAN OVERSIGHT

- EPA in 2004 estimated the costs to clean up just 156 hardrock mining sites in the U.S. to be between $7 billion and $24 billion. At the time, the EPA's maximum exposure was seen to be $15 billion, or an order of magnitude bigger than the EPA's annual Superfund budget.[120]

In addition to the near-inevitable and permanent contamination risks, other unique and unjustifiable risks to the human environment include, but are not limited to, the following.[121]

Large Land Surface Areas Would Be Affected with Consequences to Natural and Cultural Resources.

Considering the scale of the mining operations contemplated by Twin Metals and the low-grade ore of the Duluth Complex,[122] processing facilities, waste piles, tailings basins, and the other extensive infrastructure would very likely require multi-thousand-acre footprints.[123] The resulting ecological, social, and economic effects would be significant and include:

- Permanent and multi-decade-long land conversion of thousands of acres from forest and wetland and stream to open pit and/or underground mines, ore-processing and concentrating facilities, pipelines, access roads, waste rock and tailings piles, and more.
- Movement of pollution from mines and mine facilities into the Boundary Waters Canoe Area Wilderness and other downstream protected areas. A 2016 Journal of Hydrology paper shows that under ordinary operations, mine contaminants would move with groundwater flows, intercept surface waters, and flow into waters of the Boundary Waters.[124,125]
- Effects on the entire Boundary Waters Canoe Area Wilderness, Wilderness-edge communities, and the Arrowhead region – including heavy metals, sulfates, and acid flowing into the low-sulfate waters of the Boundary Waters watershed. As a consequence, mercury methylation would increase in those waters and downstream,[126] and as explained throughout these comments, the reputation of and visitorship to the Boundary Waters and Superior National Forest would be damaged.[127]

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[120] *Id.*
[121] *See also* Section V (Ecological and Socio-Economic Impacts of Sulfide-Ore Copper Mining in the Boundary Waters Watershed).
[122] TMM NI 43-101 Fig. 4-3 – TMM Project Ground Holdings Map
[123] TMM NI 43-101 at p. 177 [a k.a. page 4-29]
[124] Myers, 2016b
[125] The Myers 2016 paper in the Journal of Hydrology is based on reasonable assumptions and the best available data. First, it is based on the Twin Metals Pre-Feasibility Study Technical Report. Second, no sulfide-ore copper mine has operated and closed without polluting surrounding surface and groundwater. A 2012 study by Earthworks, which looked at 14 of what were then 16 operating copper mines in the U.S. (two of the 16 mines had not been operating for at least five years, and were not included in the study for lack of at least a minimal operating record), and found that at all mines (100%) there had been pipeline spills or other accidental releases of pollution. It also found that, "[a]t 13 of the 14 mines (92%), water collection and treatment systems [] failed to control contaminated mine seepage, resulting in significant water quality impacts." Earthworks, 2012, US Copper Porphyry Mines.
[126] Engstrom, D. R. (2017, August 11). Scoping Comment on N. MN Federal Mineral Withdrawal.
[127] Many people do not distinguish between the different HUC-11 watersheds in the BWCAW, but see it as a whole, and the perception of the BWCAW as a whole would be forever tarnished by sulfide-ore copper mining in the BWCAW watershed.

AMERICAN OVERSIGHT

- Effects on remaining habitat near the converted areas, including: former interior forest habitat would become edge habitat; significant micro-climate alterations would occur in the new edge forest (warmer, drier air; higher wind speeds); more wind damage would occur to trees in the new forest edges around the mine footprint(s); interior forest bird habitat would be lost; and invasion of that habitat by a variety of edge species would occur; features required by Canada lynx for foraging and denning would be destroyed.

Sulfide-Ore Copper Mining Inherently Produces Large Amounts of Waste Rock and Tailings, Toxic Metals, Acids, Processing Chemicals, and Pulverized Sand, All of Which Pollute Water with High Likelihood and Low Probability of Remediation.

Duluth Complex ore is low-grade, sulfide-bearing ore that has already been shown to produce acid mine drainage in the Boundary Waters watershed despite efforts being made to control it.[128,129] More than 99% of the ore in identified deposits, if mined, would be tailings and other waste.[130] This waste would need to be stored in massive tailings basins,[131] which are subject to consistent failure despite industry claims of safety and reliability.[132] A review of tailings basin failures from 1990-2010, found the majority (60%) to be considered Serious or Very Serious (those involving release of >1 million cubic meters of tailings, and/or the travel of released material >12 miles, and/or loss of ≥ 20 human lives.)[133] Severe tailings dam failures are costly to address, with an average cost of $543 million per failure in recent years.[134] Even with the use of state-of-the-art technology and following best practices, it is not possible to alleviate the risk of contamination to surrounding ground and surface waters.[135] Hydrological modeling of surface seepage and groundwater pollution flows show pollution from a proposed Twin Metals tailings facility would flow into the Peter Mitchell Pit and from there into the Boundary Waters watershed.[136]

The reasonably foreseeable contamination impacts of sulfide-ore copper mining are irremediable. For instance, the elimination of wild rice from traditional waters, the loading of sport and subsistence fish species with additional mercury, and the siting of an enduring source of pollution in a formerly clean and healthy watershed are effects that last as long as the

[128] EPA, Office of Solid Waste, Special Waste Branch. (1994). Technical Document: Acid Mine Drainage Prediction.
[129] The Timberjay. 10-7-2015, Mining vs. Water: Dunka site exposes breakdown in mine regulation.
[130] *See* Table 1-4, Mineral Resource Statement, TMM NI 43-101 at p. 56 [a k.a. Page 1-16]
[131] TMM NI 43-101, at p.4-29. Note that though the TSF in this case was proposed to be located outside of the BWCAW watershed, it cannot be assumed that it would have been, nor that other mines' tailings and waste piles would be anywhere but inside the BWCAW watershed. Also note that, even if the TMM TSF were located just outside the BWCAW watershed, hydrological modeling shows that unrecaptured leachate from such a TSF would flow first to the Peter Mitchell Pit, and from there back into the Boundary Waters watershed. *See* Myers, 2016a.
[132] Chambers, D. (n.d.). Long-Term Risk of Tailings Dam Failure. National Park Series, Alaska Park Science, Vol. 13, Issue 2. Available at: https://www.nps.gov/articles/aps-v13-i2-c8.htm.
[133] Bowker & Chambers, 2015.
[134] *Id.*
[135] Chambers, 2014.
[136] Myers, T. (2016). Technical Memorandum: Twin Metals Mine and the Peter Mitchell Pit – Simulation of the Development of the Peter Mitchell Pit and its Effects on the Proposed Twin Metals Tailings Impoundment. Prepared for Northeastern Minnesotans for Wilderness, Ely, MN. (Myers 2016a).

AMERICAN OVERSIGHT

pollution source – in this case, centuries or millennia, a time frame in which humans are not accustomed to assessing and weighing risks.

Acid Mine Drainage Causes Severe Damage and is a Pervasive Problem for America's Public Lands and Waters and is a Predictable Result of Sulfide-Ore Copper Mining in the Water-Rich Boundary Waters Watershed.

Acid mine drainage (AMD) is the combination of acid and heavy metals leached from waste rock, tailings, mine walls, and other mine features. AMD occurs when sulfides formerly locked within the bedrock are exposed to water and oxygen through the mining process.[137] When AMD occurs, it can be impossible to control.[138] Considering that all liners and tailings basins leak and will fail eventually,[139] it is reasonably foreseeable that pollution would leach, seep, and flow from surface, open pit, and underground facilities of any mine developed in the wet environment of Minnesota's Boundary Waters watershed.

AMD has multiple direct, indirect, and cumulative effects on receiving waters. AMD lowers the pH of receiving waters and, because many forms of aquatic life have sensitive pH ranges below which they cannot live and reproduce, AMD can extirpate species or even all pre-existing aquatic life from receiving waters.

Sulfate in AMD is a necessary ingredient in a set of chemical interactions that convert mercury (whether existing in the AMD or pre-existing in receiving waters) to methylmercury, which bio-accumulates in organisms. Heavy metals that bio-accumulate in lower trophic levels of aquatic and terrestrial food webs also bio-magnify at each successive step up the food web. These products from a mine act individually and cumulatively with other water quality problems, such as septic contamination, to exacerbate water pollution problems in waters around sulfide-ore copper mining.[140]

AMD may require continuous on-site management and perpetual or "indefinite" water treatment.[141]

The Risks and Effects of Sulfide-Ore Copper Mining in the Boundary Waters Watershed Would Have Severe and Enduring Direct, Indirect, and Cumulative Negative Effects on Public Health and the Public's Natural and Cultural Resources.

Given that mechanical equipment and basic materials such as geomembranes all eventually fail (both before or beyond design life expiration), and given that the Duluth Complex is clearly capable of producing serious environmental pollutants, some of which pose direct threats to public health, there is near-certainty that any sulfide-ore copper mining in the Boundary Waters

[137] Chambers, 2014.
[138] EPA 2004.
[139] Rowe, R.K. and H. P. Sangam. (2002). Durability of HDPE geomembranes. *Geotextiles and Geomembranes* 20(2002) 77-95. (Rowe & Sangam, 2002).
[140] Baker, 2013.
[141] *See* NorthMet FEIS, pages 175 [a k.a. 3-17, Table 3.2-2, "Long-term management"]; 230 [a k.a. 3-72 paragraph 3, "...modeling performed in support of this FEIS indicates that water treatment systems would be needed indefinitely at the Mine Site and Plant Site."]; 284-285 [a.k.a. 3-126 – 3-127]; and 297 [a.k.a. 3-139]

AMERICAN OVERSIGHT

watershed will pollute lands and waters of the Boundary Waters watershed, including the Boundary Waters, MPA, VNP, and large portions of the SNF.

Any true measure of the environmental risks and consequences of the Proposed Action and its industry intended outcomes must consider the context in which the risks and effects would occur. The context here includes the high-quality and sensitive waters and aquatic habitats, and the terrestrial resources and wildlife habitat of federally protected lands in the SNF.

The risks and effects of sulfide-ore copper mining include, among other things, AMD (heavy metals, pH reduction, and sulfates); forest destruction-related damage to adjacent and connected stream systems' stability, morphology, and ability to provide high-quality aquatic habitat and to maintain high water quality; damage to terrestrial ecosystem functions and wildlife habitats; damage to air quality; and degraded Wilderness characteristics.

Collectively, the reasonably foreseeable impacts of lease renewal and associated sulfide-ore copper mining in the Boundary Waters watershed pose unique and unjustifiable risks that warrant preparation of an EIS.

- **The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration (40 C.F.R. § 1508.27(b)(6))**

As described in the section above on the scope of the analysis, lease renewal is a critical pre-requisite – and connected action – to development of a Twin Metals mine on the doorstep of the Boundary Waters Canoe Area Wilderness. Indeed, the leases seem to purport to grant the lessee the "right to mine, remove, and dispose of" certain minerals on the leased lands. Thus, lease renewal may threaten to establish a precedent for future actions with significant effects and represent a decision in principle about a future consideration, which warrants an EIS.

- **Whether the action is related to other actions with individually insignificant but cumulatively significant impacts (40 C.F.R. § 1508.27(b)(7))**

While the impacts of lease renewal are clearly significant in their own right, the renewal decision is also related to other actions with cumulatively significant impacts. Those actions include, but are not limited to, issuance and extensions of prospecting permits and approvals of plans of operation, special use permits, and other authorizations for exploration activities on the leased and prospecting permit lands. Over the last decade, the Forest Service and BLM have authorized dozens of drill pads, hundreds of exploratory and hydrogeologic wells, and the construction of new access roads on Superior National Forest lands. Those actions alone are having ongoing and cumulatively significant impacts, including noise, surface disturbance and associated habitat fragmentation, truck and other heavy equipment traffic, public access restrictions, road building, and other impacts.

As described above in the section on scope of analysis, mine development is also closely related to lease renewal and is foreseeable, given the advanced stage of Twin Metals' exploration work. The cumulative environmental impacts of renewal and mine development would certainly be

AMERICAN OVERSIGHT

significant. Importantly, NEPA regulations make clear that BLM cannot avoid a finding of significant cumulative impacts by breaking down an action into small component parts.[142]

- **The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources (40 C.F.R. § 1508.27(b)(8))**

Section 106, the portion of the NHPA that is concerned with federal undertakings, is designed to further the national policy of protecting historic properties, including historic properties to which any Indian tribe attaches cultural or religious significance.[143] The BLM has failed to follow and compete the process for identifying historic properties, and so there may be and likely are more historic sites than those already identified, as explained in Section IV, below. There are known to be at least nine documented Laurel Indian archaeological sites in the area,[144] as well as at least six other archaeological sites on or adjacent to the leases. Mining and other reasonably foreseeable effects on known archaeological sites as a result of renewing the leases would introduce of significant noise and air pollution likely to continue 24 hours per day and 365 days per year, as well long-term water pollution, contamination of fish and wildlife, and scenic disruption from construction and operation of an industrial mining district. Regular blasting during construction and operation of the mine would shake nearby sites, some of which are at or below the water level of Birch Lake. These effects would greatly diminish the setting and integrity of the historic properties' significant aspects. The jarring and shaking associated with regular blasting could cause the destruction of documented and undiscovered inundated historic sites, by causing shifting or slumping of sediments. These effects would violate the goal of the NHPA, and BLM's manual, which requires it to "manag[e] [] cultural resources so that the scientific and socio-cultural values are not diminished, but rather maintained and enhanced."[145] The BLM has failed to include stipulations "adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the propert[ies'] historic significance," to avoid the adverse effect example provided in the Code of Federal Regulations involving transfer of leases.[146] Stipulations drafted before a reasonable and good-faith effort has been made to identify historic properties with an APE could not be asserted as adequate in any case. Renewing the Leases now, would restrict subsequent consideration of alternatives to avoid, minimize, and mitigate the undertaking's adverse effects on historic properties.[147] The BLM has failed to follow and complete the process for identifying historic properties, and thus renewing the Leases would violate the NHPA.

- **The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973 (40 C.F.R. § 1508.27(b)(9))**

[142] 40 C.F.R. § 1508.27(b)(7).
[143] NHPA § 101(d)(6)(B); 34 U.S.C. § 306108; 36 CFR Part 800
[144] BLM, 1985. Foreword
[145] BLM, 1985. (citing BLM Manual § 8100).
[146] 36 CFR § 800.5(a)(2)(vii).
[147] 36 CFR § 800.1©.

AMERICAN OVERSIGHT

Large-scale sulfide-ore mining will have significant adverse effects on listed species, including the threatened Canada lynx, threatened gray wolf, and threatened northern long-eared bat, and on candidate species moose. These effects include the loss, fragmentation, and contamination of habitat, disturbance of and cumulative stress impacts on critical biological functions including feeding and reproduction, and increased human interaction including poaching and harassment, and may in turn lead to decline or local extirpation.[148]

In the case of Canada lynx and the gray (eastern timber) wolf, the Boundary Waters and the rest of the SNF have played a critical role as habitat because of the extent of large natural areas with low human population density and, relative to the rest of the region, lower road densities and traffic intensities. With the exception of an area of northeastern Koochiching County, all critical lynx habitat in Minnesota exists in northeast Minnesota's St. Louis, Lake, and Cook Counties. Nearly all of the SNF is designated critical habitat for lynx; it includes both foraging and denning habitat. [149, 150, 151, 152, 153] The analysis area is also within the designated critical habitat for the gray wolf.[154] While the wolf was extirpated everywhere else in the lower 48 states over the course of the 19th and 20th centuries, a wolf population persisted on the SNF, in large part because the Boundary Waters served as refuge habitat and a population source.

The long-eared bat, listed as a threatened species in 2015, is also present on the SNF and the Boundary Waters.[155] Threatened long-eared bats prey on many insects that emerge from aquatic larvae. Loss of aquatic larvae, which could be caused by acid mine drainage, would reduce populations or eliminate some of the most sensitive insect species from affected waters, with corresponding impacts on bat food sources. That loss of nutrition will have a negative direct effect on long-eared bat populations. Any negative effects on bat nutrition caused by sulfide-ore mining in the Boundary Waters watershed will exacerbate the precarious existence of these bats, leave them more vulnerable to white-nose syndrome (a threat affecting neighboring bat species)-mediated depletion of fat reserves and starvation and lead them closer to extinction locally.[156]

While moose are not currently listed as endangered or threatened under the ESA, their populations in Minnesota, including the Boundary Waters watershed, have been in significant decline, with the northwestern population collapsing and the northeastern population declining by 50% since 2005.[157] The U.S. Fish and Wildlife Service is overdue on its determination in

[148] Frelich, L. (2014). Forest and terrestrial ecosystem impacts of mining. St. Paul: The University of Minnesota Center for Forest Ecology. (Frelich, 2014).
[149] *See* USFS Map: "Lynx Critical Habitat and Foraging Habitat" in Appendix (folder "Maps")
[150] 50 CFR Part 17. (2014, September 12). Endangered and Threatened Wildlife and Plants: Revised Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx and Revised Distinct Population Segment Boundary. 79 Fed. Reg. 54781, 54843.
[151] Heart of the Continent School Trust Lands Initiative (a cooperative effort of U.S. Forest Service, Bureau of Land Management, National Park Service, and U.S. Fish & Wildlife Service). (2016). Map of Critical Habitat.
[152] *See* HofC_Map- Lynx Critical Habitat, in Appendix (folder "Maps")
[153] Moen, R., et al. 2008. Movement and Habitat Use of Canada Lynx During Denning in Minnesota. *J. Wildlife Management,* 72(7): 1507-1513.
[154] 43 Fed. Reg. 9607, 9614 (March 9, 1978).
[155] 80 Fed. Reg. 17,974 (April 2, 2015).
[156] Powell, 2017.
[157] MN DNR. (2018). Species Profile: Moose (*Alces americanus)*. *Availble at* https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=AMALC03010. P. 1.

AMERICAN OVERSIGHT

response to a petition to list the moose.[158] Due to the significant decline, the Minnesota DNR designated moose as a species of special concern in 2013.[159]

Moose populations are sensitive to forest fragmentation and water pollution. The additional traffic and associated moose-vehicle collisions, forest fragmentation, density of deer which carry brainworm fatal to moose, and avoidance of high-value habitats due to disturbance from mining activity are just a few of the reasonably foreseeable adverse impacts to struggling moose. Moose seek out aquatic vegetation because it tends to have more sodium than terrestrial vegetation. Reduction or contamination of aquatic vegetation from acid mine drainage would harm moose and moose populations.[160]

The likelihood of significant impacts to the threatened lynx, wolf, and northern long-eared bat from large-scale mining activities is recognized in the 2016 biological opinion prepared for the proposed NorthMet mine and land exchange. As explained by FWS, species habitat effectiveness would be reduced due to vegetation removal and subsequent habitat fragmentation, increasing human presence, noise, increasing traffic, and other factors, and wildlife travel corridors may be further reduced.[161] As with the NorthMet proposal, most of the impacts of the mine on lynx, wolves, and northern long-eared bats would be permanent, and even where reclamation is proposed the loss of habitat would last for several decades.[162] As with NorthMet, a Twin Metals mine proposal would "result in significant adverse effects to these three species in the action area."[163] There would be similar adverse impacts to the local moose population.

In short, lease renewal and mine development would adversely and significantly affect multiple listed and candidate species, as well as designated critical habitat for Canada lynx and gray wolf, thereby requiring an EIS to assess and disclose these impacts in considerably greater detail, and also requiring formal consultation with FWS, pursuant to Section 7 of the ESA, to insure against jeopardy and the destruction or adverse modification of critical habitat.

- **Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment (40 C.F.R. § 1508.27(b)(10))**

As described throughout this letter and in detail in Section IV below, lease renewal threatens to violate numerous laws designed to protect the environment, including but not limited to laws designed to protect the irreplaceable wilderness and watershed resources of the Boundary Waters Canoe Area Wilderness and Voyageurs National Park.

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[158] Albert, J. (2015, July 16). Groups File Petition to Classify Moose as Endangered Species. Outdoor News. https://outdoornews.com/2015/07/16/groups-file-petition-to-classify-moose-as-endangered-species/.
[159] MN DNR. (2018). Species Profile: Moose (*Alces americanus). Availble at* https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=AMALC03010. P. 1.
[160] Powell, 2017; *and see* Frelich, 2014.
[161] US Fish and Wildlife Service. (2016, February 5). Biological opinion for proposed NorthMet Project and Land Exchange, p. 44.
[162] *Id*., p. 51.
[163] *Id*., p. 62.

AMERICAN OVERSIGHT

For instance, the Boundary Waters and Voyageurs National Park are subject to a non-degradation standard for water quality. Mining on federal lands outside of these protected boundaries cannot occur if it would lead to pollution of the waters within the Boundary Waters and/or MPA. No sulfide-ore copper mine can meet this standard, as described in the section on unique risks to the human environment, above, and particularly not one located in the water-rich environment of the Superior National Forest. Thus, lease renewal threatens a violation of Minnesota's Clean-Water-Act-compliant anti-degradation rules for Outstanding Resource Value Waters.[164]

As described in detail in Section IV, below, lease renewal also threatens violations of:

- The Wilderness Act of 1964 and Boundary Waters Canoe Area Wilderness Act of 1978, which obligate the Forest Service to preserve the wilderness character of the Boundary Waters Wilderness, and the existing natural values and high standards of environmental quality of the lakes, streams, shorelines and associated forest areas of the Boundary Waters Wilderness and the Mining Protection Area; and to intensify the development on the Superior National Forest outside the Wilderness Area of dispersed outdoor recreation, including remote campsites on lightly developed lakes, "... to provide motorized recreation experiences similar to those previously available in the Boundary Waters."
- The Boundary Waters Treaty of 1909 between the United States and Canada obligates each party to ensure that, "the waters herein defined as boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury or health or property on the other."[165]
- §402 of Reorganization Plan No. 3 of 1946, 60 Stat. 1097, 1099, which prohibits mineral development on acquired National Forest lands in Minnesota, except when the Secretary of Agriculture advises that development will not interfere with the purposes for which the land was acquired, which, for example, under the Weeks Act (16 U.S.C. §515), was for, "the regulation of the flow of navigable streams or for the production of timber."
- The Clean Water Act, which imposes the strictest antidegradation standard on the Boundary Waters and Voyageurs National Park (both classified as "outstanding Nation resource waters");
- The Clean Air Act, which among other things establishes the national visibility goal for Federal Class I airsheds—Wilderness Areas and National Parks—as the prevention of any future, and the remedying of any existing, impairment of visibility resulting from manmade air pollution.
- The Minnesota Wetland Conservation Act (WCA), which prohibits actions that would cause permanent harm to rare natural communities. Rare natural communities under WCA are defined as "native plant communities (NPCs) having a conservation status rank of S1,S2, or S3 that are mapped or determined by the DNR to be eligible for mapping in the Natural Heritage Information System; or, any native plant community that is contained within an area mapped or determined by the MBS to be eligible for mapping in

[164] *See* Section IV on the Clean Water Act.
[165] Boundary Waters Treaty of 1909, Article IV, May 13, 1910, 36 Stat. 2248.

AMERICAN OVERSIGHT

the Natural Heritage Information System as having an Outstanding or High biodiversity significance ranking"

- The National Historic Preservation Act (NHPA) § 106, which is meant to further the national policy of protecting historic properties, including properties to which any Tribe attaches cultural or religious significance, and which establishes a process with clear requirements for identifying historic properties that may be affected by a federal undertaking such as lease renewal.[166]

The Forest Service's 2016 non-consent decision describes in significant detail how many of these legal obligations could not be met should the Twin Metals leases be renewed, given the significant adverse impacts associated with lease renewal. The science has only grown stronger in the intervening two years, and the proposed lease stipulations fail to mitigate those impacts,[167] showing that violations of numerous federal laws designed to protect the environment are highly likely – if not certain – to occur.

In short, renewal of Twin Metals two reinstated federal mineral leases constitutes a major federal action that significantly affects the quality of the human environment and will require preparation of an EIS. The impacts associated with that course of action, in the context of the world-class resources of the Boundary Waters and surrounding Superior National Forest and the current level of interest in and controversy around sulfide-ore copper and nickel mining, are simply too numerous and intense to justify a FONSI.

E. FAILURE TO TAKE A HARD LOOK AT REASONABLY FORESEEABLE DIRECT, INDIRECT, AND CUMULATIVE IMPACTS TO UNIQUE AND IRREPLACEABLE RESOURCES

NEPA requires federal agencies to take a "hard look" at the environmental consequences of proposed actions, including their direct, indirect, and cumulative effects.[168] The required hard look encompasses effects that are "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative."[169] Section V of this comment letter provides detailed information about the affected environment – including the unique and irreplaceable resources of the Boundary Waters and surrounding national forest lands and their myriad social, economic, and ecological benefits – and the numerous reasonably foreseeable impacts – based on the best available scientific information – associated with lease renewal. The Forest Service's December 14, 2016 decision withholding its consent to lease renewal also included a detailed analysis of the environmental and socio-economic issues and impacts related to renewal and development of Twin Metals' leases. These impacts must be fully analyzed.

Unfortunately, the EA utterly fails to take the required hard look at numerous reasonably foreseeable significant impacts. First, the EA fails to analyze the impacts of mine development –

[166] NHPA §101(d)(6)(B); 34 U.S.C. § 306108; 36 CFR Part 800.
[167] *See* Section V.
[168] *Robertson*, 490 U.S. at 348–50; 42 U.S.C. § 4332(2)©; 40 C.F.R. §§ 1502.16, 1508.7, 1508.8.
[169] 40 C.F.R. § 1508.8.

AMERICAN OVERSIGHT

much less the overwhelming evidence that measures designed to prevent and mitigate mine-related contamination are highly likely to fail. While the EA acknowledges that mine development is reasonably foreseeable, it addresses the cumulative impacts of that development in a single, highly-generalized sentence and claims that future project-level NEPA analysis will more thoroughly analyze those impacts.[170] Throughout the Chapter 3 impact analysis, BLM repeatedly relies on other, often unspecified laws and regulatory requirements, forest plan or prospecting permit EIS direction that was never meant to safeguard resources from the impacts of sulfide-ore copper mining, and subsequent unspecified conditions of approval on future plans of operation. As described above in the scope of analysis section, BLM may not defer analysis of the impacts of mine development – or the virtual certainty of significant failure and contamination – and can and must address them as part of the lease renewal decision.

Second, the EA completely fails to consider a number of reasonably foreseeable significant impacts, including to the robust amenity-based economy of northeastern Minnesota, to public health, to wilderness character, to downstream Voyageurs National Park and Quetico Provincial Park, and to and from climate change.

Third, BLM's analysis of impacts to water resources, cultural resources, noise, recreation, vegetation, soils, air quality, and wildlife is incomplete and inadequate in a number of respects. For instance, Chapter 3 of the EA cites virtually no scientific information, despite the wealth of published, peer-reviewed literature and other best available scientific information addressing the impacts of sulfide-ore copper mining on those resources. Rather than actually analyzing reasonably foreseeable resource impacts in any meaningful way, the analysis generally cites back to the 2004 forest plan, the 2012 prospecting permit EIS, or existing plans of operation – none of which contemplated the impacts of lease renewal or associated mining activity – or forward to unspecified and hypothetical conditions of approval on future plans of operation. NEPA does not permit this sort of shell game to supplant a meaningful impacts analysis. And, as discussed above, the inadequate baseline and range of alternatives means that the EA repeatedly concludes there would be no measurable difference in resource impacts between alternatives. The result is an EA that utterly fails to take a hard look at the impacts of the Twin Metals leases, which have never been subject to NEPA analysis.

BLM must remedy these deficiencies by preparing a full EIS that takes the requisite hard look at the following reasonably foreseeable significant impacts, among others:

1. Resource impacts included in the EA but inadequately analyzed

a. Water resources

As with most resource impacts addressed in Chapter 3, the EA concludes that there would be no measurable difference in potential impacts to water quality between the proposed action and no action alternative, and claims that other laws and conditions of approval on future plans of operation will be sufficient to prevent contamination.[171] This obscures the very significant difference between the existing pristine quality of the interconnected waterways of the Boundary

[170] *See* EA at 22.
[171] EA at 14.

AMERICAN OVERSIGHT

Waters watershed and the near certainty that sulfide-ore copper mining will result in significant water contamination and a host of cascading effects.

Any true measure of the environmental risks and consequences of the proposed action and no action alternative must consider the context in which the risks and effects would occur. The context here includes the high quality, sensitive, and highly interconnected waters and aquatic habitats of the BWCAW, MPA, VNP, Quetico, and the rest of the SNF in the Boundary Waters watershed. The risks and effects of sulfide-ore copper mining to these water resources include among other things acid mine drainage (heavy metals, pH reduction, elevated specific conductance, [172,173,174] and sulfates); forest destruction-related damage to adjacent and connected stream systems' stability, morphology, and ability to provide high-quality aquatic habitat and to maintain high water quality. Aquatic ecosystem degradation, including secondary pollution effects caused by elevated sulfate levels, which increase concentrations of methyl-mercury and eutrophying pollutants nitrogen and phosphorus, has cascading effects on fish and other aquatic species, wildlife, and human health.

The EA fails to address the near certainty of irremediable water contamination via acid mine drainage, likely failure of tailings storage facilities, and other reasonably foreseeable causes. Sulfide-ore copper mining inherently produces large amounts of waste rock and tailings, toxic metals, acids, sulfate, processing chemicals, and pulverized sand, all of which pollute water.[175] The industry has a consistent history of polluting water and state-of-the-art prevention, treatment methods, and technologies cannot eliminate risk.[176,177 ,178] A 2012 peer-reviewed report by Earthworks showed that at 13 of the 14 mines reviewed, water collection and treatment systems failed to contain contaminated mine seepage, causing significant negative water quality impacts.[179] All liners and tailings basins leak and will fail eventually.[180] Contrary to what the mining industry may assert, tailings dam failures occur at modern mines and in countries with supposedly strong mine safety regulations.[181] A 2006 study by Kuipers & Maest of predictions of sulfide-ore copper mine water quality performance for 25 representative hardrock mines (52% still operating, 48% closed) proved that predictions usually did not accurately match the actual water pollution outcomes.[182] A 2018 report by Dr. Myers refutes claims that geophysical analysis and video of boreholes can be determinative for location and connectivity of fractures that could transport contaminants from mining activity into surface waters.[183] It is reasonably foreseeable

[172] WaterLegacy & B. Johnson. (2011, March 10). Letter to MPCA Re- Dunka Mine & Attachments to letter.
[173] Johnson, B.L. and M.K. Johnson (2015). Evaluation of Field-Based Aquatic Life Bechmark for Specific Conductance in Northeast Minnesota (Johnson & Johnson, 2015).
[174] Cormier, S.M., NCEA, EPA. (2016). Scientific Review of B.L. & M.K. Johnson An Evaluation of Field-Based Aquatic Life Benchmark for Specific Conductance in Northeast Minnesota. (Cormier, 2016).
[175] *See* Section V of comment letter for discussion
[176] Chambers, 2014.
[177] *See* Part V for discussion of mining industry's track record of pollution
[178] *See* Part V for discussion of mining industry's inability to accurately predict or prevent pollution
[179] Earthworks, 2012, US Copper Porphyry Mines.
[180] Rowe & Sangam, 2002.
[181] *See* Part V for discussion of risks and consequences of tailings storage facility failures
[182] Kuipers & Maest, 2006.
[183] Myers, T. (2018). Technical Memorandum: Twin Metals Mining and the Boundary Waters Canoe Area Wilderness, Identifying Flow Pathways. Prepared for Northeastern Minnesotans for Wilderness, Ely, MN. (Myers 2018)

AMERICAN OVERSIGHT

that millions of gallons of pollution per year would seep untreated into groundwater and surface water.[184]

Mistakes and miscalculations in mine design and operation are never intended, yet they occur, and that is how many mine accidents happen. The potential for corporate corner-cutting must be taken into account in the EA. According to dam committee reports and government reviews, an extensive record shows that corner-cutting, risk-taking, and other failures to follow accepted practices is at the root of many if not most severe tailings basin failures.[185] The EA should address how devastating the effects of leaks, failures, spills, mistakes, misjudgments, and even business-as-usual can be.

Acid mine drainage (AMD) produced by sulfide-ore copper mining has multiple pathways to and direct, indirect, and cumulative effects on receiving waters.[186] When AMD occurs, it can be impossible to control.[187] Effects of AMD on ground and surface waters in the Boundary Waters watershed are predicted by peer-reviewed science published in 2016 in the Journal of Hydrology. Dr. Tom Myers modeled three scenarios of pollution releases under normal operating conditions in a Twin Metals mine as described in the Twin Metals pre-feasibility report, the NI 43-101, and tracked the movement of pollution from mines and mine facilities *into the BWCAW*. The paper shows that under ordinary operations, mine contaminants would move with groundwater flows, intercept surface waters, and flow into waters of the BWCAW.[188, 189, 190] AMD would deliver heavy metals to ground and surface waters, increasing exposure of aquatic and certain terrestrial organisms to the heavy metals and their effects. AMD contamination, particularly heavy metals and sulfates, will damage water quality and harm aquatic habitat and resources including fish.

The EA should address the effects[191] that sulfide-ore copper mining in the Boundary Waters watershed would have on water resources including:

- Effects of AMD, particularly heavy metals and sulfates, on water quality, fish, invertebrates, and other aquatic organisms;
- Effects of reduced low-flows and water quality changes on fish, invertebrates, and other aquatic organisms;

[184] *See* Appendix B-1, Oct. 2017 Comment letter Part III, p 127
[185] Bowker & Chambers, 2015.
[186] *See* Part V for discussion of AMD
[187] EPA, 2004.
[188] *See* NMW Map, Path of Pollution, in Appendix (folder "Maps")
[189] Myers, 2016b.
[190] The Myers 2016 paper in the Journal of Hydrology is based on reasonable assumptions and the best available data. First, it is based on the Twin Metals Pre-Feasibility Study Technical Report. Second, no sulfide-ore copper mine has operated and closed without polluting surrounding surface and groundwater. A 2012 study by Earthworks, which looked at 14 of what were then 16 operating copper mines in the U.S. (two of the 16 mines had not been operating for at least five years, and were not included in the study for lack of at least a minimal operating record), and found that at all mines (100%) there had been pipeline spills or other accidental releases of pollution. It also found that, "[a]t 13 of the 14 mines (92%), water collection and treatment systems [] failed to control contaminated mine seepage, resulting in significant water quality impacts." Earthworks, 2012, US Copper Porphyry Mines.
[191] *See* Appendix, Oct. 2017 comment letter Part III, p 130-135 for science backing these effects

AMERICAN OVERSIGHT

- Effects of mining-related damage to diversity and health of aquatic macroinvertebrates, aquatic vegetation, smaller fish, and other fish prey items on aquatic ecosystem health and fish;
- Effects of elevated sulfate in AMD on wild rice; and
- Effect of elevated levels of sulfate in AMD on the establishment and spread of aquatic invasive species.

b. Cultural resources

Despite acknowledging the presence of known archaeological sites located within or adjacent to leased lands and the fact that very little inventory has been conducted in the area,[192] the EA fails to include any meaningful analysis of impacts to cultural resources. Instead of taking the time to conduct cultural resource inventories, meaningfully consult with affected tribes, and ensure compliance with its National Historic Preservation Act section 106 obligations, *see* Section V, below, BLM claims that the proposed action will enhance cultural resource protection because tribes may conduct surveys of areas proposed for use.[193] But the EA and associated stipulation includes no information about if or how tribes will receive notice of planned uses and operations, if or how the BLM or Forest Service will consider information collected through any potential tribal survey, or how the possibility of a future tribal survey will ensure protection of cultural resources.

The EA should address the enormous cultural importance of the Boundary Waters watershed, particularly for Minnesotans, but for many others as well. For Minnesotans, the BWCAW is a defining natural feature of the state, a point of state pride and, to echo Governor Dayton, a "crown jewel" and a "national treasure." People from across the U.S. and around the world treasure the clean waters of the BWCAW.[194] The Boundary Waters watershed provides a wide range of direct and indirect benefits. Among them are experiential and recreational benefits of great value to the people who use the BWCAW and surrounding SNF, who look forward to using it, or who are simply pleased by its existence. These and other types of uses are, so long as usership is managed, of limitless benefit to Wilderness-edge communities, the Arrowhead region, Minnesota, the Midwest, and the nation.[195]

The EA should also address the cultural effects of diminished or eliminated wild rice stands in the Boundary Waters watershed due to increased sulfate loading caused by mine-water discharge, to levels beyond Minnesota's existing sulfate standard, and to levels inconsistent with protection of wild rice.[196] Wild rice is an essential piece of Ojibwe culture and livelihood. Land use decisions that put sulfide-ore mining interests before Treaty rights, such as the proposed action, would violate legal Treaty guarantees, interfere with enrolled members' exercise of rights to gather the sacred grain, and undermine the Tribes' abilities to sustain their communities in

[192] EA at 14.
[193] EA at 14.
[194] Keeler, B. L., S. A. Wood, S. Polasky, C. Kling, C. T. Filstrup, and J. A. Downing. (2015). Recreational demand for clean water: evidence from geotagged photographs by visitors to lakes. *Front Ecol Environ* 13: 76-81 doi:10.1890/140124. (Keeler, et al, 2015).
[195] Wilderness net (n.d). "How Wilderness Benefits You". Available at: http://www.wilderness net/NWPS/values.
[196] International Lake of the Woods Basin Water Quality Plan of Study at p. 85.

AMERICAN OVERSIGHT

ways that are consistent with their culture and worldview. Mining and its ecological impacts also have the potential to negatively impact the cultural and life sustaining resources of the Anishinaabe.[197]

c. Noise

The EA impacts analysis finds no difference in noise impacts between the proposed action and no action alternatives, and relies on vague and unspecified operating plan requirements to minimize impacts to other uses and users of the land.[198] Here again, the analysis is utterly meaningless. As just one example, the EA fails to address the significant foreseeable acoustic impacts associated with the seven 18.5 ft. diameter mine ventilation raises included in Twin Metals' most recent mine site plans for Maturi.[199,200] The plans call for three of the seven to be air intake raises that would be fitted with eleven 40 million BTU gas heating units, heating the clean air being carried into the mine. The remaining four raises would be exhaust ventilation raises. They would eject 3.25 million cubic feet of dirty air per minute from the underground mine at Maturi, with the airflow moving at 4,000 ft/minute, near-maximum velocity for unlined raises.[201] Two ventilation rises at a mine near Sudbury, ON, produce noise levels that, measured at a 100' distance, are louder than some of the loudest rock concerts ever recorded,[202] and produce nuisance-level noise disturbances experienced in a community nine kilometers away, without intervening open water to help carry the sound. In other words, distinctive, persistent and intense noise associated with mining operations would pervade the area in and around the leases, including Birch Lake, the South Kawishiwi River, and in the nearby Wilderness, with corresponding degradation of wilderness character including opportunities for experiencing the untrammeled wilderness soundscape, silence, and solitude. There is simply no way to "minimize" such impacts.

The EA should address the threats of sulfide-ore copper mining-related noise pollution that will harm the scenic recreation values of leased and surrounding areas[203] and the BWCAW's Wilderness character[204]. In particular, the significant harm to scenic recreation values and Wilderness character from syncopated or otherwise unnatural low-frequency noises (heavy equipment engine noise, detonations, air compressors, processing equipment, ventilation

[197] GLIFWC, 2016.
[198] EA at 15-16.
[199] TMM NI 43-101, *See* Figure 1-2: "Completed Mine Design," showing locations of ventilation raises as vertical lines (p. 1-21); and Figure 16-5: "Planned Ventilation Plenums and Raises to Surface, Maturi," showing seven ventilation raises for Maturi, three labeled intake 1-3, and four labeled exhaust 1-4 (p. 16-23)
[200] *See* NMW_Map_T–M - new facilities footprint, in Appendix (folder "Maps")
[201] TMM NI 43-101 at p. 16-24
[202] E.g., The Who, playing at The Valley in London, May 31st, 1976; and Manowar, whose 1984 performance holds the last record given by The Guinness Book of World Records for the category, "loudest musical performance." A few louder performances have been documented, but Guinness no longer includes a category for loudest band, possibly because it does want to promote deafness.
[203] MNES 1352 is located within a SNF Recreation Use in a Scenic Landscape Management Area on the shores of Birch Lake., EA at 13
[204] Reyer, J. and R. Garwin. (2015). The Impacts of Mining on the Character of a Wilderness Landscape: Considerations for Federal Decision-Making. (Reyer & Garwin, 2015).

AMERICAN OVERSIGHT

equipment, and the like) must be given thorough attention.[205,206] Because these sounds stand out as unnatural and are more noticeable in a Wilderness setting, even emanating from a significant distance, non-natural low-frequency sounds are more annoying and disruptive to the wilderness experience than high-frequency and often higher-decibel sounds (like the sound of wind in the trees, water lapping at the shore, and bird song). Low-frequency sounds travel "better" through dense forest vegetation than do high-frequency sounds.[207] According to a 2015 report by Reyer and Garwin, residents and visitors to the Boundary Waters watershed have already found that exploratory noises (drilling, blasting, and truck traffic) to be disruptive.[208,209]

d. Recreation

The EA's analysis of impacts to recreation consists primarily of an unsupported statement that generalized requirements in the 2004 forest plan and 2012 prospecting permit EIS to minimize impacts to developed recreation sites, trails, and recreational experiences will sufficiently address impacts, which will be identical under the proposed action and no action alternatives.[210] Siting a massive mining complex on the shores of one of the Superior National Forest's most popular recreational lakes[211] and a stone's throw from two beloved Wilderness entry points will undoubtedly have significant adverse impacts on recreation that were in no way contemplated by the 2004 forest plan or the 2012 prospecting permit EIS.

The Birch Lake and S. Kawishiwi River area provides important high-quality recreational opportunities to those who want to experience the high-quality natural resources of the SNF without the permit requirements or other considerations involved in going into the Wilderness.[212,213] The unsurpassed recreation opportunities of the Birch Lake and S. Kawishiwi area including but not limited to hunting, fishing, wildlife watching, paddling, hiking, cross-country skiing, snowshoeing, trapping, and dogsledding would be diminished if not eliminated

[205] Garstang, M., D. Larom, R. Raspet, and M. Lindeque. (1994). Atmospheric Controls on Elephant Communication. *J. Experimental Biology* 198: 939-951. (Garstang, et al, 1994).
[206] Unnatural low-frequency sounds stand out in Wilderness settings in part because so few natural sounds exhibit low- to very-low-frequency profiles, and in part because low-frequency sounds lose less energy over long distances than do high-frequency sounds.
[207] Webster, B. (1986, February 11). Secret Language Found in Elephants. *The New York Times.*
[208] Reyer & Garwin, 2015, at p. 26
[209] "The noise level would almost certainly be greater than what is currently heard from mineral exploration. In its Record of Decision governing mineral exploration in the Superior National Forest, the Forest Service limited the volume at the boundary of the BWCAW to 30 dBA 50% of the time (L50 level of 30 dBA) and 35 dBA 10% of the time (L10 level of 35 dBA).[209] Assuming those levels are being met, it is clear that the noise of a mine, even at the lowest possible level, would impact people's wilderness experience. It is also apparent that the noise of a mine would be greater than the level that the Forest Service deems unacceptable." Reyer and Garwin 2015, p. 30
[210] EA at 16.
[211] MPCA. 2011. A Water Quality Assessment of Select Lakes within the Kawishiwi River Watershed. See p. 40.
[212] The area previously considered for mineral withdrawal and contains fourteen campgrounds, five designated picnic areas, one designated swimming area on the S. Kawishiwi R., perhaps sixty backcountry campsites, one trailhead, and at least 14 Wilderness entry points.
[213] USFS. (2008). Birch Lake Back Country Brochure

AMERICAN OVERSIGHT

were the proposed action approved and sulfide-ore copper mining to advance in the Boundary Waters watershed.[214,215]

e. Vegetation

The analysis of impacts to vegetation assumes that the clearings associated with exploration activities are insignificant in the context of the overall forest cover, revegetation requirements, and vague stipulations about protection of biological resources, and that future site-specific analysis will address ground disturbance impacts.[216] Here too, the analysis has incredibly little substance, makes unjustifiable assumptions, and presents little or no information to back up claims it makes. This leaves it largely meaningless. So, too, is the vague discussion of the proposed 20-acre maximum of surface use. It fails to address how a 20-acre maximum surface use stipulation would be applied at the mineral development stage (e.g., what types of surface use would count toward the limitation); or the significance of stipulation in light of cumulative impacts with other activity in the area regardless of ownership; or in light of the cumulative impacts across ownerships from all the other historic and current mining in the region.[217] There is no information or analysis whatsoever regarding whether this stipulation or others would affect overall ecosystem health, habitat fragmentation, and other foreseeable impacts of development. Without knowing the number of disturbed sites with and without the 20-acre maximum, it is useless speculation to suggest that the 20-acre limit could lead to less ground clearance during mineral development, or less harm at the area, Forest, or regional levels.[218]

Permanently converting thousands or tens of thousands of acres[219] of natural vegetation into industrial mining uses would have many effects on remaining habitat near the converted areas. Former interior forest habitat would become edge habitat; significant micro-climate alterations would occur in the new edge forest (warmer, drier air; higher wind speeds); more wind damage would occur to trees in the new forest edges around the mine footprint(s); interior forest bird habitat would be lost; and invasion of that habitat by a variety of edge species (such as the parasitic brown-headed cowbird) would occur; features required by Canada lynx for foraging and denning would be destroyed.[220, 221] This is only a partial sample of a long list of negative effects on edge areas and broader habitats and home ranges for wildlife species in the SNF.

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[214] Reyer & Garwin, 2015.
[215] "In regards to the South Kawishiwi/Birch Lake area outside of the wilderness area, it would simply no longer be appropriate for recreational activities. It would be naïve at best to believe that this area would retain any of its current character as a forest and water recreational area if a mine is located there." Reyer & Garwin 2015, p.26
[216] EA at 17.
[217] Emmons and Olivier Resources, Inc. (2006). Cumulative Effects Analysis on Wildlife Habitat Loss and Wildlife Travel Corridors in the Mesabi Iron Range and Arrowhead Regions of Minnesota. Prepared for the Minnesota DNR. (EOR, 2006)
[218] Frelich, L.E. (2019, January 9). Comments on "Environmental Assessment. NEPA #: DOI-BLM-ES-030-2018-0002-EA. Addition of Terms and Conditions for Renewal of Hardrock Leases, MNES 001352 and MNES 001353." (Frelich, 2019, EA comments).
[219] TMM NI 43-101 at p. 4-29 (Twin Metals, for example, contemplated 1,000-acre concentrator site and 7,000-acre tailings basin site)
[220] MCEA Map_LynxDenMap_RegionalMap, in Appendix (folder titled, "Maps")
[221] CSTBWMAP_LynxDenningHabitatwithPagamiCreekFire, in Appendix (folder "Maps")

AMERICAN OVERSIGHT

The EA must address the effects on the lands in the Boundary Waters watershed converted to mining infrastructure including but not limited to:

- some permanent and some multi-decade-long land conversion from forest and wetland and stream. The conversion would occur by logging, then earthmoving, draining, filling, and obliterating wetlands, streams, small lakes, and other land features;
- the construction of open pit and/or underground mines, ore-processing and concentrating facilities, utility corridors, ventilation and access portals, pipelines and pumping stations, paste plants, access roads, railroad lines and spurs, waste rock and tailings piles, contact water lined basins, and perhaps more;
- the on-and-off operation-and-idling of the mine(s) depending on market prices, international exchange rates, etc.
- the long term effects of these constructions remaining on the land for long periods of time (from decades to centuries). Tailings basins, for example, bury original vegetation and land forms, destroy plant and sedentary wildlife species, and displace more mobile wildlife species. Tailings basins are intended to remain in perpetuity.[222,223]

The EA should also describe the terrestrial vegetative values and significance of the Boundary Waters watershed including but not limited to ecosystem services provided, such as delivery of extremely clean water downstream to the Boundary Waters.[224,225]

f. Soils

The analysis of impacts to soils suffers from the same deficiencies. It relies on unspecified and generalized requirements to address soils in operating plans, prevent erosion, and reclaim the land,[226] but does not meaningfully analyze the significant cumulative impacts of how exploration and mine development activity will impact the area's sensitive soils.

The landscape would be affected permanently. The chemistry, consistency, and hydrology of the soils and substrate in areas affected by mining are also likely to be changed for centuries if not longer.[227]

g. Air quality

The EA air quality analysis consists of little more than a recitation that current laws, regulations, and policies will adequately protect air quality, that there will be no difference between the

[222] TMM NI 43-101.
[223] Bowker & Chambers, 2015.
[224] Boreal forests are one of the world's most important providers of ecosystem services, including the production of soils and the control of erosion and flooding; interception and storage of surface water inflows and precipitation; purification and provision of water; cleansing and moderation of the temperature and humidity of air; production of oxygen; storage of carbon; service as habitat for many hundreds of ecologically important and valuable species; and space for recreation. Boreal forests have a large impact on climate at local, regional, and global scales.
[225] USDA Forest Service December 14, 2016 decision letter to USDOI BLM, P. 1.
[226] EA at 18.
[227] Frelich, 2019, EA comments.

AMERICAN OVERSIGHT

proposed action and no action alternative, and that future site-specific analysis will address impacts from dust and diesel emissions.[228]

Sulfide-ore copper mining would result in a significant increase in certain types of air pollutants in close proximity to the Class I airshed of the BWCAW. Substantial amounts of mining-related air pollution would be generated in the Boundary Waters watershed (including large grains and other size particles of sulfide-copper and –nickel ore, dust, $PM_{2.5}$, heavy equipment exhaust, and non-vehicle volatile organic compounds produced during hydrometallurgical and electro-winning processes. Dust and ore or tailings particles would be blown from tailings piles, waste rock piles, roads, crushing facilities. More than a dozen ventilation rises would vent blasting gasses and ore particulates from mine workings. Fugitive dust would be generated by infrastructure and utility facilities.

In addition to addressing the above pollution types and sources, the EA should study CO2 and other greenhouse gas emissions produced onsite and at the location of the power plant(s) that will be devoted to supplying electricity to sulfide-ore copper mine(s) that would be a foreseeable result of the implementation of the proposed action.[229] Along with the energy consumption and greenhouse gas emissions of mine facilities and transportation, the EA should account for the emissions effects and forgone carbon sequestering effects caused by fragmentation and long-term or permanent loss of large acreages of wetlands and forests resulting from mining-related land-clearing and earth-moving. Effects on species composition are likely to occur in areas directly disturbed and for some distance into undisturbed forests.[230] The copper industry has a significant carbon footprint. The technology to mine and produce copper with little effect on the climate does not exist yet.[231] Consideration of the global environmental effects of carbon emissions is essential for a thorough EA.

h. Wildlife

Again the EA concludes there will be no measurable difference between alternatives and relies on future plans of operation to address impacts to wildlife.[232] The impacts analysis provides no support for its conclusion that impacts to wildlife are not expected to cause or contribute meaningfully to the downward trend of any Regional Forester Sensitive Species or listed species beyond a statement that only small amounts of land will be utilized.[233] Among other deficiencies, the analysis does not even mention the significant impacts to wildlife that would result from forest fragmentation, habitat loss, and acid mine drainage and associated contamination of water sources, aquatic habitat, and aquatic-dependent food sources.

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[228] EA at 19-20.
[229] *See* TMM NI 43-101 at p.74 [a k.a., page 1-33]: "Total power consumption of surface facilities including filtration is estimated to be 19,852 kWh/st and a unit power cost of $48.90 per MWH, this equates to $17.72 [million] per ye"r." The TMM mine production life was approximated at 30 years. *Id.* at p.59 [a.k.a. page 1-18]
[230] Frelich, 2014.
[231] Giurco, D., and J. G. Petrie. (2007). Strategies for Reducing the Carbon Footprint of Copper: New Technologies, More Recycling or Demand Management? *Minerals Engineering*, 20, no. 9: 842–53.
[232] EA at 20.
[233] *See* EA at 20-21.

AMERICAN OVERSIGHT

Pollution and other impacts of mining and related activity, if the proposed action approved will negatively impact many species of birds and mammals that rely on the BWCAW, the MAP, and other parts of the SNF in the Boundary Waters watershed for food, shelter, and reproduction. Moose, lynx, wolves, long-eared bat, and little brown bat populations already face serious threats in the Boundary Waters watershed and are not equipped to withstand the extended negative effects of sulfide-ore copper mining in the watershed. Those populations would likely decline or be locally extirpated as a result of additional cumulative stresses (direct and indirect mortality, a decline in reproductive success, or avoidance of higher-quality foraging, sheltering, mating, or thermal control habitat). Forest fragmentation resulting in direct loss of habitat; indirect loss of interior habitat because of loss of forest habitat nearby; degradation of habitat through other industrial effects (noise, traffic, light) or because of pollution-mediated decline in bird prey items, such as caddis flies and other insects; and expanded nest parasitism, are just a few of the ways in which sulfide-ore copper mining in the Boundary Waters watershed would harm bird species richness and population health.[234, 235] High levels of methylmercury in birds and small mammals result in neurotoxicity and death.[236] The bald eagle, a protected species, and the common loon, Minnesota's most iconic bird, are risk from mercury pollution because of fish-heavy diet.[237,238, 239]

2. Resource impacts improperly excluded from the EA

a. Economics

BLM's claim that the scope of the proposed action does not affect the robust and sustainable amenity-based economy of northeastern Minnesota,[240] is contrary to the best available information. A 2018 independent study by Harvard economist James Stock analyzed the longer-term dynamic economic effects of a 20-year mining ban in the Boundary Waters watershed and concluded that protecting the Boundary Waters from a Twin Metals mine would result in dramatically more jobs and income over a 20-year period.[241] As outlined in Phillips & Alkire, 2017, sulfide-ore copper mining in the Boundary Waters watershed would have a series of significant negative economic effects on the Arrowhead region (lost visitor expenditures, losses to the broader economy, lost property value, and more).[242] The EA should address the reasonably foreseeable significant direct, indirect, and cumulative economic costs to the Arrowhead region

[234] Frelich, 2014.
[235] Fitzpatrick, J.W. (2017). Birds of Minnesota's Boundary Waters Canoe Area and Adjacent Upstream Regions, with Comments on Conservation Implications of New Copper Mining Under Consideration. Cornell Lab of Ornithology. (Fitzpatrick, 2017).
[236] Scheuhammer, A.M., M.W. Meyer, M.B. Sandheinrich, and M.W. Murray. (2007). Effects of Environmental Methylmercury on the Health of Wild Birds, Mammals, and Fish. *Ambio,* Vol. 36, No 1 (Feb 2007), pp 12-18. (Scheuhammer, et al, 2007).
[237] Scheuhammer, et al. 2007.
[238] Evers, D.C., L.J. Savoy, C.R. DeSorbo, D.E. Yates, W. Hanson, K.M. Taylor, L.S. Siegal, J.H. Cooley Jr., M.S. Bank, A. Major, K. Munney, B.F. Mower, H.S. Vogel, N. Schoch. M. Pokras, M.W. Goodale, and J. Fair. (2008). Adverse effects from environmental mercury loads on breeding common loons. *Ecotoxicology* 17, no. 2 (February 2008): 69–81. doi:10.1007/s10646-007-0168-7.
[239] Fitzpatrick, 2017.
[240] *See* EA at 8.
[241] Stock & Brandt, 2018.
[242] Phillips & Alkire, 2017.

AMERICAN OVERSIGHT

(St. Louis, Lake, and Cook counties) of sulfide-ore copper mining that could result if the proposed action were approved.

The BWCAW is one of the major attractions cited by the state business development agency, the Minnesota Department of Employment and Economic Development.[243] Federal lands in the Boundary Waters watershed support a large number of resorts, cabin rental businesses, campgrounds, canoe and dogsledding outfitters, and at least one science center (Hubachek Wilderness Research Center).[244,245, 246, 247] These businesses account for a substantial amount of spending, jobs, and wages in the communities of the Boundary Waters watershed.[248] Just as the BWCAW draws visits from paddlers, anglers, campers, dogsledders, skiers, and snowshoers from all over the U.S. and other countries to visit Minnesota, it also causes people who value wild places and want to live within driving distance of them to choose to live, work, recreate, and retire in Minnesota. If sulfide-ore copper mining were to proceed in the Boundary Waters watershed, the environmental effects would include heavy metals, sulfates, and acid flowing into the low-sulfate waters of the BWCAW watershed, including both the BWCAW and the greater SNF. As a consequence, mercury methylation would increase in those waters and downstream,[249] and as explained more thoroughly *infra*, the reputation of and visitorship to the BWCAW as a whole would be damaged.[250] Fewer visits to the BWCAW and BWCAW-edge communities and the diminished attractiveness of BWCAW-edge communities and the Arrowhead region as a whole would result in outmigration of people.[251]

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[243] MN Department of Employment and Economic Development. (2014). A Great Place to Live, Work and Do Business. p.7

[244] There are thirty campgrounds, resorts, and outfitters, located on the banks of the Kawishiwi River, or lakeshore of Birch Lake and the White Iron Chain of Lakes – the path that water pollution would take from mines of the sort proposed by Antofagasta subsidiaries Twin Metals Minnesota and Franconia Minerals through the Boundary Waters watershed and MPA, and into the BWCAW.

[245] MAP_TMM Site & 30 Businesses in Path of Pollution, in Appendix (folder "Maps"). Please note that this map displays the outdated processing facility location shown on the west side of Birch Lake. The updated processing facility location can be seen on NMW_Map_Flow path from TMM mining activity in Appendix, (folder "Maps"). This processing facility location change does not change the path of pollution or its potential effects on the 30 business cited in the former map.

[246] *See* Save the Boundary Waters (n.d.) Fact Sheet- Ely by the Numbers for a listing of the 30 businesses on the Kawishiwi River and downstream lakes, in the Withdrawal Area.

[247] Myers 2016b.

[248] Hjerpe, E. (2016). Regional Economic Impacts of Boundary Waters Wilderness Visitors. Conservation Economic Institute. (Hjerpe, 2016). *N.B.*: This study measures a small slice of BWCAW recreation spending in the three-county area, in that it only counts spending from summer visitors who traveled from outside the three-county area, used an outfitter, and actually entered the BWCAW. Not counted were expenditures from: spring, fall, and winter visitors; those who traveled from within the three-county area; those who consider themselves to have visited the BWCAW, but who remained outside of it by staying at facilities (campgrounds, cabins, resorts) on the edge of the BWCAW; those who had relocated permanently to or remained a resident of the three-county area because of the proximity to the BWCAW but who didn't visit the BWCAW; and so on. Thus is is a valuable study for what it measures, but must not be seen as attempting to take the full measure of BWCAW recreation-related economic impact.

[249] Engstrom, D. R. (2017, August 11). Scoping Comment on N. MN Federal Mineral Withdrawal.

[250] Many people do not distinguish between the different HUC-11 watersheds in the BWCAW, but see it as a whole, and the perception of the BWCAW as a whole would be forever tarnished by sulfide-ore copper mining in the BWCAW watershed.

[251] University of Minnesota, Morris. (2014). The Four Townships Area Economic, Housing and Development Survey. (University of Minnesota, Morris, 2014).

AMERICAN OVERSIGHT

As discussed above, methylmercury is especially harmful to babies and infants since it is a neurotoxin and can cause a number of developmental disorders and damage, including loss of intelligence.[252] Developmental damage, specifically lowered IQ, caused by methylmercury toxicity carries very large economic costs in the form of lost productivity and income for the affected individuals. Trasande, et al., for example, estimated those costs associated with direct mercury emissions from power plants to to be $1.3 billion per year.[253] The EA should address the significant economic costs of increased methylmercury damage to human health and intelligence following from increased sulfate pollution in the Rainy River watershed from sulfide-ore copper mining in the Boundary Waters watershed. The EA should also address the economic costs of health risks associated with other heavy metals and air pollutants.[254] Exposure to mining byproducts, including but not limited to heavy metals and particulate matter ($PM_{2.5}$) can contribute to increased risk of chronic obstructive pulmonary disorder, stroke, and cancer.

Additionally, the EA should asses the economic costs related to losses in economic activity, stability, and diversity in Wilderness-edge communities cause by boom-and-bust dynamics. Boom times have the capacity to distort local economies in a number of ways not in keeping with long-term economic goals. [255] Workers in mining as well as in support industries (construction, road building, etc.) may forgo or postpone education, training, and other longer-term development opportunities and instead take work in the mining industry, only to be released with few additional skills or training in an economic downturn.[256] Non-mining-related businesses (e.g., sporting goods stores) that struggle to find or hire employees in boom times may have to lay employees off and temporarily or permanently close when the mining industry has a sharp downturn, as customers cut back on spending. Research shows that communities heavily reliant on mining have more regular layoffs and relatively higher unemployment rates than adjacent, economically diversified communities or, in this case, the three-county Arrowhead region as a whole.

b. Public health

The EA does not address the very significant foreseeable impacts of mining activity on public health and wellbeing. Pollution from sulfide-ore copper mining contains many harmful components such as heavy metals (some of which, like mercury, bio-accumulate), dust, and fine particulates (PM_{10} and $PM_{2.5}$). Sulfide-ore copper mining pollutants have been identified in many government reports, medical articles, and peer-reviewed scientific publications as sources of harm to mining community health, human physical and mental health, and neurological functioning. [257] Accordingly, the EA should include a health impact assessment (HIA).

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[252] Trasande, et al, 2005.
[253] *Id.*
[254] World Health Organization. (2010). 10 chemicals of major public health concern.
[255] For example, boom times may drive up wage competition beyond non-mining-related businesses' ability to pay. In addition, boom times may deplete local labor pools entirely, leaving businesses without candidates to hire or labor to operate – though this may be less significant now than in the past, because so much labor has been replaced by machinery and automation in today's mines and worker-per-ton-of-production ratios continue to decline.
[256] As the taconite industry has shown, mining busts today are followed by ever-smaller booms, in terms of mining employment.
[257] (2018, February 19). Physician Comment Letter to USFS Re: Mineral Withdrawal.

AMERICAN OVERSIGHT

The EA should address the direct, indirect, and cumulative risks that sulfide-ore copper mining in the Boundary Waters watershed would pose to human physical and mental health and intellectual functioning. Heavy metals ingestion and the contamination or elimination of otherwise healthy dietary components are reasonably foreseeable, would have significant human health effects, and would be caused or exacerbated by sulfide-ore copper mining in the Boundary Waters watershed. Groups that should be addressed in the EA include but may not be limited to:

- enrolled members of the Grand Portage, Fond du Lac, and Bois Forte Bands of Lake Superior Chippewa, who retain fishing, hunting, and gathering rights as provided in the 1854 Treaty of La Pointe;
- members of the Lac La Croix First Nation, many of whom live on the north shore of Lac La Croix, a Border Route lake that is in the path that pollution would take from the Boundary Waters watershed;
- occasional and regular visitors to the BWCAW and/or waters in the Boundary Waters watershed;
- seasonal and full-time residents of communities in and near the Boundary Waters watershed;
- residents near or downwind of mining operations (consult the wind rose for Ely, Minnesota);[258]
- mine and processing facility workers;
- people whose diet includes water, fish, and/or wild rice from the Boundary Waters watershed;
- people with a higher body mass index;
- fetuses and infants in the above categories or whose mother is in one or more of the above categories;
- children less than 15 years old in the above categories; and
- women in the above categories who are or may become pregnant.

Particular attention in the EA should be paid to physical, mental, and intellectual effects on pregnant women, fetuses, and children.

The EPA has reported that the metal mining industry is the largest toxic polluter in the nation, releasing 3.4 billion pounds of toxins in 2000, or 47 percent of the total released by all U.S. industries combined.[259] Five sulfide-ore copper-nickel mining pollutants – mercury, lead, arsenic, asbestos-like fibers, and particulate matter – are among the ten chemicals listed by the World Health Organization[260] as being of major public health concern, as pointed out by Duluth-area medical professionals in a 2016 Minnesota Medical Association Journal article.[261] The EA should address these toxins and their connections to human health consequences in the HIA. Such a study was requested in a 2016 letter signed by 35 Rochester-area physicians, and by the Minnesota Academy of Family Physicians, the Minnesota Medical Association, and the

[258] *See* Wind Rose__Station Graph__Ely, MN 1-1-2006 to 6-23-2017 in Appendix
[259] EPA, 2004.
[260] World Health Organization. (2010). 10 chemicals of major public health concern.
[261] Onello, et al, 2016.

AMERICAN OVERSIGHT

Minnesota Nurses Association.,[262] and was again echoed by a group of physicians representing the voices of thousands of Minnesota healthcare professionals in 2018.[263] The short- and long-term direct, indirect, and cumulative effects on human mental and physical health from exposure to these substances can be significantly harmful and, in some cases, irreversible, as documented in government reports, medical professional opinions, peer-reviewed and published scientific journal articles, and peer reviewed studies.

The EA should also address the following human health impacts of sulfide-ore copper mining in the Boundary Waters watershed:

- Rock dust and other airborne pollutants[264,265] as airborne pollutants travel beyond the mine site and lead to exposure for local residents and visitors. In addition, modern mining practices may expose mine workers and others to a variety of hazards including: explosive gases; shotcrete; isocyanates; carbon monoxide; welding, metalworking fluids, and other maintenance-related exposures, and more.[266]
- Effects of water pollutants including AMD and mercury on human health
- Effects on mining communities exposed to poor air quality, contaminated water, occupational hazards, and elevated metal health stress.[267]
- Overarching community health issues prominent during boom and bust periods include burdens to health and social services, family stress, violence toward women, and addiction issues.[268]
- The negative (normal and abnormal)[269] social and socio-economic effects that come with

[262] Allert, D. (2015, November 11). Medical professionals' vi–w - Minnesota medical professionals call for PolyMet health-impact statement. *Duluth News Tribune*; *and see* Rome, Jeffrey D., M.D., et al. (2016). Letters to Members, MN Congressional Delegation. 2 pp.; *and see* Minnesota Academy of Family Physicians. *Resolution #3: Request for Health Risk Assessment of Sulfide Mining in Northeastern Minnesota*. Resolution adopted April 15, 2015

[263] (2018, February 19). Physician Comment Letter to USFS Re: Mineral Withdrawal.

[264] Stevenson, R.J. (1978). Regional Copper-Nickel Study: Concentrations of Mineral Fibers in Process Samples from Northeast Minnesota. Minnesota Environmental Quality Board. The Copper-Nickel Study was commissioned by a legislative commission to look at current and potential impacts of copper nickel mining and abilities of available technology. The result is a fact-finding study, presenting no recommendations or "subjective social judgments." The study focused on the levels of mineral fibers, defined as a mineral particle with an aspect ratio greater than 3 to 1, by collecting samples from around the Duluth Complex. Some samples had abnormally high levels of certain mineral fibers. A number of these mineral fibers had asbestos-like qualities.

[265] Sulfide-ore copper mining activities generate rock dust that includes highly reactive elements, mineral fibers, ultrafine particulates, heavy metals, heavy equipment exhaust, power supply emissions, ore processing gasses, and other airborne pollutants that can contribute to increased morbidity and heightened risk of stroke, cardio-pulmonary disease, and more.

[266] Earthworks. (2004). Hardrock Mining: Risks to Community Health.

[267] University of Arizona Superfund Research Program (n.d). Copper Mining and Processing: Copper Mining in Arizona and Tribal Lands., https://superfund.arizona.edu/learning-modules/tribal-modules/copper/AZ-tribal

[268] Shandro, J.A., M.M Veiga, J. Shoveller, M. Scoble, M. Koehoorn. (2011). Perspectives on community health issues and the mining boom-bust cycle. *Resources Policy* 36 (2011) 178–186. (Shandro, et al, 2011).

[269] Under abnormal conditions up to and including catastrophic failure of a mine or tailings dam, the reasonably foreseeable consequences include obliteration of communities and loss of life. *See* Bowker & Chambers, 2015; *and see* Baker, 2013.

AMERICAN OVERSIGHT

mining.[270,271]

c. Wilderness values

The EA does not address the how lease renewal and associated exploration and mine development activity will degrade the statutorily protected wilderness values of the Boundary Waters Canoe Area Wilderness.

A series of increased protections over time has translated into improved wilderness character for the BWCAW in many ways,[272] and federal agencies are obligated to protect the BWCAW's existing wilderness character. Exploratory drilling noise in the Boundary Waters watershed damaged Wilderness character, despite mining company assurances that noise mitigations would be followed.[273] Sulfide-ore copper mining in the Boundary Waters watershed would lead to significant direct, indirect, and cumulative negative effects on the BWCAW's existing Wilderness character.

No other activity contemplated in the SNF would create the amount, intensity, and duration of disturbances — including forest and wetland destruction, noise pollution, light pollution, air pollution, water pollution (with effects of all the foregoing extending into remote locations), heavy vehicle traffic, human presence, and more — as sulfide-ore copper mining. Noise, night lighting, and increased human activity associated with mining development would change the solitude, natural integrity, and primitive recreation experience available in the BWCAW.[274]

While second-growth logging activity on non-Wilderness lands, for example, is known to negatively impact Wilderness character through soil disruption, loss of biodiversity, and increased traffic, and temporary noise, these non-Wilderness second-growth logging events often can be remediated and mitigated, and their long-term effects ordinarily are lesser in scale, severity, and duration when compared to those of sulfide mining on the edge of a Wilderness Area.[275] Mining generates long-term continuous and distinct industrial noise, and continues to pollute for centuries with harm extending far beyond the site of activity itself, and it permanently devastates the landscape at and near the mine site. The Forest Service's recent report on the state of and threats to the Wilderness character of the BWCAW should be used in the EA analysis and consideration of the effects of the proposed action on the BWCAW.[276]

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[270] Power, T. M. (2007). The Economic Role of Metal Mining in Minnesota: Past, Present, and Future.
[271] Mining's boom and bust cycle and the long-term decline in the labor required to produce any given volume of metal ore (a trend seen in copper mining nationwide, just as in iron mining in Minnesota) have negative social and socio-economic effects on miners and their families, and on the social environment of areas that become hosts to mining
[272] Proescholdt, Kevin. June, 2014. Improvements to BWCAW Wilderness Character Since 1966.
[273] Reyer & Garwin, 2015. *E.g., see* affidavits testifying to sound-shed degradation experienced inside the BWCAW, caused by exploratory drilling in the Withdrawal Area.
[274] Reyer & Garwin, 2015. The Impacts of Mining on the Character of a Wilderness Landscape: Considerations for Federal Decision-Making. Report prepared for Northeastern Minnesotans for Wilderness. *E.g., see* affidavits testifying to sound-shed degradation experienced inside the BWCAW, caused by exploratory drilling in the former Withdrawal Area.
[275] Tricker, et al, 2017.
[276] *Id.*

AMERICAN OVERSIGHT

Sulfide-ore copper mining-related noise pollution, light pollution, and scenic degradation will harm the BWCAW's Wilderness character.[277] Those threats and their impact should be examined in the EA. Negative effects on Wilderness character will diminish people's enjoyment of the BWCAW and near-BWCAW portions of the SNF, and diminish both current and future residents' and visitors' well-being. This should be a critical consideration in the EA. Because the Wilderness Act of 1964 (and subsequently-enacted regulations) require it, the EA must address how sulfide-ore copper mining would detrimentally affect the Wilderness character of the BWCAW.[278]

In addition to considering the viewshed-damaging effects of dust and other air pollution-caused haze, and the night-sky damaging effects of light pollution, the EA should address mining-related noise that would affect people's experience of Wilderness. "Wilderness, especially the BWCAW, is one of the last places in the U.S. where one can escape from the constant noises of civilization and be reminded that there is a world significantly less governed by human will."[279] Preserving Wilderness character takes precedence over mineral development in the SNF, and the EA must consider how approval of the proposed action and foreseeable sulfide-ore copper mining would run counter to federal agencies' duty to consider effects on the BWCAW from actions allowed outside of the BWCAW boundary.[280]

d. Impacts to Voyageurs National Park

The EA is inadequate because it fails to consider any potential impacts to Voyageurs National Park (VNP). VNP encompasses more than 84,000 acres of water—an area roughly the size of Minneapolis and Duluth combined. Forty percent of the park are the waters of Rainy, Kabetogama, Namakan, and Sand Point Lakes. The nearly 240,000[281] people who visit Voyageurs each year enjoy kayaking, canoeing, boating, and world-class fishing in the pristine waters of the park. These visitors contribute more than $22 million to the local economy each year and support 273 jobs. The park waters are also home to many animals, including loons, snapping turtles and wood frogs, and 53 species of fish, including lake sturgeon, walleye, and northern pike. These recreational opportunities and native species rely on clean water, but the lakes and rivers of Voyageurs National Park that support the local economy are at risk from nearby sulfide mining. Because Voyageurs National Park is at the bottom of the watershed, any pollution that reaches riverways in the watershed would flow right toward the waters of the park.

According to a 2015 hydrology study commissioned by NPCA and the Voyageurs National Park Association (VNPA), the "[d]evelopment of mining leases in Rainy River watershed presents a

[277] Reyer & Garwin, 2015.
[278] Landres, P., C. Barnes, S. Boutcher, T. Devine, P. Dratch, A. Lindholm, L. Merigliano, N. Roeper, and E. Simpson. (2015). Keeping It Wild 2: An Updated Interagency Strategy to Monitor Trends in Wilderness Character across the National Wilderness Preservation System. USDA Forest Service, Rocky Mountain Research Station. (Landres, et al, 2015).
[279] Reyer & Garwin, 2015.
[280] IWLA v. Kimbell, 516 F. Supp. 2d 982, 996 (D. Minn 2007)
[281] NPS. (2017). 2017 National Park Visitor Spending Effects – Economic Contributions to Local Communities, States, and the Nation, Table 3, p. 29.

AMERICAN OVERSIGHT

significant long-term risk to [Voyageurs National Park]."[282] More specifically, the report found the following:

- Because of the unique geology and water-dominated landscape, combined with the direction of flow, acid mine pollution from sulfide mines as far as 100 away miles could flow into Voyageurs National Park.
- Even small amounts of contamination would impact the park's fish, wildlife and entire ecosystem for decades.
- Mercury is already found in lakes throughout the watershed at Voyageurs. Even small quantities of pollution will increase mercury in the park's waters or make the existing pollution worse by increasing the acidity, further endangering human health.
- The rocks in the watershed don't have much ability to absorb or neutralize acidic mining pollution, which means that mining pollution can be carried a long way downstream, including into Voyageurs National Park.
- Mine waste, or tailings, would be stored in dams that must not fail in perpetuity or they will release acid mine drainage or other process chemicals. However, research shows that failures are common, and leakage in the watershed, once it reaches the riverways, would flow toward the park, putting its waters at risk.

The EA contains no discussion whatsoever on these potential impacts to the park from sulfide mining in the park's watershed.

Additionally, the EA is inadequate because BLM did not consult the National Park Service about impacts from the proposal to Voyageurs National Park. In Chapter 5, which contains the list of tribes, individuals or agencies consulted, the National Park Service is not listed. Given that Voyageurs is at the bottom of the watershed within which the proposed mine would be sited, NPS should have been consulted in the development of the EA and designated a "cooperating agency," as discussed more fully below in Section IV.I.

e. Climate Change

The EA does not even mention climate change, much less analyze the reasonably foreseeable impacts of lease renewal and mine development on climate change – through emissions of greenhouse gasses – or of climate change on the various resources that will be impacted by lease renewal. The intensifying and unequivocal impacts of climate change are affecting ecosystems, natural resources, and communities across the nation and the world, making them more vulnerable to other stressors.[283] Climate change effects must be integrated into the NEPA analysis as part of the environmental baseline to ensure that the impacts of a proposed action are evaluated based on the already deteriorating, climate-impacted state of the resources, ecosystems, human communities, and structures that will be affected. Accordingly, existing and reasonably foreseeable climate change impacts must be included as part of the affected environment, assessed as part of the agency's hard look at impacts, and integrated into each of the alternatives, including the no action alternative. BLM has not even attempted to do so in the lease renewal EA.

[282] Myers,2015, at 6.
[283] *See, e.g.*, US Global Change Research Program. (2018, November). Fourth National Climate Assessment, Available at https://nca2018.globalchange.gov/ and attached in Appendix.

AMERICAN OVERSIGHT

One example of climate related impacts includes an increased likelihood of tailings dam failures due to unusual rain events. [284,285] Since northeastern Minnesota is a rainy, water-rich, low-buffered environment of Northern Minnesota, projections that very intense rainfall events are becoming more frequent must be taken into account when considering the risks of the proposed action. 2016 was the wettest year on record in Minnesota, according to the Minnesota Climatology Office and National Weather Service.[286] The Boundary Waters watershed receives between 28 and 31 inches of annual rainfall and is replete with an extensive network of surface water resources, which flow into the BWCAW.[287] Northeastern Minnesota is already receiving and is projected to receive a growing number of extreme rainfall events, in which 24-hour rainfall totals exceed 6 inches.[288]

Many of the currently operating sulfide-ore copper mines in the U.S. are located in the arid southwest, where precipitation is limited and there are fewer surface water resources. The EA should examine the available evidence[289] and assess whether extensive water pollution impacts are more likely in the water-rich landscape[290] and the wetter climate and increasingly severe precipitation regime of the Boundary Waters watershed.

f. Transboundary Impacts

NEPA requires agencies to "include analysis of reasonably foreseeable transboundary effects of proposed actions in their analysis of proposed actions in the United States," being "particularly alert to actions that may affect migratory species, air quality, watersheds, and other components of the natural ecosystem that cross borders."[291] Federal courts have repeatedly confirmed this obligation.[292] Yet the EA fails to address the reasonably foreseeable transboundary impacts of lease renewal and associated mine development – including, for instance, the near-certainty that mine-related water pollution will eventually contaminate the Quetico Provincial Park and other

[284] Rico, M., G. Benito, A. R. Salgueiro, A. Díez-Herrero, and H. G. Pereira. (2008). Reported Tailings Dam Failures: A Review of the European Incidents in the Worldwide Context." *Journal of Hazardous Materials* 152, no. 2 : 846–52. Doi:10.1016/j.jhazmat.2007.07.050. (Rico, et al, 2008).
[285] A report evaluating all known tailings dam failures found that the most common cause of failure was an unusual rain event (Rico, et al, 2008).
[286] *See* @NWS Twin Cities. (2016, December 25). Available at: https://twitter.com/NWSTwinCities/status/813239693760462848
[287] CSTBWMAP_Withdrawal Area-WaterFeaturesAcreageMileageTroutStreams, in Appendix (folder "Maps")
[288] *See* MN Department of Health. (2014). Minnesota Climate Change Vulnerability Assessment 2014. Minnesota Climate and Health Program, Environmental Impacts Analysis Unit.
[289] Kuipers & Maest, 2006.
[290] CSTBWMAP_Withdrawal Area-WaterFeaturesAcreageMileageTroutStreams, in Appendix (folder "Maps")
[291] Council on Environmental Quality, Guidance on NEPA Analyses for Transboundary Impacts (1997), available at http://ceq hss.doe.gov/nepa/regs/transguide html.
[292] *See, e.g.*, *Manitoba v. Salazar,* 691 F.Supp.2d 37, 51 (D.D.C. 2010) ("NEPA requires agencies to consider reasonably foreseeable transboundary effects resulting from a major federal action taken within the United States."); *Swinomish Tribal Cmty. V. FERC*, 627 F.2d 499, 510-12 (D.C. Cir. 1980) (concluding that the agency took a "hard look" at the Canadian impacts of dam construction in Washington State); *Wilderness Soc'y v. Morton*, 463 F.2d 1261, 1261-63 (D.C. Cir. 1972) (granting intervenor status to Canadian environmental groups seeking to challenge the trans-Alaska pipeline under NEPA).

AMERICAN OVERSIGHT

downstream resources in Canada.[293] Nor does the EA analyze compliance with the Boundary Waters Treaty of 1909, as discussed in Section IV, below. BLM must acknowledge and analyze these and other transboundary impacts of lease renewal.

The EA should address the activities of the International Rainy-Lake of the Woods Watershed Board, which was created when the International Rainy Lake Board of Control and the International Rainy River Water Pollution Board were combined and given responsibility for water quality in the transboundary watershed, in addition to compliance with water level curve rules.[294] The EA should also review the International Lake of the Woods Basin Water Quality Plan of Study, which states in part:

> The possibility of mining disseminated sulfide ores in the Basin has resulted in concerns over the potential for serious adverse effects, including: acid mine drainage …; impaired wild rice production due to sulfate contamination; elevated methylation of mercury in downstream waters (which would exacerbate the mercury problem); and harmful levels of trace metals that could impair downstream waters. Given these concerns, and the developing efforts to explore and mine metals in the Basin, there is a need to examine the potential for cumulative effects of runoff from past, ongoing, and possible future mining operations to contaminate border waters, and in particular the cumulative effects from operations on both sides of the U.S.-Canada border.[295]

The EA should address the communications dated 1-22-2015 from the IJC to the respective State Departments of the United States of America and Canada, and to the U.S. and Canadian co-Chairs of the Rainy-Lake of the Woods Watershed Board, expressing concern over how current and projected impacts from mining operation proposals in the Rainy–Lake of the Woods basin, including on the U.S. side of the border, could have cumulative and transboundary effects on the water quality and ecosystem health in the Basin.[296]

g. Cumulative Impacts

While the EA identifies other reasonably foreseeable mineral actions, including Polymet and a Twin Metals mine plan, in its cumulative effects analysis,[297] the BLM neglected to conduct any actual analysis of the cumulative impacts of lease renewal and those other mineral actions. Instead, it recites the possibility of negative environmental impacts to broad categories of resources and states that future mineral actions will be subject to project-level NEPA analysis and permitting requirements.[298] This in no way constitutes a hard look at the very significant cumulative impacts of hardrock mineral exploration and development activity on the Superior National Forest, as NEPA requires. Nor does the analysis include any mention of the significant

[293] *See, e.g.*, Myers, 2016a; Myers 2016b; Myers, 2015; Myers, 2018; and NMW Map, "Path of Pollution" in Appendix folder "Maps"
[294] International Rainy-Lake of the Woods Watershed Board (n.d.). Homepage. Available at: http://ijc.org/en_/RLWWB.
[295] International Lake of the Woods Basin Water Quality Plan of Study. Final Report, 11-2014, at p.5.
[296] *See* (2015, January 22). Letter from IJC to U.S. Dept of State & Foreign Affairs & International Trade Canada.
[297] EA at 23.
[298] EA at 22.

AMERICAN OVERSIGHT

cumulative effects of lease renewal and mine development in the context of climate change and the increased vulnerability of resources to stressors.

In order to "consider" cumulative impacts, as required by NEPA, "some quantified or detailed information is required."[299] "General statements about 'possible' effects and 'some risk' do not constitute a 'hard look' absent a justification regarding why more definitive information could not be provided."[300] "Nor is it appropriate to defer consideration of cumulative impacts to a future date," as "NEPA requires consideration of the potential impact of an action *before* the action takes place."[301] The EA wholly fails to take a detailed look at the overall cumulative impacts of all past, present, and reasonably foreseeable actions, in violation of NEPA.

In conclusion, BLM must take the hard look that NEPA requires on the reasonably foreseeable impacts described above. This will necessarily require preparation of an EIS.

F. INADEQUATE STIPULATIONS

"Implicit in NEPA's demand that an agency prepare a detailed statement on 'any adverse environmental effects which cannot be avoided should the proposal be implemented,' is an understanding that the EIS will discuss the extent to which such adverse effects can be avoided."[302] Accordingly, an EIS – which is required to support renewal of the Twin Metals leases – must discuss appropriate mitigation measures.[303] Those measures "must be discussed in sufficient detail to ensure that environmental consequences have been fairly evaluated."[304] Likewise, an EA "must . . . identify and analyze mitigation measures, if any, which may be taken to avoid or reduce potentially significant effects," and "must describe and analyze the anticipated effectiveness of mitigation measures and any direct, indirect, and cumulative effects that remain after the application of all mitigation measures—that is, residual effects."[305] Simply identifying mitigation measures, without analyzing their effectiveness, violates NEPA. Rather, an "essential component of a reasonably complete mitigation discussion is an assessment of whether the proposed mitigation measures can be effective."[306] In addition, CEQ has instructed that the "possibility of mitigation" should not be relied upon to avoid further environmental analysis.[307]

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[299] *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1379 (9th Cir. 1998).
[300] *Id*. At 1380.
[301] *Id*., quoting *City of Tenakee Springs v. Clough*, 915 F.2d 1308, 1313 (9th Cir. 1990).
[302] *Robertson*, 490 U.S. at 351-52 (quoting 42 U.S.C. § 4332(2)©(ii)).
[303] *See* 40 C.F.R. §§ 1502.14(f), 1502.16(h), 1508.25(b). 40 C.F.R. § 1508.20 defines mitigation to include:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

[304] *Neighbors of Cuddy Mountain v. U.S. Forest Serv.*, 137 F.3d 1372, 1380 (9th Cir. 1998) (quotations and citation omitted).
[305] BLM NEPA Handbook, § 8.3.6.
[306] *S. Fork Band Council of W. Shoshone of Nevada v. U.S. Dep't of Interior*, 588 F.3d 718, 727 (9th Cir. 2009).
[307] *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations*; *see also Davis v. Mineta*, 302 F.3d 1104, 1125 (10th Cir. 2002).

AMERICAN OVERSIGHT

The lease renewal EA fails to discuss the proposed lease stipulations in sufficient detail to ensure that environmental consequences have been fairly evaluated and to assess their effectiveness as mitigation measures. Instead, the EA lists the proposed action stipulations in Appendix A, purports to summarize them in Table 1, and occasionally references in Chapter 3 how a particular stipulation might slightly reduce impacts as compared to the no action alternative.[308] Such "broad generalizations" and references to potential mitigation measures "do not constitute the detail as to mitigation measures that would be undertaken, and their effectiveness, that the [agency] is required to provide."[309] Moreover, the EA fails to clearly identify and define the stipulations and if and how they would apply to various stages of mineral development activity. There are significant and unexplained discrepancies between the summary in Table 1 and the list in Appendix A. For instance, Table 1 suggests that the current prohibition on strip-mining, rim-cutting, and open-pit mining would be eliminated under the proposed action, while Stipulation #6 in Appendix A states that the leases do not authorize mining or removal of mineral deposits by stripping, rim cutting, or open pit methods. And Stipulation #8 in Appendix A properly recognizes that lease renewal is subject to and may only be issued upon prior consent of the Forest Service, while the remainder of the EA ignores the Forest Service's consent rights and suggests that renewal is mandatory. More generally, the structure and organization of Table 1 does not track the stipulations in Appendix A. Where such discrepancies exist, it is unclear what stipulations would apply. Nor is it clear if BLM adopted verbatim the stipulations that the Forest Service provided, or if the BLM made changes to those stipulations. Without the ability to review the draft lease language – which has not been made publicly available – the public has no way of knowing what terms, conditions, and stipulations will in fact apply under the proposed action.

Nor does the EA provide information or meaningful analysis to support a conclusion that application of the stipulations will effectively prevent or mitigate significant impacts – or that the proposed action would be more protective than the no action alternative. For instance, elimination of the prohibition on open pit mining would unquestionably intensify the already significant adverse impacts associated with sulfide-ore copper mining, particularly where the Spruce Road deposit – located adjacent to the BWCAW – is shallow and likely would be mined to the surface. And it is unclear if or how the proposed 20-acre surface use restriction would be applied to mining development, as opposed to exploration activities. Moreover, as discussed in Section II(A), above, while the EA claims that the no action alternative represents the terms and conditions of the 2004 leases, the summary of no action alternative stipulations in Table 1 instead reflects the original 1966 leases, and many of the stipulations included in the proposed action are already reflected in the terms and conditions of the 2004 leases. Accordingly, any statements in the EA suggesting that proposed action stipulations would reduce impacts are highly suspect.

[308] As discussed in Section II(A), above, while the EA claims that the no action alternative represents the terms and conditions of the 2004 leases, the summary of no action alternative stipulations in Table 1 instead reflects the original 1966 leases, and many of the stipulations included in the proposed action are already reflected in the terms and conditions of the 2004 leases. Accordingly, any statements in the EA suggesting how proposed action stipulations would reduce impacts are highly suspect.

[309] *See Neighbors of Cuddy Mountain*, 137 F.3d at 1381.

AMERICAN OVERSIGHT

Other proposed stipulations are unlikely to be effective in preventing or mitigating impacts. For instance, BLM may not rely on the possibility that tribes may choose to conduct cultural resource surveys prior to proposed ground disturbance where the stipulation provides no information about if, how, or when the tribes will receive notification of the proposed disturbance, if or how BLM or the Forest Service will consider the information from any tribal surveys, and how the agencies will ensure compliance with their obligations under section 106 of the National Historic Preservation Act. Stipulations 1-3 in Appendix A recite Forest Service authority over surface management and occupancy and use but appear to contemplate exploration and drilling, as opposed to mining, and provide few standards to guide future decision-making. Moreover, statements in the EA suggest that the rights granted in the leases would override U.S. Department of Agriculture rules and regulations and supersede the Forest Service's ability to implement many of the stipulations and prevent surface resource damage going forward.[310] Ultimately, the EA and associated stipulations provide little assurance that the stipulations will be meaningful, enforceable, or effective in preventing or mitigating significant adverse impacts.

BLM must clearly articulate the lease stipulations on which it is relying, ensure their enforceability, and meaningfully analyze their effectiveness, based on the best available scientific information. It should also make publicly available the draft lease renewal language so the public can assess how the proposed stipulations will be integrated into the lease document.

G. IMPROPER PRE-DETERMINATION

NEPA's twin aims are to facilitate informed government decision-making and ensure public transparency.[311] Courts have held that those aims are undermined and a violation of NEPA has occurred where an agency "predetermines" the outcome of the analysis by "irreversibly and irretrievably commit[ting] itself to a plan of action" before completing the necessary analysis.[312] Here, BLM has done just that, by committing itself to renewal of the leases and only analyzing alternatives that would achieve that pre-determined outcome.[313]

As described above, BLM has no authority to renew Twin Metals' leases, which expired in December 2016 and were subject to renewal only at BLM's discretion and upon the consent of the Forest Service. Nevertheless, BLM is attempting to proceed with lease renewal based on the faulty interpretation advanced in the December 2017 Solicitor's opinion. That interpretation and BLM's corresponding May 2018 decision to reinstate the expired leases and lease renewal

[310] *See, e.g.*, EA at 32 ("The lessee must comply with all the rules and regulations of the Secretary of Agriculture . . . governing the use and management of National Forest System (NFS) lands *when not inconsistent with the rights granted by the Secretary of Interior in this lease*." (emphasis added)).
[311] *See* 40 C.F.R. § 1500.1; *Robertson*, 490 U.S. at 349.
[312] *Forest Guardians v. U.S. Fish & Wildlife Serv.*, 611 F.3d 692, 714 (10th Cir. 2010); *see also, e.g.*, *Davis v. Mineta*, 302 F.3d 1104, 1112 (10th Cir. 2002) (finding improper pre-determination where consultant preparing environmental assessment was contractually obligated to reach a certain environmental analytic outcome, with the endorsement of the agency); *Metcalf v. Daley*, 214 F.3d 1135, 1144 (9th Cir. 2000) (finding improper pre-determination where agency signed written agreements binding them to support the proposal undergoing analysis); *Save the Yaak Comm. V. Block*, 840 F.2d 714, 717–19 (9th Cir. 1988) (finding improper pre-determination where construction contracts were awarded prior to completion of NEPA analysis).
[313] *See, e.g.*, EA at 4, 5, 9 (reciting purported non-discretionary right to lease renewal).

AMERICAN OVERSIGHT

application are the subject of ongoing litigation. To the extent that reinstatement of the expired leases constitutes or implies a contractual obligation, federal courts have routinely found that similar contractual obligations constitute improper pre-determination under NEPA.[314] The Interior Department's current interpretation that the BLM lacked discretion in deciding whether to renew Twin Metals' leases, and that Twin Metals is entitled to a non-discretionary right of renewal of its leases, unequivocally pre-commits the outcome and damages the integrity of this NEPA process. Indeed, the BLM premises its entire analysis at least in part on this pre-determined conclusion.[315]

To avoid improper pre-determination, BLM must meaningfully analyze at least one alternative that would not renew the leases, account for the Forest Service consent authority, and defer any decision on lease renewal while the litigation over lease reinstatement is pending.

H. FOREST SERVICE ROLE IN THE NEPA PROCESS

As the surface managing agency with various legal obligations to protect the sensitive and unique resources of the Superior National Forest and BWCAW from mining-related degradation (discussed in detail in Section III, below), the Forest Service must play a central and significant role in this NEPA process. This is particularly so where the Forest Service's December 2016 decision to withhold consent to lease renewal and subsequent application for withdrawal were based on its well-reasoned conclusion that it cannot satisfy those obligations should the Twin Metals leases be renewed. Troublingly, the EA fails to address the robust analysis and resulting conclusions presented in the Forest Service's December 2016 decision – all of which bear directly on the lease renewal decision and associated impacts. The Forest Service's extremely limited role in the current lease renewal process and associated NEPA analysis is inconsistent with a number of legal and regulatory requirements.

First, according to a 1984 interagency agreement between the BLM and the Forest Service governing mineral leasing decisions on split estate lands (National Forest System or private surface), the Forest Service is to be the lead agency for NEPA compliance with respect to any leasing decisions "which primarily involve" National Forest Service lands.[316] The agreement goes on to state that "[i]n all cases, [Forest Service] expertise will be recognized for that portion of any analysis or document concerning protection and utilization of the [National Forest System]."[317] Consistent with the approach articulated in that agreement, the Forest Service prepared the 2012 prospecting permit EIS. BLM's preparation of the lease renewal EA is inconsistent with that direction and with the need to utilize the Forest Service's significant

[314] *See, e.g.*, *Metcalf*, 214 F.3d at 1144 (agency's prior written commitments to permit whale hunting prior to NEPA analysis constituted improper pre-determination); *Save the Yaak Comm.*, 840 F.2d at 717–19 (finding an irreversible and irretrievable commitment when construction contracts were awarded prior to the completion of the relevant NEPA analysis).
[315] *See, e.g.,* EA at 4 (noting that "[u]nder both the Proposed Action and the No-Action Alternative, the leases will be renewed. As such, the scope of this EA is to provide analysis of the impacts the BLM expects to occur as a result of the new stipulations, and a comparison of those impacts to the impacts expected under the No-Action Alternative.")
[316] Interagency Agreement Between the Bureau of Land Management and the Forest Service for Mineral Leasing, § III(A) (June 19, 1984).
[317] *Id.*

AMERICAN OVERSIGHT

expertise and to ensure the agency can satisfy its surface management obligations. To the extent the 1984 agreement has been superseded, the public should be made aware of that, and the BLM should provide a reasoned rationale for why it is the lead agency for NEPA purposes.

Second, at the very least, NEPA requires that the Forest Service participate as a cooperating agency. CEQ regulations call for early and significant involvement by other federal agencies with jurisdiction by law or special expertise.[318] In this case, the Forest Service has both jurisdiction by law (to, for instance, withhold its consent to leasing decisions, among other statutory and regulatory authorities to ensure mineral development activities do not compromise its ability to manage and protect surface resources) and special expertise as the surface managing agency. Yet it is unclear from the EA whether the Forest Service is participating as a cooperating agency and, if it is, whether the BLM has ensured its sister agency has had adequate opportunity to help direct and influence the NEPA process and content of the analysis. A comparison of the EA to the Forest Service's December 2016 decision denying its consent to lease renewal and January 2017 withdrawal application suggest that the Forest Service has not been permitted to exercise its authority over or contribute its expertise to the current NEPA process. Indeed, the BLM EA ignores the numerous significant risks previously identified by the Forest Service of sulfide-ore copper mining in the Boundary Waters watershed, including but not limited to the irreversible impacts of acid mine drainage on downstream resources that would render the Forest Service unable to meet its statutory obligations to protect the BWCAW and other public resources.

Third, even under the Interior Department's faulty legal interpretation that lease renewal is mandatory and the Forest Service may only prescribe additional stipulations on lease renewal, the Forest Service must be meaningfully involved in analyzing the effectiveness of those stipulations in protecting Superior National Forest resources and demonstrating how the stipulations will ensure the agency can meet its surface management obligations. As described above, the EA fails to include that analysis or make such a showing.

Finally, given the Forest Service's statutory consent rights, surface management obligations, preparation of stipulations, and special expertise, both BLM and the Forest Service have independent obligations to comply with NEPA.[319] CEQ regulations permit an agency to adopt an EA or EIS prepared by another agency, but only after an independent review and determination that the analysis is sufficient and complies with applicable laws and policies.[320] In other words, a cooperating agency must independently review the analysis, accept responsibility for its scope and content, and issue its own decision document.[321] Here, given the numerous significant deficiencies with the BLM's EA, the Forest Service cannot rely on it to ensure compliance with its independent statutory consent and other legal obligations to manage and protect surface resources.

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[318] 40 C.F.R. § 1501.6.
[319] 42 U.S.C. § 4332(2); *see also North Carolina v. Fed. Aviation Admin.*, 957 F.2d 1125, 1129-30 (4th Cir. 1992) ("This provision precludes an agency from avoiding the Act's requirements by simply relying on another agency's conclusions about a federal action's impact on the environment.").
[320] 40 C.F.R. § 1506.3.
[321] *See North Carolina*, 957 F.2d at 1130 (FAA properly reviewed and adopted EA prepared by the Navy and issued its own FONSI, thereby demonstrating that it took responsibility for the scope and content of the EA); BLM NEPA Handbook 5.4.2.

AMERICAN OVERSIGHT

The Forest Service should be the lead agency in the lease renewal NEPA process, or, at a minimum, a cooperating agency that participates meaningfully in the analysis and decision-making process and independently ensures compliance with NEPA, including through the preparation of an EIS.

I. THE NATIONAL PARK SERVICE ROLE IN THE NEPA PROCESS

We believe the National Park Service should be given cooperating agency status to the extent that it has not been already designated as such. Based on the location of the proposed project in the Rainy River watershed and upstream location from Voyageurs National Park, the Park Service has a strong interest in the proposed project and its potential impact on the national park and its resources. As more fully stated above, pollution from the proposed mining operation could reach the park waters given the unique geology of the watershed and direction of water flow. As such, granting cooperating agency status will ensure NPS is notified of all relevant actions in a timely fashion and can respond accordingly.

III. FOREST SERVICE ROLE

The Forest Service is the agency Congress has given primary responsibility for managing the leased land, as well as affirmative duties to protect the Boundary Waters. By contrast, Congress gave BLM only a minor role—a limited ability to authorize mineral development with the consent of the Forest Service.

Consistent with its relevant statutory obligations and substantial expertise, the Forest Service must play the lead role in any lease renewal decision.[322] Instead, BLM has unlawfully minimized the Forest Service's role here, rendering both the NEPA process and any resulting BLM decision based on that process illegitimate.

As the Forest Service has already found, BLM's proposal to renew the leases is inconsistent with the Forest Service's obligations to protect the Boundary Waters. The proposed version of the leases would be especially inconsistent, because it does not expressly reserve the Forest Service's right to preclude a mine and contains no stipulations that even attempt to address the risks the Forest Service has identified. Moreover, the Forest Service has already denied consent to renewal. BLM's decision to treat that denial as "inoperative" subverts the statutory scheme.

Finally, lease renewal is inconsistent with the 2004 Superior National Forest Plan, which did not address, consider, or anticipate sulfide-ore copper mining. That plan requires protection of the Boundary Waters, water resources, recreation and scenery, among other resources and uses of the Superior National Forest.

[322] *See also* 1984 Interagency Agreement between BLM and Forest Service providing the Forest Service should take the lead and BLM serve as a cooperating agency in mineral leasing environmental review. The Superior National Forest in preparing the 2006-2012 prospecting permit EIS followed the process laid out in the 1984 Interagency Agreement.

AMERICAN OVERSIGHT

A. THE FOREST SERVICE IS CHARGED WITH PROTECTING THE BOUNDARY WATERS AND MANAGING THE LEASED LAND, AND HAS THE FINAL SAY ON MINERAL LEASING

The Boundary Waters Canoe Area Wilderness Act and the Wilderness Act of 1964 affirmatively require the Forest Service to preserve the Boundary Waters' wilderness character and values.[323] This includes an obligation to protect the Boundary Waters from potentially harmful activities outside of the wilderness boundaries.[324] Harm posed by mining is no exception to this Forest Service obligation; in fact, one of Congress' stated goals in the 1978 Act is to "minimize to the maximum extent possible, the environmental impacts associated with mineral development affecting" the Boundary Waters.[325]

Under the National Forest Management Act, the Forest Service is also responsible for managing the surface resources of the Superior National Forest where the leases are located, and to consider wilderness, habitat, recreational, spiritual, non-extractive business, and other non-mining values in so doing.[326] The BLM has no conflicting statutory obligations with respect to the Superior National Forest or Boundary Waters, and no authority to supersede the Forest Service's management decisions regarding these lands.

The vast majority of the leases are comprised of Superior National Forest lands withdrawn from the public domain, and the remainder is comprised of lands acquired under the Weeks Act.[327] On such lands, the BLM has a limited authorization under 16 U.S.C. §§ 508b, 520 and Sec. 402 of Reorganization Plan No. 3 of 1946 to allow mineral development, but only with the Forest Service's consent. These laws do not require either agency to allow mineral development. They also do not relieve the Forest Service of its responsibilities under the Wilderness Act, Boundary Waters Canoe Area Wilderness Act, or National Forest Management Act. In fact, 16 U.S.C. § 508b does not place any limitation on the Forest Service's discretion to withhold consent. Therefore, with respect to Superior National Forest lands withdrawn from the public domain, the Forest Service exercises full discretion to preclude mineral development, and must do so where mineral development would be incompatible with its obligations to protect surface resources. With respect to acquired lands, the Forest Service exercises more limited discretion, but can still preclude development if it would interfere with the primary purposes for which the land was acquired.[328] The BLM, meanwhile, has no obligation to lease Superior National Forest land and no authority to overrule any Forest Service decision to deny mineral development on the Forest, including the Forest Service's 2016 decision to withhold its consent to renewal of the leases.

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[323] Pub. L. 95-495, 92 Stat. 1649 (1978); 16 U.S.C. § 1133(b); *see also* Section IV, below.
[324] *See Izaak Walton League of Am., Inc. v. Kimbell*, 516 F. Supp. 2d 982, 988 (D. Minn. 2007), judgment entered, No. CIV. 06-3357 JRT/RLE, 2008 WL 141728 (D. Minn. Jan. 11, 2008), amended, No. CV 06-3357 (JRT/RLE), 2008 WL 11383666 (D. Minn. May 21, 2008), and 'ff'd, 558 F.3d 751 (8th Cir. 2009) (explaining, "the plain language of §[1133](b) makes no distinction based on the source of the allegedly degrading agency activity.").
[325] Pub. L. 95-495, 92 Stat. 1649, Sec. 2(4).
[326] *See* 16 U.S.C. § 1600(2), (3).
[327] USDA Forest Service December 14, 2016 decision letter to USDOI BLM, at 5.
[328] Section 402 of Reorganization Plan No. 3 of 1946.

AMERICAN OVERSIGHT

B. THE FOREST SERVICE MUST PLAY A CENTRAL ROLE IN ANY LEASE RENEWAL DECISION

As discussed immediately above and in Section IV below, as the surface managing agency with statutory consent rights and other legal obligations to protect the unique and vulnerable resources of the Superior National Forest and BWCAW, the Forest Service must play a central role in any lease renewal decision. This includes serving as the lead agency in the NEPA process, consistent with the governing interagency agreement and past practice, or, at a minimum, as a cooperating agency with jurisdiction by law and special expertise. The current process with this EA does not facilitate meaningful participation by the Forest Service. The Interior Department's faulty interpretation that lease renewal is mandatory purports to eliminate both BLM and Forest Service discretion, and BLM's failure to consider a no-leasing alternative or to analyze the reasonably foreseeable impacts of mine development further eviscerates the Forest Service's role. Absent a meaningful look at the foreseeable impacts of lease renewal and mine development, the Forest Service and BLM simply cannot develop and implement stipulations that might be effective in preventing or mitigating those impacts.

In short, BLM cannot ignore the Forest Service's significant authority and expertise – as articulated in Chief Tidwell's December 2016 decision to deny Forest Service consent to lease renewal and in the agency's January 2017 application for withdrawal – by denying its sister agency the ability to meaningfully direct and participate in this consequential decision.

C. AS THE FOREST SERVICE ALREADY FOUND, LEASE RENEWAL IS INCONSISTENT WITH THE FOREST SERVICE'S OBLIGATIONS TO PROTECT THE BOUNDARY WATERS

The Forest Service correctly determined that renewing the leases would be incompatible with its obligations to protect the Boundary Waters in its well-supported December 2016 letter denying consent to renewal. As Chief Tidwell found, a copper-nickel sulfide ore mine is likely to result in acid mine drainage that would flow directly from the leases into the Boundary Waters.[329] The geology and hydrology of the area render it particularly vulnerable to harm from acid mine drainage, he added, because of its limited acid buffering capacity.[330] If acid mine drainage contaminates the Boundary Waters, he wrote, the damage could be extreme, remediation would be at best very difficult to achieve, and few if any of the remediation methods available would be consistent with maintaining the area's wilderness character.[331] Moreover, a mine would cause habitat fragmentation and degradation, threatening moose, wolves, lynx, and long-eared bats.[332] Based on these findings, the Forest Service correctly concluded that renewing the leases would be inconsistent with its statutory obligation to protect the Boundary Waters.[333] All of the factual findings in the December 2016 letter remain correct, and the statutory obligations are unchanged.[334] Moreover, additional scientific studies from the last two years further confirm the

[329] USDA Forest Service December 14, 2016 decision letter to USDOI BLM, at 12-13.
[330] *Id.* At 11.
[331] *Id.* At 15, 21.
[332] *Id.* At 15-17.
[333] *Id.* At 21.
[334] *See* Section V(A)

AMERICAN OVERSIGHT

near-certainty that sulfide-ore mining would have devastating and significant effects on the Boundary Waters, the Superior National Forest, Voyageurs National Park, and the sustainable economy that depends on their pristine condition. Therefore, renewing the leases would be inconsistent with the Forest Service's obligations.

Although renewing the leases in any form would be inconsistent with the Forest Service's obligations, it would be profoundly inconsistent with those obligations to renew the leases under the stipulations proposed in the EA. As an initial matter, the public does not have access to the actual draft lease language and therefore cannot fully evaluate the terms, conditions, and stipulations that would apply to development of the leases. Based on the confusing and incomplete information contained in the EA, however, the proposed leases utterly fail to ensure the Forest Service can meet its obligations to protect the Boundary Waters and other forest resources.

First, the proposed leases would not expressly reserve the Forest Service's absolute right to preclude a mine.[335] Chief Tidwell found that it may not be possible to develop a mine in a way that prevents the spread of acid mine drainage and associated leached metals in the watershed.[336] Indeed, there is no such foolproof design.[337] This means that no mere stipulation is adequate to eliminate the extreme risks that a mine poses to the Boundary Waters. The Forest Service must and does retain the absolute right to preclude mining.

Second, the proposed action contains no stipulations that even begin to address the risks the Forest Service has identified.[338] There are no proposed stipulations about where and how tailings and waste rock should be stored, how Twin Metals should manage drainage, or protocols for determining the extent to which waste is potentially acid generating. General admonitions to "[c]omply to the Clean Water Act" and "[c]onduct all operations to minimize impacts to land, air, water and to cultural, biological, visual, mineral, and other resources and other uses and users" are wholly inadequate to address the relevant risks.[339]

In sum, even though there is no renewal that would be consistent with Forest Service obligations, the proposed action is particularly egregious because it does not identify or propose any mitigation in any way to address or manage the risks the Forest Service identified.

D. THE BLM IS REQUIRED TO OBTAIN FOREST SERVICE CONSENT

The laws that authorize the leases require Forest Service consent as a prerequisite to BLM's authorization of mineral development.[340] BLM's own regulations require Forest Service consent.[341] BLM wrongly concluded that the Forest Service's December 2016 decision denying consent is "not legally operative," based on BLM's interpretation of Twin Metals' leases as

[335] *See* EA at 10-12, Tbl. 1.
[336] *Id.* At 20-21.
[337] *See* Section V(A)
[338] *See* EA at 10-12, Tbl. 1.
[339] *See* EA at 11, Tbl. 1.
[340] *See* 16 U.S.C. §§ 508b, 520 and Sec. 402 of Reorganization Plan No. 3 of 1946.
[341] *See* 43 C.F.R. § 3507.19I.

AMERICAN OVERSIGHT

requiring renewal.[342] Not only is BLM's interpretation of the leases incorrect, but, as the Forest Service explained in its December 2016 decision, it is beside the point.[343] There is no statute or regulation that allows BLM to bargain away the Forest Service's right to consent, or to nullify that right by reinterpreting the leases. The Forest Service retains the right to deny consent to renewal.

E. LEASE RENEWAL IS INCONSISTENT WITH THE 2004 SUPERIOR NATIONAL FOREST PLAN

The National Forest Management Act (NFMA) requires that "[r]esource plans, permits, contracts, and other instruments for the use and occupancy of National Forest System lands shall be consistent with the land management plans."[344] In addition, the Federal Land Policy & Management Act (FLPMA) requires BLM to "coordinate [its] . . . management activities . . . with the land use planning and management programs of other Federal departments and agencies and of the States and local governments within which the lands are located . . . and of or for Indian tribes."[345] This coordination requirement includes, among other things, working to resolve inconsistencies between land use decisions and non-Federal Government plans and providing for meaningful public involvement of State and local government officials.[346]

The 2004 Superior National Forest Plan did not contemplate, analyze, or anticipate sulfide-ore copper mining. Indeed, mining was identified among the "Issues Not Addressed in Detail" in the forest plan EIS, with active and anticipated mining activities focused only on gravel and granite.[347] Unsurprisingly, the plan provides virtually no management direction for mining, and neither the Record of Decision nor the appendix of proposed and probable practices even mentions mining activities.[348]

Since the 2004 plan, the interest in sulfide-ore mining has grown, with the reinstated Twin Metals leases that BLM now intends to renew, as well as significant exploration activities occurring under more than two dozen prospecting permits, and other lease applications and additional prospecting permit applications pending. The numerous significant impacts associated with ongoing and reasonably foreseeable exploration and mining activities on the Twin Metals leases were simply not analyzed or anticipated in the plan revision process resulting in the 2004 forest plan. As a result, a decision to renew the Twin Metals leases represents a significant change in circumstances since the 2004 forest planning process and thus necessitates a forest plan amendment and supplemental EIS that provides the programmatic NEPA analysis necessary

[342] USDOI BLM. (2018, May 2). Reinstatement of Twin Metal's 2012 Lease Renewal Rejection, at 2.
[343] *See* USDA Forest Service December 14, 2016 decision letter to USDOI BLM, at 7 ("Irrespective of the [Solicitor's interpretation of the leases,] the FS's consent to any hardrock lease is mandated by 16 U.S.C. § 508b and Sec. 402 of Reorganization Plan No. 3 of 1946, 60 Stat. 1097, 1099.").at
[344] 16 U.S.C. § 1604(i).
[345] 43 U.S.C. § 1712(c)(9).
[346] *Id.*; *see also id.* § 1712(c)(8) (similar obligation to "provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standards or implementation plans").
[347] FEIS, p. 1-29; *see also, e.g.*, USFS, SNF. (2004). Land and Resource Management Plan, (2004 Superior National Forest Plan or forest plan), p. 2-10 (S-MN-9) (standard requiring Forest Service to provide sand and gravel for public and private use from within the MPA).
[348] *See* 2004 Superior National Forest Plan, p. 2-9 (providing minimal direction on mining) & Appx. D (proposed and probable practices).

AMERICAN OVERSIGHT

to inform adequate plan direction to guide any project-level leasing or mining decisions.[349] Absent a forest plan that addresses the numerous significant impacts of sulfide-ore copper mining, the Forest Service cannot meet its obligations under NFMA to provide for multiple use, sustained yield, the diversity of plant and animal communities, protection of forest resources, and ecological integrity and sustainability.[350]

Despite the fact that existing plan direction was not designed to address the impacts of mining, renewal of the Twin Metals leases is still inconsistent with forest plan direction aimed at resource protection. For instance, the plan requires that the Forest Service manage the BWCAW in a manner that perpetuates and protects its unique natural ecosystems, provides an enduring wilderness resource for future generations, and provides opportunities for a primitive and unconfined recreation experience – direction that cannot be achieved should sulfide-ore copper mining proceed within the headwaters of the Wilderness.[351] The plan also recognizes that "[m]aintaining and improving watershed health is vitally important in managing the Superior National Forest" and includes direction to accomplish that goal.[352] Lease renewal and associated sulfide-ore copper mining is inconsistent with that plan direction. And the plan emphasizes enhancing scenic integrity and semi-primitive recreation opportunities – also directly at odds with mining.[353] Thus, the EA's conclusion that the proposed action is in conformance with the 2004 plan is unsupported and contrary to the record.

The EA also incorrectly states that BLM was a cooperating agency in the forest planning process. This is false. Beyond a single mention in the FEIS of the BLM as one of *thirty-four* federal agencies with which the Forest Service *consulted*,[354] neither the Forest Plan, the FEIS, or the ROD even mention BLM – much less address the agency's authority over mineral leasing on the forest.

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[349] *See* 40 C.F.R. § 1502.9(c). Any such amendment would directly implicate substantive requirements of the 2012 planning rule, including but not limited to the requirements to provide for ecological sustainability, including soil and water quality, 36 C.F.R. § 219.8(a), the diversity of plant and animal communities, *id.* § 219.9, and protection of congressionally designated wilderness areas, *id.* § 219.10(b)(1)(iv). *See id.* § 219.13(b)(5) (responsible official must apply substantive requirements determined to be directly related to the plan direction being altered by the amendment). Ensuring compliance with those substantive provisions almost certainly would require plan direction prohibiting or significantly limiting sulfide-ore prospecting, leasing, and development in the Boundary Waters watershed, and thus foreclose renewal of the Twin Metals leases.

[350] *See* 16 U.S.C. 1604(e) & (g)(3)(A&B); 36 C.F.R. §§ 219.8-219.10.

[351] *See* 2004 Superior National Forest Plan, pp. 2-50 – 2-51; 2016 Forest Service decision denying consent, pp. 8, 11-21 (finding that lease renewal would be inconsistent with those requirements).

[352] Record of Decision, p. 10; *see also, e.g.*, 2004 Superior National Forest Plan D-WS-4 ("Management activities do not reduce existing quality of surface or groundwater or impair designated uses of surface and ground water."), O-WS-1 ("Improve and protect watershed conditions to provide the water quality, water quantity, and soil productivity necessary to support ecological functions and intended beneficial water uses."), G-WS-13 & -15 ("Wetland impacts will be avoided whenever possible" and "[w]etlands will be managed to prevent the reduction of their water quality, fish and wildlife habitat, and aesthetic values. Management actions will not reduce water quality within a wetland, or upstream or downstream of a wetland, unless restoration of natural conditions is the primary goal of the activity.").

[353] *See, e.g.*, Record of Decision, p. 15; 2004 Superior National Forest Plan O-SC-1 & associated scenic integrity guidelines ("Management activities will maintain the Forest's scenic resource values by meeting as a minimum the Scenic Integrity Objectives in Table O-SC-1 and on Figure O-SC-1," with 27% of the forest outside the BWCAW managed for high scenic integrity and 61% managed for moderate scenic integrity, generally requiring minimization of negative visible impacts.).

[354] FEIS p. 5-2.

AMERICAN OVERSIGHT

Hardrock mineral development was not addressed, considered, or anticipated in the forest planning process. Nevertheless, lease renewal and associated mine development is inconsistent with general direction in the forest plan for resource protection, including but not limited to direction for managing the BWCAW, water resources, and recreation and scenic integrity. Lease renewal will require a forest plan amendment.

IV. LEASE RENEWAL IS INCONSISTENT WITH OTHER LEGAL OBLIGATIONS

As described below and throughout these comments, renewal of the Twin Metals leases is inconsistent with a host of environmental laws and policies. BLM is obligated to ensure its renewal decision is compliant and consistent with those laws – regardless of whether another federal or state agency is charged with their implementation. FLPMA requires BLM, in developing and implementing land use plans and management activities, to "provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standards or implementation plans" and to "coordinate . . . with the land use planning and management programs of other Federal departments and agencies and of the States and local governments within which the lands are located . . . and of or for Indian tribes."[355] This coordination requirement includes, among other things, working to resolve inconsistencies between land use decisions and non-Federal Government plans and providing for meaningful public involvement of State and local government officials.[356]

A. LEASE RENEWAL IS INCONSISTENT WITH AND VIOLATES THE WILDERNESS ACT OF 1964 AND THE BOUNDARY WATERS CANOE AREA WILDERNESS ACT OF 1978.

1. Requirements of the Wilderness Act of 1964 and the Boundary Waters Canoe Area Wilderness Act of 1978

The The Wilderness Act of 1964 (Public Law 88-577; 16 U.S.C. 1131-1136) ("Wilderness Act" or "1964 Act") established the National Wilderness Preservation System "to secure for the American people of present and future generations the benefits of an enduring resource of wilderness." The 1964 Act designated the Boundary Waters Canoe Area among the original wilderness areas, to preserve and protect its lands and waters in their natural condition so they would be administered for the use and enjoyment of the American people, to ensure they would be left unimpaired for future use and enjoyment as Wilderness, and to preserve their wilderness character, among other reasons.

Section 1(c) of the Act defines wilderness:

> A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of

[355] 43 U.S.C. § 1712(c)(8) & (9).
[356] *Id.* § 1712(c)(9).

AMERICAN OVERSIGHT

> wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.[357]

Section 4(b) of the Act requires each agency to preserve the wilderness character of any wilderness area it administers.[358] This responsibility extends to activities occurring beyond the wilderness boundaries, but which degrade the wilderness character of a designated wilderness area.[359] Federal actions that result in more intense, constant, or frequent pollution or disturbance, or pollution or disturbance of a different type or quality, is more likely to degrade wilderness character from its present condition and thus violate § 4(b).[360]

The Boundary Waters Canoe Area Wilderness Act of 1978[361] ("1978 Act") granted additional protections to the Boundary Waters above and beyond those granted in the Wilderness Act of 1964. For example, it established a Boundary Waters Canoe Area Mining Protection Area (MPA) on 220,000 acres of Superior National Forest lands along roads extending toward the Boundary Waters, and banned all permits, leases, and authorizations for exploration or mining of federal-owned minerals in the BWCAW and MPA, and did the same for non-federal minerals if exploration or mining "may affect navigable waters."[362]

By protecting and enhancing natural values and imposing high environmental standards, the purpose of 1978 Act was to safeguard the BWCAW and MPA from harmful impacts of mineral development. To that end, the 1978 Act provides clear management direction to the Forest Service, including to:

- 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;
- Protect and enhance the natural values and environmental quality of the lakes, streams, shorelines and associated forest areas of the wilderness;
- Maintain high water quality in such areas;
- Minimize to the maximum extent possible, the environmental impacts associated with mineral development affecting such areas.

Congress recognized that by putting most of the lakes in the Boundary Waters off-limits to

[357] 16 U.S.C. § 1131(c)
[358] *Id.* § 1133(b).
[359] *Izaak Walton League of America, Inc. v. Kimbell*, 516 F. Supp. 2d 982 (D. Minn. 2007).
[360] *Id.*
[361] Public Law 95-495
[362] *Id.* at § 11(a).

AMERICAN OVERSIGHT

motorboat use, the 1978 Act was restricting the highly-prized activity of dispersed motorized recreation in the scenic lakeland landscape of the Boundary Waters. Accordingly, and to partially offset the loss of such recreational opportunity in the Boundary Waters, the 1978 Act directs the Secretary of Agriculture to "expedite and intensify the program of dispersed outdoor recreation development on the Superior National Forest outside of the Boundary Waters ... consider[ing] in such new program development the need for … remote campsites on lightly developed lakes" among other things.[363] The purpose of Section 18(a) of the 1978 Act is to ensure that the Superior National Forest areas outside of the Boundary Waters "provide motorized recreation experiences similar to those previously available in the Boundary Waters Canoe Area."[364]

As discussed below, the Boundary Waters is the most-visited Wilderness Area, and has been since 1964, a distinction owed in part to its unparalleled accessibility to people of all ages and abilities. In addition, Birch Lake and the South Kawishiwi River are two of the most popular areas on the Superior National Forest for motorized recreation in a lightly-developed scenic recreational lake setting.[365] They hosts resorts, Voyageurs Outward Bound School, private homes, two developed forest campgrounds and rare, remote, water-access backcountry campsites, as well as two of the most popular entry points to the Wilderness – all of which is located on, along, or immediately adjacent to the leases and proposed sulfide-ore copper mining.

2. The U.S. Forest Service has concluded that renewal of the leases is incompatible with federal responsibilities under the 1964 and 1978 Acts, and the evidence supports that conclusion.

The U.S. Forest Service made clear in its 2016 decision letter that renewal of the leases is incompatible with its obligations, under the 1964 and 1978 Acts, to maintain the quality and character of the Boundary Waters and MPA for present and future generations. Even if any of the available remediation measures and techniques that might be used to attempt to handle and treat that pollution are effective, which the U.S. Forest Service did not concede, few if any are compatible with maintaining the quality and character of the Boundary Waters and MPA.[366] The U.S. Forest Service concluded that "the potential for environmental harm is inherent" to sulfide-ore copper mining, "at all phases of mine development, mineral extraction and processing, and long-term mine closure and remediation,"[367] that the environmental harm to the Boundary Waters that could result from any contamination of the area with [acid mine drainage] and leached metals might be extreme,"[368] and that "any degree of contamination of the Boundary Waters by acid mine drainage and leached metals has the potential to seriously degrade the wilderness area's character and quality."[369]

Renewal of the leases is inconsistent with federal agency obligations under § 4(b) of the Wilderness Act of 1964, and with §§ 2 & 18 of the Boundary Waters Canoe Area Wilderness

[363] *Id*. § 18(a).
[364] *Id*.
[365] MPCA. 2011. A Water Quality Assessment of Select Lakes within the Kawishiwi River Watershed. See p. 40.
[366] *Id.*
[367] USDA Forest Service December 14, 2016 decision letter to USDOI BLM, at p. 15.
[368] *Id.*, at p. 21.
[369] *Id.*

AMERICAN OVERSIGHT

Act of 1978. The leases, by their terms, purport to convey the right to explore for, drill for, mine, extract, remove, beneficiate, concentrate, or otherwise process and dispose of the minerals in the leased areas; and to construct and maintain thereon structures and facilities necessary or convenient for the mining, preparation, and removal of the minerals.[370] "[D]evelopment under a preference right lease 'is a logically foreseen result of successful prospecting'"[371] Renewal of the leases, which the BLM says it will do,[372] is an indication that BLM considers such activities appropriate in the proposed location, and therefore the activities named in the leases are reasonably foreseeable consequences of renewing the leases. The BLM is required to have, but has not, considered the direct, indirect, and cumulative effects of those reasonably foreseeable activities.

Mining, extracting, removing, beneficiating, concentrating, and otherwise processing Duluth Complex ore in the Boundary Waters watershed would have significant negative effects on the Boundary Waters, the MPA, and the Superior National Forest. As detailed in Part V of this comment, these would include pollution and degradation of the existing high quality of the waters, lands, fish and wildlife, air, views, acoustic environment, and other natural values of the Boundary Waters, the MPA, and the Superior National Forest.

a. Water pollution

With respect to the existing extremely high water quality of the Superior National Forest, the MPA, and Boundary Waters, and of Voyageurs National Park and Quetico Provincial Park downstream, peer-reviewed and published science shows how under ordinary operations, pollution from sulfide-ore copper mining in the Rainy River-Headwaters would flow from mining sites through groundwater and surface waters, through the MPA at Fall Lake, and into the Boundary Waters.[373] Peer-reviewed studies of hardrock and sulfide-ore copper mines confirm that despite rosy predictions made in environmental review documents prepared for mine projects, mine plans, pollution control measures, and mitigations regularly fail to predict or prevent the actual groundwater contamination and surface water pollution that consistently occurs at modern hardrock and sulfide-ore copper mines.[374,375,376] The pollution would include sulfates, heavy metals, lowered pH,[377,378] high specific conductance,[379,380,381] and secondary contamination from increased methyl-mercury, nitrogen, and phosphorus.[382] There are no new

[370] *See* 1989 and 2004 Lease renewals at Sec. 2, and 1966 leases at Sec. 1
[371] USDA Forest Service December 14, 2016 decision letter to USDOI BLM, at p. 13, citing and quoting from *John A. Nejedly Contra Costa Youth Association,* 80 IBLA 14, 26 (1984) (concurring opinion).
[372] NEPA #: DOI-BLM-ES-030-2018-0002-EA at p. 6.
[373] Myers 2016b; *See also* Myers 2015; *and* Myers 2016a
[374] Kuipers & Maest, 2006.
[375] Earthworks, 2012, US Copper Porphyry Mines.
[376] Earthworks, 2006, Predicting Water Quality Problems at Hardrock Mines.
[377] Baker, 2013.
[378] Engstrom, D. R. (2017, August 11). Scoping Comment on N. MN Federal Mineral Withdrawal.
[379] WaterLegacy & B. Johnson. (2011, March 10). Letter to MPCA Re- Dunka Mine & Attachments to letter.
[380] Johnson & Johnson, 2015.
[381] Cormier, 2016.
[382] Myrbo, A., E.B. Swain, N.W. Johnson, D.R. Engstrom, J. Pastor, B. Dewey, P. Monson, J. Brenner, M. Dykhuizen Shore, and E.B. Peters. (2017). Increase in nutrients, mercury, and methylmercury as a consequence of

AMERICAN OVERSIGHT

control or mitigation technologies that can alleviate the risk of pollution from mining at the leases reaching the Boundary Waters,[383] and pollution in the Boundary Waters could not be mitigated due to incompatibility with wilderness. Due to the omnipresence, proximity, interconnectedness, lack of buffering capacity, and current low background concentrations of sulfate and specific conductance of the waters, they are both more likely to be polluted and uniquely vulnerable to sulfide-ore copper mining pollution.[384,385,386,387,388] Pollution from mining the leases would be more likely to occur and be more acidic than predicted and observed at mined areas elsewhere in the Duluth Complex.[389] The mining pollutant would increase methyl-mercury formation and concentrations in the environment, especially in popular sport fish and the wildlife and anglers that consume them.[390,391] See Section V, below, for more complete detail.

b. Noise pollution

Construction and operation of a mine on the leases would produce industrial noise pollution at all hours of the day and for decades at a time, at distinct frequencies and volumes loud enough to be audible throughout Birch Lake and in the Boundary Waters. Noise generated by exploration and drilling has already caused considerable disturbance. Despite mining company assurances that noise mitigations would be followed during drilling, significant noise from Twin Metals' exploratory drilling on the leases between 2006 and 2014 damaged the Boundary Waters' Wilderness character on and around the Wilderness lakes of Little Gabbro, Gabbro, and Bald Eagle lakes and the Kawishiwi River,[392] and severely damaged the natural soundscape on and around Birch Lake.[393,394] The same or similar damage from mining, including explosives, drilling, and heavy equipment operations should be expected to reoccur and worsen if the leases are renewed, not only because of additional mining activity on the leases themselves, but also because renewal may incentivize other prospecting permit holders to conduct additional exploration and development.

In addition, the Twin Metals project NI 43-101 Prefeasibility Study Report shows that the engineering plan for mining the Maturi and Maturi Southwest mineralized areas includes a total of six exhaust ventilation raises. The four exhaust ventilation raises in the completed mine

elevated sulfate reduction to sulfide in experimental wetland mesocosms. *Journal of Geophysical Research: Biogeosciences*. (Myrbo, et al, 2017b)

[383] Chambers, 2014.
[384] Kuipers & Maest, 2006.
[385] Baker, 2013.
[386] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.
[387] Johnson & Johnson, 2015.
[388] Cormier, 2016.
[389] Chambers, 2018.
[390] Engstrom, D. R. (2017, August 11). Scoping Comment on N. MN Federal Mineral Withdrawal.
[391] Venturelli, P. and B. Vondracek. (2017). The Fish and Fisheries of the Boundary Waters Canoe Area Wilderness and Voyageurs National Park, and Their Vulnerability to Copper Sulfide Mining. Prepared for Save the Boundary Waters. (Venturelli & Vondracek, 2017).
[392] Reyer & Garwin, 2015. *E.g., see* affidavits testifying to sound-shed degradation experienced inside the BWCAW, caused by exploratory drilling in the former Withdrawal Area.
[393] Declaration of Steven L. Koschak, 10-26-2016.
[394] Declaration of Gail Bollis, 10-27-2016.

AMERICAN OVERSIGHT

design for the Maturi would move 3.25 million cubic feet per minute out of the working faces of Maturi, nearly every hour of nearly every day, for decades during planned mine operations.[395] Mine ventilation raises produce extremely powerful noise levels and, in a similar situation at the Totten Mine near Sudbury Ontario, two such ventilation raises produced nuisance-level industrial noise disturbances at a community in a non-wilderness setting approximately 9 kilometers away, despite use of sound mitigations.[396] Given the proximity of a Twin Metals mine to the Boundary Waters, industrial mining noise has been documented to and would undoubtedly penetrate the Wilderness, severely degrading wilderness character, including opportunities for solitude and the area's naturalness.

c. Air pollution

Fine particulate matter and other haze-forming pollutants would be ejected from the mine in the 3 million cubic feet of exhaust air vented from the mine every minute. Particulate matter would also be emitted from the tailings storage facility, the surface rock storage facility, and the eleven 40 million BTU heating units at the air intake raises for Maturi, along with the haze-forming air pollutants from the approximately 45 megawatts of continuous power demand the Twin Metals project would require,[397] which would likely be provided by re-starting a coal-fired power plant, most likely the coal-fired power plant in Taconite Harbor.[398] These air pollution emissions, separately, combined, and cumulatively with other major sources including taconite furnaces,[399,400] degrade air quality, visibility, and scenic views in the Boundary Waters and Voyageurs National Park – both Class I airsheds.

Renewing the leases and foreseeable consequences of doing so, therefore, would contaminate rather than protect the fish & wildlife in the Boundary Waters and the MPA; diminish rather than enhance public enjoyment and appreciation of the unique biotic resources of the region; degrade the natural values and environmental quality of the lakes, streams, shorelines, and associated forest areas of the Boundary Waters and the MPA; and degrade rather than maintain the high water quality in the Boundary Waters and the MPA – all in violation of the 1978 Act § 2. These degradations separately and in combination with each other, would impair the natural conditions, outstanding opportunities for solitude and primitive recreation, the significant ecological, scenic, and other values, and the primeval character – the wilderness character – of the Boundary Waters in violation of the Wilderness Act § 4(b).

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[395] TMM NI 43-101 Figure 1-2: "Completed Mine Design" at p. 1-21, and Figure 16-5: "Planned Ventilation Plenums and Raises to Surface, Maturi" on p. 16-23.
[396] Acuña, E. and A. (2017). Dobson. Results of the return air raise silencer system upgrade at Totten Mine. J. of Underground Mining Technology 2017.
[397] TMM NI 43-101, Table 21-10 "Surface Power Costs" at p. 21-17.
[398] Slater, B. (2015, July 9). Coal-fired operations to end at Taconite Harbor Energy Center; plant will be idled in 2016. *Duluth News Tribune* (Minnesota Power representative says "the company will explore future options for the Taconite Harbor plant, including […] finding a new mission […].).
[399] Hemphill, S. (2009, August 19). Air Cleanup effort launched in Boundary Waters Area. *MPR News*.
[400] Shaffer, David. (2012, March 23). Feds critical of how Minnesota polices haze over parks. Star Tribune.

AMERICAN OVERSIGHT

d. Destruction of dispersed recreation including water-access backcountry campsites in a lightly-developed scenic lake setting

Industrial noise, air, and water pollution from activities on the leases, would damage the lightly-developed natural setting of Birch Lake and the South Kawishiwi River outside of the Boundary Waters. The introduction of tall industrial buildings, surface waste rock and ore stockpiles, and other mining infrastructure on the shore of Birch Lake would conflict with and degrade the scenic qualities for which Birch Lake's shoreline is managed,[401] as would the shaking and vibrations caused by blasting on the leases. These effects would destroy the atmosphere and primitive quality of the experience at most if not all of the 14 dispersed backcountry water-access campsites which the Forest Service maintains along Birch Lake,[402] and at the two larger Forest Service campgrounds, contrary to the direction and intent of the 1978 Act § 18(a).

e. Degradation of one of the most popular Boundary Waters Wilderness gateways

The same impacts noted immediately above would damage the wilderness experience of visitors in the Gabbro-Bald Eagle Lakes area,[403] and those entering and exiting the Boundary Waters through the South Kawishiwi River and Gabbro entry points. The taint of an industrial mining setting would follow visitors into the Wilderness, and greet them jarringly on their way out. Those who know about the degradation of the setting beforehand would not likely choose to travel through this part of the Boundary Waters; the area would become a "sacrifice zone" to sulfide-ore copper mining. This would be a great loss for visitors and the Boundary Waters.[404]

B. BLM'S ENVIRONMENTAL ASSESSMENT DEMONSTRATES THAT RENEWAL OF THE TWIN METALS LEASES THREATENS TO VIOLATE THE CLEAN WATER ACT.

The Clean Water Act (CWA) requires states to establish water quality standards for every body of water within a state. *See* 33 U.S.C. § 1313. These standards include three components:

(1) designated uses for each body of water (e.g., recreational, agricultural, or industrial uses);
(2) specific limits on the levels of pollutants necessary to protect those designated uses; and
(3) an antidegradation policy designed to protect existing uses and preserve the present condition of the waters.

See 40 C.F.R. §§ 131.10-12. The antidegradation policy is further divided into three general levels of protection. "Tier I" establishes the minimum level of water quality that must be maintained in every body of water. *See id*. § 131.12(a)(1). "Tier II" applies to waters whose

[401] 2004 Superior National Forest Plan, Figure MAS-1 "Superior National Forest Management Areas"
[402] USFS. (2008). Birch Lake Back Country Brochure.
[403] Declaration of Paul Schurke, 7-5-2015, paragraphs 1-8, in Reyer & Garwin, 2015:
[404] *Id.*, paragraphs 9-16.

AMERICAN OVERSIGHT

quality already exceeds the level "necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water," and only allows a reduction in quality when "necessary to accommodate important economic or social development." *Id*. § 131.12(a)(2). For a state's highest quality waters where ordinary use classifications may not suffice, "Tier III" prohibits any degradation of existing water quality standards with a limited exception for short-term or temporary changes in quality. Waters falling into Tier III are designated "outstanding National resource waters" (ONRW):

> Where high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

See id. § 131.12(a)(3); Water Quality Standards Regulation, 48 Fed.Reg. 51400-51403 (1983) (preamble).

Per the federal CWA's antidegradation mandate described above, the state of Minnesota designated waters in both the Boundary Waters Canoe Area Wilderness (Boundary Waters or Wilderness) and Voyageurs National Park (Voyageurs National Park or Park) as "outstanding resource value waters" (ORVWs). Minn. R. 7050.0335, Subp. 3. In Minnesota, ORVWs are further classified as either "prohibited" or "restricted." Prohibited ORVWs receive the highest level of protection:

> The commissioner shall prohibit a proposed activity ***that results in a net increase in loading***[405] ***or other causes of degradation***[406] to prohibited outstanding resource value waters identified under part 7050.0335, subparts 3 and 4.

Minn. R. 7050.0265, Subp. 7 (emphasis added). Minn. R. 7050.0255, Subp. 26(A) defines "net increase in loading or other causes of degradation" to mean "***any*** loading or other causes of degradation resulting from the proposed activity" when applied to a proposed activity that is not regulated by a CWA section 401 certification or a CWA NPDES permit.

Given this highly restrictive standard, BLM's decision to renew the leases threatens to violate both the federal Clean Water Act and Minnesota's state-level counterparts. Based on the facts set forth below, it is not reasonable to assume that the antidegradation standards that apply to the Boundary Waters and Voyageurs National Park would or could be maintained if sulfide-ore copper mines are developed in the location of the proposed leases:

[405] Minn. R. 7050.0255, Subp. 22: "Loading" means the quantity of pollutants, expressed as mass, resulting from a discharge or proposed discharge to a surface water.

[406] Minn. R. 7050.0255, Subp. 11: "Degradation" or "degrade" means a measurable change to existing water quality made or induced by human activity resulting in diminished chemical, physical, biological, or radiological qualities of surface waters. For municipal sewage and industrial waste discharges, degradation is calculated at the edge of the mixing zone upon reasonable allowance for dilution of the discharge according to part 7053.0205, subparts 5 to 7.

AMERICAN OVERSIGHT

- The location of the proposed leases is uniquely vulnerable to long term damage that would be reasonably expected from low-grade sulfide-ore copper mines, whether underground or open pit.[407, 408, 409]
- The proposed lease areas are located on public lands with public minerals in the Superior National Forest.
- One of the proposed lease areas is immediately adjacent to the Boundary Waters; the second proposed lease area is within three to five miles of the Wilderness boundary.[410]
- The Boundary Waters is 1.1 million acres in size and is part of the 3-million-acre Superior National Forest. The Superior National Forest, including the Boundary Waters, represents less than 2% of the National Forest System's combined acres and holds 20% of the 193-million acre National Forest System's freshwater.[411]
- The location of the proposed leases is adjacent to and along lakes and rivers that flow directly into the Boundary Waters and downstream into Voyageurs National Park.[412]
- The Boundary Waters and Voyageurs National Park are highly valuable national resources for a host of reasons,[413, 414, 415] but notably because both the Wilderness and the Park have waters of extremely high quality and contain among the cleanest water in the nation.[416, 417] Mining in the watershed of the Wilderness threatens an extremely valuable and rare national natural resource – abundant clean water of a National Wilderness Area and of a National Park – with multiple kinds of water quality degradation from sulfate pollution. Adding sulfate increases methylmercury concentrations in water and fish, increases concentrations of eutrophying pollutants nitrogen and phosphorus in the water,

[407] Kuipers & Maest, 2006.
[408] Levit, 2018b, Follow-up Report.
[409] Myers 2016b.
[410] *See* NMW_Map_TMM – new facilities footprint, in Appendix (folder "Maps")..
[411] USDA Forest Service. (2018). Water Resources of the Superior National Forest. https://www.fs.usda.gov/detail/superior/about-forest/?cid=fsm91_049844.
[412] *See* NMW_Map – Waters at risk of pollution from sulfide-ore mining in the Rainy River Basin , in Appendix (folder "Maps"). Note that this map depicts the path of contaminants flowing from the Twin Metals lease sites as well as from additional Federal prospecting permit sites.
[413] Phillips & Alkire, 2017.
[414] Keeler, et al, 2015.
[415] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.
[416] Myers, T. 2013. "Technical Memorandum: Twin Metals Mining and the Boundary Waters Canoe Area Wilderness, Risk Assessment for Underground Metals Mining." Prepared for Northeastern Minnesotans for Wilderness. Hereinafter, (Myers 2013).
[417] Minnesota Rules 7050.0335, Subp. 3 designates the waters within both the BWCAW and VNP as "Prohibited Outstanding Resource Value Waters."

AMERICAN OVERSIGHT

aids the spread of non-native hybrid cattail and other invasive species, and harms wild rice and other important native aquatic vegetation.[418, 419, 420, 421, 422, 423, 424, 425, 426, 427]

- Research shows the geology underlying portions of the Superior National Forest and Boundary Waters, including the Duluth Complex geology within the Boundary Waters watershed, is characterized by a groundwater network of fractures and fissures.[428, 429, 430] Numerous studies including peer-reviewed, published science shows that contaminated groundwater from sulfide-ore copper mines in the proposed lease areas would be transported via these fractures and fissures deep into the Boundary Waters and/or into surface waters that flow to the Boundary Waters, without interception or treatment, noticed or unnoticed, and continue for decades or centuries.[431, 432, 433] This contaminated water would have a pathway to flow via surface waters or via fractures and fissures into Voyageurs National Park.[434]
- Because the leased areas are located in an extensive interconnected water-intensive ecosystem, acid mine generation from proposed mines would lead to pollution flowing into Mining Protection Area, and across the Wilderness boundary into the Boundary Waters and from there into Voyageurs National Park.[435, 436]
- Peer-reviewed science published in the Journal of Hydrology documents how sulfide-ore copper mining pollution generated by mines in the proposed lease areas, whether

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[418] Myers 2016b.
[419] Lake of the Woods Water Sustainability Foundation. (2014). Rainy-Lake of the Woods – State of the Basin Report. (Rainy-Lake of the Woods, 2014, State of the Basin Report).
[420] Myrbo, et al, 2017a.
[421] Myrbo,et al. 2017b.
[422] Pollman, C.D., E.B. Swain, D. Bael, A. Myrbo, P. Monson, and M. Dykhuizen Shore. (2017). The evolution of sulfide in shallow aquatic ecosystem sediments – an analysis of the roles of sulfate, organic carbon, iron, and feedback constraints using structural equation modeling. *Journal of Geophysical Research: Biogeosciences*. 122. (Pollman, et al, 2017).
[423] Pastor, et al. 2017.
[424] Ng, G.-H. C., et al. (2017), Modeling hydrologic controls on sulfur processes in sulfate-impacted wetland and stream sediments, *J. Geophys. Res. Biogeosci.*, 122, 2435–2457, doi:10.1002/2017JG003822.
[425] LaFond-Hudson, S., N.W. Johnson, J. Pastor, and B. Dewey. (2018). Iron sulfide formation on root surfaces controlled by the life cycle of wild rice. (*Zizania palustris)*. *Biogeochemistry* 141: 95. https://doi.org/10.1007/s10533-018-0491-5
[426] Levit, S. (2018a). White Paper: An Overview of Mine Facilities and Issues. Center for Science in Public Participation. (Levit 2018a.).
[427] Levit, 2018b, Follow-up Report.
[428] Siegel, D.I. and S.W. Ericson. (1980). Hydrology and water quality of the Copper-Nickel Study region, northeastern Minnesota- U.S. Geological Survey Water-Resources Investigations 80-739. P.7. (Siegel & Ericson, 1980).
[429] Myers 2013.
[430] Barr Engineering. (2014). Hydrogeology of Fractured Bedrock in the Vicinity of the NorthMet Project. Prepared for PolyMet Mining, Inc., p. 2. (Barr Report 2014).
[431] Myers 2016b.
[432] Myers 2014.
[433] Myers 2016a.
[434] Myers 2015.
[435] *See* NMW_Map – Waters at risk of pollution from sulfide-ore mining in the Rainy River Basin, in Appendix (folder "Maps").
[436] *See* BWCAW & VNP Watershed Area at Risk, with mining-exploration-district, in Appendix (folder "Maps").

AMERICAN OVERSIGHT

produced underground or on the land surface, would quickly intercept surface waters and flow across the Wilderness boundary and into the waters of the Boundary Waters.[437]

- "In addition to the existing high-water quality of the waters, the dramatic hydrogeology and interconnectedness of the Boundary Waters' forests, lakes, streams, and wetlands make the region unique and susceptible to degradation" – U.S. Forest Service Chief T. Tidwell.[438]
- Because of unique water chemistry the waters of the Boundary Waters and Voyageurs National Park are highly vulnerable to acid mine drainage. The waters have a near-absence of base compounds, meaning the water lacks the acid-buffering capacity that could otherwise maintain the existing pH. [439, 440, 441, 442] The introduction of acid mine drainage would lead to a profound decrease in water pH (making the water acidic) and lead to significant loss of aquatic plants and fisheries.[443, 444, 445]
- The forest and abundance of wetland trees in the Boundary Waters and the Park are uniquely vulnerable to acid mine drainage because of the extremely high degree of interconnectedness between terrestrial soils and water.[446, 447]
- The large volume of waste from the sulfide-bearing ore body increases the risk of acid mine drainage. Mines in the proposed lease areas would be developed in an ore body that has less than 1% mineral content. Ninety-nine percent of the extracted sulfide-bearing ore would be waste.[448]
- The waste (in waste rock or tailings) would be a major source of acid mine drainage for centuries;[449] EIS modeling for a proposed copper mine in the same sulfide-bearing ore complex (NorthMet) showed generation of acid mine drainage for more than 200 years at some sites and more than 500 years at other sites.[450, 451] The mineralized areas under the

[437] Myers 2016b.
[438] USDA Forest Service December 14, 2016 decision letter to USDOI BLM, p. 1.
[439] Siegel & Ericson, 1980.
[440] Baker, 2013.
[441] Myers 2013.
[442] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.
[443] Baker, 2013.
[444] Venturelli & Vondracek 2017.
[445] Jenning, S.R., Neuman, D.R., & Blicker, P.S. 2008. "Acid Mine Drainage and Effects on Fish Health and Ecology: A Review." Reclamation Research Group Publication, Bozeman, MT.
[446] Frelich, 2014.
[447] Frelich, 2018.
[448] *See* Table 1-4, Mineral Resource Statement, TMM NI 43-101, p. 56 [a.k.a. Page 1-16].
[449] Bowker & Chambers, 2015.
[450] FEIS PolyMet Pollution Graphs with water quality standards – Water Quality Modeling Results for Nickel and Sulfate at Mine Site West Pit – Mitigation will be required for at least 200 years at the Mine Site and 500 years at the Processing Site.
[451] MN DNR. (2013) SDEIS on NorthMet Project, Chapter 5 (*See, e.g.,* p. 5-7: "Both mechanical and non-mechanical treatment would require periodic maintenance and monitoring activities. Mechanical water treatment is part of the modeled NorthMet Project Proposed Action for the duration of the simulations (200 years at the Mine Site, and 500 years at the Plant Site)."); *and see* MN DNR. (2009) DEIS on NorthMet Project, Volume I, p. 4.1-80, Fig. 4.1-45, showing groundwater exceedences for antimony, sulfate, nickel, manganese lasting for ~50 – 2000 years.

AMERICAN OVERSIGHT

federal mineral leases proposed for renewal, if mined, would be more likely to generate more acidic mine drainage (AMD) than the NorthMet project and the Dunka Pit.[452]

- There is no technology in existence or in development that can be guaranteed to contain or treat acid mine drainage, especially in a water-intensive ecosystem.[453, 454]
- Sulfide-ore copper mines have a consistent track record of water pollution[455] resulting from the mine operations, including from accidents, human-caused design or operational errors, and similar unintended but nonetheless common events such as burst or corroded pipes, stuck valves, other mechanical failures, and catastrophic failures.[456, 457, 458] A 2012 peer-reviewed study of modern copper mines in the United States representing 89% of U.S. copper production found that 100% of the mines studied had experienced pipeline spills or other accidental releases, and 92% had experienced water collection and treatment failures resulting in significant negative effects on water quality.[459]
- Water pollution in the Boundary Waters cannot be fixed, mitigated, or remedied; the damage would be irreparable.[460, 461] The laws governing National Wilderness Areas prohibit water treatment in the Boundary Waters.
- Consideration of the near-certainty of significant negative impacts of sulfide-ore copper mining on water quality must be rigorously analyzed in this EA and, according to NEPA, in an EIS prior to the granting or renewing of these federal mineral leases in the Boundary Waters watershed. The consistent over-optimism of modern hardrock mine project plan NEPA reviews, their failure to accurately predict negative water quality impacts, and their consistent overestimation of the effectiveness of mitigation measures,[462] also must be analyzed and taken into account here and in an EIS prior to

[452] Chambers, D. M. 2018. "Potential for Acid Mine Drainage in the Duluth Complex Magmatic PGE Deposits." Center for Science in Public Participation, Bozeman, MT.
[453] Chambers, 2014.
[454] Levit, 2018b, Follow-up Report.
[455] EPA, 2000.
[456] Chambers, D.M. (2015). A Review of the "Report on Mount Polley Tailings Storage Facility Breach, Independent Expert Engineering Investigation and Review Panel." Center for Science in Public, Bozeman, MT. (Chambers, 2015).
[457] Earthworks, 2013. Polluting the Future.. Polluting the Future.
[458] Rico, et al, 2008.
[459] Earthworks, 2012, US Copper Porphyry Mines.
[460] Chambers, 2014.
[461] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.
[462] The Kuipers & Maest 2006 peer-reviewed study of predictions of sulfide-ore copper mine water quality performance for 25 representative hardrock mines (52% still operating, 48% closed) proved that predictions usually did not match the actual water pollution outcomes. Sixty percent (15/25 or 60%) had mining-related exceedances in surface water and 64% (16/25) had exceedances of drinking water standards in groundwater, even though more than half of the mines were still operating. Most of the mine EISs predicted no impacts to surface water quality after mitigation was in place but impacts occurred in a majority of the cases. For mines in close proximity to groundwater or surface water and with high AMD or contaminant leaching potential, 93% had impacts to groundwater, and 85% had exceedances of standards or permit limits in surface water as a result of mining activity.

AMERICAN OVERSIGHT

renewal or granting of leases in the Boundary Waters watershed.[463, 464, 465, 466, 467, 468, 469, 470] The only rational conclusion from the failure to predict negative water quality impacts is that before even considering granting or renewing federal leases for sulfide-ore copper-nickel mining in the Boundary Waters watershed, there should have been completed a full and comprehensive environmental analysis and review of whether this watershed is an appropriate place to consider leasing to an industry with such a high likelihood of significant irreparable impacts to irreplaceable national lands and our most-visited Wilderness Area.[471, 472, 473, 474, 475, 476, 477, 478]

- Even if treatment or mitigation were allowed within and throughout the Wilderness, the extraordinarily water-intensive landscape of the Boundary Waters, which it is not,[479] with its extensively interconnected and sensitive waters, precludes any assurance that treatment or mitigations would prevent mine degradation of the existing extremely high water quality.[480, 481]

Because of the interconnectedness of the surface and ground waters in the region, water contamination that would result from proposed mines threatens the waters of the Boundary Waters, the Superior National Forest, and Voyageurs National Park and the MPA and its state-level counterpart. Also threatened would be Canada's Quetico Provincial Park, a wilderness park located across the international border and protected by the Boundary Waters Treaty of

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[463] Sherlock, E.J. (1995). Evaluation of Static and Kinetic Prediction Test Data and Comparison with Field Monitoring Data" (MAS thesis). Retrieved from MEND database. MEND Project 1.16.4.
[464] Levit, 2018b, Follow-up Report.
[465] Earthworks, 2012, US Copper Porphyry Mines.
[466] Earthworks, 2006, Predicting Water Quality Problems at Hardrock Mines.
[467] Robertson, 2011.
[468] Earthworks, n.d.
[469] Earthworks. (2004). Hardrock Mining: Risks to Community Health.
[470] Earthworks, 2013. Polluting the Future..
[471] Chambers, D.M. & B. Higman. (2011). Long Term Risks of Tailings Dam Failure. Center for Science in Public Participation, Bozeman, MT, and Ground Truth Trekking, Seldovia, AK. (Chambers & Higman, 2011).
[472] Hughes, R.M., F. Amezcua, D.M. Chambers, W.M. Daniel, J.S. Franks, W. Franzin, D. MacDonald, E. Merriam, G. Neall, P. dos Santos Pompeu, L. Reynolds, and C.A. Woody. (2016). AFS Position Paper and Policy on Mining and Fossil Fuel Extraction, Fisheries, 41:1, 12-15, DOI:10.1080/03632415.2016.1121742. (Hughes, et al, 2016, AFS Position Paper).
[473] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.
[474] USDOI Bureau of Land Management (2016). *Obama Administration Takes Steps to Protect Watershed of the Boundary Waters Canoe Area Wilderness*. Available at: https://www.blm.gov/press-release/obama-administration-takes-steps-protect-watershed-boundary-waters-canoe-area .
[475] USDA (2016, December 5). Obama Administration Takes Steps to Protect Watershed of the Boundary Waters Canoe Area Wilderness. Press Release. Available at: https://www.usda.gov/media/press-releases/2016/12/15/obama-administration-takes-steps-protect-watershed-boundary-waters.
[476] USDA Forest Service (2017, February 1). Application for Withdrawal to Secretary of Interior; Superior National Forest; Cook, Lake, and Saint Louis Counties, Minnesota.; *see also* usfs_withdrawal_application_maps_dnr_figures1_8_as_of_jan20_2017, in Appendix (folder "Maps").
[477] *See* 2016-12-14 Superior National Forest Mineral Withdrawal Application Map, in Appendix (folder "Maps").
[478] USDA Forest Service. (n.d.). Questions and Answers on lease decision Available at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd527646.pdf [Accesses 3 Jan. 2019].
[479] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.
[480] Levit, 2018b, Follow-up Report.
[481] Myers 2013.

AMERICAN OVERSIGHT

1909 wherein the United States has committed to not pollute the waters of Canada. If mines in the proposed lease area included a tailings storage area south of the Laurentian Divide, acid mine drainage from those tailings would flow into the Boundary Waters watershed,[482] and also threaten Lake Superior and downstream waterways between the tailings basin and Lake Superior.

The environmental assessment fails to account for or evaluate any of the factors outlined above, despite the fact that all this and more was documented in comments and materials submitted to the U.S. Forest Service and BLM. Any NEPA review must include the potential for negative impacts associated with pre-mining and mining activities, since that is the purpose of the leases and hence reasonably foreseeable consequence of renewing the leases. The significant negative impacts outlined above and in prior comment letters and appendix materials submitted to the agencies, which are herein incorporated and included, must be studied prior to granting or renewing any mineral leases in the Boundary Waters watershed.

C. RENEWAL OF THE LEASES THREATENS TO VIOLATE THE BOUNDARY WATERS TREATY OF 1909 BETWEEN THE UNITED STATES AND CANADA

The United States and Canada signed the Boundary Waters Treaty in 1909 (Treaty), in recognition that each country is affected by the other's actions in lake and river systems along the lakes and rivers that form much of the international border,.[483] By Treaty, each country agreed not to cause a variety of injuries to the other by mistreatment of their shared "boundary waters."[484] Article IV of the Treaty commits Canada and the United States to ensure neither country will pollute the waters forming or flowing across their common border to the injury of property or health on the other side.[485]

The Treaty created the International Joint Commission (IJC), composed of three commissioners appointed by each country, and and charges it with preventing and resolving disputes involving the boundary waters, according to the principles established in the Treaty.[486] The IJC maintains a number of water system-specific boards to address issues, including water quality, at river, lake system, or watershed scales. One such board is the International Rainy-Lake of the Woods Watershed (IR-LOWW) Board. The Kawishiwi River drains the eastern-most U.S. headwaters of the International Rainy-Lake of the Woods watershed.

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[482] Myers 2016.

[483] The Boundary Waters Treaty of 1909

[484] TheTreaty, in its "Preliminary Article" defines "boundary waters":

> For the purpose of this treaty boundary waters are defined as the waters from main shore to main shore of the lakes and rivers and connecting waterways, or the portions thereof, along which the international boundary between the United States and the Dominion of Canada passes, including all bays, arms, and inlets thereof, but not including tributary waters which in their natural channels would flow into such lakes, rivers, and waterways, or waters flowing from such lakes, rivers, and waterways, or the waters of rivers flowing across the boundary.

[485] *Id.*, Article IV: "boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other."

[486] The Boundary Waters Treaty of 1909, Art. III. The Treaty specifies that each country picks three members of the IJC.

AMERICAN OVERSIGHT

The IR-LOWW Board coordinates bi-national water quality efforts for the transboundary watershed, and monitoring and reporting on its ecological health and water quality, and reports to the IJC on the status of the watershed and issues of concern..[487] In October, 2014, the IR-LOWWB brought to the IJC its concern that a large number of proposals for mining in the transboundary area draining to Lake of the Woods had the potential to increase mining contamination of the boundary waters in the IR-LOWW. It noted that such contamination had happened during an earlier period of mining, as evidenced by high levels of heavy metal contaminants in bottom sediments, documented in the Board's 2014 Rainy-Lake of the Woods State of the Basin Report. The Board noted that it planned to study the vulnerability of the boundary waters to contamination from mining, and requested that the IJC seek guidance from the two signatory governments as to how a cumulative effects analysis of potential mining pollution should be coordinated between the two governments and their subdivisions.[488]

The IJC responded that it shared the Board's concerns, and in January, 2015, wrote to the Canadian Foreign Affairs Office and the U.S. State Department, forwarding the request, asking for clarification from the governments, "on how cumulative effects and transboundary effects are being assessed not only in general but with a particular interest in the Lake of the Woods basin."

The prohibition by treaty on pollution of the boundary waters is a significant issue that should have been addressed but is ignored in the EA. Too much evidence has been delivered to the BLM directly, and by and through the U.S. Forest Service, for it to be unaware of the "unacceptable risk of pollution" posed by sulfide-ore copper mining in the Rainy-River Headwaters.[489]

It is reasonably foreseeable that renewing the leases will lead to the connected action of sulfide-ore copper mining—a type of mining that has a history of generating pollution lasting centuries—will generate pollution including but not limited to heavy metals, low pH, and sulfate pollution. Sulfate is conservatively transported and would flow from the leases into the boundary waters.[490] Renewing the leases, in other words, will lead to the pollution by the United States not only of the Boundary Waters, but of the boundary waters covered by the Boundary Waters Treaty of 1909.

As discussed and below (Section V), sulfate pollution is now understood to be quite ecologically active and harmful. It is well-documented that in low-sulfate waters such as those of the Boundary Waters, Quetico Provincial Park, and Voyageurs National Park, addition of sulfate leads to increased concentrations of the neurotoxin methyl-mercury, which bio-accumulates in the food chain to dangerous levels in fish, making it unsafe for regular consumption, particularly

[487] (2014, October 21). Letter from IR-LOWWB to the US and Canadian IJC Secretaries.
[488] *Id.*
[489] USDA Forest Service December 14, 2016 decision letter to USDOI BLM; *see also* Myers 2016b.
[490] From the leases, the flow of water would carry pollution via Birch Lake and the South Kawishiwi River, through White Iron, Farm, Garden, Fall, and Newton Lakes, into Pipestone and Jackfish Bays of Basswood Lake, one of the boundary waters covered under the Treaty. From there it would continue along the border route, through a series of boundary lakes and rivers – Basswood River, Crooked Lake, Iron Lake, Bottle Lake, Lac La Croix, the home of the Lac La Croix First Nation and the Neguaguon Lake Indian Reserve. From there, it would flow partly through the Namakan River, which is entirely in Canada, and partly through Loon Lake, Loon River, Little Vermilion Lake, and Sand Point Lake. Both paths flow to Namakan Lake and then Rainy Lake.

AMERICAN OVERSIGHT

for women pregnant or of childbearing age, and for children. Sulfate also leads to increased concentrations of phosphorus and nitrogen in the water column, two nutrients which can lead to ecologically harmful eutrophication and algal blooms in formerly healthy lakes, and harm its value for A variety of uses.[491,492,493,494,495]

The EA fails to address in any way the potential for renewing the leases, alone and cumulatively with other mining projects in the IR-LOW watershed, to contaminate boundary waters to the harm of health and property, in violation of the Boundary Waters Treaty of 1909.

D. LEASE RENEWAL VIOLATES THE WEEKS ACT AND SECTION 402 OF THE REORGANIZATION PLAN NO. 3 OF 1946

A significant portion of the lands covered by the Leases is land acquired under the Weeks Act.[496,497,498] An examination of U.S. Forest Service GIS data indicates that Weeks Act lands amount to slightly more than 820 acres of lease MNES-001353, including most of the surface at the Spruce Road mineralized area, and more than 200 acres of lease MNES-001352, including nearly all of the surface at the Maturi Southwest mineralized area.[499] This is important, because mineral development is a logically foreseen result of renewing the Leases, and both the Spruce Road and Maturi Southwest, if mined, would likely be developed by open-pit methods or be mined to the surface. Evidence for this with respect to the Maturi Southwest mineralized area is provided in the Twin Metals Project Prefeasibility Study Report.[500] The Spruce Road mineralized area has relatively consistent mineralization from at or near the surface on down, and a 2010 Minnesota Department of Natural Resources (DNR) map shows that mining Spruce Road as an underground mine would require it to forego two-thirds or more of the mineralized tons, which might prevent the area from being economical to mine.[501] In short, the BLM must consider the foreseeable impacts of mining these deposits, which are on acquired lands within the leases and will require surface mining operations.

Under the Weeks Act, mineral development on acquired lands is authorized only when "deem[ed] to be for the best interests of the United States" by the leasing agency.[502] The

[491] Myrbo, et al, 2017a.
[492] Myrbo, et al, 2017b.
[493] Pollman, et al, 2017.
[494] Pastor, et al, 2017.
[495] Engstrom comment 2017.
[496] USDA Forest Service December 14, 2016 decision letter to USDOI BLM, P. 7-8
[497] NMW Map: "Land Acquisition Authority Types" January, 2015, using relevant data from US Forest Service.
[498] NMW Map: "Metallic Mineral Interests in the Rainy River Basin"
[499] NMW has used U.S. Forest Service GIS layers to arrive at these numbers. The U.S. Forest Service and the BLM should review the U.S. Forest Service data independently to confirm the acquisition authority and purposes for every parcel covered by the Leases.
[500] Per TMM NI 43-101 at p.274 [a.k.a. Page 14-30], Maturi SW "will likely be mined to the surface at some point in the future."
[501] Minnesota DNR Division of Lands and Minerals map, "Duluth Complex Mineral Deposits." The map shows tonnages of mineralized rock at different metals concentrations, under two scenarios: "Spruce Road Open Pit" is associated with 377 million tonnes indicated and 24 million tons inferred, and "Spruce Road Underground" is associated with 124 million tonnes.
[502] 16 U.S.C. § 520.

AMERICAN OVERSIGHT

Reorganization Plan No. 3 of 1946, Section 402, transferred authority over mineral leasing decisions on acquired lands from the Secretary of Agriculture to the Department of the Interior, "*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."[503] In other words, the Plan prohibits the Secretary of Interior from authorizing mineral development unless the Secretary of Agriculture reports that the mineral development on those lands will not conflict with the original purposes for which the lands were acquired. The BLM's regulations at 43 C.F.R. § 3507.19(b) implement these statutory obligations and require that BLM consider the following when making leasing decisions: (1) the relevant land use plan created by the surface managing agency, (2) unsuitability criteria under 43 C.F.R. subpart 1610, (3) any environmental impacts, and (4) the purposes of the statute under which the lands were acquired, before granting or denying a lease. The EA fails to demonstrate adequate consideration of these factors or compliance with the Weeks Act or section 402 of the Reorganization Plan No. 3. In fact, lease renewal would be entirely inconsistent with the purposes for which the land was acquired and not in the "best interests of the United States," as discussed below and throughout these comments.

Development of the Spruce Road and Maturi Southwest mineralized areas would destroy and degrade the surface and surface uses, in direct conflict with the Weeks Act purposes for which those acquired lands were acquired – and, therefore, in violation of section 402 of the Reorganization Plan No. 3. Under the Weeks Act of 1911, as amended,[504,505] Congress authorized and directed the Secretary of Agriculture "to examine, locate, and purchase such forested, cut-over, or denuded lands within the watersheds of navigable streams as […] may be necessary to the regulation of the flow of navigable streams or for the production of timber." These Weeks Act purposes require that the surface of the acquired lands remain intact and that the water flowing to and from them remain unpolluted; the Weeks Act purposes are incompatible with consistently pollution-generating sulfide-ore copper mining and the open-pit or "mined to the surface" mining methods that are reasonably foreseeable if the Leases are renewed.

Where Weeks Act land was acquired with funding appropriated by statutes that have their own additional primary purposes, such as recreation, Reorganization Plan No. 3 requires consistency with those additional purposes as well.[506] Because the EA fails to even discuss the primary purposes for which the leased land was acquired, it is unclear whether there are primary purposes in addition to watershed protection and timber production that are inconsistent with lease renewal.

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[503] Reorganization Plan No. 3 of 1946, § 402.
[504] 16 U.S.C. § 515
[505] In fact, for the proposed NorthMet Mine on the Superior National Forest, the Forest Service determined that the mine proposal is inconsistent with the Weeks Act and that therefore the agency "is not willing or able to authorize such private, surface mining operations on lands of the Superior National Forest." January 2017 NorthMet Project Land Exchange Record of Decision, p. 1.
[506] *See Gifford Pinchot Task Force v. Perez*, No. 03:13-CV-00810-HZ, 2014 WL 3019165 (D. Or. July 3, 2014).

AMERICAN OVERSIGHT

BLM must consult with the Forest Service about the foreseeable impacts of lease renewal and mine development on acquired lands and may not proceed with lease renewal unless and until the Secretary of Agriculture determines that such development will not interfere with the primary purposes for which the lands were acquired. Given the impacts discussed above and the information in the record, such a determination is simply not possible: lease renewal and sulfide-ore copper mining is decidedly incompatible with the watershed protection and timber production for which the SNF lands were acquired. As discussed throughout these comments, BLM cannot avoid compliance with governing legal obligations – including those under section 402 of the Reorganization Plan No. 3 and the Weeks Act – based on its faulty legal interpretation that lease renewal is mandatory.

E. BLM'S ENVIRONMENTAL ASSESSMENT DEMONSTRATES THAT RENEWAL OF THE TWIN METALS LEASES THREATENS TO VIOLATE THE ENDANGERED SPECIES ACT.

The Endangered Species Act ("ESA") represents "the most comprehensive legislation for the preservation of endangered species ever enacted by any nation." *Tenn. Valley Authority v. Hill*, 437 U.S. 153, 180 (1978). Congress intended federal agencies to afford endangered species "the highest of priorities," and "to halt and reverse the trends towards a species extinction, whatever the cost." *Tenn. Valley Authority*, 437 U.S. at 174, 184, 194.

"The heart of the ESA is section 7(a)(2)," which requires each federal agency, in consultation with the US Fish and Wildlife Service (FWS), to ensure that any proposed action authorized, funded, or carried out by the action agency is not likely to "jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat." *W. Watersheds Project v. Kraayenbrink*, 632 F.3d 472, 495 (9th Cir. 2011), citing16 U.S.C. § 1536(a)(2). During consultation, the action agency and FWS must use the best scientific data available. 16 U.S.C. §1536(a)(2).

"Action" is broadly defined under the ESA to include the granting of a lease, and actions that directly or indirectly cause modifications to the land, water, or air. 50 C.F.R. § 402.02. Moreover, "effects of the action" is defined to include "the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline." *Id*. "Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur." *Id*. "Interrelated actions are those that are part of a larger action and depend on the larger action for their justification." *Id*. And interdependent actions "are those that have no independent utility apart from the action under the consideration." *Id*.

As explained by FWS in its Consultation Handbook,

> As a practical matter, the analysis of whether other activities are interrelated to, or interdependent with, the proposed action under consultation should be conducted by applying a "but for" test. The biologist should ask whether another activity in question would occur "but for" the proposed action under consultation. If the answer is "no," that

AMERICAN OVERSIGHT

> the activity in question would not occur but for the proposed action, then the activity is interrelated or interdependent and should be analyzed with the effects of the action.

FWS Consultation Handbook, 4-27.[507]

The action agency is required to review its proposed action "at the very earliest time" to determine whether the action "may affect" a listed species or critical habitat. 50 C.F.R. §402.14(a). The "may affect" threshold for when a proposed action triggers ESA consultation is low. *Western Watersheds Project v. Kraayenbrink*, 632 F.3d 472, 496 (9th Cir. 2011). Under the "may affect" standard, "[*a]ny possible effect*, whether beneficial, benign, adverse, or of an undetermined character, triggers formal consultation." 51 Fed. Reg. 19,926, 19,949 (June 3, 1986) (emphasis added); *Karuk Tribe of California, v. U.S. Forest Service*, 681 F.3d 1006, 1027 (9th Cir. 2012); *see also* FWS Consultation Handbook at xvi (the "may affect" standard is satisfied "when a proposed action may pose any effects on listed species or designated critical habitat.").[508]

The first step of the consultation process is for the action agency to request from FWS information whether any listed or proposed species, or designated critical habitat, may be present in the area of the proposed action. 16 U.S.C. §1536(c)(1); 50 C.F.R. § 402.12(c). If FWS advises, based on the best scientific data available, that such species may be present, the action agency must prepare a "biological assessment." 16 U.S.C. §1536(c)(1).

For the proposed mineral lease renewal, listed species and critical habitat are present in the proposed action area. The Boundary Waters and the Superior National Forest are home to the Canada lynx, gray wolf, and northern long-eared bat, and include designated critical habitat for the lynx and wolf:

- The threatened Canada lynx has been repeatedly observed in the Boundary Waters and Superior National Forest, and the entire action area is within the designated critical habitat for the species.[509, 510, 511, 512, 513] Similarly, the threatened gray wolf has been observed throughout the Boundary Waters and Superior National Forest, and the proposed action area is within the designated critical habitat zones 1 and 2 for the species.[514]

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[507] Available at https://www fws.gov/ecological-services/es-library/pdfs/esa_section7_handbook.pdf.
[508] The consultation process applies both to actions taken directly by federal agencies, and to actions taken by private parties that require federal agency permits, approval, or funding. 51 Fed. Reg. 19926 (June 3, 1986); 50 CFR § 402.01.
[509] *See* USFS Map: "Lynx Critical Habitat and Foraging Habitat" in Appendix (folder "Maps").
[510] *Revised Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx and Revised Distinct Population Segment Boundary*. 79 Fed. Reg. 54781, 54843 (September 12, 2014).
[511] *See* HofC_Map- Lynx Critical Habitat, in Appendix (folder "Maps").
[512] Heart of the Continent School Trust Lands Initiative. (2016). Map of Critical Habitat.
[513] Moen, R., et al. 2008. Movement and Habitat Use of Canada Lynx During Denning in Minnesota. *J. Wildlife Management,* 72(7): 1507-1513.
[514] US Fish and Wildlife Service. (2016, February 5). Biological opinion for proposed NorthMet Project and Land Exchange.pdf: Effects to Canada Lynx, Gray Wolf, and Northern Long-eared Bat From the Proposed NorthMet

AMERICAN OVERSIGHT

- The threatened northern long-eared bat is also found within the Boundary Waters and Superior National Forest.[515]

The BLM was therefore required to consider the potential effects of the proposed action on these three species, and the designated critical habitat for the wolf and lynx, including indirect effects, and interrelated and interdependent actions. 16 U.S.C. § 1536(c)(1); 50 C.F.R. § 402.02 (definition of "effects of the action"). This assessment of potential impacts was required to include consideration of a mine plan of operations, which BLM found reasonably foreseeable. 50 C.F.R. § 402.02 (defining indirect effects are later in time, but reasonably certain to occur); EA at 22 (finding that the combination of current leases, private leases, and proposed action would be sufficient for the lessee to construct and operate an economically viable mine, and that therefore the mining plan of operations was included in the cumulative effects analysis). Twin Metals' mining plan of operations is also contingent on the approval of the proposed action, and thus the mining plan is considered both interrelated and interdependent. 50 C.F.R. § 402.02 (definition of "effects of the action").; EA at 22 (finding that mining in the Superior National Forest is currently not economically feasible, but that if the lease renewals are approved, along leases for private minerals and with an additional federal mineral lease that has been requested, it would be sufficient for the lessee to construct and operate an economically viable mine).

A mining plan of operations, within the action area of the proposed mineral lease renewals, would adversely and significantly affect lynx, wolves, northern long-eared bats, and the designated critical habitat for lynx and wolves.

- For the Canada lynx, available habitat would be reduced and fragmented by proposed sulfide-ore copper mines.[516, 517, 518] Conversion of forest to industrial mining, and additional roads and traffic, would result in increased lynx-human interactions and mortality, including from increased trapping, increased vehicle-lynx collisions, and cumulatively significant loss of travel corridors and fragmentation of lynx habitat due to extension of a mining-scarred landscape inhospitable to wildlife, to the edge of the Boundary Waters.[519] The clearing of forest land will lead to medium-term loss of lynx denning and foraging habitat; conversion of forest land to mining infrastructure will permanently eliminate valuable lynx denning and foraging habitat. Elimination of suitable habitat for snowshoe hare, a primary lynx prey item, will decrease lynx reproductive success and total fertility rates.
- The gray wolf population[520] would also be negatively impacted by increased road traffic, disrupted travel corridors, reduced interior habitat and light and noise pollution that would result from the proposed activity. Additional roads and traffic will lead to

Project and Land Exchange. P. 24 Figure 6 shows critical habitat zones. MNES 1352 is located within CH Zones 1 & 2 and MNES 1353 is located within CH Zone 1.

[515] *See* FWS_RangeMap_NLEB02Jan2018, in Appendix (folder "Maps").

[516] Frelich, 2014.

[517] Frelich, 2018.

[518] TMM NI 43-101 at p. 4-29 (Twin Metals, for example, contemplated 1,000-acre concentrator site and 7,000-acre tailings basin site).

[519] Powell, 2017.

[520] *See* CBD Map_Wolf, Lynx sightings, 2000-2008, in Appendix (folder "Maps"). Note that this map includes wolf and lynx sightings near both the Northmet project site and the Twin Metal project site.

AMERICAN OVERSIGHT

increased wolf mortality due to vehicle-wolf collisions, increased trapping pressure, and increased poaching opportunity.[521]

- For the northern long-eared bat, the forest clearing necessary to build surface infrastructure could reduce habitat for hibernacula and roost trees.[522] Additionally, mine pollution-caused decreases in pH, increased concentrations of sulfate, heavy metals, and specific conductance are all factors that would lead to the extirpation of sensitive aquatic macroinvertebrates from affected streams, which would decrease the availability of important prey items for the northern long-eared bat. [523] Pollution-tolerant aquatic insect species would biomagnify concentrations of heavy metals. Bats would further magnify pollutant concentrations in their bodies, leading to decreased vigor and reproductive success.[524]
- While not yet listed, mining operations would also add additional stress on the northwestern moose, an iconic Boundary Waters species already under significant threat from climate change and recently petitioned to be listed under the ESA; additional habitat loss, travel corridor interruption and road kill fatalities will add stress to the significantly declining population. USFWS has initiated a review to determine if the petition to list the species as threatened or endangered is warranted.[525] Accumulation of toxic heavy metals in the aquatic ecosystem also poses a threat to moose, which rely on a heavy diet of aquatic vegetation during the summer months.[526]

The proposed action easily surpasses the low threshold of "may affect," triggering the requirement for formal consultation. 50 C.F.R. § 402.14(a). Despite the location of these species and their respective habitats in or around the proposed project area, however, BLM failed to formally consult with FWS, as required under Section 7 of the ESA. 16 U.S.C. § 1536(a)(2). Any "no effect" determination for this proposed action would violate the ESA and APA by failing to consider the best available science, and all relevant factors. 16 U.S.C. §§1536(a)(2); 5 U.S.C. 706.

Additionally, in failing to formally consult on this proposed action, the BLM has violated the substantive obligation under Section 7 of the ESA to avoid taking any action that may jeopardize a listed species or destroy or adversely modify critical habitat. 16 U.S.C. 1536(a)(2). Without substantial compliance with the required consultation procedures of Section 7, the BLM is unable to ensure against jeopardy and adverse modification, in violation of the ESA. *Id*; *see Sierra Club v. Marsh*, 816 F.2d 1376, 1384 (9th Cir. 1987) (stating that "[t]he substantive and procedural provisions of the ESA are the means determined by Congress to assure adequate protection" for endangered species, and "[o]nly by requiring substantial compliance with the act's procedures can we effectuate the intent of the legislature.").

[521] Powell, 2017.
[522] *See* MNDNR_nleb township list and map, in Appendix (folder "Maps").
[523] Powell, 2017.
[524] *Id.*
[525] US Fish and Wildlife Service. (2016, May). Endangered and Threatened Wildlife and Plants; 90-Day Findings on Two Petitions.
[526] Powell, 2017.

AMERICAN OVERSIGHT

The Forest Service and FWS recently acknowledged that the proposed PolyMet land exchange on the Superior National Forest was directly connected to the proposed NorthMet Mine, and therefore the Forest Service prepared a biological assessment and FWS a biological opinion, that considered the impacts of both the land exchange and mine project on the Canada lynx, gray wolf, and northern long-eared bat, and designated critical habitat for the lynx and wolf. Similarly, here, the proposed mineral lease renewals are directly connected to the Twin Metals mine proposals, and the BLM and FWS must therefore formally consult on the entire project. 16 U.S.C. 1536(a)(2); *see Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988) (recognizing that the ESA requires a comprehensive biological opinion that considers all stages of a proposed agency action, as to hold otherwise "would eviscerate Congress' intent to give the benefit of the doubt to the [listed] species.").

F. BLM'S ENVIRONMENTAL ASSESSMENT DEMONSTRATES THAT RENEWAL OF THE TWIN METALS LEASES THREATENS TO VIOLATE THE CLEAN AIR ACT

"To protect public health and welfare nationwide, the federal Clean Air Act requires EPA to establish national ambient air quality standards for certain common and widespread pollutants based on the latest science. EPA set air quality standards for six common 'criteria pollutants,'" including particulate matter.[527] States develop plans to achieve and maintain compliance with these standards.

The EA specified that the nearest air quality monitor is the Ely monitoring station.[528] Measurements from there show that the air quality at the project is listed as "good" most days of the year.[529] The EA failed to consider how renewing the leases would likely degrade air quality and violate the Clean Air Act.

The Clean Air Act establishes the goal of restoring visibility in all Class I areas to natural conditions. "In section 169A of the 1977 Amendments of the Clean Air Act, Congress established a national visibility goal as the 'prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Federal Class I areas which impairment results from manmade air pollution.'"[530] "The BWCAW is specially designated a Class I air quality area,"[531] as is Voyageurs National Park to the west of the Boundary Waters, and Isle Royale National Park to the east. Given this special designation, "the maximum allowable increase in concentrations of . . . particulate matter over the baseline concentration" may not exceed 5 micrograms per cubic meter for the annual geometric mean, or 10 micrograms per cubic meter for the twenty-four-hour maximum.[532] Further, visibility must be protected in this area, as

[527] EPA. (n.d.). Clean Air Act Overview, https://www.epa.gov/clean-air-act-overview/clean-air-act-requirements-and-history.
[528] EA at 19.
[529] *Id.*
[530] EPA. (2003). Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Program. EPA-454/B-03-005. U.S. Environmental Protection Agency Office of Air Quality Planning and Standards Emissions, Monitoring and Analysis Division Air Quality Trends Analysis Group Research Triangle Park, NC.
[531] *Id.*
[532] 42 U.S.C. § 7473.

AMERICAN OVERSIGHT

"visibility is an important value" in Class I areas.[533] The highly restrictive standards applicable to Class I areas allow for only minimal degradation of air quality and impose a substantial limitation on the amount of particulate matter that may be emitted and cause impacts in such areas.

But as outlined in the comments above, the EA fails to consider the recognized and significant air pollution threats posed by particulate matter and other haze-forming pollutants released by sulfide-ore copper mining operations.[534] Instead, the EA relies on conclusory assertions, suggesting that the "Proposed Action is not expected to result in measurable changes in air quality as compared to the No-Action Alternative."[535] These assertions are inadequate and incorrect. Both the Proposed Action and the No-Action Alternative threaten to result in a direct increase in the amount of air pollutants emitted over a denial of the leases, regardless of whether the lessees were to submit further plans of operations. Both the Proposed Action and the No-Action Alternative would increase the likelihood of additional bad air days and introduce additional haze and pollutants in the Boundary Waters Canoe Area Wilderness, Voyageurs National Park, and Isle Royale National Park, which are Class I air quality areas. Thus, given the strict legal and regulatory air pollution prohibitions highlighted above, lease renewal threatens to violate the federal Clean Air Act.

G. RENEWAL OF THE LEASES THREATENS VIOLATION OF THE MINNESOTA WETLANDS CONSERVATION ACT

Permanent impacts to rare natural communities are not allowed under Minnesota's Wetland Conservation Act (WCA).[536] Rare natural communities under WCA are defined as:

> "Native plant communities (NPCs) having a conservation status rank of S1, S2, or S3 that are mapped or determined by the DNR to be eligible for mapping in the Natural Heritage Information System; or any native plant community that is contained within an area mapped or determined by the [Minnesota Biological Survey] to be eligible for mapping in the Natural Heritage Information System as having an Outstanding or High biodiversity significance ranking."[537]

There are rare natural communities on and around the leases.[538] Renewal of the leases, and reasonably foreseeable consequences of renewal would result almost certainly result in permanent damage being don to those rare natural communities, in violation of the Minnesota WCA. The EA includes no discussion or analysis of potential effects on rare natural communities.

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[533] 42 U.S.C. § 7491.
[534] *See* Part V *and* Part IV.A.2.c., and Appendix.
[535] EA at 19-20.
[536] Minn. R. 8420.0515 Subp. 3
[537] Minnesota Board of Water & Soil Resources, Minnesota Department of Natural Resources. Wetland Conservation Act Technical Guidance on Rare Natural Communities. 11-7-2017. http://www.bwsr.state.mn.us/wetlands/wca/guidance/Rare_natural_communities.pdf
[538] NMW Map. 1-20-2019. "Rare Natural Communities Protected By Minnesota's Wetland Conservation Act"

AMERICAN OVERSIGHT

H. BLM'S ENVIRONMENTAL ASSESSMENT DEMONSTRATES THAT RENEWAL OF THE TWIN METALS LEASES THREATENS TO VIOLATE THE NATIONAL HERITAGE PRESERVATION ACT.

The BLM has violated Section 106 of the National Historic Preservation Act (NHPA) by failing to follow and complete the process for identifying historic properties, as required for identifying historic properties, as required for the undertaking of renewing the leases.

Section 106, the portion of the NHPA that is concerned with federal undertakings, is designed to further the national policy of protecting historic properties, including historic properties to which any Indian tribe attaches cultural or religious significance.[539] NHPA Section 106 is structured to ensure that federal agencies take into account the effects of their undertakings on historic properties including archaeological resources, and give the Advisory Council on Historic Preservation (Council) a reasonable opportunity to comment on agencies' undertakings.[540] An undertaking is "a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a federal permit, license or approval."[541]

An essential element in the Section 106 consultation process requires federal agencies proposing an undertaking to complete specific steps in the identification of historic properties.[542] In consultation with the State Historic Preservation Office (SHPO) and Tribal Heritage Preservation Office (THPO), the agency must "determine and document the area of potential effects (APE) of the proposed federal undertaking.[543] It must then review existing information on historic properties within the APE, including data on the existence of historic properties not yet identified, before making a reasonable and good-faith effort, in coordination with Tribes, to identify additional historic properties within the APE.[544] If there are historic properties in the APE that may be affected, the agency, in consultation with the SHPO and THPO must apply a set of criteria of adverse effects, (direct, indirect, and cumulative) to properties in the APE.[545] "An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association."[546] Examples of adverse effects on historic properties include, but are not limited to, physical destruction,[547] "introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features,"[548] and the "transfer, lease or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term

[539] NHPA §101(d)(6)(B); 34 U.S.C. 306108; 36 CFR Part 800
[540] 36 CFR §800.1
[541] 36 CFR §800.16(y)
[542] 36 CFR § 800.2
[543] 36 CFR § 800.4(a)(1)
[544] 36 CFR § 800.4(a)(2) and (3)
[545] 36 CFR § 800.5(a)
[546] 36 CFR § 800.5(a)(1)
[547] 36 CFR § 800.5(a)(2)(i)
[548] 36 CFR § 800.5(a)(2)(v)

AMERICAN OVERSIGHT

preservation of the property's historic significance."[549] If the agency finds there are likely adverse effects to historic properties, then the agency must attempt to come to agreement on the possibility and method for avoiding or mitigating adverse effects.[550] If attempts fail to resolve adverse effects, the agency must provide the Advisory Council on Historic Preservation with opportunity to comment, and consider those comments before making a decision on the undertaking.[551]

Deferring or skipping steps in the Section 106 consultation process is not an option. The agency "must complete the Section 106 process 'prior to the approval of the expenditure of any Federal funds on the undertaking, or prior to the issuance of the license.'"[552]

The decision to renew the leases is an undertaking within the meaning of Section 106,[553] because renewing the leases is a discretionary action (as explained in Section I, above) and presupposes a right to develop the mineral deposits within the leasehold. The BLM has not considered or analyzed in any meaningful way the connected action of developing and operating a mine or mines on the leases, nor has it defined the area of potential effects (APE) for its undertaking as required.[554] Without those steps, it cannot have made a reasonable and good faith effort to identify historic properties in the APE, nor can it have properly applied the adverse effects criteria necessary to list the potential direct and indirect effects of the action on historic properties in the APE. The scant information in the EA shows that the BLM has not properly assessed the magnitude and nature of the undertaking and its effects on historic properties, nor that it has properly phased or deferred final identification of historic properties.[555]

The EA states that "[s]ix known archaeology sites are located within or adjacent to the boundaries of [the leases]."[556] In addition, there are at least nine Laurel Indian archaeological sites along the edge of Birch Lake, including the first-discovered and best-studied Laurel Indian sites in the United States, some of which are directly across the South Kawishiwi River from leased areas.[557] Stating the existence of known archaeology sites is not sufficient, because without identifying an APE or demonstrating it has reviewed other existing information and conducted additional survey efforts to identify potentially eligible properties, BLM has no possible way of knowing what other sites are present within that area. The EA is clear that without these leases no economical mining could occur here; the magnitude of the undertaking, therefore, is enormous. As public land, access to the area is unrestricted, and the land areas at issue are not unduly large.[558] Moreover, the nature of the effects on the historic properties would severe.[559] The reasonably foreseeable effects on these sites of renewing the leases, detailed

[549] 36 CFR § 800.5(a)(2)(vii)
[550] 36 CFR § 800.6
[551] 36 CFR § 800.3 through 800.8
[552] 36 CFR § 800.1(c)
[553] Stumpf, G. (n.d.). What Triggers Section 106 Compliance? Fundamentals of Managing the Cultural Heritage Program. BLM National Training Center. In Appendix, and accessed 1-13-2019 at https://www.ntc.blm.gov/krc/uploads/646/WhatTriggersSection106Compliance.pdf
[554] 36 CFR § 800.4(a)(1)
[555] 36 CFR § 800.4(b)(2)
[556] EA at p. 14
[557] Harrison, 1985, Figure 4.
[558] 36 CFR § 800.4(a)(1)
[559] 36 CFR § 800.4(b)

AMERICAN OVERSIGHT

above, including introduction of significant noise and air pollution that would continue 24 hours per day and 365 days per year, long-term water pollution and harm to fish and wildlife, and scenic disruption from construction and operation of an industrial mining district. Regular blasting during construction and operation of the mine would shake nearby sites, some of which are at or below the water level of Birch Lake. There may be more such sites in existence, now near the edge or inundated by the conversion of Birch River to Birch Lake. These effects would certainly be transformative for the historic properties, diminishing the integrity of their significant historic aspects. The jarring and shaking associated with regular blasting could cause the destruction of documented and undiscovered inundated sites, by causing shifting or slumping of sediments. These effects would violate the goal of the NHPA, and BLM's manual, which requires it to "manag[e] [] cultural resources so that the scientific and socio-cultural values are not diminished, but rather maintained and enhanced."[560]

Finally, the EA's proposed stipulations contain no provisions whatsoever to protect historic properties – nor could they without the required survey, identification, and analysis. Thus, the BLM fails to provide "adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the propert[ies'] historic significance."[561] An EIS-level review must include a reasonable and good-faith effort has been made to identify historic properties with the APE. Renewing the leases now, would restrict subsequent consideration of alternatives to avoid, minimize, and mitigate the undertaking's adverse effects on historic properties.[562] The BLM has failed to follow and complete the Section 106 process, and thus renewing the leases would violate the NHPA.

I. THE SECRETARY OF THE INTERIOR CANNOT PERMIT ACTIONS BY ONE DEPARTMENTAL BUREAU (BLM) TO PRECLUDE THE ABILITY OF ANOTHER DEPARTMENTAL BUREAU (THE NATIONAL PARK SERVICE) TO COMPLY WITH ITS MANDATE

BLM is a technical bureau of the Department of the Interior ("Department"), the same as the National Park Service. And yet, with this action, the BLM, which has a multiple-use mission, would appear to be precluding the National Park Service from complying with its mandate under the 1916 Organic Act, which requires the Park Service to conserve the natural resources in the national parks. Specifically, the Organic Act established the National Park Service "...to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such a manner and by such a means as will leave them unimpaired for the enjoyment of future generations." National Park Service Organic Act, 16 U.S.C. §I. In this instance, the Park Service would no doubt have difficulty fulfilling its mission under the Organic Act were Voyageurs National Park (VNP) to be degraded due to toxic heavy metal pollution from operations or leakages from the proposed mine.[563]

[560] Harrison, 1985, Foreword (citing BLM Manual § 8100)
[561] 36 CFR § 800.5(a)(2)(vii)
[562] 36 CFR § 800.1(c)
[563] Moreover, the proposed action may also violate the specific enabling legislation for Voyageurs National Park, which was established "to preserve, for the inspiration and enjoyment of present and future generations, that outstanding scenery, geological conditions, and water system which constituted a part of that historic route of the Voyageurs who contributed significantly to the opening of the Northwestern United States." Voyageurs National Park Enabling Legislation, January 8, 1971, Public Law 91-661, 84 Stat. 1970.

AMERICAN OVERSIGHT

And yet, despite this, the BLM has not even considered potential impacts to VNP in this EA. How can the Secretary of the Interior allow one bureau of the Department to undertake a federal action that may preclude another, equal bureau of the Department from complying with its core legal mandate? Here, because the BLM did not even consider the potential impacts to VNP, there is no way the Department of Interior could know whether or not BLM's action rendered it impossible for another agency under the same Department to fulfill its mandate, and therefor violates the Organic Act. Accordingly, at this stage of environmental review, BLM must not only consult with the Park Service, as discussed above, but also at a minimum evaluate and discuss in its NEPA review the potential impacts of the proposal on the resources at Voyageurs National Park.

V. ECOLOGICAL AND SOCIO-ECONOMIC IMPACTS OF SULFIDE-ORE COPPER MINING IN THE BOUNDARY WATERS WATERSHED

Sulfide-ore copper mining irrefutably threatens irreparable harm to aquatic and terrestrial ecosystems, public uses, and social values of the Boundary Waters watershed, and the economy of the Arrowhead Region of Minnesota and beyond. A robust body of peer-reviewed scientific reports explain these threats, and region-specific modeling demonstrates the likelihood of impact and the degree to which these potential impacts would harm the Boundary Waters watershed. The report summaries and discussion below are organized by general topic area to best describe the context and intensity of the reasonably foreseeable impacts of sulfide-ore copper mining of Duluth Complex ore in the heart of the Boundary Waters watershed, were the proposed action to be approved. Various cited documents and maps can be found in the attached Appendix in their associated folders as referenced throughout this document. We believe that the information contained in this narrative and the cited sources constitute the best available scientific information that federal agencies are obligated to utilize in analyzing the reasonably foreseeable consequences of a proposed action.

A. The ecological, human, and economic health of the Superior National Forest and Arrowhead region would be harmed by sulfide-ore copper mining in the Boundary Waters watershed.

"Mining by its nature and scale causes significant changes in the landscape and ecosystem." (Mining Minnesota/Global Minerals Engineering, 2014)[564] The development of a sulfide-ore copper mining district on Superior National Forest (SNF) lands in the Rainy-River Headwaters – along and under waterways that flow directly into the Boundary Waters Canoe Area Wilderness – would transform the ecosystem from a healthy, well-managed, productive multiple use national forest that supports a full range of recreational and economic activities into a single-use area that would be devoid of nearly all the natural resource and community values it now provides.

Scientific evidence shows, without a doubt, that Superior National Forest's downstream ecosystems including the Boundary Waters Canoe Area Wilderness (Boundary Waters), the Mining Protection Area (MPA), Quetico Provincial Park (Quetico), Voyageurs National Park

[564] Eger, P., & Ongaro, F. (2014). Successful Non-Ferrous Mining: Promise or Reality? [PowerPoint slides].

AMERICAN OVERSIGHT

(VNP), and local communities would be harmed by sulfide-ore copper mining in the Boundary Waters watershed. This scientific evidence was considered when the US Forest Service made its decision withholding consent to renew the mineral leases in question, MNES 1352 and MNES 1353. In the December 14, 2016 "Forest Service Record of Decision on Lease Renewals" letter to Bureau of Land Management Director, Neil Kornze, U.S. Forest Service Chief Thomas L. Tidwell made it clear that sulfide-ore copper mining in the Boundary Waters watershed is too risky to proceed in the watershed of the Boundary Waters. [565] This decision was accepted by the Bureau of Land Management (BLM)/ Department of the Interior (DOI).[566] On January 13, 2017, the Forest Service filed an application to withdraw from mineral leasing approximately 234,000 acres of Superior National Forest lands in the Boundary Waters watershed, initiating a 2-year segregation and study of the withdrawal area and a 20-year ban on mining in the withdrawal area.[567] This application was also accepted by BLM/DOI.[568]

Together, the withdrawal application, December 14, 2016 letter withholding agency consent to renewal of the Twin Metals leases, and the December 15, 2016 letter denying lease renewals demonstrate the Forest Service's, the BLM's, and the Department of Interior's considered view that sulfide-ore mining in the Boundary Waters watershed would pose significant risks to the wilderness and other downstream resources. As US Secretary of the Interior Sally Jewel stated in the BLM/DOI December 15, 2016 press release regarding the mineral withdrawal:

> Today's best available science is helping us understand the value of the land and water and potential impacts of development in places like the Boundary Waters. This is the right action to take to avoid irrevocably damaging this watershed and its recreation-based economy, while also taking the time and space to review whether to further protect the area from all new mining.[569]

The science and rationale utilized in that letter remain accurate, and have been further bolstered, including by the information discussed and cited in this narrative.

1. **The proximity of a sulfide-ore copper mine to historic and culturally significant resources, federally protected park lands, wetlands, and ecologically critical areas in the Boundary Waters watershed would threaten the unique characteristics of the area.**

Twin Metals Minnesota (TMM) currently holds permits and leases to more than 65,000 acres of Superior National Forest land in the Rainy River headwaters watershed. TMM's recently re-instated mineral leases, MNES-01352 and MNES01353, lie directly adjacent to and upstream of Boundary Waters Canoe Area Wilderness. MNES-01353 adjoins the Wilderness border in two places.[570] MNES-0152 is located approximately five miles from the Wilderness boundary.

[565] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.
[566] USDOI BLM. December 15, 2016. Letter to TMM rejecting application for renewal of leases MNES-001352 and -001353
[567] USDA Forest Service (2017, February 1). Application for Withdrawal to Secretary of Interior
[568] USDOI BLM. (2017, January 19). BLM Notice of Application for Withdrawal
[569] USDOI Bureau of Land Management. (2016, December 15). Obama Administration Takes Steps to Protect Watershed of the Boundary Waters Canoe Area Wilderness. Press Release.
[570] *See* Federal Mineral Lease Distinctions, in Appendix (folder "Maps")

AMERICAN OVERSIGHT

TMM's proposed copper-nickel processing site would be along the Maturi deposit, within 6 miles of the Wilderness border, and close to the shore of Birch Lake.[571] TMM's plans also include the Spruce Road deposit, located on MNES-0153 and within ¼-mile of the Wilderness boundary. Additional prospecting permits and state leases nearby are held by TMM and other mining companies, adding to the total impact area of reasonably foreseeable mining activity in Superior National Forest.

The proximity of the proposed sulfide-ore copper mining activity to this uniquely vulnerable, water-rich environment greatly heightens the risk of water pollution and subsequent harm to the ecologically critical and culturally important resources therein. This includes the Birch Lake and South Kawishiwi River located directly adjacent to and in the immediate downstream path of any runoff or discharge from the land occupied by the Twin Metals expired mineral leases.[572] Birch Lake itself is the principal lake in the watershed and one of the most popular recreational lakes with the South Kawishiwi River as its largest tributary.[573] The Birch Lake- South Kawishiwi region is listed by the US Forest Service as a Recreation and Scenic Management Area[574,575] and supports an enormous amount of recreation[576] and is a popular canoe route into the Boundary Waters. Birch Lake, the South Kawishiwi River, and lakes downstream of the mineral leases in question house 30 of the Ely-area's economic engines including resorts, outfitters, camps, education/research centers, campgrounds, and other outdoor recreation businesses and organizations[577] as well as hundreds of private homes and cabins.[578]

a. The Boundary Waters watershed and its resources are unique and irreplaceable.

The Boundary Waters watershed contains a host of important natural resources which are essential to various ecological processes and functions (forest growth, fish and wildlife habitat provision, water cleansing and regulation, etc.), and which carry a set of social, cultural, and economic values. The Superior National Forest is a predominantly natural landscape, comprised of upland forests, woodlands, and forested and open peatlands that are dissected by a complex network of high-quality lakes, rivers, and streams. Large portions of the Superior National Forest

[571] *See* NMW_Map_TMM – new facilities footprint, in Appendix (folder "Maps")
[572] *See* NMW_Map_Flow path from TMM mining activity, in Appendix (folder "Maps")
[573] MPCA. 2011. A Water Quality Assessment of Select Lakes within the Kawishiwi River Watershed. See p. 40.
[574] *See* 2004 Forest Plan Revision Figure MAS-1 SNF Management Areas, in Appendix (folder "Maps")
[575] *See* USFS M–p - Recreation and Scenic Use Management Hydrogeo SUP, in Appendix (folder "Maps")
[576] USFS. (2008). Birch Lake Back Country Brochure
[577] *See* Save the Boundary Waters (n.d.) Fact Sheet- Ely by the Numbers for a listing of the 30 businesses on the Kawishiwi River and downstream lakes, in the Boundary Waters watershed.
[578] *See* Save the Boundary Waters. (n.d.) Fact Sheet- Ely Gateway to Wilderness or Mining Town. This sheet lists lakeshore properties alone to be taxed on a value of $318 million.

AMERICAN OVERSIGHT

contain exceptional biodiversity locally and statewide, and harbor species and communities of regional and national significance.[579,580,581,582]

The fourth largest and the eighth most visited National Forest in the country, the entirety of the Superior National Forest is open to hunting and fishing and it offers a wealth of land- and water-based outdoor recreation opportunities including camping, boating, hiking, photography, cross-country skiing, dog sledding, and more.[583] That use and those users bolster the existing natural amenity-based economy. Additional compatible uses occurring on Superior National Forest land include scientific research, snowmobile and OHV use, surface and groundwater drinking water uses, ricing and other gathering activities as well as commercial harvest of important natural resources like timber[584] and small-scale granite quarrying.[585] The outstanding natural resources and human significance of the larger Quetico-Superior region has been described by many noted scientific and popular writers.[586]

The ecological, human health, social, and scientific benefits and world-class recreational opportunities of the Boundary Waters, Mining Protection Area (MPA), and other adjacent Superior National Forest lands are dependent on the reality and reputation of the existing outstanding water quality, scenic, and wildlife habitat.

- **Park Lands and Ecologically Critical Areas**

The region is unique because of the qualities of the landscape and because the core of the ecosystem is substantially protected: the 1,098,057-acre Boundary Waters, the 218,054-acre

[579] MN DNR. (n.d). MBS Survey Procedures: http://www.dnr.state mn.us/eco/mcbs/procedures/index html
[580] MN DNR. (n.d.). MBS Guidelines for Ranking of Sites of Biodiversity Significance (and draft map of areas of biodiversity significance in Minnesota): http://www.dnr.state mn.us/eco/mcbs/biodiversity_guidelines html
[581] MN DNR. (n.d.). MBS Native Plant Community and Rare Species Maps: http://www.dnr.state.mn.us/eco/mcbs/maps.html
[582] MN DNR. MBS Sites used in a regional/international assessment: Lake Superior Lakewide Action and Management Plan (LAMP). (2013). Lake Superior Biodiversity Conservation Assessment. Superior Work Group. Updated March 2015. http://www natureconservancy.ca/assets/documents/on/lake-superior/A-Biodiversity Conservation-Assessment-for-Lake-Superior-Vol-1-Final-Draft-Updated-March2015.pdf. (LAMP, 2013).
[583] USDA Forest Service. (2005). Superior National Forest Recreation Niche Available at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm91_048974.pdf.
[584] USDA Forest Service. (n.d.). Forest Facts. Available at https://www fs.usda.gov/detail/superior/about-forest/?cid=fsm91_049590.
[585] USDA Forest Service. (2011). Scoping Comment Letter for the Shamrock Gravel Pit Expansion Project. Available at: http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/81430_FSPLT2_055897.pdf
[586] Noteworthy writers describing cultural and/or scientific values of the Boundary Waters include but are not limited the following authors and some of their assorted works: author and environmentalist Sigurd Olson, *Of Time and Place, Reflections from the North Country, The Singing Wilderness* and *The Lonely Land*; author and former owner-operator of Gunflint Lodge Justine Kerfoot, *Woman of the Boundary Waters* and *Gunflint:Reflections on the Trail*; naturalist, photographer, and author Mark Sparky Stensaas, *Boundary Waters Wild, Canoe Country Wildlife: A Field Guide to the North Woods and Boundary Waters,* and *North Country Flora: Plants and Trees of the North Woods and Boundary Waters,* author and educator R. Newell Searle, *Saving Quetico-Superior*; best-selling fiction writer William Kent Krueger, *Boundary Waters: A Novel* and *Iron Lake*; and explorers Amy and Dave Freeman, *A Year in the Wilderness*.

AMERICAN OVERSIGHT

VNP, and the 1,166,192-acre Quetico.[587] Additionally, the federal MPA covers roughly 222,000 acres of National Forest System lands along entry corridors into the Wilderness.[588] The U.S. Forest Service has also designated areas within the Superior National Forest as Research Natural Areas (RNAs), Candidate Research Natural Areas (CRNAs), Riparian Emphasis Areas, Unique Biological Areas (UBAs), Recreation Use in a Scenic Landscape Areas, and Semi-primitive Motorized Recreation Areas, as well as lands designated under the General Forest and General Forest – Longer Rotation Management Areas.[589]

The Boundary Waters, MPA, and surrounding Superior National Forest provide watershed benefits by purifying water, sustaining surface water and ground water flows, maintaining habitats for fish and other aquatic life, controlling erosion, and stabilizing stream banks.

- **1978 Boundary Waters Canoe Area Act**

Creation of the federal Mining Protection Area (MPA) around portions of the Boundary Waters was one of the primary purposes of Public Law 95-495, also known as the Boundary Waters Canoe Area Wilderness Act, passed by Congress and signed into law in October 21, 1978 ("1978 Act"). The 1978 Act withdrew federal lands and minerals within the federal MPA from the federal mining program, thereby putting the lands permanently off-limits to mineral exploration and mining.[590]

The text of the 1978 Act explains the federal MPA as a necessity, "in order to protect existing natural values and high standards of environmental quality from the adverse impacts associated with mineral development."[591] The federal MPA covers roughly 222,000 acres of National Forest System lands mostly in the gaps between different parts of the Wilderness created by the Fernberg Road, Echo Trail, and Gunflint Trail. The federal MPA also extends in a thin band around the southern and southeastern border of the Trout Lake Unit of the Boundary Waters. The 1978 Act does not authorize mining in the SNF outside of the Boundary Waters and federal MPA.

The State of Minnesota's mining protection area, which the state termed the "BWCAW Mineral Management Corridor," overlaps much of the federal MPA, and extends beyond it in some areas, particularly to the immediate south of the Boundary Waters. The state's Mineral Management Corridor put state-owned minerals off-limits to mineral leasing if they met any of certain criteria. Areas affected are small surface watersheds that flow directly into the Boundary Waters, lands within ¼ mile of the BWCAW boundary, and recreational entrances and travel corridors entering the Boundary Waters.[592] The purpose of the Mineral Management Corridor is to protect waters in the Boundary Waters by protecting certain sub-drainages that flow into the Boundary Waters and to protect the natural landscape along entry points.

[587] Scoping Comments on Northern Minnesota Federal Minerals Withdrawal EIS. 10-12-2017. P. 54-59 describe attributes of above referenced Federally protected lands. This and other comment letters submitted by Northeastern Minnesotans for Wilderness on the proposed Federal mineral withdrawal are hereby incorporated into this letter.
[588] BWCAW Act of 1978, Pub. L. No. 95-495, § 9 (1978)
[589] 2004 Superior National Forest Plan, Figure MAS-1 "Superior National Forest Management Areas"
[590] 1978 Act, Section 11
[591] 1978 Act, Section 9
[592] Minn. Rules 6132.2000, Subpart 3

AMERICAN OVERSIGHT

- **Wetlands, Rivers, Lakes, and Streams**

The water resources in the Boundary Waters watershed include an extraordinary number of wetlands, more than a thousand miles of major streams and rivers, and more than a thousand lakes. [photo essay?] Superior National Forest lands lie within three continental-scale watersheds – the Great Lakes/St. Lawrence drainage which flows to the Atlantic Ocean; the Mississippi River, which flows to the Gulf of Mexico; and the Rainy River drainage, which flows to Hudson Bay. It features a wealth of fresh water resources, with more than 445,000 acres of surface water – more than 20% of all the fresh water in the entire National Forest System – including more than 2,000 lakes larger than 10 acres in size and more than 2,250 miles of streams, 1,300 miles of them cold water streams.[593] The streams, rivers, and lakes feature "extremely high water quality"[594] that support sport fisheries of national and international importance. These aquatic resources are spread over a million-plus acre naturally-vegetated landscape that helps ensure the waters remain clean.

Numerous sources of water quality data from federal and state agencies (backed by citizen water monitoring efforts), taken from at least as early as the 1950s, and through 2016, confirm that these waters are, and consistently have been, of extremely high quality for as long as measurements have been taken.[595, 596, 597, 598, 599, 600] Additionally, Ecoregion 50, which includes all of northeast Minnesota, has the lowest background specific conductance (SC) among the ecoregions of Minnesota, at 135 μS/cm, while supplemental data suggests that the background SC in the Boundary Waters area is lower still (68 μS/cm).[601, 602, 603]

The scale, purity, and beauty of the watershed's waters draw people to visit and care about this place, as the U.S. Forest Service attests:

> *The Superior National Forest is treasured for its abundant water resources. Within the forest boundaries are 445,000 acres of surface water, almost 2,000 lakes at least 10 acres in size, over 1,300 miles of major streams supporting coldwater fisheries, and over 950 miles of major streams supporting warm water*

[593] USDA Forest Service. (n.d.). Forest Facts. Available at https://www fs.usda.gov/detail/superior/about-forest/?cid=fsm91_049844
[594] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.
[595] *See* water quality data and reports in the Appendix
[596] Geerts, S., L. Woodruff, and P. Jones. (2017). USGS/NRRI/MNDNR Report to LCCMR: Assessment of Natural Copper-Nickel Bedrocks on Water Quality. M.L. 2013, Chp. 52, Sec. 2, Subd. 05b. (Geerts, et al, 2017).
[597] Anderson, J., D. Thompson, R. Valley, and J. Butcher. (2010). Sentinel Lake Assessment Report, White Iron Lake (69-0004), St. Louis County, Minnesota. Minnesota Pollution Control Agency & Minnesota DNR. (Anderson et al., 2010).
[598] *See* water quality data collected by Dave and Amy Freeman from September 2015 to September 2016 (YITW_Freeman Water Quality Data Sheet).
[599] MPCA. Jan. 2011. A Water Quality Assessment of Selected Lakes within the Kawishiwi River Watershed.
[600] MPCA. June 2017. Rainy River-Headwaters Watershed Monitoring and Assessment Report.
[601] Johnson & Johnson, 2015.
[602] Cormier, 2016.
[603] Excel file titled, "YITW_Freeman Water Quality Field Data Sheet," available in Appendix.

AMERICAN OVERSIGHT

fisheries. Clean, clear, and productive water is a big reason that people come to the Superior National Forest to fish, swim, boat, camp, and enjoy scenery.[604]

- **Outstanding Resource Value Waters Naturally Low in Sulfates**

The Superior National Forest is the most freshwater-rich National Forest in the National Forest System.[605] Within the Superior National Forest, the Boundary Waters watershed stands out as containing the bulk of those water resources. [Add ORV waters]

Sulfate concentrations in waters of the Boundary Waters watershed are relatively low as shown by water samples taken by the federal, state, and local agencies. A recent sampling effort found that the surveyed streams, which drained to Birch Lake and the South Kawishiwi River, had sulfate levels less than 3.0 mg/L, and often substantially less. The range of sulfate concentrations varied little with flow conditions and among the three streams.[606] MPCA data likewise show very low sulfate levels in water sampled at the S. Kawishiwi River monitoring station (S000-108).[607]

- **Safe Drinking Water**

The quality of life, health, and safety of people who reside and spend time in the area is highly dependent on the high-quality clean water resource. Most of the people who live in and visit the Superior National Forest depend upon lake water or shallow wells for drinking, cooking, and bathing. Wells serve about half the population of Lake County, and most of those wells are shallow and can be readily contaminated.[608, 609] Paddlers and campers in the Study Area depend upon lake water for drinking and cooking. Many popular waters for paddling and camping – such as the South Kawishiwi River and Birch, White Iron, Farm, Garden, Fall, Newton, and Basswood Lakes – are along the paths of pollution from proposed sulfide-ore copper mining in the watershed.[610] Surface waters test as clean and safe, with any pollutants well below federal drinking water standards in all measured categories.[611, 612] Pollution of these waters, whether originating in surface or groundwater, would make its way into the waters people use for drinking, cooking, bathing and recreating, and would pose potential health threats.[613]

- **Healthy Fisheries**

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[604] 2004 Superior National Forest Plan, page 2.
[605] USDA Forest Service, (2018). Water Resources of the Superior National Forest: Available via: https://www.fs.usda.gov/detail/superior/about-forest/?cid=fsm91_049844, "By the United States Forest Service's measure, the Superior National Forest contains 20% of all the fresh water in the entire National Forest System, and the Boundary Waters contains most of the fresh water in the Superior National Forest."
[606] Geerts, et al, 2017.
[607] MPCA. (n.d.) Water data S Kawishiwi River- Station S000-108.
[608] Baker, 2013.
[609] MPCA. (n.d.) Water data S Kawishiwi River- Station S000-108.
[610] *See* NMW_M–p - Waters at risk of pollution from sulfide-ore mining in the Rainy River Basin, in Appendix (folder "Maps")
[611] Geerts, et al, 2017.
[612] Anderson et al., 2010
[613] Myers, 2015.

AMERICAN OVERSIGHT

The Boundary Waters watershed aquatic resources are of major importance ecologically and recreationally. The Boundary Waters and VNP are home to a wide diversity of native fish, including nearly 40% of Minnesota's approximately 150 native fish species, and nearly 55% of Minnesota's approximately 25 native fish families. Genetic strains and cold-water fish assemblages are supported in the Boundary Waters and VNP. About 50 lakes there have been identified as refuges for cisco and other cold-water species such as lake whitefish and lake trout. This diversity results from the region's current abundance and diversity of clean, healthy habitats. Even with 155,000 annual visitors spending multiple days on average paddling, camping, and fishing in the Boundary Waters, the large number of lakes keeps fishing pressure low on most of them, and consequently sport fish caught in the Boundary Waters are larger on average than those caught on lakes outside the Boundary Waters.[614] The abundance, diversity, and health of habitats result in large part from historical efforts to maintain the health and ecological integrity of the natural landscapes and water bodies in the watershed.

Fishes in the Boundary Waters and VNP are an integral component of a larger ecological system. They provide a diversity of ecosystem services. Peer reviewed and published scientific papers describe fish as ecological engineers that regulate nutrients and food webs, and contribute to the resiliency of aquatic systems. These qualities are perhaps most famously demonstrated by trophic cascades, i.e., the process whereby changes in fish abundance cascade through a food chain to affect water quality. Fish provide important links to terrestrial ecosystems, and several species in the Boundary Waters watershed are essential to the life cycle of state-listed freshwater mussels that also occur in the region, such as the threatened flutedshell, *Lasmigona costata*.[615]

- **Endemic Wild Rice**

Wild rice (*manoomin*; *Zizania palustris*), an important emergent aquatic plant for wildlife, is endemic only to the upper Great Lakes area of North America. Mucky-bottomed, and low-sulfate waters such as those in northeast Minnesota are ideal for its growth and self-propagation. Many waters within the Boundary Waters watershed are on the Minnesota Department of Natural Resource's list of wild rice waters.[616] These include but are not limited to: the South Kawishiwi River and Birch, White Iron, Farm, Garden, and Fall Lakes (which are all on the flow-path downstream from the proposed sulfide-ore copper mine); Stony Lake, Stony River, and Harris Lake.

Wild rice is an important social and cultural resource to the Anishinaabe in northern Minnesota.[617] The traditional sustainable hand-harvesting of this subsistence resource has

[614] Venturelli & Vondracek, 2017.
[615] *Id*.
[616] MN Dept. of Natural Resources (2008, February 15) Wild Rice Distribution and Abundance in Minnesota. Retreived from https://files.dnr.state mn.us/fish_wildlife/wildlife/shallowlakes/statewide-inventory-wild-rice-waters.pdf (Accessed 2018, December 18)
See: NMW_M–p - Wild Rice Waters in Appendix (folder "Maps") for geographic location of wild rice waters in the Boundary Waters watershed. Please note: this and other maps show US Forest Service previously proposed mineral withdrawal area which has since been rescinded.
[617] *See* (2016, April 29). Letter from Norman W. Deschampe, Chairman of the Grand Portage Reservation Tribal Council, to the U.S. Departments of Agriculture and the Interior, and to the Director of the Council on

AMERICAN OVERSIGHT

been central to Ojibway culture for centuries, and wild rice is considered by Ojibway to be a sacred gift from the creator.[618] Minnesotans of other cultures engage in and enjoy the existence and harvest of wild rice harvest in the watershed, as well.

The low sulfate concentrations that have existed and continue to exist in the waters of the Boundary Waters watershed are critical to the maintenance of wild rice stands,[619] including wild rice stands in the White Iron Chain of Lakes.[620] An increase in sulfate concentrations, whether in surface waters or in groundwater that intercepts surface waters, would diminish wild rice stands or eradicate wild rice altogether from the affected waters.

- **Terrestrial Ecosystem Services**

Much of the forest in the Superior National Forest within the Boundary Waters watershed is a southern extension of the boreal forest. Boreal forests are one of the world's most important providers of ecosystem services, including the production of soils and the control of erosion and flooding; interception and storage of surface water inflows and precipitation; purification and provision of water; cleansing and moderation of the temperature and humidity of air; production of oxygen; storage of carbon; service as habitat for many hundreds of ecologically important and valuable species; and space for recreation. Boreal forests have a large impact on climate at local, regional, and global scales.[621]

Though not typically valued by traditional markets, the benefits provided by natural areas on human wellbeing must be incorporated into natural resource management and planning.[622] The best available science supports the assertion that preserving ecosystem services and the irreplaceable landscape baseline provided by the Boundary Waters are issues that weigh in favor of preparation of an EIS regarding the proposed action and the likely harm to terrestrial ecosystems and their associated functions[623] following foreseeable mining activity in the Boundary Waters watershed were the proposed action to be approved.

- **Wildlife and Biodiversity Significance**

Minnesota's southern boreal forests, particularly in the Superior National Forest and in the Boundary Waters, harbor diverse plant and globally significant wildlife communities, including

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Environmental Quality. 2 p.; *also see* (2014, April 3). Letter from Karen R. Diver, Chairwoman of the Fond du Lac Band of Lake Superior Chippewa Reservation Business Committee, to the U.S. Department of Agriculture, 2 p.

[618] Johnson, A. (2014, October 15). Protecting Our Wild Rice Heritage. Quetico Superior Wilderness News. Available at: http://queticosuperior.org/blog/protecting-our-wild-rice-heritage.

[619] Pastor, J. et al. Effects of sulfate and sulfide on the life cycle of *Zizania palustris* in hydroponic and mesocosm experiments. *Ecological Applications*, Vol. 27, Issue 1 (2017): 321-336.

[620] Anderson et al., 2010, at p. 31 (Figure 17. Presence of wild rice surveyed during September 2008 in White Iron Lake)

[621] Frelich, 2014.

[622] Bear, D. (2014). Integration of Ecosystem Services Valuation Analysis into NEPA Compliance: Legal and Policy Perspectives. In *Federal Resource Management and Ecosystem Services Guidebook.* Durham: National Ecosystem Services Partnership, Duke University, p. 4.

[623] Frelich, 2018 details the direct and cumulative impacts of sulfide-ore copper mining on the forest and other terrestrial ecosystems and asserts that 25 of the 39 potential impacts will affect the wilderness to some degree, Table 1 P. 21-22

AMERICAN OVERSIGHT

approximately 50 species of native mammals,[624] three of which are federally listed as threatened under the Endangered Species Act (see Threatened and Endangered Species section below). As recognized by the Forest Service, the Boundary Waters is the only large-scale protected sub-boreal forest in the lower 48 United States, and the Superior National Forest "provides abundant and diverse habitat for thousands of breeding, wintering, and migratory species of terrestrial and aquatic habitat."[625] Moreover, portions of the Superior National Forest (including lands in the MPA, and Boundary Waters) with moderate, high, and outstanding biodiversity significance have been and are being studied, delineated, and ranked by the Minnesota Department of Natural Resources, Minnesota Biological Survey (MBS) as part of a systematic statewide survey of biodiversity significance.[626, 627, 628, 629, 630, 631]

The Superior National Forest, including the Boundary Waters and the MPA, is a globally-important birding area. More than 200 bird species depend on the Superior National Forest for nesting, wintering, summering, year-round, or migratory habitat.[632] The American Bird Conservancy lists the Superior National Forest as one of 100 "globally important bird areas." Thirteen of the 86 bird species identified as of significant "continental concern" by North America's two premier bird conservation consortia (Partners In Flight and the North American Bird Conservation Initiative), are hosted in the Boundary Waters region. According to John W. Fitzpatrick, "[e]very possible effort to conserve or restore their highest-quality habitats is essential for conservation of the species [of significant continental concern]," and "therefore, maintaining the pristine condition of all BWCAW regional habitats" is vital to their long-term conservation.[633]

The Superior National Forest and Boundary Waters region also carries world-wide significance as home to the greatest wood warbler species concentration in the world.[634] Maintenance and protection of native habitats in the Superior National Forest is key to the continued population viability of some bird species in Minnesota, including the black-throated blue warbler, and habitat specialist, the boreal owl.[635, 636]

A number of terrestrial plant and animal species have an aquatic stage in their life history, depend for a share of their diet on aquatic plant or animal prey items, or otherwise depend on

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[624] Powell, 2017.
[625] USDA Forest Service December 14, 2016 decision letter to USDOI BLM, p. 1-2.
[626] MN DNR. (n.d.). MBS Survey Procedures: http://www.dnr.state.mn.us/eco/mcbs/procedures/index.html
[627] MN DNR. (n.d.). MBS Guidelines for Ranking of Sites of Biodiversity Significance (and draft map of areas of biodiversity significance in Minnesota): http://www.dnr.state mn.us/eco/mcbs/biodiversity_guidelines html
[628] MN DNR. (n.d.). MBS Native Plant Community and Rare Species Maps: http://www.dnr.state.mn.us/eco/mcbs/maps.html
[629] LAMP, 2013.
[630] CSTBWMAP_MBSSeries-Withdrawal Area
[631] CSTBWMAP_MBSSeries-Withdrawal Area&lands
[632] Green, J.C. (2006). Annotated Checklist of Birds of the Superior National Forest.
[633] Fitzpatrick, 2017.
[634] *Id.*
[635] Wolter, P. T., and W. H. Lane. (2001). A Look at Boreal Owl Nesting Habitat in Minnesota Using Landsat Thematic Mapper Data. The Loon Vol 73:192-199.
[636] Hayward, G.D. (1997). Forest Management & Conservation of Boreal Owls in North America. *J. Raptor Research* 31(2) 114-124.

AMERICAN OVERSIGHT

organisms whose own life histories have an essential aquatic component.[637] For example, moose – an iconic and prized species to see in the Superior National Forest and the Boundary Waters – depend on aquatic plant matter to supply a substantial share of their sodium requirements. A number of other iconic species, such as loons, bald eagles, osprey, river otter, and mink also are sought-after by wildlife watchers in the Boundary Waters watershed. These species consume and to varying degrees depend on fish for food. Bats and some birds consume insects whose development involves aquatic larval stages. In short, harm to terrestrial resources would follow from harm to aquatic resources.

- **Threatened and Endangered Species Habitat**

The Boundary Waters provides an important refugia for wildlife species with declining populations, which in the face of climate change will be critical to the continued existence of imperiled species in Minnesota.[638] The Boundary Waters and Superior National Forest are home to three species that are listed as threatened with extinction under the Endangered Species Act: Canada lynx, gray wolf, and northern long-eared bat.[639] The analysis area for the mineral leases is also within the formally designated critical habitat for both the Canada lynx and gray wolf.[640]

While moose are not currently listed as an endangered or threatened species, their populations in Minnesota, including the Boundary Waters watershed, have been on the decline and petitions have been submitted calling for federal protection of the species.[641] In May 2016 the U.S. Fish and Wildlife Service issued a notice of petition findings and initiated a status review of the northwestern population of moose. The notice states that the petition "presents substantial scientific or commercial information indicating that the petitioned action may be warranted".[642] The U.S. Fish and Wildlife Service is now overdue on a determination.

In the case of Canada lynx and the gray (eastern timber) wolf, the Boundary Waters and the rest of the Superior National Forest play a critical role as habitat because of the extent of large natural areas with low human population density and, relative to the rest of the region, lower road densities and traffic intensities. While the wolf was extirpated everywhere else in the Lower 48 states over the course of the 19th and 20th centuries, a wolf population persisted in the Superior National Forest, in large part because the Boundary Waters served as refuge habitat and a population source. Canada lynx and gray wolves both range over large areas, and would be significantly affected by continued development and habitat fragmentation.[643]

Significant wolf and lynx sightings in the Superior National Forest are shown by a 2000-2008 study.[644] With the exception of an area of northeastern Koochiching County, all critical lynx

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[637] Frelich, 2014.
[638] USDA Forest Service December 14, 2016 decision letter to USDOI BLM, p. 2.
[639] *Id*.
[640] *Id*.; 43 Fed. Reg. 9607, 9614 (March 9, 1978).
[641] Albert, J. (2015, July 16). Groups File Petition to Classify Moose as Endangered Species. Outdoor News. https://outdoornews.com/2015/07/16/groups-file-petition-to-classify-moose-as-endangered-specie
[642] US Fish and Wildlife Service. (2016, May). Endangered and Threatened Wildlife and Plants; 90-Day Findings on Two Petitions.
[643] USDA Forest Service December 14, 2016 decision letter to USDOI BLM, p. 16.
[644] *See* Wolf, Lynx Sightings. 2000-2008, CBD. NorthMet Project, in Appendix (folder "Maps")

AMERICAN OVERSIGHT

habitat in Minnesota exists in northeast Minnesota's St. Louis, Lake, and Cook Counties. Nearly all of the Superior National Forest is designated critical habitat for lynx; it includes both foraging and denning habitat.[645,646,647,648,649]

Long-eared bats are found in throughout Minnesota with hibernacula and roost trees located near the proposed Twin Metals leases and project site.[650] Although these bats do not generally forage over water, they prey on many insects that emerge from aquatic larvae. Loss of aquatic larvae, which could be caused by acid mine drainage, would reduce populations or eliminate some of the most sensitive insect species from affected waters. Some sensitive species that could be lost are important food for bats. That loss of nutrition would have a minor but negative direct effect on long-eared bat populations. Long-eared bats often share winter roosts with little brown bats and, like little brown bats, are threatened by white-nose syndrome. White-nose syndrome has already reduced by at least 70% the numbers of little brown bats using winter hibernation roost in the Soudan Mine, the largest winter roost known in the Boundary Waters area. This leaves bats in the Boundary Waters area particularly sensitive to threats to their food supplies.[651] Any negative effects on bat nutrition caused by sulfide-ore mining in the Boundary Waters watershed will exacerbate the precarious existence of these bats, leave them more vulnerable white-nose syndrome-mediated depletion of fat reserves and starvation and lead them closer to extinction locally.

Moose populations have been declining in Northern Minnesota and are sensitive to forest fragmentation and water pollution. The additional traffic and associated moose-vehicle collisions, forest fragmentation, density of deer which carry brainworm fatal to moose, and avoidance of high-value habitats due to disturbance from mining activity are just a few of the reasonably foreseeable adverse impacts to struggling moose. Moose seek out aquatic vegetation because it tends to have more sodium than terrestrial vegetation. Reduction or contamination of aquatic vegetation from acid mine drainage would harm moose and moose populations.[652]

Due to past iron ore and taconite mining, and other development, there are few remaining wildlife corridors in northeastern Minnesota for wildlife such as lynx, wolves, and moose that cover large areas. In 2006, Emmons and Olivier Resources prepared for the DNR, "*Cumulative Effects Analysis on Wildlife Habitat Loss/Fragmentation and Wildlife Travel Corridor Obstruction/Landscape Barriers in the Mesabi Iron Range and Arrowhead Regions of Minnesota."*[653]. As stated by Emmons & Olivier, wildlife travel through this region is restricted "because of the extensive change to the landscape, including large mine pits, stockpiles, mining

[645] *See* USFS Map: "Lynx Critical Habitat and Foraging Habitat" in Appendix (folder "Maps")
[646] *Revised Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx and Revised Distinct Population Segment Boundary*. 79 Fed. Reg. 54781, 54843 (September 12, 2014).
[647] Heart of the Continent School Trust Lands Initiative. (2016). Map of Critical Habitat.
[648] *See* HofC_Map- Lynx Critical Habitat, in Appendix (folder "Maps")
[649] Moen, R., et al. 2008. Movement and Habitat Use of Canada Lynx During Denning in Minnesota. *J. Wildlife Management,* 72(7): 1507-1513.
[650] *See* MNDNR_nleb township list and map, in Appendix (folder "Maps")
[651] Powell, 2017.
[652] *Id.*
[653] EOR, 2006.

AMERICAN OVERSIGHT

infrastructure, regional development associated with the Mesabi Iron Range, and highways." *Id.* at 2. Emmons & Olivier identified only 13 remaining wildlife corridors across the 100-mile Mesabi Iron Range. *Id.* at 51. Moreover, Emmons & Olivier found that any future losses of these relatively small remaining corridors may be considered significant. *Id.* Additionally, due to cumulative effects of past habitat losses in this region for "mammalian species of greatest conservation need," Emmons & Olivier determined that "any future losses to the habitat requirements for these species could be considered significant." *Id.* at 52.

A second study entitled, "*Cumulative Effects Analysis of Wildlife Habitat and Threatened and Endangered Wildlife Species, Keetac Expansion Project*," was prepared by Barr Engineering in 2009.[654] (Barr Report 2009). The Barr Report states that mining features already cover 118,314 acres along the Iron Range, including 36,962 acres of open pit mines, 78,620 acres of stockpiles and tailings basins, and 212 acres of facilities and infrastructure. *Id.* at 4. The cumulative impacts of mining in this region has fragmented habitat and resulted in a loss of wildlife travel corridors. *Id.* "It is feasible that in the future, mining in the Iron Range could potentially culminate in a 100-mile long landscape barrier that severs wildlife travel corridors, which may have impacts on dispersal, migration, and/or seasonal movements of many species." *Id*.

The Barr Report identified 18 remaining wildlife corridors. *Id.* at 51. Of the 18, the Barr Report predicts that "four will likely become completely impassable within the next 25-30 years as a result of planned mining activities," and an additional four corridors "will retain some functionality, but will be significantly degraded by future mining plans." *Id.* at 56. "As wildlife are increasingly exposed to mining activity, roads, and urban centers due to the degradation of available corridors, the incidence of wildlife mortality within the corridors is likely to increase." *Id*. Due to insufficient data, however, the Barr Report was unable to determine whether wide-ranging mammals such as lynx would be "sensitive" to these cumulative effects. *Id*.

Despite the presence of federally threatened species, critical habitat, and a significantly declining moose population, BLM failed to analyze in the EA the potentially severe impacts of a reasonably foreseeable mine plan of operations, along with all past, present, and reasonably foreseeable future actions, on the survival and recovery of lynx, wolves, and moose. BLM thereby failed to provide the hard look required by NEPA, and also failed to ensure that the proposed action will not result in the jeopardy of any of the three listed species or the destruction or adverse modification of critical habitat, as required by Section 7 of the Endangered Species Act.

- **Cultural Significance of the Boundary Waters Canoe Area Wilderness**

The Boundary Waters Canoe Area Wilderness is of enormous social and cultural importance, particularly for Minnesotans, but for many others as well. The Boundary Waters is the nation's only significant lakeland wilderness, is a "unique, iconic, and irreplaceable wilderness area,"[655] defined by and prized for its vast, high-quality, and massively interconnected fresh water resources. For Minnesotans, the Boundary Waters is a defining natural feature of the state, a

[654] Barr Engineering. (2009, February). Cumulative Effects Analysis of Wildlife Habitat and Threatened and Endangered Species. Keetac Expansion Project. Prepared for U.S. Steel. (Barr Report 2009).
[655] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.

AMERICAN OVERSIGHT

point of state pride and, to echo Governor Dayton, a "crown jewel" and a "national treasure." People from across the U.S. and around the world treasure the clean waters of the Boundary Waters.[656] In the 2016 US Forest Service letter to the BLM discussed in Part II, former US Forest Service Chief Tom Tidwell describes the "irreplaceable natural qualities" of the watershed as central to the social significance of region, particularly "the opportunity to pursue and experience expansive solitude, challenge and personal immersion in nature are integral to the BWCAW experience."[657]

At 1,086,953 acres, the Boundary Waters is the largest Wilderness Area east of the Rocky Mountains and north of the Everglades. This hugely popular and most heavily-visited wilderness in the nation hosts 1,175 lakes larger than 10 acres and hundreds of stream and river miles support outstanding aquatic habitat quality, and thriving stocks of some 50 fish species, including many popular sport fish species.[658] The Boundary Waters provides one of the best and certainly the biggest Wilderness freshwater fishing destination in the U.S. The backcountry hunting and fishing opportunities in the Boundary Waters are the most extensive available east of the Rockies. The Boundary Waters is the only Wilderness backcountry fishing and hunting area of substantial size in the middle of the country.

The interconnectedness of lakes, streams, and rivers means that visitors can travel through it by boat or canoe in spring, summer, and autumn, and can choose routes from easy to difficult. Water travel means that gear can be transported more efficiently and easily than when backpacking. The comparative ease of movement by canoe allows more extensive trips in less time and with less effort. The Boundary Waters offers truly unique and unparalleled accessibility to people representing a wide range of ages and abilities, from families with small children to people with physical limitations.

The Boundary Waters provides a wide range of direct and indirect benefits. Among them are experiential and recreational benefits of great value to the people who use the Boundary Waters, who look forward to using it, or who are simply pleased by its existence. These and other types of uses are, so long as usership is managed, of limitless benefit to Wilderness-edge communities, the Arrowhead region, Minnesota, the Midwest, and the nation.

Some of these uses and benefits are explained in "How Wilderness benefits you" at Wilderness.net, a collaborative project between the University of Montana College of Forestry and Conservation, the USDA-Forest Service, the Bureau of Land Management, the National Park Service, and U.S. Fish & Wildlife Service:[659]

> [W]ilderness benefits are many and varied. … [I]t's important to remember that those who value wilderness may include not only a devoted trekker who spends weeks of the year in the backcountry, but also a city-dweller who never visits a federal wilderness area in his lifetime.
> …

[656] Keeler, et al, 2015.
[657] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.
[658] Venturelli & Vondracek 2017.
[659] Wilderness net (n.d". "How Wilderness Benefits You". Available at: http://www.wilderness net/NWPS/values.

AMERICAN OVERSIGHT

[R]ecent data from the National Survey on Recreation and the Environment[660] indicate that protecting air quality, water quality, wildlife habitat, unique wild plant and animal species, and benefitting future generations are all consistently rated as the top five most important benefits of wilderness. Most Americans, whether urban or rural, also ascribed high importance to six additional benefits including the scenic beauty of wild landscapes, the knowledge that wilderness is being protected (existence value), the choice to visit wilderness at some future time (option value), the opportunity for wilderness recreation experiences, preserving nature for scientific study, and spiritual inspiration.

- **Array of Recreational Assets**

Numerous areas within the Boundary Waters watershed have recreation-related Management Area designations. These include: Semi-Primitive Motorized Recreation; Wild, Scenic, and Recreational Rivers; and Recreation Use in a Scenic Landscape. Known as dispersed or back country camping, these areas provide important opportunities for people who want high-quality recreational opportunities without going into the Boundary Waters. The Birch Lake and South Kawishiwi River area in particular supports an enormous amount of the recreation[661] with a broad diversity of recreation types,[662,663] including motorized and non-motorized boating, fishing, hunting, foraging, summer and winter motorized trails, non-Wilderness backcountry camping that does not require a permit, fourteen campgrounds, five designated picnic areas, one designated swimming area, roughly sixty backcountry campsites total, one trailhead, and 14 Wilderness Entry Points.[664,665]

The minimally developed nature of Birch Lake and South Kawishiwi River area is important to its designation as a Recreational Use in a Scenic Landscape Area[666] Much of the shoreline remains undeveloped, most sounds are natural and rarely loud with inconsistent occasional motorized recreation sounds. This is one of the most popular recreation areas in the watershed and one place where people can experience what recreation was like prior to the 1978 Act described above.[667] Conversion of a large area of existing natural vegetative landscape and replacing it with an industrial mining complex that will be seen and heard from the lake would degrade existing recreation opportunities. This action would be inconsistent with Section 18a of the 1978 Act which directs the Secretary of Agriculture:

> to expedite and intensify the program of dispersed outdoor recreation development on the Superior National Forest outside the Boundary Waters Canoe Area Wilderness… The

[660] National Survey on Recreation and the Environment (NSRE): 2000-2002. The Interagency National Survey Consortium, Coordinated by the USDA Forest Service, Recreation, Wilderness, and Demographics Trends Research Group, Athens, GA and the Human Dimensions Research Laboratory, University of Tennessee, Knoxville.
[661] MPCA. 2011. A Water Quality Assessment of Select Lakes within the Kawishiwi River Watershed. See p. 40.
[662] Schurke P. (2016, October 28). Declaration of Paul Schurke.
[663] Schurke, S. (2016, October 28). Declaration of Susan Schurke.
[664] *See* 10-12-2017 Scoping comment letter (part 3) of NMW *et al.* Northern Minnesota Federal Minerals Withdrawal, at page 40 to 41.
[665] USFS. (2008) Birch Lake Back Country Brochure
[666] *See* 2004 Forest Plan Revision Figure MAS-1_SNF Management Areas, in Appendix, (folder "Maps")
[667] The Birch Lake/S Kawishiwi region offers motorized and non-motorized recreation in a minimally developed setting similar to how it was pre- 1978.

AMERICAN OVERSIGHT

> Secretary shall consider in such new program development the need for the following: additional snowmobile trails, particularly those now planned or under construction; remote campsites on lightly developed lakes; and lake access sites and parking facilities to provide 'motorized recreation experiences similar to those previously available in the Boundary Waters Canoe Area.[668]

- **Historic and Prehistoric sites**

The lands and waters of the Boundary Waters watershed has been used by people for some 10,000 years, and is home to a number of prehistoric and historic sites. One such site is the Laurel Indian Village site known to exist at the southernmost point of land at the confluence of the South Kawishiwi River and Birch Lake.[669] Undoubtedly there are many other known and unknown sites.

b. The scientific evidence that sulfide-ore copper mining would harm the Superior National Forest, the Boundary Waters, the MPA, Quetico Provincial Park, Voyageurs National Park, and local communities, is overwhelming and not disputed.

There are more than forty studies directly applicable to proposed sulfide-ore copper mining in the Boundary Waters watershed – environmental, economic, social, human health, and copper mine performance. These studies document in great detail the high risk and inevitable harm that would result following approval of the Proposed Action. The full scale of the threat to water resources posed by sulfide-ore copper mining, and the level of risk that its water pollution would enter the Boundary Waters (and other Protected Areas), has become clear in recent decades (since the mid-1990s), with publication of a large number of authoritative agency, expert, and

[668] 1978 BWCA Act §18(a)
[669] Harrison, 1985.

AMERICAN OVERSIGHT

NGO studies.[670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689] A summary of the most applicable science is attached to this comment letter.[690] Maps, attached, show surface waters in Twin Metals proposed footprints, with multiple flow paths to Birch Lake and the South Kawishiwi River, and from there into the Boundary Waters.

i. High water quality and low to no buffering capacity of waters makes waters of the Boundary Waters watershed especially susceptible to acidification

Water in the Boundary Waters, as well as in the Mining Protection Area and the Boundary Waters watershed upstream from the Wilderness boundary, is of extremely high quality, and has nearly no acid buffering capacity, low specific conductivity, and low concentrations of sulfates, nitrogen, phosphorus, and other pollutants.[691,692,693,694,695,696] Low-to-no buffering capacity leaves the waters of the region highly sensitive to acidic mine drainage.[697,698,699,700]

Waters in the Boundary Waters watershed are circumneutral. For example, USGS measurements of pH values at three locations along the Kawishiwi River, taken from 1958 to 1976, typically

[670] EPA. Technical Document: Acid Mine Drainage Prediction – Dunka Pit (1994)
[671] EPA. Liquid Assets 2000: America's Water Resources at a Turning Point. (2000)
[672] GAO. (2005). Environmental Liabilities- EPA Should Do More to Ensure That Liable Parties Meet Their Cleanup Obligations. Report to Congressional Requesters.
[673] EPA Office of General Council. Evaluation Report: Nationwide Identification of Hardrock Mining Sites (2010)
[674] Kuipers and Maest. (2005). Predicting Water Quality at Hardrock Mines: Methods and Models, Uncertainties, and State-of-the-Art.
[675] Kuipers & Maest, 2006.
[676] Robertson, A.McG. 2011. Mine Waste Management in the 21st Century (2011)
[677] Rico, et al, 2008
[678] Petticrew et al. (2015). Impact of a Catastrophic Mine Tailings Impoundment Spill into one of North America's largest fjord lakes: Quesnel Lake, British Columbia, Canada. *Geophysical_Research_Letters* 42.
[679] Bowker & Chambers, 2015.
[680] Earthworks. (2004). Hardrock Mining: Risks to Community Health.
[681] Earthworks, 2006, Predicting Water Quality Problems at Hardrock Mines.
[682] Earthworks, n.d.
[683] Earthwor–s - FINAL COPPER PORPHYRY REPORT (2012)
[684] Earthworks. (2017). U.S. Gold Mines Spills & Failures Report.
[685] Chambers, 2014.
[686] Myers 2016b.
[687] Baker, 2013.
[688] Frelich, 2014
[689] Myers 2016a.
[690] The Science Updated – December 2018
[691] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.
[692] MPCA. June 2017. Rainy River-Headwaters Watershed Monitoring and Assessment Report.
[693] USGS WQ Data, by station (in Appendix J)
[694] MPCA. Jan. 2011. A Water Quality Assessment of Selected Lakes within the Kawishiwi River Watershed.
[695] Anderson et al., 2010.
[696] Myers 2013.
[697] Baker, 2013.
[698] Chambers, 2014.
[699] Myers 2016b.
[700] Siegel & Ericson, 1980.

AMERICAN OVERSIGHT

ranged from 6.5 to 7.3.[701] Average pH values in Keeley Creek (draining to Birch Lake) and Filson Creek (draining to the South Kawishiwi River) were 6.1 and 6.2, respectively, because of the nature of the wetland areas they drained.[702] Values for pH at the South Kawishiwi River monitoring station (S000-108) similarly tend to range from mid-6 to high 7.[703] Such sensitive variation indicates that changes in acid content in surrounding waters, such as from acid mine drainage, would have a demonstrable effect on the area's clean water resources.[704]

ii. The large amount, distribution, and interconnectedness of surface and ground waters in the Boundary Waters watershed heightens risk for contamination of waters by sulfide-ore copper mining, and makes containment and recovery of contaminants highly improbable

The rocks of the Duluth Complex, which underlie the permeable Rainy and Superior Lobe surficial deposits, are fractured and faulted. This has been known since the Copper-Nickel Study was prepared beginning in the 1970s. There are fault zones in the Boundary Waters watershed, including in the Kawishiwi River HUC-11 watersheds. Siegel and Ericson (1980), who studied the copper-nickel study area, reported that, *"fractures and joints in the Duluth Complex may extend to considerable depths but are more extensive in the upper 200 to 300 feet of the bedrock.* […]

> *Near the surface, water in bedrock fractures and joints is hydraulically connected with overlying surficial aquifers, and water movement is coincident with local gradients on the water table. Regionally, groundwater probably moves very slowly through deep fractures toward the main drainages.*[705]

A hydrology report prepared by Barr Engineering with respect to a Duluth Complex sulfide-ore mining project proposed outside the Withdrawal Area is informative:

> In the bedrock units in Northeastern Minnesota, the bulk hydraulic conductivity of the bedrock reflects fracture flow. Intrusive igneous rock, for example, has little, if any, primary porosity (Reference (5)), indicating that water moves almost entirely through fractures and secondary porosity features. In order for groundwater flow to occur, there must be fractures, such as joints and open faults, the characteristics of which can be highly variable within the rock body.[706]

An indicator of the connectedness of bedrock fractures is provided in an affidavit by the owner of a sizeable resort in the Birch Lake area, located roughly equidistant between the Maturi and Maturi SW deposits and possessing 16 single and multi-family cabins and chalets, which was

[701] USGS data from field/lab water quality samples collected at stations 05125000, 05126210, and 05127000.
[702] Geerts, et al, 2017.
[703] Excel file titled, "MPCAwaterdata-SKawishiwiRiver-Station_S000-108" available in Appendix (folder Environment).
[704] Baker, 2013.
[705] Siegel & Ericson, 1980.
[706] Barr Report 2014, p. 2.

AMERICAN OVERSIGHT

served by wells that delivered drinking during decades of use. The water quality in its drinking water wells, which intercept bedrock fractures, deteriorated rapidly between 2006 and 2014 – the time period during which exploratory drilling was occurring on the far shores to the east of the Kawishiwi River and to the west of Birch Lake. One well saw a 40-fold increase in metal content, to the point that silverware and plumbing fixtures began to tarnish badly and corrode, and guests complained about the water's taste and color. The owners attribute the deterioration in well water quality to bedrock fracture flows. The resort's location in comparison to the areas in which drilling was ongoing during those years, suggests bedrock fracture flows over distances of several thousand feet to several miles.[707]

The combination of the above factors – (i) permeable surficial deposits atop (ii) bedrock that is fractured and faulted, mostly in the top 300 feet – indicates the strong potential for hydraulic interconnectivity of water in the bedrock aquifer, surficial aquifer, and surface water. Consequently, AMD that forms from proposed sulfide-ore copper mining in the Boundary Waters watershed would be very likely to move into and through surficial and bedrock groundwater, and reach the BWCAW.[708] Indeed, peer-reviewed science and modeling published in the Journal of Hydrology demonstrate that to be the case.[709]

Freshwater is everywhere in the Boundary Waters watershed. This is particularly true in the Kawishiwi River area, which is an important canoe travel route that flows through the heart of the Boundary Waters Canoe Area Wilderness. A photo-essay shows the Birch Lake – South Kawishiwi River confluence, with and without the boundaries of Twin Metals proposed leases and mine sites and surface processing facilities superimposed.[710] In addition, in the Boundary Waters watershed, a surficial aquifer consisting of glacial till or sand and gravel generally less than 3-6 meters thick covers the area.[711]

"The dramatic hydrogeology and interconnectedness of the Boundary Waters' forests, lakes, streams, and wetlands make region unique and susceptible to degradation."[712,713] The presence of surface and ground water resources near to the surface and close by are powerful factors that heighten the risk of sulfide-ore copper mining contaminating surrounding surface and groundwater resources.[714] For contaminants to reach surface water through bedrock and surficial aquifers requires both fractures in and connectivity among fractures in bedrock.[715] Both of these have been determined to be present in the upper several hundred feet of the Duluth Complex formation.[716,717] A 2018 technical report prepared by hydrologic consultant Dr. Tom Myers

[707] Koschak, S.L. (2016, October 26). Declaration of Steven L. Koschak.
[708] Runkel, A.C. (2015, December 21). Comment on the NorthMet Supplemental Draft Environmental Impact Statement.
[709] Myers 2016b.
[710] Photo-essay of Twin Metals Minnesota proposed location, with outer boundaries of surface processing facilities, and three of the four deposits that would be mined. (Photo-essay) (in Appendix, folder Maps)
[711] Myers 2016b.
[712] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.
[713] Myers 2013.
[714] Kuipers & Maest, 2006.
[715] Myers 2018.
[716] Myers 2013
[717] Myers 2018

AMERICAN OVERSIGHT

describes the numerous available pathways for mining contaminants to reach surface waters in the watershed of the Boundary Waters Canoe Area Wilderness.[718]

In a very wet environment such as the Boundary Waters watershed, existing technologies are unlikely to be capable of capturing all released contaminants.[719] This is particularly true if large volumes of contaminants are involved, if the failure is not immediately detected when it occurs, or if the release occurs over, under, or adjacent to water. As a series of maps and a hydrology technical report shows, the Twin Metals' proposed site is riddled with wetlands, streams, and lakes that flow into the Kawishiwi River.[720,721] Dr. Myers' report refutes claims that geophysical analysis and video of boreholes can be determinative for location and connectivity of fractures that could transport contaminants into surface waters. "The risk is from spills on the surface, leaks from the surface storage of waste, even temporary stockpiles, and from seepage through buried waste. Geophysical analyses of boreholes cannot provide evidence of a lack of connectivity through bedrock to the surface. It is not possible for video of boreholes to show the length of fractures to show their lack of connectivity."[722]

iii. Peer-reviewed published science shows how, under ordinary operations, pollution from sulfide-ore copper mining in the Rainy River-Headwaters would flow through groundwater and surface waters and into the Boundary Waters

In the wet environment of the Boundary Waters watershed, a region with substantial winter and non-winter precipitation amounts, there is no practical possibility of preventing air, rainwater, and snowmelt from reaching sulfide-bearing rock.[723] Due to the proximity of waters to reactive materials, it would be impossible to prevent mine waste (including leachate from sulfides in fugitive crusher dust, tailings, process water, and lean ore and waste rock stockpiled on the surface) from entering those waters.[724]

Peer-reviewed science published in the Journal of Hydrology demonstrates how sulfate – a well-documented pollutant generated when Duluth Complex rock is processed and exposed to air and water – would follow flow-paths through the Superior National Forest and into the MPA and the Boundary Waters.[725] If sulfide-ore copper mining is developed in the Boundary Waters watershed, it is only a question of when, not if, mining pollution reaches the MPA and Boundary Waters.[726]

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[718] Myers 2018
[719] Levit, 2018b, Follow-up Report.
[720] NMW_Map_Flow path from TMM mining activity, in Appendix A.
[721] Myers 2013.
[722] Myers 2018
[723] Myers 2013.
[724] Id.
[725] Myers 2016b.
[726] Myers, T. Technical Memorandum: Twin Metals Mining and the Boundary Waters Canoe Area Wilderness, Risk Assessment for Underground Metals Mining. Technical Memorandum dated August 8, 2014, prepared for Northeastern Minnesotans for Wilderness (Myers 2014)

AMERICAN OVERSIGHT

The proposed action is dangerous: "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 irreparable harm to [the] unique, iconic, and irreplaceable wilderness area" is "unacceptable."[727]

iv. Sulfate would damage water quality in the Boundary Waters in multiple ways and is known to be far more reactive and damaging to aquatic environments than was previously understood

Research sponsored by the Minnesota Pollution Control Agency (MPCA) has generated a series of peer-reviewed, published scientific reports that document the relationships between sulfate, sulfide, iron, organic carbon, and wild rice; sulfate and methyl-mercury formation; and sulfate and eutrophication.[728, 729, 730, 731] Three reports explain the chemical processes by which the addition of sulfate to low-sulfate waters, like those in the Boundary Waters Canoe Area Wilderness and Superior National Forest, and the reduction of sulfate to sulfide – a process mediated by organic carbon and iron – is particularly damaging to wild rice (and other aquatic plants) and can lead to diminution and elimination of plants from waters where they now grow. The fourth report explains how addition of sulfate to surface water leads to increased surface water concentrations of phosphorus, nitrogen, mercury and methylmercury.

Sulfide-ore copper mining sulfate pollution of the currently low-sulfate waters of the Boundary Waters watershed would cause a "biogeochemical cascade" of damaging effects on the water quality and ecology in the Boundary Waters watershed.[732] These would include, at a minimum:

- the diminishment and extirpation of wild rice caused by conversion of sulfate to sulfide in the rooting zone;
- increase in mercury methylation rates and methyl-mercury concentrations in sediments and the water column;
- increase in methyl-mercury loads in the food web, particularly for medium and large fish, and organisms (including humans, otters, eagles, osprey, mink and others) that eat fish;
- release of nitrogen and phosphorus from sediment into the water column;
- increased suitability of polluted waters to spread of invasive species; and
- increased eutrophication of oligotrophic and mesotrophic waters in the Boundary Waters watershed as a result of greater nitrogen and phosphorus concentrations.[733,734,735,736,737]

[727] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.
[728] Pollman, et al, 2017.
[729] Myrbo, et al, 2017a.
[730] Pastor, 2015.
[731] Myrbo, et al, 2017b.
[732] Engstrom, Daniel R. 8-11-2017 Scoping Comment on N. MN Federal Mineral Withdrawal (Engstrom comment 2017)
[733] Myrbo, et al, 2017a.
[734] Myrbo, et al, 2017b.
[735] Pollman, et al, 2017.
[736] Pastor, et al, 2017.
[737] Engstrom comment 2017.

AMERICAN OVERSIGHT

Dr. Daniel Engstrom, a lead researcher in the sulfate research projects sponsored by the Minnesota Pollution Control Agency, submitted a comment to the Forest Service during the initial scoping period for the now-terminated withdrawal study process. Dr. Engstrom wrote that, because of "the abundant evidence that sulfate releases from mining operations through the Kawishiwi watershed into the Boundary Waters pose substantial environmental risk to outstanding resource value waters," the completion of the proposed 20-year mining withdrawal was a "scientifically prudent" means of ensuring the protection of the Boundary Waters and surrounding watershed.[738]

v. Sulfide-ore copper mining pollution (sulfate, heavy metals, pH, specific conductivity) would harm aquatic resources and fisheries, terrestrial resources, mammalian resources, avian resources, and the wilderness character of the Rainy River-Headwaters watershed and the Boundary Waters Canoe Area Wilderness & Voyageurs National Park

Acid mine drainage (AMD) would deliver heavy metals to ground and surface waters, increasing exposure of aquatic and certain terrestrial organisms to the heavy metals and their effects. Mining in the Boundary Waters watershed that would be the likely result of the proposed action would damage aquatic resources of the SNF, BWCAW, MPA, and the rest of the Boundary Waters watershed—including waters of Quetico and VNP. A 1991 large scale study in a 130-mile river system (Blackfoot River, Montana) found that some solute and particulate contaminants were transported through the river system and an extensive marsh system, resulting in heavy metals contamination of the food web downstream. Of the heavy metals present downstream (cadmium, zinc, copper, arsenic, and nickel), cadmium accumulated most in the food web, followed by zinc, copper, arsenic and nickel. Stream sediment contamination coincided with diminished benthic communities lower fish populations.[739] Copper is particularly toxic to aquatic organisms, but current National Ambient Water Quality Criteria for Protection of Aquatic Life for copper are not totally protective of all aquatic species.[740]

- **Aquatic Resources, Fisheries, and Wild Rice**

The Boundary Waters watershed is home to almost half of Minnesota's native fish species, including two of the state's species of special concern (lake sturgeon and northern brook lamprey) and cold-water fish rare in other parts of the state. This diversity and value are a direct result of past preservation efforts. Fishes in the Boundary Waters watershed are an integral component of a larger ecological system and provide a diversity of ecosystem services essential for ecosystem function and resilience. For example, fish regulate nutrients and food webs, and provide important links to terrestrial ecosystems (e.g., as food for birds and mammals). Several species in the BWCAW and VNP are essential to the life cycle of state-listed freshwater mussels. Fish in the BWCAW and VNP also benefit humans directly by serving as ecological indicators

[738] Id. At p. 6.
[739] Moore, Johnnie N., Samuel N. Luoma, and Donald Peters. "Downstream Effects of Mine Effluent on an Intermontane Riparian System." *Canadian Journal of Fisheries and Aquatic Sciences* 48, no. 2 (February 1, 1991): 222–32.
[740] Chambers, 2014.

AMERICAN OVERSIGHT

and records of information and as a source of food and recreation.

Some of the chemicals used in the milling and processing of copper-nickel sulfide ore and metal concentrates are toxic to humans, while others, such as xanthates, are toxic to fish.[741] To quote a 2008 literature review for the U.S. Fish & Wildlife Service:

> Acid mine drainage commonly forms as a result of natural geochemical processes that oxidize metal sulfides exposed at the earth's surface by mining. Oxidation of sulfur and hydrolysis of iron result in acid-sulfate waters which have been observed at thousands of historic mine sites and at operational mines where mitigation measures have failed to prevent the release of acid mine drainage to down-gradient surface waters. Resultant low pH conditions mobilize metals from waste materials resulting in degradation of water quality and impairment of aquatic health. Acid mine drainage and associated weathering products commonly result in physical, chemical and biological impairment of surface water. Pre-mine characterization of the risk of AMD formation is often inaccurate leading to notable post-mine risk to fisheries. Fisheries have been impaired world-wide by releases of AMD from mining areas. The mining industry has spent large amounts of money to prevent, mitigate, control and otherwise stop the release of AMD using the best available technologies, yet AMD remains as one the greatest environmental liabilities associated with mining, especially in pristine environments with economically and ecologically valuable natural resources. Problematic to the long-term operation of large-scale metal mines is recognition that no hard rock surface mines exist today that can demonstrate that AMD can be stopped once it occurs on a large scale. Evidence from literature and field observations suggests that permitting large scale surface mining in sulfide-hosted rock with the expectation that no degradation of surface water will result due to acid generation imparts a substantial and unquantifiable risk to water quality and fisheries.[742]

Acidification and heavy metals can significantly harm fish species and numbers. A survey of lakes in Canada near mines demonstrated the effect acidification, heavy metals, and other pollution could have on fish communities and diversity. In six of the most acidic lakes, there were no fish populations at all. Top fish predators, such as walleye and yellow perch, were only found in those lakes farthest from the source of pollution. High arsenic levels from mine runoff impact fish communities as well. There was a direct relationship between number of fish species in a lake and that lake's distance from the pollution source (Somers and Harvey 1984).[743] Two studies that examined the effects of a gold mine tailings spill in Canada on walleye found significant impacts on the walleye population. There was a high mortality of walleye eggs in the polluted areas, and the research determined it was most likely because of high concentrations of copper and zinc, along with possible hypoxia from the settlement of tailings.[744] Fish near the reach of the spill were significantly smaller than those in unaffected water, were eating less, and

[741] *Id.*
[742] Jennings, S.R., Neuman, D.R. and Blicker, P.S. (2008). Acid Mine Drainage and Effects on Fish Health and Ecology- A Review. Reclamation Research Group Publication, Bozeman, MT.
[743] Somers, K.M., and H.H. Harvey. (1984). Alteration of Fish Communities in Lakes Stressed by Acid Deposition and Heavy Metals near Wawa, Ontario. *Canadian Journal of Fisheries and Aquatic Sciences* 41, no. 1: 20–29. doi:10.1139/f84-002.
[744] Leis, A.L. and M.G. Fox (1994). Effect of mine tailings on the in situ survival of walleye eggs in a northern Ontario river. *Écoscience* 1, no. 3 (1994): 215–22.

AMERICAN OVERSIGHT

dying or leaving the area at higher rates, likely because of the die-off of smaller fish that walleye feed on.[745]

Mining-related damage to the diversity and health of aquatic macroinvertebrates, aquatic vegetation, smaller fish, and other fish prey items may harm aquatic ecosystem health and fish. A significant number of macroinvertebrate species, including dragonflies, caddis flies, and mayflies, have life histories with an essential aquatic component and play important roles in aquatic ecosystems. One critical role is as food for fish.[746] The diversity and health of macroinvertebrate populations is a strong indicator of overall stream health. A study of macroinvertebrate communities at different points in a stream affected by AMD pollution showed a similar loss of diversity in habitats closer to sites of AMD.[747,748]

Heavy metals are highly toxic and tend to bioaccumulate up through food webs, with the highest concentrations found in top predators. The behavior of toxic heavy metals in fish and in aquatic settings is multi-faceted. Toxic metal concentrations may vary widely over a 24-hour period, depending on time of day, photo-chemical reactions, precipitation, temperature, dissolution, absorption, and pH and other factors and processes. In addition, some averaging-based measures of toxicity are insufficient because they miss variations into ranges that can be deadly for fish and other aquatic species. Heavy metals may bioaccumulate in lipids within fish tissue over periods of time when water and fish tissue concentrations may seem relatively benign, only to be released quickly into the blood stream when fat is metabolized, such as during spawning, migration, or dietary privation.[749]

Sulfate plays a role in the bioaccumulation of the toxic heavy metal, mercury. The reduction of sulfate to sulfide also converts inorganic mercury (Hg_2) to the toxic, bioaccumulative form of mercury, methylmercury, exacerbating existing mercury problems.[750, 751] Mercury, a common pollutant from sulfide-ore mining operations, interacts with sulfates in the presence of an organic substrate and certain bacteria to form methylmercury, a toxic form of mercury that is taken up in food chains. Increasing the sulfate concentrations in low-sulfate surface waters of the Boundary Waters watershed will enhance mercury methylation and increase methylmercury concentrations in those waters[752] and aquatic life forms.[753] Waters with low pH, such as from acid mine drainage, are more likely to contain methylmercury.[754] It can easily penetrate cell walls, leading

[745] Leis, A.L., and M.G. Fox. (1996). Feeding, Growth, and Habitat Associations of Young-of-Year Walleye (*Stizostedion vitreum)* in a River Affected by a Mine Tailings Spill. *Canadian Journal of Fisheries and Aquatic Sciences* 53, no. 11: 2408–17.
[746] Venturelli & Vondracek, 2017
[747] *Id. see*
[748] Dills, G., and D.T. Rogers. (1974). Macroinvertebrate Community Structure as an Indicator of Acid Mine Pollution. *Environmental Pollution* 6, no. 4: 239–62.
[749] Venturelli & Vondracek, 2017
[750] Rainy-Lake of the Woods, 2014, State of the Basin Report at p. 84.
[751] Engstrom, D. R. (2017, August 11). Scoping Comment on N. MN Federal Mineral Withdrawal.
[752] *Id.*
[753] Swain, E.B., J.E. Almendinger, J. Cotner, D. Engstrom, J. Jeremiason, and E. Nater. (2003). Methylmercury Sources to Lakes in Forested Watersheds: Has Enhanced Methylation Increased Mercury in Fish Relative to Atmospheric Deposition? Minnesota Pollution Control Agency.
[754] EPA. (2006). Mercury Transport and Fate Through a Watershed.

AMERICAN OVERSIGHT

to high levels of bioaccumulation and severe effects on all life forms.[755,756] It can also seep into the soil and be cycled into plants and trees.[757] Additional methylmercury mercury loading into the ecosystem would pose a serious ecological health threat extending through and beyond the aquatic environment.[758]

Increases in sulfate concentrations from AMD would likely cause the release of phosphorus and nitrogen from sediments into the water column in affected lakes, causing "a wholesale change in trophic conditions in what are otherwise among the most pristine waters of the U.S.,[759] increasing the frequency and severity of nuisance algae blooms and harming water quality, aesthetics, and aquatic habitat. The full risks of mining in the Boundary Waters watershed cannot be understood without a clearer understanding of the extent of the threat of eutrophication. Phosphorous retention in lake sediments is affected by, and would decline, as a result of increased sulfate pollution. Increased phosphorus and nitrogen concentrations will lead to greater abundance of algae, decreased water clarity, and increased biological oxygen demand (BOD).[760,761] Increased BOD will mean lower dissolved oxygen levels in waters, more stress, and lower survival in key fish species, like cisco.[762,763]

Peer-reviewed, published scientific literature has established that AMD can cause long-term declines in fish abundance, species and genetic diversity, and may facilitate the establishment of invasive species. Evidence from previous similar mining overwhelmingly demonstrates that sulfide-ore mining in the Rainy River watershed would damage the ecosystem far from the mine site for centuries.[764,765] Venturelli & Vondracek (2017),[766] and the formal position paper adopted by the American Fisheries Society[767] detail the ways in which fish species and regional fisheries are negatively affected by the pollution that follows the arrival of mining in a watershed. In short, fish are contaminated with metals, afflicted with various diseases, reduced in population size and extent, and fisheries are impoverished as sensitive species are extirpated from polluted watersheds. A 2015 study on the effects of mining on fish at a large spatial scale showed that mining had a more pronounced and consistent impact on fish assemblages than any other human

[755] Center for Science in Public Participation. (n.d.). Fact Sheets: Health and Environmental Effects of Trace Elements in Metal-Mining Wastes.
[756] Scheuhammer, et al, 2007.
[757] Frelich, 2014.
[758] Myers, 2015.
[759] Engstrom, D. R. (2017, August 11). Scoping Comment on N. MN Federal Mineral Withdrawal.
[760] Heiskary, S. and H. Markus. (2001). Establishing Relationships Among Nutrient Concentrations, Phytoplankton Abundance, and Biochemical Oxygen Demand in Minnesota, USA, Rivers. *J. Lake and Reservoir Management* 17(4):251-262.
[761] Baker, 2013.
[762] University of Minnesota, St. Anthony Falls Laboratory. (n.d.) Will lake warming in Minnesota drive cold-water fish to extinction? In Appendix, and via: http://www.safl.umn.edu/featured-story/will-lake-warming-minnesota-drive-cold-water-fish-extinction
[763] Venturelli & Vondracek, 2017
[764] Moore, Johnnie N., Samuel N. Luoma, and Donald Peters. "Downstream Effects of Mine Effluent on an Intermontane Riparian System." *Canadian Journal of Fisheries and Aquatic Sciences* 48, no. 2 (February 1, 1991): 222–32
[765] Venturelli & Vondracek, 2017
[766] *Id*.
[767] Hughes, et al, 2016, AFS Position Paper.

AMERICAN OVERSIGHT

activity that had been assessed over a large area, including agriculture and urban land use.[768] Mining-related increases in water contamination, as seen in the 2015 study, specific conductance (SC), applies even more stringently to the waters of the Boundary Waters watershed.[769, 770] The EA must consider SC in addressing how opening the federal lands in the Boundary Waters watershed to sulfide-ore copper mining would affect the region's aquatic resources including macroinvertebrates, fish, and other species in the ecosystem.

Reduced water quantity may harm fish, especially by further reducing flows during low flow times. Low-flow times are stressful for fish because water temperatures may rise and dissolved oxygen levels may fall. If sulfide-ore copper mining activity were commenced in the Boundary Waters watershed, reduced water availability could result from surface water and groundwater withdrawals for ore processing, surface water losses to mines from hydraulic conductance through bedrock fractures and surficial deposits, surface water diversions, out-of-basin transfers in tailings slurry, and as a consequence of hydrographic foreshortening because of vegetation clearing. In addition, mine dewatering and ponding of contact water, evaporative losses from process and contact water ponds, disposal of leachate pumpback or filtrate residues, all would reduce available surface water quantity.

Elevated levels of sulfate in AMD would likely affect wild rice. Sulfate diffuses into sediments in aquatic plant beds and is converted to sulfide through a process called sulfate reduction. "[T]he reduction of sulfate to sulfide in sediments, to the extent that it occurs in natural systems, may cause populations to decline by adversely affecting the reproductive phases of wild rice's life cycle."[771] As a result sulfate harms and can eliminate wild rice stands from polluted waters.[772] Minnesota has a 10 mg/L sulfate standard in wild rice waters to protect wild rice. Waters in the Boundary Waters watershed generally have background levels of less than 6 mg/L, so there is very little capacity of these waters to receive additional sulfate loading from AMD without violating Minnesota's existing water quality standard for sulfate. Peer-reviewed, published science shows that "wild rice seedling emergence, seedling survival, biomass growth, viable seed production, and seed mass all decline[] with sulfate additions and hence sulfide concentrations in sediment," and observed declines grow steeper over time.[773]

Wild rice is an essential piece of Ojibwe culture and livelihood. Land use decisions that put sulfide-ore mining interests before Treaty rights, such as the proposed action, would violate legal Treaty guarantees, interfere with enrolled members' exercise of rights to gather the sacred grain, and undermine the Tribes' abilities to sustain their communities in ways that are consistent with their culture and worldview. Mining and its ecological impacts also have the potential to negatively impact the life sustaining resources of the Anishinaabe.[774]

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[768] Daniel, Wesley M., Dana M. Infante, Robert M. Hughes, Yin-Phan Tsang, Peter C. Esselman, Daniel Wieferich, Kyle Herreman, Arthur R. Cooper, Lizhu Wang, and William W. Taylor. "Characterizing Coal and Mineral Mines as a Regional Source of Stress to Stream Fish Assemblages." *Ecological Indicators* 50 (March 2015): 50–61.
[769] Johnson & Johnson, 2015.
[770] Cormier, 2016.
[771] Venturelli and Vondracek, 2017
[772] Baker, 2013
[773] Pastor, J.et al., 2017. Effects of sulfate and sulfide on the life cycle of Zizania palustris in hydroponic and mesocosm experiments. *Ecol. Applications*
[774] GLIFWC, 2016.

AMERICAN OVERSIGHT

Wild rice is an important plant for wildlife. Stands of wild rice in the Boundary Waters watershed waters[775] contribute to shallow water aquatic vegetative structure and shade, two characteristics of sheltering, feeding, and nursery habitat for minnows and larger fish. Wild rice produces a nutritious late summer-to-fall grain crop that has higher protein content than most cereal grains. The nutritional value and timing of production make wild rice an important food for fish and other wildlife, particularly migratory waterfowl.

Diminution or elimination of wild rice stands in the SNF, BWCAW, MPA, and VNP could occur following approval of the proposed action because of increased sulfate loading caused by mine-water discharge, to levels beyond Minnesota's existing sulfate standard, and to levels inconsistent with protection of wild rice.[776] Loss of or damage to wild rice and the ability of waters in the Boundary Waters watershed to support wild rice, would continue for as long as sulfate contamination is present. Sulfate pollution at levels exceeding water quality standards have been produced at the Dunka Pit, are predicted to be produced at excessive levels by other mining in the Duluth Complex and are expected to last from centuries to millennia. Harm to wild rice in the above areas would have negative effects on people, fish, and wildlife, all of which use and benefit from it.

Elevated levels of sulfate in AMD would likely contribute to the establishment and spread of aquatic invasive species. The Forest Service should study the potential of mining-related increased sulfide concentrations contributing not only to displacement of wild rice, but also establishment and spread in the Boundary waters watershed of aquatic invasive species including phragmites (*Phragmites australis*) and hybrid cattails (*Typha* spp.), which are tolerant of high sulfide concentrations in aquatic sediment.[777,778]

- **Terrestrial, Mammalian, and Avian Resources**

As explained by Frelich, Powell, and Fitzpatrick, terrestrial vegetation, mammalian, and avian elements of the Boundary Waters watershed ecosystem would also be negatively affected. In the Boundary Waters watershed, because of the high edge-density – the interconnectedness – of waters and uplands, water pollution makes its way into terrestrial vegetation and wildlife. Wildlife that consume water (all wildlife) and particularly those that consume fish and aquatic vegetation would be contaminated by sulfide-ore copper mining pollution.[779,780,781] Vegetation and wildlife habitat would be destroyed within the mine surface footprints, affected beyond the footprint by fragmentation and disturbance, and in many other ways affected negatively. Many of the large numbers of bird species that migrate through, summer in, or are year-round residents of the Boundary Waters region would be affected by habitat fragmentation, disturbance, and the

[775] CSTBWMAP_Wild Rice Waters in Appendix (folder "Maps")
[776] Rainy-Lake of the Woods, 2014, State of the Basin Report at p. 85.
[777] Lamers, L.P.M., L.L. Govers, I.C.J.M. Janssen, J.J.M. Geurts, M.E.W. Van der Welle, M.M.Van Katwijk, T. Van der Heide, J.G.M. Roelofs, and A.J.P. Smolders. (2013). Sulfide as a soil phytotox–n - a review. *Frontiers in Plant Science*. Vol. 4. Art. 268.
[778] Rainy-Lake of the Woods, 2014, State of the Basin Report at p. 85.
[779] Frelich, 2014.
[780] Frelich, 2018.
[781] Powell, 2017.

AMERICAN OVERSIGHT

contamination or loss of favored food items, some of which include species of insects that spend a portion of their life cycle in fresh water lakes and streams.[782]

- **Wilderness Character**

Establishment of a sulfide-ore copper mining district in the Boundary Waters watershed would damage the wilderness character of the Boundary Waters. Acoustic, light, and aesthetic impacts will be particularly intense in and around the proposed mine site(s), but will also transcend into the Wilderness. The impacts will likely be greatest where MNES 1353 abuts the Wilderness[783] and encompasses a shallow deposit that would likely need to be mined via open pit. [784] The sights and sounds associated with industrial activity would severely degrade the naturalness, opportunities for solitude, opportunities for primitive recreation, and ecological and social values of the BWCAW. Garwin & Reyer documented how sulfide-ore copper mining exploration and mining operations cause low and high-frequency industrial sounds, light pollution, traffic, air pollution, water pollution, and damage to the scenic quality of the Boundary Waters watershed – all of which are incompatible with, and will severely degrade, the wilderness character of the Boundary Waters.

A series of increased protections over time has translated into improved Wilderness character for the Boundary Waters in many ways,[785] and federal agencies are obligated to protect the Boundary Waters' existing Wilderness character. Exploratory drilling and other prospecting methods, which together present a narrow spectrum of the noise, light, and view pollution that would be generated by development and exploitation of mining complex on the Twin Metals leases along the Kawishiwi River and Birch Lake, was and is incredibly disturbing to the experience of living, hunting, and recreating in the Kawishiwi River—Birch Lake region, and the rest of the Boundary Waters watershed affected by exploration.[786,787,788,789,790 ,791,792,793,794,795] Sulfide-ore copper mining in the Boundary Waters watershed would lead to significant direct, indirect, and cumulative negative effects on the Boundary Waters' existing Wilderness character.

No other activity contemplated in the SNF would create the amount, intensity, and duration of disturbances — including forest and wetland destruction, noise pollution, light pollution, air pollution, water pollution (with effects of all the foregoing extending into remote locations),

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[782] Fitzpatrick, 2017.
[783] *See* Federal Mineral Lease Distinctions, in Appendix (folder "Maps")
[784] TMM NI 43-101 at p. 274 [a k.a. Page 14-30]
[785] Proescholdt, 2014
[786] Koschak, S.L. (2016, October 26). Declaration of Steven L. Koschak.
[787] Koschak, J.S. (2016, October 26). Declaration James S. Koschak.
[788] Tomsich, L. (2016, October 26). Declaration of Louis Tomsich.
[789] Bollis, G. (2016, October 27). Declaration of Gail Bollis.
[790] Beymer, R. (2016, November 4). Declaration of Robert Beymer.
[791] Reyer & Garwin, 2015 *E.g., see* affidavits testifying to sound-shed degradation experienced inside the BWCAW, caused by exploratory drilling in the former Withdrawal Area.
[792] Declaration of Steven L. Koschak, 1-10-2019.
[793] Declaration of Gail Bollis, 1-10-2019.
[794] TMM NI 43-101.
[795] Acuña, E. and A. (2017). Dobson. Results of the return air raise silencer system upgrade at Totten Mine. J. of Underground Mining Technology 2017.

AMERICAN OVERSIGHT

heavy vehicle traffic, human presence, and more — as sulfide-ore copper mining. Noise, night lighting, and increased human activity associated with mining development would change the solitude, natural integrity, and primitive recreation experience available in the Boundary Waters.

While second-growth logging activity on non-Wilderness lands, for example, is known to negatively impact Wilderness character through soil disruption, loss of biodiversity, and increased traffic, and temporary noise, these non-Wilderness second-growth logging events often can be remediated and mitigated, and their long-term effects ordinarily are lesser in scale, severity, and duration when compared to those of sulfide mining on the edge of a Wilderness Area.[796] Mining generates long-term continuous and distinct industrial noise, and continues to pollute for centuries with harm extending far beyond the site of activity itself, and it permanently devastates the landscape at and near the mine site. The Forest Service's recent report on the state of and threats to the Wilderness character of the BWCAW should be used in the EA analysis and consideration of the effects of the proposed action on the BWCAW.[797]

Sulfide-ore copper mining-related noise pollution, light pollution, and scenic degradation will harm the Boundary Waters' Wilderness character.[798] Negative effects on Wilderness character will diminish people's enjoyment of the Boundary Waters and near-Boundary waters portions of the SNF, and diminish both current and future residents' and visitors' well-being. This should be a critical consideration in the EA. Because the Wilderness Act of 1964 (and subsequently-enacted regulations) require it, the EA must address how sulfide-ore copper mining would detrimentally affect the Wilderness character of the Boundary Waters.[799]

In addition to considering the viewshed-damaging effects of dust and other air pollution-caused haze, and the night-sky damaging effects of light pollution, the EA should address mining-related noise that would affect people's experience of Wilderness. "Wilderness, especially the BWCAW, is one of the last places in the U.S. where one can escape from the constant noises of civilization and be reminded that there is a world significantly less governed by human will."[800] In particular, the significant harm to Wilderness character from syncopated or otherwise unnatural low-frequency noises (heavy equipment engine noise, detonations, air compressors, processing equipment, ventilation equipment, and the like) must be given thorough attention. Unnatural low-frequency sounds stand out in Wilderness settings in part because so few natural sounds exhibit low- to very-low-frequency profiles, and in part because low-frequency sounds lose less energy over long distances than do high-frequency sounds.[801] Because these sounds stand out as unnatural and are more noticeable in a Wilderness setting, even emanating from a significant distance, non-natural low-frequency sounds are more annoying and disruptive to the wilderness experience than high-frequency and often higher-decibel sounds (like the sound of wind in the trees, water lapping at the shore, and bird song). Low-frequency sounds travel "better" through dense forest vegetation than do high-frequency sounds.[802] Mining activity that would be the likely result of approval of the proposed action would result in more low-frequency

[796] Tricker, et al, 2017.
[797] *Id.*
[798] Reyer & Garwin, 2015.
[799] Landres, et al, 2015.
[800] Reyer & Garwin, 2015.
[801] Garstang, et al, 1994.
[802] Webster, B. (1986, February 11). Secret Language Found in Elephants. *The New York Times*.

AMERICAN OVERSIGHT

noises and damage to the Wilderness character in the Boundary Waters. Preserving Wilderness character takes precedence over mineral development in the SNF, and the EA must consider how sulfide-ore copper mining would run counter to federal agencies' duty to consider effects on the Boundary Waters from actions allowed outside of the Boundary Waters boundary.[803]

vi. The Duluth Complex is acid-generating and pollution would continue for centuries

It is well-established that the Duluth Complex is an acid-generating sulfide-ore copper deposit, as attested to by a 1994 EPA Technical Document on Acid Mine Drainage Prediction,[804] and Minnesota state agency documents dated from the mid-1970s to the 2000s.[805] Recent modeling of sulfate, lead, copper, and nickel pollution from the nearest mine to have gone through a project-specific EIS shows that mine and its processing and tailings facility will be generating water pollutants at concentrations in excess of standards, for at least two centuries.[806, 807] Water quality sampling of leachate from a surface seep at the Spruce Road Bulk Sample Site shows extremely high concentrations of heavy metals and sulfate.[808, 809]

As at Dunka and Spruce Road, "at all of the sulfide mine developments in the Duluth Complex it is extremely likely there will [be] seepage from waste rock, pit walls, and tailings to ground and/or surface waters that will require treatment for elevated levels of metals and potentially sulfate. Sulfate levels of the discharges from conventional and passive water treatment systems will not reduce sulfate contaminant levels, which will be two or more order of magnitudes higher than the Minnesota water quality standard for sulfate of 10 mg/L."[810]

The mineralization at Maturi, Maturi Southwest, Birch Lake, and Spruce Road deposits contains sulfides at higher concentrations than either the NorthMet deposit or Dunka mine waste rock. Accordingly, there is good reason to expect that mine pollution from sulfide-ore copper mining at the Maturi, Maturi Southwest, Birch Lake, and Spruce Road deposits, will be produced at higher rates and concentrations than seen at Dunka.[811]

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[803] IWLA v. Kimbell, 516 F. Supp. 2d 982, 996 (D. Minn 2007), available in Appendix (folder Boundary Waters Treaty, Law & Regulations), and via https://www.gpo.gov/fdsys/pkg/USCOURTS-mnd-0_06-cv-03357/pdf/USCOURTS-mnd-0_06-cv-03357-1.pdf

[804] EPA. Technical Document: Acid Mine Drainage Prediction (1994)

[805] WaterLegacy & B. Johnson. (2011, March 10). Letter to MPCA Re- Dunka Mine & Attachments to letter

[806] FEIS PolyMet Pollution Graphs with water quality standards – Water Quality Modeling Results for Nickel and Sulfate at Mine Site West Pit – Mitigation will be required for at least 200 years at the Mine Site and 500 years at the Processing Site

[807] MN DNR. (2013) SDEIS on NorthMet Project, Chapter 5 (*See, e.g.,* p. 5-7: "Both mechanical and non-mechanical treatment would require periodic maintenance and monitoring activities. Mechanical water treatment is part of the modeled NorthMet Project Proposed Action for the duration of the simulations (200 years at the Mine Site, and 500 years at the Plant Site)."); *and see* MN DNR. (2009) DEIS on NorthMet Project, Volume I, p. 4.1-80, Fig. 4.1-45, showing groundwater exceedences for antimony, sulfate, nickel, manganese lasting for ~50 – 2000 years.

[808] (1977, May 26). Preliminary Report on Spruce Road Bulk Sample Site Monitoring Results.

[809] USDA Forest Service, (2011, April 20). Technical Memo: Spruce Road Bulk Sample Site Project File - Minerals.

[810] Chambers, 2018.

[811] *Id* at p. 6.

AMERICAN OVERSIGHT

In addition to the example of the Dunka pit's AMD-producing overburden storage piles, careful study and water quality modeling of a nearby proposed sulfide-ore copper mine has shown that the Duluth Complex, if mined, will produce pollution requiring mechanical treatment indefinitely: that is, for a minimum of 200 years, very likely for a millennium, and possibly in perpetuity.[812] The modeling data suggest lead, sulfate, and copper pollution would be generated continuously at both the mine site and the tailings basin site for substantially longer than 200 years. The graphed modelling data[813] concludes that:

- models were run for 200 years at both the project mine site and tailings basin site for three pollutant concentrations: sulfate, copper, and lead;
- pollutant concentrations would be much higher under the mine scenario for all three pollutants in both locations;
- the trend lines for copper, lead, and sulfate pollution concentration at the mine site are essentially flat for all 200 years (meaning elevated levels for all three pollutants is expected to continue for far longer than 200 years, and possibly for 1000 years);
- Sulfate trend lines at the tailings basin site show seepage concentrations as high as 4,500 mg/L and increasing for the final 140 years (suggesting very high sulfate pollution levels may continue for far longer than 200 years, and possibly for 1000 years);
- Lead trend lines at the tailings basin site show seepage concentrations as high as 70 micrograms/L that drop to 30 micrograms/L by year 35 and continue in slow decline at more than 20 micrograms/L beyond the 200-year mark (suggesting lead pollution far exceeding background levels and standards for far more than two centuries); and
- Copper trend lines at the tailings basin site show seepage concentrations as high as 650 micrograms/L that drop to 400 micrograms/L at year 40, and continue in slow decline to approx. 200 micrograms/L (P50) at the 200-year mark (suggesting copper pollution far exceeding background levels and standards for far more than two centuries).

c. Sulfide-ore copper mining is inherently dangerous, regionally untested industry, and has a terrible track record.

Sulfide-ore copper mining has a consistent history of polluting water and modern mines and mines in the U.S. are no exception. As of 2012, of sixteen operating copper mines in the U.S., fourteen had been operating for at least five years. A review of records for those 14 mines found that each (100%) has experienced pipeline spills or other accidental pollution releases. A 2012 peer-reviewed report by Earthworks showed that at 13 of the 14 mines, water collection and treatment systems failed to contain contaminated mine seepage, causing significant negative

[812] MN DNR 2013, page 166 [a.k.a. 3-5]: ("Both mechanical and non-mechanical treatment would require periodic maintenance and monitoring activities. Mechanical water treatment is part of the modeled NorthMet Project Proposed Action for the duration of the simulations (200 years at the Mine Site, and 500 years at the Plant Site)." *and* "Post-closure activities would include monitoring and maintenance of reclamation and operation of mechanical water-treatment infrastructure *until facility features were deemed environmentally acceptable in a self-sustaining and stable condition.*" Emphasis added.); *and* FEIS, page 101 [a.k.a. ES-35]. The USFS should note that this modeling data and discussion were prepared for a project in a different regulatory context, in a different watershed. The conditions in the mineralized areas on MNES-001352 and MNES-001353, though similar to those at NorthMet, would be worse for AMD generation, per Chambers, 2018.

[813] MN DNR, 2013. Pb, SO4, and Cu annual average concentration statistics

AMERICAN OVERSIGHT

water quality impacts.[814] In addition, tailings spills occurred at more than half the sites. Acid mine drainage created the most severe and lasting environmental impacts; in the case of the two largest mines in New Mexico, the state and federal governments have filed charges because of severe damage to surface and ground water from 2 million gallons of contaminated seepage per year.

Enumerated below are several characteristics of sulfide-ore copper mining, a type of hardrock mining, that demonstrate its unique and unjustifiable risk to the human environment.

- Data from the U.S. Environmental Protection Agency (EPA) Toxic Release Inventory show hardrock mining, including copper mining, to be the nation's largest toxic polluter. In 2000, the industry released 3.4 billion pounds of toxics, or 47 percent of all toxic waste released by all U.S. industries for the year, combined.[815]
- Many hardrock mine sites carry high or medium human health risks. How many is not clear, however, because the EPA databases are not complete with respect to abandoned mines' human health risks.[816]
- The EPA estimates that hardrock mining is responsible for the contamination of streams in the headwaters of more than 40% of watersheds in the western United States.[817]
- Most sulfide-ore copper mining in the United States and elsewhere is conducted in drier locations, such as the arid southwestern U.S. and the Atacama desert of northern Chile.[818]
- A review of hardrock mining projects (52% operating, 48% closed) and their EIS documents found a majority (77%) in violation of groundwater or surface water standards despite the majority predictions of "no impact" in their EISs. For mines in close proximity to surface water or groundwater and with high acid drainage or contaminant leaching potential, 93% near groundwater had exceedances of water quality standards , and 85% near surface water had "exceedances of standards or permit limits in surface water as a result of mining activity." This is with mitigation factored in.[819]
- Even in arid places, sulfide-ore copper mining has a record of long-lasting water pollution, despite environmental review document predictions to the contrary.[820,821,822,823,824,825,826,827]
- No sulfide-ore copper mines have operated and closed without polluting surrounding surface and groundwater. A careful look at the examples the industry has offered of non-

[814] Earthworks, 2012, US Copper Porphyry Mines.
[815] EPA, 2004.
[816] *Id.* at i.
[817] EPA, 2000.
[818] USGS. (n.d.). Mineral Resources in Deserts. Available at: https://pubs.usgs.gov/gip/deserts/minerals/.
[819] Kuipers & Maest, 2006.
[820] *Id.*
[821] Earthworks, 2012, US Copper Porphyry Mines.
[822] Earthworks, 2006, Predicting Water Quality Problems at Hardrock Mines.
[823] Robertson, A. M. 2011. Mine Waste Management in the 21st Century: Challenges & Solutions Beyond Incremental Changes.
[824] Earthworks, n.d.
[825] Earthworks. (2004). Hardrock Mining: Risks to Community Health.
[826] Earthworks, 2013. Polluting the Future..
[827] CBC News, 2014, Aug 6.

AMERICAN OVERSIGHT

polluting mines reveals 1) documented evidence that they have in fact polluted ground and/or surface water[828, 829, 830, 831, 832]; 2) they are still operating; and/or 3) they are incomparable to mining that could be developed in the Duluth Complex within the Rainy River watershed.

- Sulfide-ore copper mining industry as a whole is turning more often to larger, lower-grade deposits. This trend is significant because waste material in larger volumes is left behind ever-larger tailings dams, which creates greater risks and more catastrophic consequences of failure. These hazards endure for centuries after the mining ends.[833, 834]
- EPA in 2004 estimated the costs to clean up just 156 hardrock mining sites in the U.S. to be between $7 billion and $24 billion. At the time, the EPA's maximum exposure was seen to be $15 billion, or an order of magnitude bigger than the EPA's annual Superfund budget.[835]

i. Leaks occur at all sulfide-ore copper mines.

No sulfide-ore copper mine in the United States has operated and been closed for at least 10 years without polluting surrounding waters. The mines most often offered as successful have in fact polluted surrounding water, and most are still operating. The peer-reviewed report by Earthworks, titled U.S. Copper Porphyry Mines Report: The Track Record of Water Quality Impacts Resulting from Pipelines Spills, Tailings Failures and Water Collection and Treatment Failures (July 2012, revised November 2012)[836] documents the fact that all sulfide-ore copper mines experienced spills, pipeline ruptures, and other releases of mining pollutants. The study:

- Examined the record of all 14 copper mines that at the time of the study had been operating in the U.S. for at least five years (two mines that had been operating for less than five years at the time of the study were not considered due to their insufficient track record). The 14 mines examined represented 89% of U.S. copper production.
- The review found that 100% of the mines reviewed had experienced pipeline spills and other accidental releases of contaminants to water, and that 92% (13 of 14) of the mines had experienced polluted water collection and treatment system failures resulting in significant negative effects on water quality.
- At four of the mines, partial tailings impoundment failures occurred.
- At nine of the mines, tailings spills have occurred.
- Though the likelihood of a particular kind of leak cannot be pre-determined (even with a detailed, comprehensive mine plan) the probability of some type of leak of

[828] Wisconsin DNR (2012) Surface Water Quality Assessment of the Flambeau Mine Site.
[829] Chambers, D. (2012). Supplemental Expert Report of Dr. David M. Chambers.
[830] EPA. (2014, June 25). Approval letter of Wisconsin's 2012 303d list. *See* p. 66, at bottom.
[831] Kuipers & Maest, 2006.
[832] *See* Stillwater Mining Company. (2011, Feb 2). Form 10-K and Stillwater Mining Company. (2017, Feb.16). Form 10-K.
[833] Robertson, A. M. 2011. Mine Waste Management in the 21st Century: Challenges & Solutions Beyond Incremental Changes.
[834] Bowker & Chambers, 2015.
[835] *Id.*
[836] Earthworks, 2012, US Copper Porphyry Mines.

AMERICAN OVERSIGHT

> contaminants to water is high, and water quality impacts to surface and/or groundwater are common and should be expected at sulfide-ore copper mines.

None of the mines offered as examples of a successful sulfide-ore copper mining has passed the test of operating and being closed for at least ten years without polluting surrounding waters. Stillwater, Eagle, and Flambeau all fail that test.[837] The simple fact that the Wisconsin Legislature and governor just repealed that state's long-standing "prove-it-first" law (which prohibited permitting of any sulfide-ore copper mining mine in the state until it had been shown that at least one such mine in the world had been operated and closed for 10 years without polluting surrounding surface and groundwater) adds to the evidence that the test has not been met by any sulfide-ore copper mine. Had the test been met, there would have been no need for repeal, and if any mine could operate safely according to Wisconsin's definition, then the Wisconsin law wouldn't have prevented it from operating in Wisconsin.[838]

ii. Risks that a hardrock mine will contaminate surface and groundwater increases when there is heighted risk of AMD formation, and when surface and/or groundwater are in close proximity to the mine

The Boundary Waters watershed is located within the most freshwater-rich portion of the most freshwater-rich National Forest in the National Forest System, as well as being in the headwaters of the Boundary Waters – the most visited and largest Wilderness Area east of the Rocky Mountains and north of the Everglades. It is the only substantial lake-country Wilderness Area in the nation. Based on TMM's 2014 prefeasibility study, both open pit and underground mining are possibilities for mining the disseminated copper-nickel deposits in the Duluth Complex (for example, the Spruce Road deposit will likely be an open pit mine; the Maturi and Birch Lake deposits will likely be underground mines; the Maturi SW deposit will likely begin underground and may be mined to the surface because of the location of metal minerals within 15 feet of the surface) [839] with tailings storage facilities estimated to store around half of the tailings produced. The proposed site of the Twin Metals mines and its surface processing facilities is riddled with surface waters (wetlands, lakes, and streams) that drain by multiple flow-paths to Birch Lake and the South Kawishiwi River.[840,841] After pollution reaches Birch Lake and the South Kawishiwi River, flowage into the Boundary Waters, and other downstream protected areas, in inevitable.

As stated in Section 2 f., above, the Duluth Complex has a proven record of acid mine drainage generation. Both tailings and waste rock can be sources of dissolved metal and other ionic contaminants, which affect both surface and ground waters. [842] Mine pollution from the Twin Metals Birch Lake, Maturi, Maturi Southwest, and Spruce Road deposits is likely to be produced

[837] 10-12-2017 Scoping comment letter (part 3) of NMW *et al.* Northern Minnesota Federal Minerals Withdrawal EIS, at pp. 122 to 125
[838] Opoien, J. (2017, November 8). Bill to end Wisconsin's effective sulfide moratorium heads to Scott Walker's desk. Madison Cap Times.
[839] Chambers, 2018.
[840] Photo-essay (in Appendix A, NEW MAPS)
[841] NMW Map Set, "Surface Waters in Twin Metals Proposed Footprints: Multiple Flow-Paths to Birch Lake and S. Kawishiwi River" (in Appendix A, NEW MAPS)
[842] Chambers, 2018.

AMERICAN OVERSIGHT

in greater volumes and with higher concentrations of sulfate and other pollutants than at other studied deposits in the Duluth Complex. It is reasonably foreseeable that millions of gallons of pollution per year would seep untreated into groundwater and surface water despite efforts to contain, detect, mitigate, or remediate contaminants.

All liners and tailings basins leak and will fail eventually.[843] In a severe and fairly wet environment like Minnesota's, it is reasonably foreseeable that pollution would leach, seep, and flow from surface, open pit, and underground facilities of any mine developed in the Boundary Waters watershed. Considering the scale of the mines that have been contemplated by Twin Metals,[844] any processing facilities, waste piles, tailings basins, and the other massive and extensive infrastructure for any mines in the large, low-grade Duluth Complex in the Boundary Waters watershed would very likely require multi-thousand-acre footprints.[845]

These factors – risk of acid mine drainage formation, and amount and proximity of a proposed mine to surface waters and groundwater – have been shown to result in a heightened risk that sulfide-ore copper mining will pollute surrounding ground and surface waters.[846]

iii. Risks and severe consequences associated with large volume, low grade ore mines that produce very large amounts of waste rock and tailings

Metal mining produces a large amount of waste because of the relatively small amounts of desirable metal contained in most deposits.[847] The areas targeted for mining in the Boundary Waters watershed have a combined copper-nickel concentration of less than 1%, meaning that more than 99% of any ore that might be mined would be waste.[848] Mining lower-grade deposits results in more tailings accumulated behind bigger, taller tailings dams. Mining companies compensate for narrower margins in predictable ways. They take advantage of the economies of scale, building bigger mines that process larger volumes of the low-grade ore which results in increased volume of waste tailings basins, which in turn require more massive tailings dams.[849]

Twin Metals Minnesota currently estimates that it will process approximately 20,000 tons of this low-grade ore per day.[850] Since releasing its pre-feasibility study in 2014, TMM has developed new plans for a lined tailings storage facility to be located just outside of the Rainy River watershed to store around half, potentially as much as 100%, of the tailings produced by the mine while the other approximate half is intended to be replaced in the mine as cemented backfill. [851] According to the 2014 prefeasibility study, however, TMM seeks to mine four

[843] Rowe & Sangam, 2002.
[844] TMM NI 43-101 Fig. 4-3 – TMM Project Ground Holdings Map
[845] TMM NI 43-101 at p. 177 [a k.a. page 4-29]
[846] Kuipers & Maest, 2006.
[847] Chambers, 2018.
[848] *see* Table 1-4, Mineral Resource Statement, TMM NI 43-101, p. 56 [a.k.a. Page 1-16]
[849] *see* Bowker & Chambers, 2015; *and* Robertson 2011. "Mine Waste Management in the 21st Century Challenges & Solutions Beyond Incremental Changes" Andrew Macgregor Robertson, Key Note Address Tailings & Mine Waste, Vancouver B.C., 2011. http://www.infomine.com/library/publications/docs/Robertson2011c.pdf
[850] Twin Metals Minnesota. About the Project. http://www.twin-metals.com/about-the-project/
[851] *Id.*

AMERICAN OVERSIGHT

deposits whose measured, indicated, and inferred resources total more than two billion tons of ore, based on certain metals price assumptions.[852] In that respect, proposed mining in the Boundary Waters watershed fits the current trend, in which the sulfide-ore copper mining industry is turning more often to larger, lower-grade deposits. This trend is significant because waste material in larger volumes is being deposited behind ever-larger tailings dams.

- **Tailings Dam Failures Are Frequent and Costly**

The large dams built to contain mine processing waste (a.k.a. "tailings dams") are among the largest dams and structures in the world. Much of what they are built to hold back is toxic.[853] The dams are supposed to stand, unfailing, in perpetuity. They must be maintained and monitored, since the waste never goes away.[854] In the long term, mine tailings dams present serious hazards that can result in catastrophic failure.

Despite the need for safety margins and stability, and despite mining company representations of safety, and despite the fact that the world's 25,000 large water supply dams far outnumber the world's 3,500 tailings dams, tailings dam failures occur more frequently than failures of water supply dams.[855] Instead of improving over time, as the mining industry claims, the pace of tailings dam failures over the last 50 years has remained fairly constant: about one tailings dam fails every eight months, which equates to three failures every two years (*Id.*). Records show that most tailings dam failures occur at operating mines, and that 39% of such failures occur here in the U.S. (*Id.*). In short, contrary to what the mining industry may assert, tailings dam failures occur at modern mines and in countries with supposedly strong mine safety regulations.

Today's bigger, taller tailings dams hold back more waste, toxic metals and more process chemicals, all of which present a greater magnitude of risk for the communities asked to host the mines. Robertson (2011) describes a level of risk growing by a factor of 20 every ⅓ century.[856] A review of tailings basin failures by Bowker and Chambers found that half (33 of 67) of all recorded "Serious" and "Very Serious" failures (those involving release of >1 million cubic meters of tailings, and/or the travel of released material >12 miles, and/or loss of ≥ 20 human lives) between 1940-2010 occurred in the last 20 years of the period. I.e., the frequency of "Serious" and "Very Serious" failures is increasing. In addition, of the 52 recorded failures from 1990-2010, 64% were Serious or Very Serious.[857]

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[852] TMM NI 43-101.
[853] *see* Paperny, A.M. (2014, August 5). What's in Imperial Metals' Mount Polley tailings? Should you be worried? GlobalNews.ca https://globalnews.ca/news/1493012/whats-in-imperial-metals-mount-polley-tailings-should-you-be-worried/.
[854] Chambers & Higman, 2011.
[855] Chambers, D. (n.d.). Long-Term Risk of Tailings Dam Failure. National Park Series, Alaska. Park Science, Vol. 13, Issue 2. Available at: https://www.nps.gov/articles/aps-v13-i2-c8.htm.
[856] Robertson, A. M. 2011. Mine Waste Management in the 21st Century: Challenges & Solutions Beyond Incremental Changes.
[857] Bowker & Chambers, 2015.

AMERICAN OVERSIGHT

It is not possible to predict exactly where and when these failures occur, but the risk is high, and when more than five million cubic meters of tailings are involved, the risk rises.[858] It is reasonably foreseeable that, even if half of the tailings were deposed back in mine pits and underground workings, a Twin Metals mine would result in more than one billion (1,000,000,000) tons of waste in one or more tailings storage facilities. That would mean 300,000,000 to 4000,000,000 cubic meters of tailings to be left forever on the surface. Due to the low topographic relief in the region, any very large tailings storage facility is likely to require multiple tailings dams. Multiple tailings dams will multiply the risk of failure.

A report evaluating all known tailings dam failures found that the most common cause of failure was an unusual rain event (Rico et al, 2008).[859] 2016 was the wettest year on record in Minnesota, according to the Minnesota Climatology Office and National Weather Service.[860] The Boundary Waters watershed receives between 28 and 31 inches of annual rainfall and is replete with an extensive network of surface water resources, which flow into the Boundary Waters.[861] Northeastern Minnesota is already receiving and is projected to receive a growing number of extreme rainfall events, in which 24-hour rainfall totals exceed 6 inches.[862]

It is not possible to undo or to recover the pollution released into the landscape by a tailings storage facility failure. Placing a tailings storage facility just over the watershed divide from the Boundary Waters watershed, whether or not the facility experiences a structural failure, would not be effective at protecting the Boundary Waters watershed from tailings pollution. Hydrological modeling of surface seepage and groundwater pollution flows show pollution from a proposed Twin Metals tailings facility would flow into the Peter Mitchell Pit and from there into the Boundary Waters watershed.[863] Bedrock pillars separating the Lake Superior and Boundary Waters Canoe Area Wilderness watersheds in the Peter Mitchell Pit have been removed.[864] This has essentially moved the watershed boundary. Heavily contaminated seepage from the proposed Twin Metals tailings storage facility would flow from the tailings facility through the bedrock and into the Peter Mitchell Pit for a period of 25-50 years, and thus into the Boundary Waters Canoe Area Wilderness watershed. [865]

Severe tailings dam failures are costly to address, with an average cost of $543 million per failure in recent years.[866] Projections suggest that the number of serious mine failures is likely to rise. Monetary costs of attempts to mitigate the addressable effects of those failures are likely to be many billions of dollars. Most mining companies are not able to cover losses so large, and no loss remediation pool or risk management program exists in the mining industry to spread the cost of serial catastrophes. Some losses are not insurable, given that they involve failure to

[858] Id.
[859] Rico, et al, 2008
[860] *See* @NWS Twin Cities. (2016, December 25). Available at: https://twitter.com/NWSTwinCities/status/813239693760462848
[861] CSTBWMAP_Withdrawal Area-WaterFeaturesAcreageMileageTroutStreams, in Appendix (folder "Maps")
[862] *see* MN Department of Health. (2014). Minnesota Climate Change Vulnerability Assessment 2014.
[863] Myers 2016a.
[864] Northshore Mining Company Progression of the Ultimate Pit Limit. 9-2-14 Public Review Environmental Assessment Worksheet. P. 8
[865] Myers 2016a.
[866] *Id.*

AMERICAN OVERSIGHT

follow accepted practices, and so would either be covered by the government, and therefore the public, or go unremediated.

Many social and environmental effects, however, are irremediable. The elimination of wild rice from traditional waters, the loading of popular fish species with additional mercury, and the siting of an enduring source of pollution in a formerly clean and healthy watershed, are effects that last as long as the pollution source. With sulfide-ore copper mining this pollution will last centuries or millennia, a time frame in which humans are not accustomed to assessing and weighing risks.

- **The Potential for Miscalculations, Mistaken Assumptions, and Corner-Cutting in Mine Design and Operation**

Mistakes are never intended, yet they occur, and that is how many mine accidents happen. The potential for corporate corner-cutting must be considered. This type of behavior should not be assumed out of prejudice toward mining companies in particular or business organizations in general, but because of the extensive record showing that corner-cutting, risk-taking, and other failures to follow accepted practices is - according to dam committee reports and governmental reviews - at the root of many if not most severe tailings basin failures.[867] When considering the harm that would be avoided by denying the proposed action, or the harm that could follow selection of any lesser alternative, and EIS should be required to address how devastating the effects of mistakes, misjudgments, and even business-as-usual can be.

One striking example is the August 4, 2014 Mt. Polley copper mine disaster in Canada, at which the tailings storage facility failed catastrophically and released at least 5 million cubic meters of mine tailings, mine effluent, and storm water into nearby creeks and pristine lakes important to the Fraser River sockeye salmon run[868]. The morning after the Mount Polley tailings basin failure, Brian Kynoch, the CEO of Imperial Metals, which owns and operates the Mt. Polley mine, said, "If you had asked me two weeks ago if that could happen, I would say it couldn't happen."[869,870]

The Mt. Polley mine opened in 1997, and was touted as the gold standard of a "modern mine." Knight Piésold Consulting, which designed Mt. Polley's tailings dam, explained in a June 28, 2013 memorandum to the U.S. EPA (regarding a tailings dam being considered for a different mine, in Alaska): "*[M]odern dam design technologies are based on proven scientific/engineering principles and there is no basis for asserting that they will not stand the test of time.*"[871] Tailings dams need to last for eternity, but the Mt. Polley tailings dam failed after only 18 years in operation. The mine was still operating when the failure happened. An independent panel found two main causes of the failure: a miscalculation of the stability and makeup of the soil at the site, and a flawed design because of a shortcut taken during

[867] Bowker & Chambers, 2015.
[868] CBC News, 2014, Aug 6.
[869] *Id.*
[870] Paperny, A.M. (2014, August 5). What's in Imperial Metals' Mount Polley tailings? Should you be worried? GlobalNews.ca https://globalnews.ca/news/1493012/whats-in-imperial-metals-mount-polley-tailings-should-you-be-worried/.
[871] Knight Piesold Consulting. (2013, June 28). Memorandum to USEPA re Review of the Bristol Bay Assessment.

AMERICAN OVERSIGHT

construction. The panel also discovered other smaller contributing flaws, some of which might have caused failures in the future. From their investigation, the panel concluded that "business as usual" could not continue in the operation and construction of tailings storage facilities, as too many dangers were being overlooked even when protocol was followed.[872]

d. Modern technology and mining operations consistently fail to accurately predict and prevent pollution.

The large base of research on the history of sulfide-ore copper mines includes examining the technology currently available, the inherent effects of extraction and processing, and the enduring nature of mine waste. The research gives a clear picture of the harm mining can do to surrounding land, water, and ecosystems. Even with the use of state-of-the-art technology and following best practices, it is not possible to reduce to zero the risk of contamination to surrounding ground and surface waters.[873] "It is not feasible, given today's or tomorrow's technology, to reduce the risk of impacting waters downstream from a copper/nickel mine in a sulfide ore body to zero." [874]

i. Irrefutable evidence that mining companies consistently make inaccurate, rosy predictions in environmental review documents about compliance with pollution limits and water quality standards

A 2006 study by Kuipers & Maest[875] of predictions of sulfide-ore copper mine water quality performance for 25 representative hardrock mines (52% still operating, 48% closed) proved that predictions usually did not accurately match the actual water pollution outcomes. Sixty percent (15/25 or 60%) had mining-related exceedances in surface water and 64% (16/25) had exceedances of drinking water standards in groundwater, even though more than half of the mines were still operating. Most of the mine EISs predicted no impacts to surface water quality after mitigation was in place, but at a majority impacts had already occurred. Similarly, 77% of the mines with groundwater impacts exceeding drinking waters standards predicted low groundwater quality impacts in their EISs. Of the mines that had developed acid mine drainage at the time of the study, 89% had predicted low acid drainage potential or ignored the issue in their EISs. Of the 25 case study mines, 19 (76%) had mining-related exceedances in surface water or groundwater, though 8 of those 19 had predicted low contaminant leaching potential in their EISs.

The pollutants that most often exceeded standards or had increasing concentrations in groundwater or surface water in the above study included toxic heavy metals such as copper, cadmium, lead, mercury, nickel, or zinc (63% of mines); arsenic; and sulfate (58% of mines).[876,877] For all case studies, 64% had a water quality impact, even though more than half

[872] Chambers, 2015.
[873] Chambers, 2014.
[874] *Id*.
[875] Kuipers & Maest, 2006.
[876] *Id.* at ES-9,10
[877] Earthworks, 2006, Predicting Water Quality Problems at Hardrock Mines.

AMERICAN OVERSIGHT

were still operating. For mines in close proximity to surface water and with high AMD or contaminant leaching potential, 92% had impacts to surface water, and 85% had "exceedances of standards or permit limits in surface water as a result of mining activity." For mines with close proximity to groundwater and elevated AMD or contaminant leaching potential, 87% had mining-related exceedances in groundwater.[878]

The above rates are for mines with mitigations in place. There are many types and reasons for system and mitigation failure,[879] but the important point is that they fail regularly.

ii. There is no technology in existence or on the horizon that could alleviate the risk of pollution damage from sulfide-ore copper mining and the harm it would do

There are no mine design, pollution control, or mitigation technologies in existence or on the horizon that can eliminate the risk of sulfide-ore copper mining polluting surrounding surface waters and groundwater.[880,881] This can be predicted without having in hand a formal mine plan and project-specific EIS for TMM,[882] though it is made easier by reference to the figures, tables, and wealth of other information in the Twin Metals NI 43-101 dated October, 2014.[883]

As discussed throughout sections 2 & 3 above, all the indicators are present of a heightened risk that pollution from a sulfide-ore copper mining operation in the Boundary Waters watershed would reach and flow into the Boundary Waters. There is consistent production of acid mine drainage from Duluth Complex rock at Dunka Pit and the Spruce Road bulk sample site. Water quality modeling for a mine in the Lake Superior watershed shows that sulfide-ore copper mining pollution would last for centuries at levels violating standards for heavy metals nickel, copper, and lead, as well as sulfate. Hydrological modeling described in a peer-reviewed and published scientific article shows how sulfate pollution from sulfide-ore copper mining in the Boundary Waters watershed would enter the Boundary Waters.[884] Enormous amounts of surface and ground water are not just near, but within the footprints of proposed mine sites, processing facilities, pipelines, and tailings facilities. Finally, the Twin Metals deposits possess higher sulfide content than this Duluth Complex rock that is currently generating acid mine drainage in the Boundary Waters watershed.

A seepage rate of 10 gallons per minute (for example) equates to 5,256,000 gallons per year, while 10 gallons per second equates to more than 300,000,000 gallons. Seepage rates can be unpredictable and sometimes orders of magnitude greater than expected. Though manufactured liners may have a design life of years or decades, tailings piles and waste rock piles are on the land for eons. Systems that may be designed to capture seepage are nevertheless not able to capture all seepage.[885] Treatment systems can only treat water that is collected.

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[878] *Id.* at ES-11
[879] *Id.* at ES-13
[880] Chambers, 2014
[881] Levit, 2018b, Follow-up Report.
[882] Levit 2018a.
[883] TMM NI 43-101.
[884] Myers, T. (2016a).
[885] MN DNR. 2014. at p. 993-994 [a k.a. 5-7 – 5-8]

AMERICAN OVERSIGHT

As stated in the Dec. 14 2016 USFS letter to the BLM:
Based on the information provided by TMM to date…, existing science, and examination of similar proposals, there is no reason to doubt that the mining operations TMM hopes to eventually conduct could result in AMD and concomitant metal leaching both during and after mineral development given the sought after copper-nickel ore is sulfidic… It might be possible for TMM to develop a mine which employs mitigation and containment strategies that reduce the mine's potential to cause AMD and leached metals that could harm wilderness. However, at the very least it is equally possible that available water treatment technologies would be unable to prevent the spread of any aMD and leached metals in the watershed. Further, there appears to be even less likelihood that any contamination of the BWCAW resulting from TMM's mining operations could later be remediated, especially not in a manner compatible with the BWCAW's wilderness character. [886]

e. Pollution of the Boundary Waters cannot be mitigated or remediated, and attempts to do so would destroy the wild and natural character of the Boundary Waters.

Sulfide-ore copper mining pollution in the Boundary Waters watershed could flow through and between variable soils, shallow aquifers, and bedrock fractures and faults, to reach surface waters. Once pollution reached surface waters flowing to the Boundary Waters, it would not be possible to recover that pollution. Multiple surficial flow pathways exist in the footprints of the mine surface waste rock and ore stockpiles, the ore crusher and concentrator facility, deposits such as Maturi SW, which "will likely be mined to the surface at some point in the future,"[887] and Spruce Road, which would likely be an open pit because of the shallowness and consistent grade of the ore body from the surface to substantial depths in places.[888]

Contaminated water from a mine site "could potentially enter streams and lakes through wastewater treatment plant discharges, uncollected runoff and leakage, concentrate spills, pipeline spills, truck accidents, spillway releases, tailings dam failures, water collection and treatment operation failures, and post-closure failures."[889] Pollution that reached the Boundary Waters or surface waters flowing into the Boundary Waters could not be removed. Even if there were practicable means of partially recovering and removing pollution from surface waters, it is doubtful that installation, operation, and maintenance of mitigation measures would be compatible with maintaining wilderness character of the Boundary Waters, or with preserving water quality in the Boundary Waters and the Mining Protection Area.[890] Such mitigation measures have proven to be ineffective at meeting the performance expectations promised in mine project-specific review documents.[891]

[886] USDA Forest Service December 14, 2016 decision letter to USDOI BLM. P. 20-21
[887] TMM NI 43-101 at p. 274 [a k.a. Page 14-30]
[888] Minnesota DNR Division of Lands and Minerals. 2010 map showing Spruce Road as an open pit.
[889] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.
[890] Id.
[891] Kuipers & Maest, 2006.

AMERICAN OVERSIGHT

It is clear that contamination cannot be effectively remediated in the Boundary Waters Canoe Area Wilderness and attempting to do so would degrade Wilderness character.

i. The impacts on human health of sulfide-ore copper mining in the Boundary Waters watershed to the three-county Arrowhead region of Minnesota would be significant.

A robust body of scientific evidence demonstrating the health risks associated with sulfide-ore copper mining activities prompted an unprecedented level of concern by health professionals, including the Minnesota Medical Association, the Minnesota Academy of Family Physicians, Minnesota Nurses Association, Minnesota Public Health Organization, and hundreds of individual providers. All submitted letters in response to the prior EA done for the SNF Mineral Withdrawal in the Rainy River watershed. These health professionals and organizations represent a total of more than 30,000 healthcare professionals concerned enough about the health risks of the sulfide-ore copper mining industry to call for a comprehensive health risk assessment (HRA) and a health impact assessment (HIA) for any decision advancing sulfide-ore copper mining in Minnesota.[892]

Sulfide-ore copper mining releases six of the World Health Organization[893] (WHO) listed top ten environmental toxins with greatest concern to human health. Those six – mercury, lead, arsenic, particulate air pollution, asbestiform fibers, and cadmium – have known harmful effects on human health that include cancer, lung disease, heart disease, and neuro-developmental disease. The short- and long-term direct, indirect, and cumulative effects on human mental and physical health from exposure to these substances can be significantly harmful and in some cases irreversible, as documented in government reports, medical professional opinions, peer-reviewed and published scientific journal articles, and peer reviewed studies.[894] Described below are the multiple harmful effects on public health and safety associated with the development, operation, remediation, and closure of a sulfide-ore copper mine.

f. The popularity of the region and the certainty of environmental contamination put resident and visitor populations at risk of harm from sulfide-ore copper mining in the Boundary Waters watershed

As described in Part I, Section A., the Superior National Forest and Boundary Waters Canoe Area Wilderness in general and the Birch Lake and South Kawishiwi region specifically, are extremely popular, contain dozens – if not hundreds – of homes, and are heavily visited; the region lies adjacent to and directly downstream of the land held by the mineral leases in question. [MAP reference]. Given the inevitability of contamination along with the known health risks of sulfide-ore copper mine-related pollutants described above and in Part I, Section A, Subsections 1 & 2., it can be reasonably predicted that in a highly popular and heavily visited region the degree to which public health will be affected is correspondingly high.

[892] (2018, February 19). Physician Comment Letter to USFS Re: Mineral Withdrawal.
[893] World Health Organization. (2010). 10 chemicals of major public health concern.
[894] The studies cited below, and more, are listed in the bibliography and are attached as electronic files in the Appendix within the folder titled Human Health Impacts.

AMERICAN OVERSIGHT

i. Regional importance of sport and subsistence fishing, hunting, and gathering

Minnesota is home to 1.6 million anglers[895] and the premier fishing destinations of the Boundary Waters and Voyageurs National Park are host to a wide diversity of native fish, including nearly 40% of Minnesota's approximately 150 native fish species, and nearly 55% of Minnesota's approximately 25 native fish families.[896] In a 2014 University of Minnesota-Morris Center for Small Towns survey of residents (homestead and seasonal) of four townships near Ely, Minnesota, 41% said they engage in fishing on public lands, the highest-listed use, and 26% said they sustain their family in part by hunting, fishing, or gathering.[897] Tribal as well as low-income communities rely on hunting, fishing and gathering of wild rice and other plants in the watershed for their subsistence and cultural well-being.

Despite the region's popularity as a premier fishing destination, state survey data suggest that some game fish species are larger in the Boundary Waters Canoe Area Wilderness and Voyageurs National Park, probably due to relatively large lakes and pristine habitat, and low fishing pressure. A comparison of fish catches inside and outside of the Boundary Waters Canoe Area Wilderness and Voyageurs National Park suggests that anglers target the Boundary Waters Canoe Area Wilderness and Voyageurs National Park when fishing for lake trout (and other prized cold-water species) and smallmouth bass.[898] The implications of consuming higher concentrations of methylmercury found in larger fish specimens is described in Part I Section B, Subsection 2d above and subsection 2d below.

Heavy metals ingestion and the contamination or elimination of otherwise healthy dietary components are reasonably foreseeable, would have significant human health effects and would be caused or exacerbated by sulfide-ore copper mining in the Boundary Waters watershed. The following groups of residents and visitors would likely be exposed to and/or ingest the toxicants described above:

- enrolled members of the Grand Portage, Fond du Lac, and Bois Forte Bands of Lake Superior Chippewa, who retain fishing, hunting, and gathering rights as provided in the 1854 Treaty of La Pointe;
- members of the Lac La Croix First Nation, many of whom live on the north shore of Lac La Croix, a Border Route lake that is in the path that pollution would take through the watershed;
- occasional and regular visitors to the BWCAW and/or waters in the Boundary Waters watershed;
- seasonal and full-time residents of communities in and near the Boundary Waters watershed;
- residents near or downwind of mining operations (consult the wind rose for Ely, Minnesota);[899]

[895] American Sportfishing Association letter dated 4/1/2016 to the BLM Director and U.S. Forest Service Chief.
[896] Venturelli & Vondracek, 2017.
[897] University of Minnesota, Morris, 2014.
[898] Venturelli & Vondracek, 2017.
[899] *See* Wind Rose__Station Graph__Ely, MN 1-1-2006 to 6-23-2017 in Appendix

AMERICAN OVERSIGHT

- mine and processing facility workers;
- people whose diet includes water, fish, and/or wild rice from the Rainy River watershed;
- people with a higher body mass index;
- fetuses and infants in the above categories or whose mother is in one or more of the above categories;
- children less than 15 years old in the above categories; and
- women in the above categories who are or may become pregnant.

ii. Popularity of recreational lakes along the path of pollution

The Boundary Waters receives 155,000 wilderness visitors each year, more than any other Wilderness Area. Many of these thousands are on their first Boundary Waters trip – both youth and adults. Thousands of youth go on their first Boundary Waters trip each year. More than half of the visitors enter the Boundary Waters from entry points in the Kawishiwi Ranger District. Birch Lake itself is one of the most popular recreational lakes.[900] The Stony River, lower South Kawishiwi River, Birch Lake, White Iron Chain of Lakes, Fall Lake, Newton Lake, Pipestone Bay and Basswood Lake proper, and Crooked Lake – all are wild rice waters. People rice on those waters.[901,902]

The Girl Scouts' only wilderness base camp in the nation is on the outskirts of Ely, on Moose Lake. The Boy Scouts' Northern Tier High-Adventure Camp also is located outside of Ely on Moose Lake. Both base camps are within half a lake from the Wilderness boundary. Also serving visitors, many of them youth, are Voyageurs Outward Bound School (which also serves military veterans), five YMCA wilderness camps, and scores of resorts and outfitting companies. For generations these youth camps, wilderness institutions, and businesses have introduced thousands of youths each year to the challenges of the border country's lakeland wilderness, and the opportunities for personal growth and leadership development found there. Their canoe treks take them through the path of pollution.

g. Predicted impacts of water pollution on human health

i. Sulfates, methylmercury, and bioaccumulation in fish tissue

Sulfide-ore copper mining frequently results in sulfate pollution to waters, which is a major problem, particularly in a low-sulfate, water-rich landscape like the Boundary Waters watershed. Sulfate additions to low-sulfate waters significantly increases fuels the production of methylmercury and leads to higher daily cycles of methyl-mercury concentration in receiving lakes and streams.[903] Methylmercury is a potent neurotoxin stored in fatty tissue and nerves that

[900] MPCA. 2011. A Water Quality Assessment of Select Lakes within the Kawishiwi River Watershed. See p. 40.
[901] Wegerson, K. (2016, October 28). Declaration of Kristan A. Wegerson, M.D., esp. paragraphs 5 and 7.
[902] Ipsen, J. (2016, October 28). Declaration of John D. Ipsen, M.D., esp. paragraphs 5 and 7.
[903] Nimick, D.A., McCleskey, R.B., Gammons, C.H., and Parker, S.R., 2007, Diel mercury concentration cycles in streams affected by mining and geothermal discharge: Science of the Total Environment, **373**: 1, p. 344-355.

AMERICAN OVERSIGHT

increases in concentration as it moves up the food chain, affecting fish, humans, and other mammals.[904, 905, 906, 907]

Heavy metal contamination of fish tissue already a public health threat in Minnesota's Lake Superior region.[908] The concentration of methylmercury generally increases by a factor of ten or less with each step up the food chain, a process known as bio-magnification.[909] Consequently, even though the concentrations of total mercury and methylmercury in water may be deemed safe for human consumption as drinking water, methyl-mercury concentration levels in fish, especially predatory species such as bass, walleye, northern pike, and lake trout, may reach levels up to 10^6x greater than in the water column, levels that may be considered harmful to humans (and fish-eating wildlife, such as bald eagles and river otters).[910,911] According to a Minnesota Department of Health study, 10% of newborns in the Minnesota portion of the Lake Superior basin have blood methyl-mercury levels greater than 5.8 µg/L (the U.S. EPA Reference Dose for methyl-mercury), a level associated with loss of IQ.[912] Fetal blood appears to concentrate methyl-mercury at levels 1.7 times higher than maternal blood.[913] Fetuses, infants, and children are four to five times more vulnerable to the harmful effects of mercury.

Consuming methylmercury poses serious risks to human health. According to the Minnesota Department of Health, mercury is tightly bound to fish tissue, including muscle, so that no method of cooking or cleaning fish will reduce the amount of mercury in a meal. Adults whose diet is heavy in fish also are likely to receive harmful levels of methyl-mercury.[914] Nursing infants who have never eaten fish still receive methyl-mercury through their mothers' breast milk.[915] Methylmercury is a potent developmental neurotoxin to which the human fetus, nursing babies, and young children are most at risk; even small amounts of mercury damage developing brains.[916] A comment letter written by Minnesota physicians to the USFS in 2016 outlines the adverse effects of exposure at various stages of development including neurological and learning disorders; anxiety and depression; intellectual disabilities; ADHD; Autism; Cerebral Palsy; increased rates of aggression and criminal behavior; and higher rates of early cognitive decline and dementia among others.[917] Developmental damage, specifically lowered IQ, caused by

[904] Baker, 2013.
[905] Myrbo, et al, 2017a.
[906] Powell, 2017.
[907] Onello, et al, 2016.
[908] *Id.*
[909] EPA. 2006. Final Report_Hg Transport & Fate Throughout a Watershed.
[910] Powell, 2017.
[911] Alpers, Charles N. and M.P. Hunarlach. USGS. (2000). Mercury Contamination from Historic Gold Mining in California. Fact Sheet FS-061-00; Lind, D.T., T. Halpern, and M.D. Johnson. (1978). The toxicity of heavy metals, beneficiation reagents and hydrogen ion to aquatic organisms. Preliminary draft.183 p.
[912] McCann, P. MN Department of Health. (2011). Mercury Levels in Blood from Newborns in Lake Superior Basin. Final Report.
[913] Stern, A.H, and A.E. Smith. (2003). An Assessment of the Cord Blood: Maternal Blood Methylmercury Ratio: Implications for Risk Assessment. *Environ Health Perspectives* 111,12:1465–1470
[914] MN Department of Health. (2018). Contaminants and Minnesota Fish. http://www.health.state.mn.us/divs/eh/fish/faq html, see "health risks of eating contaminated fish."
[915] Mead, M. N. (2008). Contaminants in Human Milk; Weighing the Risks against the Benefits of Breastfeeding. Environmental Health Perspectives 116:10 pp. 427-434.
[916] Trasande, et al, 2005
[917] (2018, February 19). Physician Comment Letter to USFS Re: Mineral Withdrawal.

AMERICAN OVERSIGHT

methylmercury toxicity carries very large economic costs in the form of lost productivity and income for the affected individuals. Trasande, et al., for example, estimated those costs associated with direct mercury emissions from power plants to be $1.3 billion per year.[918]

These mining-caused increases in sulfates and methylmercury may harm human health by adversely affecting or eliminating important components of human diet in northeastern Minnesota and Ontario. Wild rice, an important nutritional source for people and wildlife, can quickly be diminished or eradicated from waters receiving sulfate pollution.[919] Methylmercury contamination of common fish species leaves people the choice of reducing fish consumption, switching to less-accessible, less desirable, and/or smaller fish (now recommended by the Minnesota Department of Health[920]), or accepting increased mercury contamination.

ii. Lead and arsenic contamination

Lead and arsenic are among the heavy metals released by sulfide-ore copper mining. The Journal of Pediatrics reported in 2016 that 10.3% of Minnesota children under six years of age (6) had elevated blood lead levels. [921] There is no safe blood lead level.[922] This toxic burden will be increased by the establishment a sulfide-ore copper mining district in the Boundary Waters watershed.

Heavy metals also pose a threat to people who eat rice harvested from waters in the Boundary Waters watershed. Studies show that naturally grown wild rice from clean water has high nutritional value and is low in arsenic.[923] But arsenic is sequestered or taken up by wild rice plants. A 2016 Food and Drug Administration (FDA) Risk Assessment for arsenic in rice showed an association between arsenic exposure and adverse pregnancy outcomes and neurologic effects in infancy and early childhood.[924] Consumption of rice from waters in the watershed of the Boundary Waters and beyond is a spiritual and retained treaty right of the Fond du Lac, the Bois Forte, and the Grand Portage Bands of Lake Superior Chippewa under the 1854 Treaty of LaPointe. Following approval of the Proposed Action and subsequent development of a sulfide-ore copper mine, all enrolled members who consume wild rice from waters in the Boundary Waters watershed could expect to consume, and worry about consuming, arsenic with their wild rice.

iii. Contamination of water used for drinking and other purposes

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[918] *Id.*
[919] Minnesota DNR. (2010). Wild Rice Literature Review.
[920] HealthPartners and MN Department of Health. (2017). Choose Your Fish – A guide. Available at: http://www health.state mn.us/divs/eh/fish/forms/choosefishenglish.pdf
[921] McClure LF, Niles JK, Kaufman HW. 2016. Lead Levels in Young Children: US, 2009-2015. Journal of Pediatrics 175:173-181.
[922] McClure LF, Niles JK, Kaufman HW. 2016. Lead Levels in Young Children: US, 2009-2015. Journal of Pediatrics 175:173-181.
[923] Brooke L, C.N. Polkinghome, H.J. Saillard, and T.P. Markee. (2004). Metal Concentrations in Wild Rice Roots and Seeds, Mollusks, Crayfish, and Fish Collected from Various Wisconsin Water Bodies in Autumn of 2003. Lake Superior Research Institute, University of Wisconsin-Superior. Superior, WI
[924] US Food and Drug Administration (2016) Arsenic in Rice and Rice Products Risk Assessment Report.

AMERICAN OVERSIGHT

"Any spill or seepage of contaminants into the Kawishiwi River will also violate the Class 1B standards for drinking water. Disinfection would not remove metals or even salts that could reach the river."[925]

Pollutants from a mine act individually and cumulatively with other water quality problems, such as septic contamination, to exacerbate water pollution problems in waters around sulfide-ore copper mining.[926] This is problematic because, as detailed previously, most of the people who live in and visit the Boundary Waters watershed depend upon the clean water resources of lake water or shallow wells for drinking, cooking, and bathing. Wells serve about half the population of Lake County, and most of those wells are shallow and can be readily contaminated.[927, 928]

Paddlers and campers in the watershed depend upon lake water for drinking and cooking. Many popular waters for paddling and camping – such as the South Kawishiwi River and Birch, White Iron, Farm, Garden, Fall, Newton, and Basswood Lakes – are along the paths of pollution from possible sulfide-ore copper mining in the Boundary Waters watershed. Surface waters test as clean and safe, with any pollutants well below federal drinking water standards in all measured categories.[929, 930] Pollution of these waters, whether originating in surface or groundwater, would make its way into the waters people use for drinking, cooking, bathing and recreating, and would pose potential health threats.[931] Any spill or seepage of contaminants into the Kawishiwi River will also violate the Class 1B standards for drinking water. Disinfection would not remove metals or even salts that could reach the river.

h. Predicted impacts of air pollution on human health

Mining operations will create fine particulates that are difficult to contain and are known to cause lung and heart disease at low levels, even below EPA standards.[932,933] The ore identified by Twin Metals contains "occupational," i.e. elongated mineral fibers that bear similarities to asbestos and are active in animal models for lung cancer.[934,935,936] Analysis of semi-massive, mineralized rock sample taken by AMAX in the late 1970s showed that "fibrous amphibole" constituted 2.4% of the semi-massive deposit.[937] The Taconite Workers' Health Study[938] showed increased risks for mesothelioma (over 200%), lung cancer (20%) and heart disease (11%) among miners. A study to detect airborne mineral fibers in the region found that the highest

[925] Myers 2013
[926] Baker, 2013.
[927] *Id*.
[928] MPCA. (n.d.) Water data S Kawishiwi River- Station S000-108.
[929] Geerts, et al, 2017.
[930] (Anderson et al., 2010).
[931] Myers 2015.
[932] Shi, et al, 2016.er
[933] Franklin, et al, 2015.
[934] Ring, S.J. Expert Opinion of Steven J Ring. Roseville, MN.
[935] Cook, *et al*, 2016.
[936] TMM NI 43-101 at pdf page 374 [a k.a. Page 18-12, top bullet point]
[937] 1978 DNR-AMAX Field Leaching and Reclamation Program. Progress Report on the Leaching Study. Jan. 29, 1979.
[938] University of Minnesota. (2014). Taconite Workers Health Study: Final Report to the Minnesota Legislature. University of Minnesota School of Public Health. Minneapolis, MN.

AMERICAN OVERSIGHT

levels occurred when winds were blowing toward Ely from the northeastern Iron Range, i.e., from taconite mines, and the lowest levels occurred during a mine shutdown.[939]

Sulfide-ore copper mining in the Superior National Forest next to the Boundary Waters would be expected to cause degradation of the air quality in a large portion of the Boundary Waters, endangering miners and people of all ages in nearby communities. The Boundary Waters is a Class I airshed, yet is degraded now by regional haze from coal-fired power generation and other industry, and the particulates and significant energy needs of a massive sulfide-ore copper mining operation adjacent to the Boundary Waters would add to the air pollution burden in the Boundary Waters watershed.

i. Predicted impacts of the boom-bust cycle of mining on community health and resources

Overarching community health issues accompanying the boom-bust cycle of mining must also be considered as threats to public health and safety associated with the advancement of sulfide-ore copper mining following approval of the Proposed Action. Mining's boom and bust cycle and the long-term decline in the labor required to produce any given volume of metal ore (a trend seen in copper mining nationwide, just as in iron mining in Minnesota) have negative social and socio-economic effects on miners and their families, and on the social environment of areas that become hosts to mining.[940] The 2018 study by Stock and Brandt described in Section 3 below confirms the likelihood of boom-and-bust associated with a Twin Metals mine. Metals are globally traded commodities and their prices are well known for being unstable, much more so than prices and production in the economy as a whole – even more volatile than fuels prices.[941] The social and socio-economic significance of the boom-bust cycle is rooted in its unpredictability.[942] Unpredictability of employment and income is hard on individuals, families, and mining-heavy communities. During good times, the greater availability of money and spending can result in local economic distortions (e.g., inflation of the local housing market and more frequent large purchases) which can leave individuals and families in economic duress when downturns hit. Health and social service providers in British Columbia report on increases in pregnancies, sexually transmitted infections, and mine related injuries during mining boom times. During bust times, mental health issues such as depression and anxiety were reported. Overarching community health issues prominent during boom and bust periods include burdens to health and social services, family stress, violence toward women, and addiction issues.[943]

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[939] Ring, S.J. Expert Opinion of Steven J Ring. Roseville, MN.
[940] Power, T. M. (2007). The Economic Role of Metal Mining in Minnesota: Past, Present, and Future.
[941] United States Congress. House. Committee On Interior And Insular Affairs. Subcommittee On Mines And Mining. *[Nonfuel minerals policy review: oversight hearings before the Subcommittee on Mines and Mining of the Committee on Interior and Insular Affairs, House of Representatives, Ninety-sixth Congress, first-second session]*. Washington: U.S. Govt. Print. Off., -<1980>, 1979. Web. Retrieved from the Library of Congress, https://lccn.loc.gov/80601095. (Accessed August 10, 2017.) *N.B.*: not in Appendix.
[942] MN DNR 2013 at 5-496: "Though this 'boom and bust' phenomenon is often present in mining communities, IMPLAN does not model this phenomenon (or assume that it will occur) because the duration of a boom or bust and the severity relative to modeled commodity prices cannot be predicted."
[943] Shandro, et al, 2011

AMERICAN OVERSIGHT

2. Predicted Economic Impacts of Sulfide-Ore Copper Mining on the Boundary Waters Region.

Advancement of America's most toxic industry in the Boundary Waters watershed is incompatible with the existing stable, growing amenity-based economy. Chief Tidwell's letter cites the economic significance of area tourism to be "rooted in the region's unique recreation opportunities such as the BWCAW … broadly dependent on hunting, fishing, boating, sightseeing, and wilderness experiences provided by the region's high-quality natural environment."[944] The letter goes on to explain that the undeniable evidence indicating the likelihood of acid mine drainage damaging the Boundary Waters and surrounding area, and thus the amenity-based economy, outweighs any economic benefit of mining operations in the Boundary Waters watershed.

The attractiveness of the region's resources, particularly clean water,[945] and the opportunities they represent to residents and visitors alike are responsible for a great deal of economic activity in Ely and in the three-county Arrowhead region. The economy in St. Louis, Lake, and Cook counties has changed markedly in recent decades and many people choose to remain in or relocate to the region because of the natural amenities and high quality of life it offers. The region's population is growing and most measures of the economy are improving.[946] Compared to the 1970s, northeastern Minnesota's economy is much less dependent upon taconite mining, despite the industry's retention of its taconite production capacity, and instead has turned to natural amenity-based and service-oriented businesses to drive economic health and stability. Today, more than 70% of jobs are "services related."[947] In short, amenity-based development, including business growth -- which extends well beyond the important and insufficiently

[944] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.
[945] Keeler, et al, 2015.
[946] Phillips & Alkire, 2017.
[947] Headwater Economics EPS. (2017). A Profile of Socioeconomic Measures of St. Louis County, MN; Cook County, MN; and Lake County, MN.

AMERICAN OVERSIGHT

appreciated impacts of recreation and tourism[948,949,950,951] -- has taken the place of mining as the engine of economic development in the Arrowhead region.[952]

This shift goes far beyond the leisure and tourism-related economic activity to include the economic power of residents who stay in the region and those who relocate to become residents (entrepreneurs, retirees, and people with portable jobs who can work from anywhere) because of the top-quality lifestyle that the Arrowhead offers.[953] In response to the question "what factors would make you leave the four township area?" in the aforementioned University of Minnesota-Morris Center for Small Towns survey, mining was the most-listed factor at a response rate of 23%, followed closely by rising taxes (22%), pollution (21%), and overdevelopment (17%).[954] While some may choose to leave, others such as outfitters and organizations who rely on the pristine quality of the natural resources and wilderness character will be forced to leave at the introduction of an entirely incompatible sulfide-ore copper mining industry.[955,956]

A number of recent studies have been completed that determine that the economic harm of reverting to a boom-bust far outweighs any short-term employment benefit. The following summaries of three economic reports provide evidence that the Arrowhead economy would be harmed by sulfide-ore copper mining in the Boundary Waters watershed. Additional economic report summaries are attached to this comment letter.

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[948] Helmberger, Marshall. (2016, August 10). Too many misunderstand the true impact of tourism. *The Timberjay*.
[949] Hjerpe, 2016. Note that this report estimates economic impact only by travelers from beyond the three-county Arrowhead region, only during summer, only for those who actually entered the BWCAW using a commercial outfitter. The EA should add to what is measured here by addressing the economic impact of three-county Arrowhead region residents who visit the BWCAW, visitors during beyond the summer months, and visitors who stay at resorts outside of the BWCAW (many people who do not enter the BWCAW, nonetheless consider themselves to have gone "to the BWCAW" after staying at a resort or camp on the edge of the BWCAW).
[950] Iron Range Resources and Rehabilitation Board (IRRRB). (2011, May 6). Northeastern Minnesota Jobs, businesses, economy boosted by impact of tourism industry.
[951] The BWCAW is one of more than 750 designated federal Wilderness Areas, and is the most-visited Wilderness Area in the nation. It accounts for roughly 1% of the 109 million acres in the National Wilderness Preservation System (NWPS), but receives 10% of the usership in the entire NWPS, according to the U.S. Forest Service (see USDA Forest Service. (n.d.) Boundary Waters Canoe Area Wilderness Trip Planning Guide, at p.10, in Appendix. In 2007 the USFS estimated visitorship at 250,000 visitors per year, with more than 130,000 visits occurring during the peak period of May 1 to September 30 (see Dvorak, R.G., et al. (2012). The Boundary Waters Canoe Area Wilderness- Examining changes in use, users, and management challenges; More recently the USFS reported 155,000 visitors in 2016. The actual number varies yearly and no methodology is likely to count all BWCAW users; some visitors do not register and some are not required to do so but are counted indirectly. The 2016 study employed a different methodology than earlier estimates, and because of the change in methodologies, the most recent study does not support the assertion of a decline in long-term average BWCAW visitorship. The USFS estimates that more than 12 million people visit American Wilderness Areas each year, though it is not clear what methodology was used in formulating this estimate. In any case, whether assessed per Wilderness Area or as a share of total Wilderness acreage, the BWCAW supports far more visitors than a random-apportionment of visitors would suggest (*see* USDA Forest Service. (n.d.). Forest Facts., and *see* USDA Forest Service. (n.d.). Wilderness, in Appendix).
[952] Phillips & Alkire, 2017. Amenity-based development is defined here as "economic activity in a host of industries, including recreation/tourism, construction, personal and professional services, retail, and others that arrives or stays in a region for the sake of its scenic, recreational, environmental, and quality-of-life amenities."
[953] Phillips & Alkire, 2017.
[954] University of Minnesota, Morris, 2014.
[955] Koschak, S.L. (2016, October 26). Declaration of Steven L. Koschak
[956] Koschak, J.S. (2016, October 26). Declaration James S. Koschak

AMERICAN OVERSIGHT

A 2018 independent study by Harvard economist, Professor James Stock provides a noteworthy example of predictive modeling that demonstrates the extreme likelihood of the long-term detrimental economic effect of sulfide-ore copper mining on the Arrowhead Region:

The Stock study compares the economic effects of two scenarios over a 20-year timeframe:

- *Scenario 1* – The Boundary Waters economy continues to develop during a 20-year mining ban (as would be the case under the now-terminated proposed withdrawal); *versus*
- *Scenario 2* – The mining ban does not occur (the current status quo following termination of the proposed withdrawal), and a Twin Metals mine is developed

The study projects 36 employment and 72 income scenarios representing a range of employment and income effects. The analysis shows that over a 20-year period, an economy based on copper mining significantly underperforms the growing, sustainable economy already in place. Specifically, compared to a Twin Metals mining economy, a 20-year mining ban and continuation of existing economic trends would result in:

- 1,500 to 4,600 more jobs in all scenarios; and
- $100 million to $900 million more income in all but three scenarios [957]

An economic analysis published by the Timberjay on August 3, 2017 provides an in-depth look at some of the potential economic costs associated with a proposed sulfide-ore copper mine in the Ely area. This conservative analysis is a case study[958] of one specific mine proposal, the Twin Metals mine, and the economic impact it would have on income generated by local residents in the Ely area (Ely and the four neighboring townships). The study concludes that the opening of a Twin Metals mine could lead to an initial loss of anywhere from $22.9 million to $28.6 million in local income, a figure that will likely increase over time. This economic loss of local income would exceed any gain in local income from a Twin Metals mine.[959, 960]

A 2017 study of the Arrowhead Region's economy by Phillips and Alkire[961] reveals a diverse and growing economy in which numerous industries – including healthcare, tourism and recreation, small businesses, manufacturing, construction, services, forest products and taconite mining – can coexist peacefully as long as copper mining does not occur in the Boundary Waters watershed.

The report also details the formidable economic costs to the three-county Arrowhead Region that would follow the introduction of sulfide-ore copper mining within the Boundary Waters Watershed – including major losses in jobs, visitor spending, property value, Main Street

[957] Stock & Brandt, 2018.
[958] Helmberger, M. (2017). An Analysis of a Twin Metals Project- Risks vs Benefits. *Timberjay*. Tower, Minnesota.
[959] Helmberger, M. (2017, August 3). Ely's Golden Goose - Township residents power Ely-area economy. *Timberjay*.
[960] Helmberger, M. (2017, August 3). Township Impact- In copper-nickel debate, we all should consider economic costs as well as gains. *Timberjay*.
[961] Phillips & Alkire, 2017.

AMERICAN OVERSIGHT

businesses and more. Although taconite mining outside the watershed still accounts for 2.5 percent of the region's overall employment, the majority of economic activity supporting jobs in a wide range of industries now relies predominantly on a healthy, pristine Boundary Waters Wilderness to attract and retain business owners, workers, visitors and retirees.

The new study concludes that opening the watershed to sulfide-ore copper mining would result in huge costs for businesses, workers and communities throughout the region by damaging the strongest growing elements of the existing Arrowhead economy. Based on conservative assumptions, sulfide-ore copper mining in the Boundary Waters watershed would cost the Arrowhead economy:

- Travel & Tourism: $288 million in lost annual visitor spending that would support:
  - 4,490 local jobs;
  - $76 million in residents' income;
  - $31 million in state and local taxes, and
  - $181 million in proprietor's income and business-to-business transactions.
- Diverse & Growing Industries: 5,066 to 22,791 lost jobs and between $402 million and $1.6 billion in lost annual income if sulfide-ore copper mining suppresses or reverses overall amenity-based growth at the heart of the Arrowhead's recovery since the early 1980s.
- Property Value: $509 million in lost property value – a one-time drop in asset value should sulfide-ore mining be allowed in the Boundary Waters watershed that will spawn annual reductions in local property tax revenue throughout the region.

The report concludes that "[b]y implementing the mining withdrawal, as proposed, these and other costs would be avoided, thus delivering a benefit to the American people and Minnesotans equivalent to a one-time payment of more than $6.1 billion. In addition, the mining withdrawal could save between 9,556 and 27,281 jobs." [962]

3. The State of Minnesota cannot be counted on to regulate mining or mining-caused pollution.

In recent years, Minnesota Pollution Control Agency (MPCA) has demonstrated a thoroughgoing inability to uphold state and federal laws protecting Minnesota water quality. Instead, MPCA has deferred to state mining interests, overlooking permit violations, granting unlawful exceptions, and choosing to ignore relevant water quality standards. MPCA's behavior indicates that the agency is unwilling—or unable—to carry out its legal obligations.

MPCA is the primary authority for state water quality, charged under the Clean Water Act with issuing permits for point-source discharges of pollutants into the state's surface waters. These permits, called National Pollutant Discharge Elimination System (NPDES) permits, must contain discharge limits designed to maintain water quality standards (WQS) set by the state.

[962] Phillips & Alkire, 2017.

AMERICAN OVERSIGHT

Minnesota's WQS include the protection of aquatic life.[963] MPCA continually refuses to consider this standard. Instead, it has declined to determine the discharge limits that would satisfy the standard.[964] Some studies have shown that mining pollution in the state is already at levels that harm aquatic life,[965] and waters affected by mining pollution "show extremely low fish counts and limited taxa richness."[966] MPCA continues to ignore the aquatic life standard in favor of more permissive, easily enforceable limits.

Even when MPCA's lax permits fail to control behavior, mining companies can count on MPCA to overlook permit violations. From 2006 to 2010, U.S. Steel's Minntac plant discharged 281,000 pounds of sulfate and 1,365,000 pounds of mineral hardness in excess of their permit.[967] MPCA declined to seek permit compliance. Instead, they granted U.S. Steel's request for facility expansion.[968] Pollution discharges increased.[969]

In some cases, MPCA will even foreclose citizen attempts to enforce a permit. In 2010, various environmental groups gave notice of intent to sue over permit violations at Cliffs mining facilities.[970] MPCA then entered into an agreement with Cliffs.[971] Seven years later, no permit renewal procedures have been initiated. MPCA chose instead to fine Cliffs $58,000, despite an available fine of over $13 million based on violations.[972] The consent decree precluded the environmental groups' suit and others like it seeking permit compliance.

[963] Minn. Stat. §115.01, Subd. 20 (2015); Minn. R. 7050.0150, Subp. 1-3 (2015); Minn. R. 7052.0240 (2015).
[964] *See, e.g.*, Mesabi Nugget NPDES Permit, approved Oct. 23, 2012, https://www.epa.gov/sites/production/files/2015-09/documents/petitionexhibits.pdf, p. 50 (allowing specific conductivity well above levels identified by the Minnesota EQB as harmful to aquatic life); U.S. Steel – Minntac Tailings Basin Area Draft NPDES Permit, https://www.pca.state.mn.us/sites/default/files/wq-wwprm1-28a.pdf, p. 33-35 (failing to establish limits for aquatic toxicity).
[965] *See, e.g.*, Bartoo, P. (1978). Environmental Requirements and Pollution Tolerance of Aquatic Insects of the Regional Copper Nickel Study Area. Minnesota Environmental Quality Board, Table 1 (detailing sulfate levels that impact certain aquatic species) *and* MPCA, *Wastewater Data Browser* (last updated November 13, 2018), https://www.pca.state mn.us/data/wastewater-data-browser (filter parameter to "sulfate" and navigate to DMR Bulk Export) (listing recent sulfate discharge levels for permitted facilities).
[966] MPCA, *St. Louis Watershed Identification Stressor Report*, Oct. 2013 Draft. Available from agency on request.
[967] MPCA. (2010). Minntac Tailings Basin Compliance Report.
[968] Iron Ore Alliance. (2014, January 29). Press Release: U.S. Steel granted permits for Minntac Mine Extension Project. Available at: http://www.ironorealliance.com/wp-content/uploads/2014/01/1-29-14-Minntac-extension-permit-release.pdf.
[969] MPCA, *Wastewater Data Browser* (last updated November 13, 2018), https://www.pca.state mn.us/data/wastewater-data-browser (filter Facility to "US Steel – Minntac Tailings Basin Area," Parameter to "Sulfate," Month of End Date to January 2012 to July 2017, and navigate to "Reported values over time") (detailing the increase in sulfate discharges after 2014 when the extension was granted).
[970] Letter from Law Offices of Charles M. Tebbutt to Cliffs Erie LLC (Jan. 25, 2010), https://www.epa.gov/sites/production/files/2015-09/documents/petitionexhibits.pdf, p. 304-317.
[971] WaterLegacy. (2010). Consent Decree, MPCA v. Cliffs Erie L.L.C., http://waterlegacy.org/sites/default/files/PolyMet_SuppEIS/WL_Ex08_Cliffs_Complaint_ConsentDecree.pdf.
[972] Arneson, C.A. (2010, May 24). Is anyone protecting Minnesota's waters? MinnPost, https://www.minnpost.com/community-voices/2010/05/anyone-protecting-minnesotas-waters.

AMERICAN OVERSIGHT

At least 15 of Minnesota's mining permits are expired.[973] U.S. Steel's Minntac facility operates under a permit that expired in 1992.[974] These permits fail to reflect modern science and potentially contain discharge limits that fail to meet WQS. Recognizing the vital importance of addressing the backlog, MPCA and EPA entered into an agreement in 2013 with the goal of resolving the backlog by July 1, 2018.[975] MPCA has so far issued a draft permit for only one facility.[976] MPCA blamed this failure on a lack of adequate staff and funding, but EPA noted that "the level of effort to date has not been sufficient to meet the joint priority objective."[977]

Unfortunately, citizens cannot count on their elected officials to discipline this pattern of lax regulatory oversight. In 2014, MPCA conducted an internal study that concluded a wild rice sulfate standard was "needed and reasonable."[978] After meeting with a small group of Iron Range legislators and a phone conference with the Governor and a cabinet member representing Iron Range economic interests, MPCA decided to withhold that conclusion.[979] Then in 2015, the Minnesota Legislature passed a law expressly prohibiting MPCA from enforcing the standard until a new one was created, an act that forbids MPCA from upholding its federal obligations under the Clean Water Act.[980]

Governor Dayton encapsulated the issue when he said in 2015 in a radio interview that U.S. Steel had "made it very clear they're not going to agree to a permit that has the [wild rice] standard of 10 [mg/L]. . . ."[981] Apparently U.S. Steel's desires were an integral part of the legal decisions MPCA and the Governor made. When a regulating party can dictate the terms of a permit, the regulating agency has lost its regulatory independence.

MPCA's actions on the crucial issue of mining permits demonstrate a wholesale disinterest in their legal obligation to protect Minnesota's water. MPCA has issued legally deficient permits,

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[973] Marcotty, J. (2016, November 15). Minnesota Pollution Regulators Propose for First Time Deadlines for Minntac Tailings Basin to Meet Goals. *StarTribune.*

[974] *Id.*

[975] EPA, MPCA. (2013, April). Metallic Mining Joint Priority PPA, https://www.epa.gov/sites/production/files/2015-09/documents/petitionexhibits.pdf, p. 7-10, at 7.

[976] MPCA. (2016, November). United States Steel – Minntac: Tailings Basin Water Permit Reissuance, https://www.pca.state mn.us/sites/default/files/wq-wwprm1-28.pdf. This draft permit is currently under litigation and thus its issuance is uncertain at best. *U.S. Steel Goes to Court Against Minnesota over Minntac Permit*, MPR NEWS (Feb. 22, 2017), https://www mprnews.org/story/2017/02/22/us-steel-goes-to-court-against-minnesota-over-minntac-permit; *see also* (2016, July 13). Letter from Ann Foss, MPCA, to Kevin Pierard, EPA, https://www.epa.gov/sites/production/files/2016-07/documents/npdes-response-to-june22-pierard-letter_0.pdf (detailing efforts on addressing backlog to date).

[977] MPCA. (2014). Mining Permit Joint Priority Report, EPA Comments, https://www.epa.gov/sites/production/files/2015-09/documents/petitionexhibits.pdf, 11-16, at 14.

[978] Wild Rice Sulfate Standard – Summary of Findings and Preliminary Recommendations Legislative Briefing Document, Feb. 2014, https://www.epa.gov/sites/production/files/2015-09/documents/petitionexhibits.pdf, 415-419, at 415.

[979] (2014, February 26). Email from Jaime Tincher, Office of the Governor, to John Stine, Minnesota Pollution Control Agency Commissioner, https://www.epa.gov/sites/production/files/2015-09/documents/petitionexhibits.pdf, p. 420.

[980] 2015 Minn. Laws 1st Spec. Sess. ch.4, art 4, § 136(a)(1)(i).

[981] Transcription, MPR News (March 29, 2015), Radio Interview with Governor Mark Dayton, https://www.epa.gov/sites/production/files/2015-09/documents/petitionexhibits.pdf, 428-429, at 428 (audio available at https://www.mprnews.org/story/2015/03/24/dayton-water-standard).

AMERICAN OVERSIGHT

ignored standards that protect aquatic life, failed to address permit backlogs and violations, and generally worked to prevent the application of good science to water quality permits. Unfortunately, MPCA cannot be counted on to resist outside influence and carry out its obligations to protect Minnesota's water quality.[982, 983, 984]

B. RENEWAL OF MINERAL LEASES FOR SULFIDE-ORE COPPER MINING IN THE HIGHLY POPULAR BOUNDARY WATERS WATERSHED IS A HIGHLY CONTROVERSIAL ACTION WITH OVERWHELMING LOCAL AND NATIONAL OPPOSITION.

On December 15th, 2016, the Bureau of Land Management rejected the renewal of Twin Metals Minnesota's expired leases, MNES 01352 and MNES 01353. The Agency's discretionary right to deny the leases was confirmed through consultation with the Department of Interior Office of the Solicitor as in compliance with the discretionary right of the U.S. Forest Service to withhold consent as expressed in the summary below.

> On December 14, 2016, the U.S. Forest Service issued a letter stating it did not consent to the renewal of MNES 01352 and MNES 01353[985]. In its decision, USFS determined that these leases were inconsistent with the Agency's affirmative duty to protect and maintain the values in the BWCA Wilderness, embodied by the directive in the 2004 Superior National Forest Plan to manage the BWCA Wilderness in such a manner that 'perpetuates and protects its unique natural ecosystems, provides an enduring wilderness resource for future generations, and provides opportunities for a primitive and unconfined recreation experience.' In considering this renewal application, the Agency identified grave concerns that the development of the copper sulfide-ore mining in the Rainy River Watershed, in particular the [mineral leases in question], risks seriously impairing the ecosystem health of the wilderness area, and with it, poses unacceptable risks to the wildlife, recreational uses, tribal hunting, fishing, and usufructuary rights, and tourism industry that depend on the pristine nature of the BWCA Wilderness.[986]

The controversy surrounding this publicly supported action and subsequent agency actions, discussed below, requires an understanding of the cultural significance and human value of the Boundary Waters Canoe Area Wilderness (discussed in Section I) in addition to its ecological and economic value. Perhaps best examined in Reyer and Garwin's 2015 paper "The Impacts of Mining on the Character of a Wilderness Landscape: Considerations for Federal Decision-Making,"

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[982] Lee, K., MCEA. Memorandum on State of MN's Regulatory Failure with regard to Mining, in Appendix (folder State Regulatory Failure)
[983] *See* 2015 WaterLegacy [De-delegation materials,] petition & news updates, in Appendix (folder State Regulatory Failure).
[984] *See* 2004 MN Center for Environmental Advocacy [De-delegation] petition, in Appendix (folder State Regulatory Failure)
[985] USDA Forest Service December 14, 2016 decision letter to USDOI BLM.
[986] USDOI BLM. December 15, 2016. Letter to TMM rejecting application for renewal of leases MNES-001352 and -001353

AMERICAN OVERSIGHT

> Some places . . . are so important to people's sense of what is right and good and of ultimate value that the character of the area becomes – or should become – a critical consideration in decisions about land use changes that will affect that character. The Boundary Waters Canoe Area Wilderness and the Birch Lake/South Kawishiwi River that flow into it are such a place. To transform this area from what it is today into an industrial mining district would amount to a change in the character of a landscape that would affect the experience and psychological well-being of tens—or even hundreds—of thousands of people in a way that simply cannot be captured by a discussion of ecological and economic considerations.[987]

In 2016, the U.S. Forest Service and BLM decisions to withhold consent on the renewal of Twin Metals' expired mineral leases, to deny applications to renew the leases, and to withdraw more than 234,000 acres of SNF land from the federal mineral leasing pool while instituting a 2-year study of and 20-year ban on mining in the area were overwhelming supported by the public. Subsequent outcry followed the 2018 reversal of decision and abrupt cancellation of the study by the Department of Agriculture. Again, articulated well by Reyer and Garwin

> Perhaps more than for any other wilderness in the country, American citizens have stood up again and again to fight to retain the wilderness qualities of the Boundary Waters Canoe Area Wilderness. They have done so because the BWCAW speaks to them in a way of no other place they have known. Mining at the edge of the wilderness would ensure that this part of the BWCAW would no longer bring the deep joy that so many come here to find.[988]

Recent polling, information collected during public comment periods, letters from private citizens, organizations, and elected officials to agency representatives, as well as media stories and opinion pieces demonstrate ongoing and growing support from a wide variety of constituencies for protecting the watershed of the Boundary Waters from sulfide-ore mining activities.

[987] Reyer & Garwin, 2015, page 2
[988] *Id*., at p. 32

AMERICAN OVERSIGHT

1. There is consistently strong public support across the nation and Minnesota for protecting the Boundary Waters watershed from the inherent risks of sulfide-ore copper mining.

a. New polling results show there is no social license for sulfide-ore copper mining in the Boundary Waters watershed.

February 2018 polling by FabrizioWard[989] documents that Minnesotans oppose sulfide-ore copper mining near the Boundary Waters. Seventy percent (70%) of Minnesotans oppose copper mining near the Boundary Waters. Fifty-six percent (56%) of Minnesotans who live in the 8th Congressional District (location of the Boundary Waters) oppose copper mining near the Boundary Waters. Three out of five Minnesotans oppose renewal of federal mineral leases for copper mining near the Boundary Waters. Governor Dayton's ban on state approvals for a Twin Metals mine is intensely popular among Minnesota voters; two-thirds of Minnesotans support the state ban, including a majority in the 8th Congressional District.[990]

While Minnesotans are not anti-mining (52% are in favor of taconite mining in MN), 70% opposition to sulfide-ore copper mining near the Boundary Waters demonstrates local protectiveness of the Wilderness. 78% of voters were in favor of the U.S. Forest Service and BLM proposed 20-year mining withdrawal and associated scientific study of lands near the Boundary Waters. Additionally, protecting the Boundary Waters from sulfide-ore copper mining was a winning issue in the gubernatorial election with voters likely to support candidates who continue the current ban on sulfide-ore copper mining near the Boundary Waters five-to-one.[991]

Furthermore, almost nine in ten voters (87%) see the importance of outdoor recreation and public lands to Minnesota's economic future.[992] In July 2018, the Boundary Waters Action Fund (BWAF), a 501(c)(4) dedicated to protecting the Boundary Waters from the threat of sulfide-ore copper mining in the watershed of the Boundary Waters, chose to certify candidates who prioritized protecting the BWCA as Boundary Waters Champions. Immediately following the first round of certifications, Tim Walz cited his certification in a live Minnesota Public Radio debate days before winning the primary election. Governor-elect Walz went on to win the midterm-election with 54% of the votes. Additionally, winning candidates holding a BWAF certification include Attorney General Keith Ellison, and four of the eight Minnesota congressional race winners – U.S. House Representatives Angie Craig, Dean Phillips, Betty McCollum, and Ilhan Omar. The U.S. House candidate in the MN 8th Congressional District who was certified as a Boundary Waters Champion beat the pro-copper mining candidate by 20% in the three Minnesota counties that house the Boundary Waters and the proposed leases.

[989] FabrizioWard, LLC. (2018, February 27). Save the Boundary Waters Survey - Polling Results.
[990] FabrizoWard, LLC. (2018, February 27). Memorandum: Sulfide ore copper mining near the Boundary Waters.
[991] *Id*.
[992] *Id*.

AMERICAN OVERSIGHT

b. Public Response to Agency Decisions and Decision Reversals Regarding Sulfide-Ore Copper Mining in the Boundary Waters Watershed.

In 2017, the Forest Service provided a public comment period for a proposed 20-year ban on mineral leasing on 234,328 acres of Superior National Forest lands in the watershed of the Boundary Waters. An analysis of the comments by Key Log economics found that out of a Minnesota record of 125,449 comments submitted, 121,539 supported the 20-year ban. Of the 125,449 total comments submitted, 81,032 were unique letters. 98.2 percent of the unique comment letters urged the Forest Service to institute the 20-year ban and protect the Boundary Waters from sulfide-ore copper mining.[993] In an additional comment opportunity in early 2018, the Forest Service received 55,949 additional comments supporting the 20-year ban, increasing the total number of comments in favor of the 20-year ban of sulfide-ore copper mining in the Boundary Waters watershed to 177,488 out of 181,398 comments submitted during the two comment periods.

In 2016 and 2017, the Forest Service held five public hearings – two meetings concerning whether the Forest Service should consent to renewal of the two expired Twin Metals leases, and three meetings concerning the proposal for a 20-year ban. In 2016, more than 2,900 people attended these meetings with 59 of 97 testimonies given by randomly drawn attendees in favor of protecting the Boundary Waters. In 2017, 101 of 157 testimonies from the more than 2,700 attendees supported protection of the Boundary Waters. More than 5,600 people turned out to voice their concerns, with a nearly two-to-one ratio of speakers in favor of protecting the Boundary Waters watershed from sulfide-ore copper mining.

On July 18, 2018, Congressman Tom Emmer (R, MN-06) withdrew an amendment to the Interior Appropriations bill that would have forbidden expenditure of money to carry out the proposed mineral withdrawal because of failure to gain support for passage. The Emmer Amendment was co-sponsored by Congressman Rick Nolan (D, MN-08). Thousands of citizen phone calls were placed to congressional offices representing Minnesota and the rest of the nation, demanding the defeat of the amendment. Threatening the Boundary Waters stirs opposition potent enough to defeat a bi-partisan amendment.

Through record participation in public comment periods and hearings and outreach to congressional offices, the commitment from Minnesotans to speak out in as many ways possible to urge the protection of the Boundary Waters demonstrates the controversial nature of any decision to the contrary. The super majority of Minnesotans undeniably reject the transformation of Superior National Forest lands in the Boundary Waters watershed into a single-use industrial mining district.

[993] *See* Key-Log Economics, LLC. (2018. February 27). Memorandum: Full results from the review of comments on the proposed withdrawal of lands from mineral leasing in the Boundary Waters, in Appendix.

AMERICAN OVERSIGHT

2. Sulfide-ore copper mining near the Boundary Waters, including the Twin Metals mine, is strongly opposed by Elected leaders, local businesses, and many segments of society.

Minnesota's Governor Dayton, Vice President Mondale, and members of the Minnesota Congressional delegation.

Minnesota elected officials as well as agency officials both present and former have spoken in opposition of the Proposed Action. In a June 14, 2018 bipartisan letter, over a dozen members of the U.S. House of Representatives urged the Department of the Interior and the Department of Agriculture "to conduct a rigorous review of the proposed twenty-year mineral withdrawal" and "to bear in mind the extremely high value and importance of the Boundary Waters to Minnesota and the nation."[994] Governor Mark Dayton, Senator Amy Klobuchar, Senator Tina Smith, Congresswoman Betty McCullum, Congressman and Governor-elect Tim Walz, Congressman and Attorney General-elect Keith Ellison, as well as Congressman Erik Paulsen all supported the Forest Service's application for withdrawal and the associated environmental review.

Governor Dayton remarked in his March 6, 2016 letter to Twin Metals Minnesota, "…the BWCAW is a crown jewel in Minnesota and a national treasure .... I have an obligation to ensure it is not diminished in any way." [995] He thus directed his agencies not to approve any agreements or issue any new state leases for a Twin Metals mine.

Former Vice-President Walter Mondale has referred to the Boundary Waters as "Minnesota's Yellowstone." Sharing Governor Dayton's determination to see it protected, he wrote: "Minnesotans understand that we cannot afford to get this wrong. Will we continue Minnesota's commitment that began more than a century ago and take steps to ensure that the Superior remains a healthy multiuse national forest? Or will we instead allow the destruction of many thousands of acres of this beloved public land, upstream from the Boundary Waters, by permitting a single-use industrial hard-rock mining district, with the inevitable acid mine drainage that would seriously harm aquatic ecosystems downstream? The watershed of the Boundary Waters is simply the wrong place for this kind of mining."

Congresswoman Betty McCollum wrote: "The proximity of the 1.1 million-acre BWCA to Voyageurs (220,000 acres) and Ontario's Quetico Provincial Park (1 million acres) results in a large-scale intact boreal forest ecosystem of international significance and inestimable value. The threat of contamination as a result of sulfide-ore mining in the Superior National Forest threatens all of these resources, including the potential for an international environmental crisis if Quetico Provincial Park were to be polluted as a result of federally sanctioned mining."

Congressmen Erik Paulsen in a speech on the floor of the U.S. House of Representatives: "Some of the best memories of my life have taken place in the Boundary Waters as I grew up or, ow, with my daughters. We owe it to future generations to understand the impact that copper-sulfide mining poses to the Boundary Waters Canoe Area…" Congressman Paulsen later reached across party lines in a 2018 campaign ad highlighting his work to protect the Boundary Waters, his

[994] *See* (2018, June 14). US Rep Betty McCullum, *et al*, Letter to Secretaries Perdue and Zinke regarding cancelled study, in Appendix.
[995] (2016, March 6). Letter from Gov. Mark Dayton to TMM

AMERICAN OVERSIGHT

support for the withdrawal environmental review, and his opposition to any and all moves in the Executive Branch to halt the review and reinstate leases. The relevance of this is that it demonstrates the non-partisan nature and popularity of protection for the Boundary Waters in Minnesota's Third Congressional District, as well as the bi-partisan support for that protection in the United States Congress.[996, 997, 998, 999, 1000]

Tribes

Three Minnesota Chippewa tribes (the Grand Portage, Fond du Lac, and White Earth) and one First Nation (Lac la Croix) have written letters to agency officials expressing concerns over sulfide-ore copper mining within ceded territory. The Grand Portage Band of Lake Superior Chippewa letters dated March 27, 2014 and April 29, 2016; the Fond du Lac Band of Lake Superior Chippewa dated April 3, 2014and June 29, 2016; the White Earth Reservation Tribal Council letter dated May 23, 2016, and the Lac La Croix First Nation letter dated September 22, 2016.[1001, 1002, 1003, 1004, 1005, 1006]

Scientists

53 preeminent scientists with backgrounds in ecology and other natural resource-related disciplines express deep concern with the prospect of hardrock mining immediately upstream of the Boundary Waters

- "The potential impacts on water quality from the mining of sulfide ores make the location of such mines upstream from a world-class resource like the Boundary Waters inherently problematic"
- "[T]he particular qualities of the area, including the low buffering capacity of water and soil and the interconnection of lakes and streams, make the Boundary Waters watershed particularly vulnerable to the impacts of mining"[1007]

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[996] (2018, July 11). Former US Rep Erik Paulsen campaign video, "Threatened." Available at: https://www.youtube.com/watch?v=tIfoB0GZSH8&feature=youtu.be.
[997] (2018, June 14). US Rep Betty McCullum, *et al*, Letter to Secretaries Perdue and Zinke regarding cancelled study.
[998] McCullum, B. (2017, July 26). Don't rewrite the rules to mine next to Minnesota's Boundary Waters. *The Hill*
[999] Helmberger, Marshall. (2016, October 24). Speaking out on wilderness issues. *The Timberjay*.
[1000] Tidwell, T. (2018, November 3). Local View: Industrial mining must be kept away from the Boundary Waters. *Duluth News Tribune*.
[1001] (2014, March 27). Letter from Norman W. Deschampe, Chairman of the Grand Portage Reservation Tribal Council, to the U.S. Departments of Agriculture.
[1002] (2016, April 29). Letter from Norman W. Deschampe, Chairman of the Grand Portage Reservation Tribal Council, to the U.S. Departments of Agriculture and the Interior, and to the Director of the Council on Environmental Quality.
[1003] (2014, April 3). Letter from Karen R. Diver, Chairwoman of the Fond du Lac Band of Lake Superior Chippewa Reservation Business Committee, to the U.S. Department of Agriculture.
[1004] (2016, June 29). Letter from Kevin R. Dupuis, Sr., Chairman of the Fond du Lac Band of Lake Superior Chippewa Reservation Business Committee, to the U.S. Departments of Agriculture and the Interior, and to the Director of the Council on Environmental Quality.
[1005] (2016, May 23). Letter from Steven "Punky" Clark, Vice-Chairman of White Earth Tribal Council to the U.S. Departments of Agriculture and the Interior, and to the Director of the Council on Environmental Quality.
[1006] to the U.S. Departments of Agriculture and the Interior, and to the Director of the Council on Environmental Quality.
[1007] (2014, April 4). Letter from Boundary Waters scientists to USDA.

AMERICAN OVERSIGHT

Wildlife and Hunting Heritage Conservation Council

- "Today, we write to express our concerns about proposed sulfide-ore copper mining operations in the headwaters flowing into the Boundary Waters Canoe Area Wilderness, which is located within the Superior National Forest. Boundary Waters is a national treasure for sportsmen and outdoor enthusiasts – and serves as an economic engine for the communities in northeastern Minnesota. It is America's most visited Wilderness Area, primarily because of the pristine habitat that supports a wide diversity of wildlife, including moose, bear, wolves, deer, grouse, loons, osprey, eagles, walleye and pike, and outdoor experiences from hunting and fishing to canoeing and camping. Tourism in this region supports thousands of jobs and hundreds of millions in dollars of economic activity."[1008]

International Joint Commission

- IRLWWB raises the attention of the IJC to the large number of proposals for mining operations within the Lake of the Woods drainage basin
- IJC and IRLWWB request explanation of how binational coordination of Canadian and American processes will consider cumulative effects and transboundary effects of mining in the Lake of the Woods basin[1009]

Medical Professionals

- "The Minnesota Medical Association, Minnesota Academy of Family Physicians, Minnesota Nurses Association, Minnesota Public Health Organization, along with hundreds of individual providers and non-profit groups with ties to human health, all submitted letters in response to the one prior Environmental Impact Statement (EIS) done for sulfide-ore copper mining in Minnesota. The consensus by all of these groups representing over 30,000 healthcare professionals and health advocates, is that a comprehensive Health Risk Assessment (HRA) and a Health Impact Assessment (HIA) be mandated as part of an EIS necessary for decisions regarding sulfide-ore copper mining."[1010]

Girl Scouts of Minnesota and Wisconsin Lakes and Pines

- "Our program cannot exist somewhere other than the Boundary Waters Canoe Area Wilderness. No other place on earth offers the perfect combination of accessibility and high adventure that the BWCAW offers."[1011]

The Boundary Waters Business Coalition

The coalition includes over 300 small businesses, outfitters, manufacturing companies, hunting and fishing businesses and others that rely on and support this world-class Wilderness for employment and quality of life.

[1008] (2015, November 6). Letter from Wildlife Hunting Heritage Conservation Council to USDOI and USDA.
[1009] (2015, January 22). Letter from US. Dep of State & Foreign Affairs & International Trade Canada & December 21, 2014 transmitting letter from International Rainy Lake of the Woods Watershed Board.
[1010] (2018, February 19). Physician Comment Letter to USFS Re: Mineral Withdrawal.
[1011] (2017, November 26). Letter from Girl Scouts of Minnesota and Wisconsin lakes and pines, to Members of Congress.

AMERICAN OVERSIGHT

- "The Boundary Waters is the most visited wilderness area in the country, spanning 1.1 million acres of interconnected waterways and forests in northeastern Minnesota. The Superior National Forest, which includes the Boundary Waters, contains 20 percent of all the freshwater in the 193 million-acre National Forest System. Voyageurs National Park and Canada's Quetico Provincial Park are downstream from the Boundary Waters."[1012]

Military Veterans for the Boundary Waters

- "The Boundary Waters is a place of healing for many veterans suffering from trauma or having difficulty readjusting to life at home. The peace found in this Wilderness is priceless, and if destroyed, we will be robbing future veterans of their chance to heal. One specific camp, Voyageur Outward Bound School (VOBS), provides vets-only trips to help veterans readjust to life at home through Wilderness experiences…Unfortunately, VOBS is located on the same lake as the proposed mines and [they] would cause this camp to shut down, eliminating hundreds of American jobs by moving to Canada, and eliminating…the opportunity for veterans to take advantage of these incredibly beneficial programs" [1013]

Sportsmen and Women for the Boundary Waters

- "The Boundary Waters is the most visited Wilderness Area in the nation, and a world-class hunting and fishing destination. Americans have outstanding access to these Wilderness fisheries through 84 entry points that lead to 1,100 lakes and over 2,000 campsites. The three million-acre Superior National Forest, which includes the Boundary Waters, contains twenty percent of all the freshwater in the 193 million-acre National Forest System. Downstream from the Boundary Waters are Voyageurs National Park, Rainy Lake, and Lake of the Woods, which provide some of Minnesota's best hunting and fishing experiences. The Boundary Waters is a public lands and waters success story. It is imperative we defend this Wilderness for future generations."
- "The Boundary Waters is a major contributor to a robust hunting and fishing economy in Minnesota that provides $3.17 billion in consumer spending annually and 47,900 direct jobs. The Outdoor Industry Association recently published a study that found 140,000 Minnesotans are employed in outdoor recreation, in no small part because of the Boundary Waters. Any damage to the Boundary Waters, or even the perception that the Wilderness is deteriorating, threatens this outdoor economy. An economic study shows that copper mining in the Rainy River Watershed is likely to destroy 4,490 local jobs in the Boundary Waters region alone."[1014]

Kids for the Boundary Waters

- Kids for the Boundary Waters is committed to doing everything possible to defend the Boundary Waters. The fight for the Boundary Waters is most especially about us KIDS who will lose something priceless and inherit the mess if this mine is built. This is our future – our water, our public lands, our resources, our health, and our country are at stake. Not this mine. Not in this place. Not Ever."[1015]

[1012] (2018, May 31). Letter from local businesses to USDOI and USDA.
[1013] (2017, November 28). Letter to Members of Congress.
[1014] (2018, May 31). Letter from sporting groups to USDOI and USDA.
[1015] (2018, December 21). Letter from Kids For the Boundary Waters to Deputy Secretary Bernhardt.

AMERICAN OVERSIGHT

Together, the coalitions of Sportsmen for the Boundary Waters, Boundary Waters Business Coalition, Campaign to Save the Boundary Waters, Veterans for the Boundary Waters, Girl Scouts and Boy Scouts for the Boundary Waters, and Kids for the Boundary Waters represent approximately 18 million sportsmen and women, more than 350 businesses, conservation groups, and hunting and angling groups, and the broad spectrum of users of the Boundary Waters from across America.

3. Past agency decisions

- Both Congress and federal agencies have acknowledged the value of some places to the human spirit as imperative over industrial use.[1016]
- In the December 14, 2016 "Forest Service Record of Decision on Lease Renewals" letter to Bureau of Land Management Director, Neil Kornze, U.S. Forest Service Chief Thomas L. Tidwell presented the agency decision to withhold consent to renewal of the Twin Metals leases.
- In the December 15, 2016 letter from the BLM to Twin Metals, TMM was notified that its applications to renew leases MNES-01252 and MNES-01253 were denied and the leases cancelled.
- On January 13, 2017, the Forest Service filed an application to withdraw from mineral leasing approximately 234,000 acres of Superior National Forest lands in the Boundary Waters watershed, initiating a 2-year segregation and study of the withdrawal area and a 20-year ban on mining in the withdrawal area. This application was accepted by BLM/DOI. Together, the withdrawal application, December 14, 2016 letter withholding agency consent to renewal of the Twin Metals leases, and the December 15, 2016 letter denying lease renewals demonstrate the Forest Service's the BLM's, and the Department of Interior's considered view that sulfide-ore mining in the Boundary Waters watershed would pose significant risks to the wilderness and other downstream resources. The Superior National Forest's 2004 Forest Plan does not account for sulfide-ore copper mining.

[1016] Reyer & Garwin, 2015.

AMERICAN OVERSIGHT

These prior agency decisions were based on an extensive record of economic, social, and environmental data in published science, peer-reviewed reports, and government records, not to mention extensive public input and comment periods, so that when the Forest Service concluded that sulfide-ore copper mining presented an unacceptable risk of irremediable harm to the Superior National Forest, Mining Protection Area, and the Boundary Waters Canoe Area Wilderness, its decisions to withhold consent to lease renewal and to apply for a mineral withdrawal carried a legitimacy in both the substance of the matter and in the process by which the decisions were made. The Department of Interior and BLM decisions leading to and including this EA on lease renewal differ with the prior decisions in every respect.

Thank you for the opportunity to submit these comments.

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