DEPARTMENT OF NATURAL RESOURCES

RECORD OF DECISION

In the Matter of the Determination of the Need for an Environmental Impact Statement for the Canisteo Mine Pit Temporary Dewatering Project in Itasca County, Minnesota

FINDINGS OF FACT, CONCLUSIONS AND ORDER

FINDINGS OF FACT

1. Mag Mining LLC (Mag) is a subsidiary of Magnetation LLC, which produces high-quality iron ore concentrate from previously abandoned iron ore waste stockpiles and tailings basins. Mag currently produces hematite iron concentrate from its Plant 1 facility near Keewatin, Minnesota and has a second facility called Plant 2 in Taconite, Minnesota. In 2014, Mag constructed Plant 4, its newest facility, near the communities of Coleraine and Bovey.

2. The Canisteo Mine Pit (CMP) is a large historic pit complex that is approximately 5 miles long with water depths of over 300 feet. Mag has an existing water appropriations permit of 12,000 gallons per minute (gpm) from the CMP that has been issued by the Minnesota Department of Natural Resources (DNR) to support operations at the Plant 2 and Plant 4 sites.

3. The Buckeye Pit is located at the western end of the overall CMP. Natural iron ore reserves of indeterminate quantity and quality are located within the Buckeye Pit. Mag proposes to conduct temporary dewatering activities from the CMP to lower the water level down to the bottom of the Buckeye Pit. Mag would apply for a second water appropriations permit of approximately 20,000 gpm from the CMP to achieve this dewatering. After the Buckeye Pit is isolated from the overall CMP, exploratory drilling, laboratory testing, and bulk sampling would be conducted to determine the quality and suitability of mineral reserves.

4. The DNR prepared an environmental assessment worksheet (EAW) for the proposed project according to guidance provided under Minn. R. 4410.1400 and 4410.1500 (2013). The EAW was filed with the Minnesota Environmental Quality Board (EQB) and a notice of its availability was published in the EQB Monitor on March 16, 2015. A copy of the EAW was sent to all persons on the EQB Distribution List and to those persons known by the DNR to be interested in the proposed project. A press release announcing the availability of the EAW was sent to newspapers and radio and television stations regionally. Copies of the EAW were also made available for public review and inspection at the Minneapolis Central Library, the Duluth Public Library, Bovey Public Library, Coleraine Public Library, DNR Library (St. Paul), and the DNR Northeast Regional Office (Grand Rapids). The EAW was also made available to the public via posting on the DNR's website.

5. Pursuant to Minn. R. 4410.1600 (2013), the 30-day EAW public review and comment period began March 16, 2015 and ended April 15, 2015. The comment period closed at 4:30 p.m. The public was provided the opportunity to submit written comments to the DNR by the U.S. Postal Service, facsimile, or email.

6. The EAW is incorporated by reference into this Record of Decision on the determination of need for an environmental impact statement (EIS).

7. During the 30-day public review and comment period, the DNR received written comments from the agencies and individuals listed below. The comment letters are included in the Record of Decision in Attachment A. Discussion on comments received and DNR responses are provided in Finding of Fact No. 8.

    1. Greg and Lynn Mihelick
    2. Timothy and Patricia Zoerb
    3. Judith L. Phillips
    4. Robert Holmbeck
    5. William Baer (for Tamara Cameron) on behalf of U.S. Army Corps of Engineers
    6. Sarah J. Beimers on behalf of State Historic Preservation Office
    7. David J. McMillan on behalf of Minnesota Power
    8. Kevin Kain on behalf of Minnesota Pollution Control Agency
    9. Fred Tanner
    10. Dave and Jackie Eckstein
    11. Steve Holmberg

8. Each comment that was submitted is summarized and grouped by topic below with DNR's response following each comment. Comments of similar content are consolidated into one comment and a single response provided.

a. **Trout Lake Water Level**

Comment TL1: Commenters express concern about rising levels in Trout Lake as a result of the CMP dewatering project, particularly for those living on flat lots or lower parts of the lake.

Response: Lines 187 - 192 of the EAW state that the south pump would serve as mitigation to control the level of Trout Lake and prevent it from rising above desired levels as a result of the dewatering project. Mag would work directly with the DNR to establish a pumping schedule to maintain the desired water elevation of Trout Lake. Lines 402 - 405 of the EAW acknowledge that the dewatering route through Trout Lake has the potential to raise water levels, depending on the conveyance capacity of the Trout Creek outlet. The EAW states that high water impacts on Trout Lake would be avoided with the use of a secondary pump at the south end of the lake that would pump water from Trout Lake directly to the Swan River.

Comment TL2: The commenter notes that, according to the chart on page 5, Mag has permits to release 4,000 to 6,000 gpm each to Plant 2 and Plant 4. This 166 percent increase in flow out

of the CMP with the additional 20,000 gpm shortens the time frame to get the Buckeye Pit dewatered and accessible for analysis to approximately three years. The commenter asks why Mag does not continue to drain according to approved and permitted dewatering and extend its timeline?

Response: The proposed project evaluated in the EAW assumes that temporary dewatering would be completed in approximately three years. Permit conditions, which may consider variability in the pumping rate, could alter the dewatering timeline. If the existing water removal rate from the CMP were continued it would take approximately nine years or longer to lower water elevations in the CMP to safe levels for the bulk sampling work. This longer timeline is not compatible with Mag's business needs. Thus, the company is proposing this plan for accelerated dewatering.

Comment TL3: The commenter is concerned about how Trout Lake levels would be monitored and asks:

- What governmental agency would be entrusted, and accept responsibility, to monitor the lake levels to ensure the 10 year average ordinary high water level (OHWL) is not breached?
- Does the equipment technology that Magnetation is proposing automatically do this?
- Would Mag be hiring an independent party to monitor the level daily?
- Does Mag or the DNR feel that Mag has a conflict of interest to self-monitor?
- There is reference in many places in the EAW that Mag would stop pumping if water levels exceed "desired" levels. Are there no longer mandated OHWL standards?
- I am assuming the "schedule" discussed with DNR (lines 189 - 190 of the EAW) has some buffer under the OHWL?

Response: The DNR would establish an environmental monitoring plan and contingency plan during the permitting process. A threshold elevation (maximum allowable water level elevation) on Trout Lake would be established in the environmental monitoring plan. The threshold water level elevation on Trout Lake would consider current water levels, precipitation events, and trends in historic water levels. Mag would operate the CMP pump and Trout Lake south pump to maintain lake water levels at or below the designated threshold elevation. The equipment used to measure Trout Lake water levels, and the frequency at which water levels would be recorded, would be defined in the environmental monitoring plan. Mag would be responsible for measuring Trout Lake water level elevations to meet the requirements designated in the monitoring plan and the contingency plan. The contingency plan would establish conditions defining when pumps would be required to be turned on or off to maintain water levels at or below the threshold elevation.

The OHWL is a reference point that defines the DNR's regulatory authority over development projects that are proposed to alter the course, current, or cross section of public waters and public water wetlands. An OHWL is the highest water level elevation that has been maintained for a sufficient period of time to leave evidence on the landscape. Landscape evidence of an OHWL defines a change between predominately aquatic to predominately terrestrial vegetation. The OHWL for Trout Lake is 1288.2 feet mean sea level (MSL). Trout Lake water level

elevation has remained above the OHWL for the past seven years. As stated previously, multiple factors would be considered in establishing the threshold elevation for Trout Lake.

Comment TL4: The commenter does not understand how 20,000 gpm inflow to Trout Lake on the north side of the lake relates to 117 cfs drain on average (450 cfs - spring) in Trout Creek and Swan River (line 556). In the summer of 2014 the commenter's lake access was flooded a good part of the summer due to the creek being congested and bogs releasing.

Response: It seems that the commenter is confused about the relationship between the 20,000 gpm discharge to Trout Lake and the average flows in Trout Creek and the Swan River. The EAW focuses on the maximum total discharge of 20,000 gpm to the Swan River. Flows from Trout Creek, as well as from the pump on the south end of Trout Lake, would contribute to the 20,000 gpm increase in flow to the Swan River, which would be the receiving water for the dewatering of the CMP.

The project would increase inflow to Swan River by a maximum of 20,000 gpm (44 cfs). Lines 554 - 557 of the EAW state that the annual average flow of Swan River, downstream of the confluence of Trout Creek, is 117 cfs (52,510 gpm). Springtime peak flows in the Swan River range from 400 (179,520 gpm) to 450 cfs (201,960 gpm). This equates to a 38 percent increase in Swan River annual average flows and a 10 percent increase in peak flows in the Swan River.

Comment TL5: The commenter asks for clarification about the EAW text that states Trout Lake watershed is predominantly a ground water system with very little flashy surface water flow.

Response: Lines 586 - 587 of the EAW acknowledges the flashiness of the Trout Lake watershed. Surface runoff within a flashy watershed moves through the system rapidly. In a watershed that is not flashy, the transport of water is slowed through absorption into and seepage through soils, containment on the surface in lakes, and retention in the soil as moisture. In the case of Trout Lake, water levels are predominately controlled by ground water inputs and less by surface runoff.

Comment TL6: The commenter understands that state regulations prevent the unnatural alteration of lake level above the 10 year average OHWL without 100 percent landowner approval. He notes that lines 621 - 624 of the EAW state that hydrological analysis of Trout Lake found that dewatering flows would raise the level of Trout Lake less than one foot. The commenter doesn't understand this point because he believes one foot would have a materially adverse effect on his property and would not be approved by all lakeshore owners.

Response: The hydrological analysis of Trout Lake water levels discussed in lines 621 - 624 of the EAW does not consider the south pump as a component of the project. Furthermore, the project's duration is *temporary* and does not involve the *permanent* alteration of water levels through the construction of a water control structure. Therefore, the commenter's assertion that 100 percent lakeshore owner approval is necessary is incorrect. The threshold water level elevation for Trout Lake, to be established in the environmental monitoring plan, would consider

current water levels, precipitation events, potential lakeshore impacts, and trends in historic water levels.

b. **South Pump**

Comment SP1: The commenter is concerned about the adequacy of the south pump and its potential failure. The commenter asks:

- Should the pump at the south end of the lake not function and the lake level is breached, is there a back-up motor?
- What is the capacity of the pump and pipe at the south end of the lake if the pumping into the lake is at 20,000 gpm?
- How many days would it take for the pump and pipe at the south end of Trout Lake to lower Trout Lake by 1" if any factor (failure to quit pumping at the north end, weather mainly heavy rain, minimal evaporation, plugged up Trout Creek, etc.) caused a 1" breach to the OHWL?

Response: Outflow from Trout Lake would occur at Trout Creek and at the pump at the south end of Trout Lake. The south pump would provide additional capacity to maintain desired water levels in Trout Lake. The capacity of the pumping system designed to remove water from Trout Lake must be equal to or greater than that pumping system within the CMP complex that puts water into Trout Lake. If the south pump failed, and Mag continued its dewatering operation from the CMP and water levels continued to rise, Mag would need to stop pumping from the CMP to avoid exceeding the threshold elevation. Mag would only be allowed to restore pumping from the CMP if the south (discharge) pump were restored or Trout Lake water levels returned to a predetermined elevation (lower than the threshold elevation), that would allow some additional pumping from the CMP to Trout Lake.

c. **Trout Creek**

Comment TC1: The commenter's property is on both sides of Trout Creek, from Trout Lake to County Road 10. The commenter is concerned about water levels in Trout Creek and potential shoreline impact and asks:

- What independent engineering company would be hired to complete a "base measurement" of Trout Creek to ensure that no physical manipulation of the shoreline occurs on both sides of the creek or at the mouth of the creek?
- Would the study go beyond County Road 10?
- How is erosion mitigated in Trout Creek other than the expected 370 cfs (additional flow of 44 cfs) increase in flow?
- If there is no plan for a study, why not and how is future manipulation measurement done?

Response: A threshold elevation, maximum allowable water level elevation, on Trout Lake would be established by the DNR in the environmental monitoring plan during the permitting process. Mag would operate the CMP pump and Trout Lake south pump to maintain Trout Lake

water levels at or below the designated threshold elevation. Historical Trout Lake water levels over the past seven years have fluctuated within 1 foot. Trout Lake water levels and Trout Creek flows are expected to remain similar to historical water levels and flows observed within the past seven years. There would be no change to the current outlet structure of Trout Lake.

Potential impacts to Trout Creek are discussed in the response to Comment TC3.

Comment TC2: The commenter understands that Trout Creek is one of the few bodies of water in Minnesota that has the potential to flow both ways during certain times of the year due to the level terrain to Swan River. The commenter asks how this is factored into the dewatering schedule.

Response: Given the gradient of Trout Creek between Trout Lake and the Swan River, it is highly unlikely that Trout Creek would reverse its flow toward Trout Lake. However, the threshold elevation that would be established for Trout Lake would account for any inflows into the lake and would determine the dewatering schedule from the south pump and from the CMP.

Comment TC3: The commenter states that the project's direct and indirect effects on surface waters are supposed to be described in the EAW. The commenter states that there is no discussion on Trout Creek, and more importantly, on the environmental effect of the dewatering process to Trout Creek and its indirect alteration.

Response: The outlet to Trout Lake is Trout Creek, which is located on the east-central portion of the basin. Trout Creek is unlikely to have the capacity for an additional 44 cfs of water from the proposed dewatering without increasing water levels in Trout Lake. To avoid impacts from high water on Trout Lake, a secondary pump is proposed at the south end of Trout Lake that would pump water from Trout Lake directly to the Swan River. This south pump would be operated to manage water levels within Trout Lake and flow rate of Trout Creek.

Because water levels in Trout Lake would be maintained at or below a threshold elevation, no increases in peak flows to Trout Creek are anticipated. During the dewatering of the Buckeye Pit portion of the CMP, seasonal variability in creek flows may be altered and overall annual flows may increase. Increased flows could affect the biological and geomorphological characteristics of Trout Creek. During their various life stages, fish species have different habitat requirements that include substrate type, cover, and water depth and velocity. Altered flows for extended periods would likely affect water depth and velocity in the creek and could cause channel instability over time. The south pump would provide additional capacity to maintain lake levels at or below the threshold elevation and limit increased flows to Trout Creek. Therefore, the magnitude of potential biological and geomorphological changes to Trout Creek is expected to be minor and temporary.

Comment TC4: The commenter asserts that the List of Figures doesn't show Trout Creek.

Response: Trout Creek is depicted in Figure 6.

Comment TC5: The commenter is concerned about Trout Creek and recommends a study and thorough analysis of aquatic plants sensitive to increased water flow. The commenter also

indicates a need to survey areas that are private property wetland/land versus public (mainly creek waters).

Response: Temporary shifts in plant communities that are adaptable to changes in flow and water levels may occur. There would likely be some changes in aquatic plant and potentially some wetland communities. However, after the project is complete it is expected these populations would reestablish themselves. The limited extent and temporary nature of the changes are such that surveys would not be warranted.

d. **Water Quality**

Comment WQ1: The commenter states that temperature, turbidity, dissolved solids, heavy metals, and oxygen content could have a serious effect on the ecosystem of the lake and asks what controls would be used to prevent contaminants from ruining the lake.

Response: Water quality impacts were assessed in a technical memorandum prepared for the project (Wenck December 18, 2014) and discussed in lines 796 - 890 of the EAW. With the exception of total phosphorus and chlorophyll-a, the water quality parameters that have been measured in the CMP and Trout Lake meet applicable water quality standards. Measurements for phosphorus and chlorophyll in the CMP are well below applicable standards, whereas measurements for these same constituents in Trout Lake exceed applicable water quality standards. Therefore, the water quality of the water that would be transferred from the Canisteo Pit to Trout Lake is expected to be better than that in Trout Lake. The Canisteo water would likely be of similar or lower water temperature, be lower in turbidity and dissolved constituents and be adequately oxygenated during the pumping/transfer process. No adverse impacts on Trout Lake water quality are expected as result of the proposed project.

Comment WQ2: The commenter asserts that running large quantities of cold water into the north end of Trout Lake would have the effect of stirring up the nutrients settled at the bottom, resuspending those nutrients, and causing even worse floating algal and duckweed blooms toward the south end of the lake at the south pump location. The commenter asserts that water clarity of the lake would degrade, not improve, and that the algal and duckweed blooms would eventually accumulate to such a degree that the entire south end would eutrophy, causing a near dead zone. The commenter further asserts that fish in the area would be limited to those found in very eutrophic waters and the area would resemble a swamp and that a Mag attendant would need to clean the screen on a daily basis because algae and duckweed would clog the screen and water would cease to flow. The commenter adds that weed and algae harvesting would need to be done on the south end.

Response: The discharge rate and flow velocities of the water being pumped from the Canisteo Pit are not expected to be high enough to disturb sediments at the north end of Trout Lake such that nutrients would be remobilized and distributed throughout the lake. The stormwater conveyance system to which the Canisteo water would be pumped to was determined to be able to accommodate the additional dewatering flows within the bankfull cross section of the ditch, with velocities remaining below the calculated bankfull velocity. (In the event that storm flows

draining to the ditch cause an increase in water elevations that are greater than the capacity of the stormwater system, Mag would stop dewatering until the storm flows within the ditch decrease to a level where dewatering could resume.)

Rather than have a negative effect on Trout Lake, the introduction of water from the Canisteo with much lower nutrient content than what is already in Trout Lake should reduce nutrient concentrations throughout the lake. As stated in lines 826 - 828 of the EAW, total phosphorus modeling suggests that the dewatering process would improve the trophic state of Trout Lake and downstream water bodies during the dewatering process. The trophic state is defined as the total weight of *biomass* (living biological material) in a waterbody at a specific location and time. Lower phosphorus concentrations are associated with less aquatic algal growth.

Although sulfate would not directly impact nutrient and algal dynamics in Trout Lake, its impact on phosphorus release from sediments has been considered (lines 842 - 843 of the EAW). A previous study of Trout Lake (Nürnberg 2007), found that iron is the primary sediment constituent responsible for binding phosphorus. The study determined that, because Trout Lake sediments are generally enriched in iron, potential increases in sulfate should not have a substantial effect on phosphorus release rates.

Comment WQ3: The commenter asks if street runoff, yard clippings, leaves, oil from cars, soaps, and other materials that are normally required to be put into a settling pond prior to entry into any lake would have the potential for a direct path into Trout Lake when water is flushed through the system from CMP? The commenter also asks if the stormwater system would be analyzed. The commenter notes that the data in Table 4 (and lines 796 - 809 of the EAW) address water quality but do not account for getting water from CMP to Trout Lake through the storm sewer.

Response: The conditions of the water appropriations permit would require a gradual increase in discharge rates from the CMP to Trout Lake, up to a maximum discharge of 20,000 gpm. Incrementally increasing discharge rates would provide the DNR an opportunity to determine how Trout Lake and Trout Creek respond to specific discharge rates. A gradual increase in the dewatering rate could be expected to minimize the initial potential flush of runoff material and sediment that have settled in the existing storm drainage system. It is important to acknowledge that this drainage system was not meant to be a settling basin, although settling does occur due to the flat topography from U.S. Highway 169 to Trout Lake.

On an average basis, the residence time for any temporary storage or settling of “normal” stormwater runoff would be lessened as a result of the project, but the *amount* of the other runoff contributions would not change. There would still be settling offered by the “pond” at the head of the open ditch portion of the dewatering route, albeit at a presumably lessened efficiency given the increase in flow. The EAW identifies that Mag, in coordination with Bovey and Coleraine, would as necessary conduct maintenance activities on the ditch system such as brush and debris removal. It may be beneficial to clean out sediments in the section of ditch prior to dewatering. At this point, there are no plans to routinely analyze the water within the stormwater system itself.

e. **Fisheries**

Comment FISH1: The commenter understands that there would be a screen that traps fish from entering Trout Lake. The commenter assumes that the flow water from CMP to the pipe screen would kill all fish in the storm sewer and pipe. The commenter asks:

- How would this be cleaned and how would the remains of dead fish in the pipe at the screen entry point not enter Trout Lake?
- Is there an anticipated negative smell that would offend local residences or people enjoying the beach?

Response: There would be a 0.25 mm mesh screen at the discharge location, similar to what is used at the east end of the CMP for Mag's Plant 2 appropriation. The screen would be essentially self-cleaning due to the volume and velocity of the discharge. A larger mesh screen would be used at the intake in the pit with approach velocities below 0.5 fps to exclude larger fish. Only very small fish would enter the pump and be forced into the outlet screen. There is no appreciable odor at the existing site at the east end of the CMP and none is anticipated at the proposed discharge site.

Comment FISH2: The commenter asks how many fish are estimated to still be in CMP. Another commenter is disappointed by the destruction of Canisteo Pit's fishery and asks if the DNR and taxpayers were reimbursed for all fish stocking done over the years.

Response: DNR does not have an estimate of the fish population remaining in the CMP. Public access closure at the Buckeye Pit was due to the construction of Plant 4, not the proposed project. Only the Buckeye Pit would be completely dewatered and fish would still be present in other portions of the CMP (King-Orwell Pit and Holman-Plummer Pit). Although the CMP was stocked with lake trout every other year, natural reproduction has been confirmed in the pit. It is likely that the lake trout would continue to reproduce even as water levels are lowered. Water levels that would remain in the main pit would be sufficient to sustain the existing fishery.

f. **Safety**

Comment SAFE1:

The commenter notes that line 153 of the EAW states that the dewatering pipes would not freeze in the winter due to flow at 20,000 gpm. The commenter is concerned about safety on the north and south end of the lake, which are proposed for inflow and outflow, because these are the main public areas where cars and snowmobiles enter and leave the lake. The commenter asks:

- Does this present a safety and stability issue on the lake for snowmobiling and ice fishing?
- Does the ice become less stable for a longer period of time with pumping under the ice or would there be a huge open water area on the north and south side of the lake similar to aeration in many lakes?

Response: Pumping on the south end of Trout Lake would be set based on lake level monitoring and Trout Creek flows during winter conditions. This would keep the pumps and pipes from freezing as well as maintain water levels in the lake. Lines 383 - 384 of the EAW address ice safety effects being considered as related to public access. The Water Appropriation permit would also address ice safety requirements in terms of areas marked around the north inflow location and the south outflow (pump intake) area of Trout Lake.

g. **Water Use**

Comment WU1: The commenter believes that the project would result in wasted water. The commenter asks if, at a time of expected drought in this area, it would be appropriate to have this large body of water for emergency or recreational use.

Response: It appears the commenter is suggesting that there is a better use of the water in the CMP than transferring it to other water bodies through the dewatering process. Water use, in this context, is outside the scope of an EAW because the wisdom of the water use is not subject to environmental review. Dewatering of the Buckeye Pit it is a potentially permittable water use and the state's water policy does not preclude this use.

h. **Noise**

Comment NOISE1: Commenters are concerned about the noise of the electric pump at the south end of Trout Lake. One commenter specifically mentions the potential for noise impacts at Loon's Landing or Country Wood or anywhere on the lake on a calm evening. Another commenter is concerned that he would hear noise 24/7 because sound carries far over water. Commenters ask:

- How far would the noise travel?
- What is the size, type, and loudness of the electric pump?
- Would there be some type of enclosure or other acoustic insulation to help reduce the noise from the pump and water intake?

Response: The sound of the electric pump at the south end of Trout Lake would be audible at the south end of the lake depending on other noise sources, such as boat motors or nearby traffic. Although the size, type, and decibel level of the south pump system (pump & electric motor) is currently unknown, the system would meet or surpass Minnesota's noise standards. The system would be contained inside an enclosure that would include dampening equipment mounts and acoustic insulation to minimize exterior noise levels due to pump operation. Depending on the capacity of Trout Creek to handle the CMP dewatering discharge, the south pump may not operate continuously.

Minnesota's noise standards are based on statistical calculations that quantify noise levels according to duration over a one-hour monitoring period. For residential locations, daytime noise levels cannot exceed 65 decibels (dBA) for more than 10 percent of the time and cannot exceed 60 dBA more than 50 percent of the time during a one-hour period. During nighttime

hours, noise levels cannot exceed 55 dBA more than 10 percent of the time and cannot exceed 50 dBA more than 50 percent of the time during a one-hour period (Minn. Rules 7030. 0040).

As a reference, the approximate noise levels of common sounds are:

dBA	description
60	normal conversation
50	moderate rainfall, quiet conversation
40	quiet room, library, refrigerator

Over distance, sound diminishes and is perceived as becoming quieter. When the distance from a point source (such as the south pump) is doubled, the sound level decreases by six decibels. If a sound level is 50 dBA at 50 feet, it would be 44 dBA at 100 feet and 38 dBA at 200 feet. A decrease of 5 dBA would be noticeable and decrease of 10 dBA would mean that the perceived loudness would be reduced by half. There would be a distance of approximately 300 feet between the south pump and the nearest residence.

Comment NOISE2: The commenter asks what kind of noise mitigation would be used for the incoming water to Trout Lake and asserts that pumping at a rate of 20,000 GPM would create a lot of noise.

Response: The system from the CMP would be a barge mounted electric pump, thus any pump related noise would be far below the pit walls. This water discharges into an artificial pond through a very fine screen. The noise anticipated at this outfall site would be similar to that of a waterfall or small rapids. The area is heavily wooded and is approximately 500 feet from adjacent residential properties.

Comment NOISE3: The commenter is concerned about the potential effect of the electric motor noise on Trout Lake's 10 or so loon pairs, of which at least 4 or 5 pairs nest successfully each year, or on the 50-100 loons that raft and rest in Trout Lake each mid to late August on their migration to the Gulf.

Response: There are no known scientific studies that assess the impacts of noise on loon behavior. A continuous noise is likely less of a concern than intermittent noise that might cause loons to repeatedly flush off nests. The southern pumping system (pump and electric motor) would be contained inside an enclosure that would include dampening equipment mounts and acoustic insulation to minimize exterior noise levels due to pump operation. The system would meet or surpass Minnesota's noise standards, as described in the response to NOISE1.

i. **Aquatic Invasive Species (AIS)**

Comment AIS1: The commenter is concerned about the potential for AIS to enter Trout Lake through the CMP discharge water. The commenter would like to know if the CMP water has been tested for aquatic invasive species.

Response: Rainbow smelt, a regulated invasive species, are present in the pit. Fine mesh screening at the discharge site would prevent the transfer to downstream waters. No other invasive aquatic species have been confirmed in the CMP.

Comment AIS2: The commenter believes that the inevitable introduction of zebra mussels into Trout Lake is perhaps only a year or so away and would further complicate and frustrate the use of a screen around a pump outlet.

Response: Currently, zebra mussels are not present within the Trout Lake watershed.

Comment AIS3: The commenter asks if the DNR has studied the CMP recently to determine if it currently contains milfoil and zebra mussels that could be transferred to Trout Lake during the dewatering process.

Response: There is no evidence to suggest Eurasian watermilfoil or zebra mussels are present in the CMP. The available habitat is extremely poor for either species to become established within the CMP.

j. **Recreation**

Comment REC1: Commenters are concerned that the CMP discharge would ruin Trout Lake and impact swimming, fishing, boating, kayaking, water skiing, and other recreational activities. One commenter is concerned about the 20,000 GPM incoming water creating a lot of turbulence and disrupting recreational activities.

Response: A maximum allowable water level elevation would be established for Trout Lake, which would minimize the potential for adverse effects on recreational opportunities. As explained in the response to WQ1, water quality in Trout Lake would not be adversely affected. Furthermore, the discharge rate and flow velocity of the water entering Trout Lake would not cause perceptible turbulence and therefore are not expected to disrupt recreational activities.

k. **Precipitation**

Comment PRECIP1: The commenter questions the effectiveness of the screen/pump during heavy precipitation. The commenter states that, in the event of a catastrophic rain (> 5 inches), flash flooding could occur and render the screen/pump apparatus useless. The commenter asserts that lake water levels could rise several feet in a very short time causing homes and properties to be flooded.

Response: The intake screen located on the pump at the south end of Trout Lake, described in lines 1019 - 1022 of the EAW, may be submerged beneath a floating dock. An increase in Trout Lake water level elevation would not have an impact on the effectiveness of the screen as the floating dock, pump and screen would fluctuate with variable water levels.

Historic Trout Lake water level data show water level elevations fluctuate over the past 10 years within 1 foot MSL. The DNR would establish an environmental monitoring plan and contingency

plan during the permitting process to define a threshold elevation on Trout Lake and conditions that define when the pumps would be turned on or off to maintain water levels at or below the threshold elevation. As a condition of the contingency plan, Mag might be required to cease pumping from the CMP during heavy rain events.

Comment PRECIP2: The commenter asks how snow cover on the lake and nearby watershed would affect the amount of water pumped into Trout Lake during the winter months to avoid additional spring flooding. The commenter also asks what estimates are made.

Response: The maximum allowable pumping rate would be capped at 20,000 gpm (44 cfs) regardless of precipitation events, such as rain or snow. If necessary, the amount of water pumped into Trout Lake from the CMP pump would equate to the amount of water discharged out of Trout Lake though the south pump. Furthermore, some of the dewatering volume would be discharged at Trout Creek. No estimates were made for volumes of water stored in ice. However the threshold elevation on Trout Lake would account for winter time operations.

Comment PRECIP3: The commenter notes that after heavy rains in 2014, it took more than a month for the water level in the lake to reach an acceptable level. The commenter adds that lines 785 - 790 of the EAW continue the discussion of a pump acting as mitigation and dewatering discontinued until “desired” levels are again reached.

Response: Depending on lake water levels, Mag would not pump in more water into Trout Lake than is pumped out. During high water levels, such as during heavy rains, pumping from the CMP into Trout Lake may need to be reduced.

l. **Visual Effects**

Comment VIS1: The commenter asserts that above ground piping out of Trout Lake on the south side of the lake by way of the roadway ditch would not be aesthetically pleasing. The commenter asks if pumps and piping would be removed or kept in place until after CMP is fully drained many years in the future.

Response: The pumps and piping would be removed after the temporary dewatering project has been completed.

m. **Land Use**

Comment LU1: The commenter states that the "Land Use" section (beginning on line 266) does not discuss Trout Creek.

Response: The commenter is correct; water bodies near the project area were not acknowledged in the land use section of the EAW. Water bodies near the project area are Trout Lake, Trout Creek, and the Swan River. Trout Lake, designated as a Recreational Development 2 lake, provides opportunities for fishing, swimming, boating, kayaking, water skiing, and other recreational activities. Trout Lake outlets to Trout Creek on the east side of the lake on the east-central portion of the lake. Trout Creek discharges to the Swan River approximately 2.5 miles

downstream. The Itasca County Shoreland Ordinance classifies Trout Creek as "Tributary" and Swan River as "Forested." Trout Creek and the Swan River are further discussed in Item 11.b.iii (Water Resources - Water Appropriation) of the EAW.

n. **Permits**

Comment PERMT1: The U.S. Army Corps of Engineers (USACE) advises of the federal wetland and waters permit requirements potentially applicable to a project of this nature. The USACE specifically references Section 404 and Section 301(a) of the Clean Water Act.

Response: Mag intends to work with the USACE and the DNR to design a dewatering system that does not require a Section 404 permit.

o. **Historic or Archaeological Properties**

Comment HIST1: The State Historic Preservation Office (SHPO) has concluded that there are no properties listed in the National or State Registers of Historic Places, and no known or suspected archaeological properties in the area that would be affected by the project.

Response: The DNR acknowledges the SHPO's conclusion that no historic or archaeological properties have been identified.

p. **Other**

Comment OTHR1: Commenters are concerned about the increase in the amount of taconite dust in the area surrounding the two Mag Plants. Commenters specifically mention dust on their properties and on Trout Lake.

Response: The proposed project does not involve scram mining (mining operation that produces natural iron ore or natural iron ore concentrates from previously developed stockpiles, tailings basins, underground mine workings, or open pits). The proposed project is a temporary dewatering project and would not deposit taconite dust on properties or Trout Lake.

Comment OTHR2: Minnesota Power indicates support for the project.

Response: The comment does not address the accuracy and completeness of the information, potential impacts that warrant further investigation, or the need for an EIS.

Comment OTHR3: Minnesota Pollution Control Agency (MPCA) staff has reviewed the EAW and has no comments at this time.

Response: The DNR acknowledges that MPCA staff has no comments.

Comment OTHR4: It is the commenter's opinion that the public has been footing the bill for most of Mag's expenses in their mining ventures and suspects the public would have to pay for this pumping cost. The commenter questions what tax benefit is derived from mining the pit.

Response: Mag would pay for the cost of implementing the proposed project as well as all required permitting and monitoring. The rules governing the content of an EAW do not include provisions for addressing socio- economic issues, such as the economic benefits derived from a project.

9. Based upon the information contained in the EAW, the DNR has identified the following topics of potential environmental effects associated with the proposed project:

    a. Project Construction
    b. Land Use
    c. Water Quantity
    d. Surface Waters
    e. Water Quality
    f. Physical Effects on Soils and Geology
    g. Groundwater and Wells
    h. Stormwater
    i. Wetlands
    j. Hazardous Materials
    k. Wildlife and Habitat
    l. Rare Features
    m. Traffic
    n. Noise
    o. Visual Effects
    p. Cumulative Potential Effects

    Each of these environmental effects is discussed in more detail below.

    a. Project Construction

    This topic was addressed in the EAW under Item No. 6, Item No. 7, Item No. 9, Item No. 10, and Item No. 11.

    The CMP dewatering project is expected to take place over a period of approximately three years. To conduct temporary dewatering of the CMP, Mag would install pump(s) on a barge in the CMP and dewatering flow would be directed to Trout Lake. After the Buckeye Pit is isolated from the main portion of the CMP, and a land bridge between the Buckeye Pit and adjacent King-Orwell port of the CMP is exposed, an additional pump(s) would be added to the Buckeye Pit. This pump(s) would be used to completely dewater the isolated Buckeye Pit by pumping into the King-Orwell portion of the CMP. Waters from this pump(s) would be piped across the exposed land bridge into the King-Orwell Pit east of the Buckeye Pit. Dewatering flows would continue to be directed into Trout Lake by the barge pump(s) on the King-Orwell Pit.

    Temporary dewatering of the CMP would be directed to Trout Lake through a dewatering pipe for a distance of approximately 2,200 feet. Minor vegetation clearing would be necessary to install the dewatering pipe. The dewatering pipe would discharge to the outfall location where it enters an existing municipal stormwater system. The existing stormwater system consists of

culverts and open ditches that discharge to Trout Lake. The temporary dewatering flow would pass through two existing culverts; one under the Mesabi Trail and a second culvert on private property. These culverts may be replaced, if needed, to accommodate the existing stormwater flow and additional temporary dewatering flow from the project.

An additional pump (south pump) would be placed at the southern end of Trout Lake to control the level of Trout Lake and prevent it from rising above desired levels. An outflow pipe would be placed primarily within roadway right-of-way from Trout Lake to the Swan River for a distance of approximately 3,850 feet. The outflow pipe would be removed after the temporary dewatering project has been completed.

b. Land Use

This topic was addressed in the EAW under Item No. 9.

The proposed project is compatible with current land uses, zoning, and plans. With the exception of the temporary change in water surface elevation within the CMP, no substantial land use alterations or impacts are anticipated.

The dewatering pipe would come ashore on private land within the city limits of Coleraine. The proposed dewatering pipe alignment would cross properties that are zoned light industrial. The dewatering pipe would cross over the Canadian Northern rail line, which is no longer in use, and a snowmobile trail. Mag is currently in discussions with the local snowmobile club that maintains the trail. Magnetation would make necessary accommodations (e.g., a bridge on the trail over the pipe) to ensure that the temporary dewatering pipe does not interfere with trail use.

The dewatering pipe would discharge into a drainage system that flows across private property into a municipal stormwater conveyance system and empties into Trout Lake. The existing stormwater conveyance system runs alongside the Bovey Business Park, crosses under U.S. Highway 169, and flows into Trout Lake adjacent to a public access.

The south pump would be placed on township land at a public boat launch at the southern end of Trout Lake. The exact location of the south pump installation and inlet structure would consider ice safety effects as related to the public access. The outflow pipe would be placed primarily in existing roadway right-of-way and would discharge to the Swan River. Mag would obtain lease agreements from the private landowners to place the outflow pipe from the south pump within roadway right-of-way on the north side of County Road 21.

Winter time operation has the potential to reduce ice thickness at the discharge point into Trout Lake and at the south pump. These areas would be posted for safety reasons. There would be a potential for a temporary reduction in lake surface use during the winter months due to thin ice.

A Shoreland Alteration Permit may be required for the placement of riprap within a Shoreland Overlay Zoning District. The Itasca County Zoning Ordinance states that, to the extent possible, riprap should be designed to have a natural appearance. Adherence to permit requirements would ensure compatibility with the county's zoning ordinance.

c. Water Quantity

This topic was addressed in the EAW under Item No. 11b.

Mag has an existing water appropriations permit of 12,000 gpm from the CMP to feed operations at the existing Plant 2 and Plant 4 sites (2012 permit). As part of the proposed project, Mag would apply for a second water appropriations permit (2015 permit) of approximately 20,000 gpm from the CMP using the primary point of taking in the King-Orwell Pit to complete temporary dewatering activities.

As dewatering progresses, pumping from the primary point of taking would expose two land bridges and divide the CMP into three pit areas: Buckeye Pit, King-Orwell Pit, and Holman-Plummer Pit. After the Buckeye Pit has been dewatered, pumping from the CMP to Trout Lake would cease. Maintenance pumping of the Buckeye Pit would occur under the new 2015 permit at new point of taking. The new 2015 permit would include water use for Plant 4 operations (currently under the existing 2012 permit) and would pump from the King-Orwell Pit and the Buckeye Pit. The existing 2012 permit for Plant 2 would be amended to include solely Plant 2 and would pump from the Holman-Plummer Pit.

The total volume of water necessary to lower the CMP from the current elevation of 1,310 MSL down to the target elevation of 1,220 feet MSL is 75,126 acre-feet of water. At the target pumping rate of 20,000 gpm, while also accounting for runoff and groundwater inflows, as well as fluctuations in pumping rates, it would take approximately three years to reach the target water elevation of 1,220 feet MSL in the overall CMP. The water elevation in the overall CMP would be maintained between 1,220 and 1,230 feet MSL until exploration is complete through a combination of Mag's appropriation permits. This lower level could be maintained for an extended period of time depending on the need for water at the plants and Mag's plan for mining in the Buckeye Pit.

d. Surface Waters

This topic was addressed in the EAW under Item No. 9a, Item No. 11a, and Item No 11b.

Project area surface waters are the CMP, Trout Lake, Trout Creek, and the Swan River. Dewatering flows would be directed from the CMP into Trout Lake which outlets into Trout Creek, which in turn flows into the Swan River, eventually discharging to the Mississippi River.

The CMP is a large historic pit complex that is approximately 5 miles long, covers approximately 1,425 acres, and has water depths of more than 300 feet. The project would dewater the Buckeye Pit portion of the CMP and reduce water elevations in the CMP from its current elevation of 1,310 MSL to a target elevation of 1,220 MSL.

Trout Lake (Lake ID 31-126) covers approximately 1,854 acres and has water depths of more than 150 feet. A team of DNR hydrologists completed a study of Trout Lake and its hydraulic capacity in November 2008 (Adams, Liljegren, and Crotteau 2008). Based on the DNR recorded

water levels for Trout Lake, water levels in Trout Lake from 2009 through 2014 have generally fluctuated within 1 foot, with one instance in 2012 when the lake reached an elevation of 1,289.7 feet MSL. The study indicated that the lowest outbuilding foundation was 1,290.5 feet MSL and the lowest house foundation was 1,291.1 feet MSL and concluded that raising the level of Trout Lake by 1.1 feet could result in localized flooding of private property.

The outlet to Trout Lake is Trout Creek, which is located on the east-central portion of the basin. Trout Creek is unlikely to have the capacity for an additional 44 cfs of water from the proposed dewatering without increasing water levels in Trout Lake. To avoid impacts from high water on Trout Lake, a secondary pump is proposed at the south end of Trout Lake that would pump water from Trout Lake directly to the Swan River. This south pump would be operated to manage water levels within Trout Lake and flow rate of Trout Creek.

During the permitting process, the DNR would establish an environmental monitoring plan and contingency plan. A threshold elevation (maximum allowable water level elevation) on Trout Lake would be established in the environmental monitoring plan. The threshold water level elevation would consider current water levels, precipitation events, potential lakeshore impacts, and trends in historic water levels. Mag would operate the CMP pump and the south pump to maintain lake water levels at or below the designated threshold elevation. The contingency plan would establish conditions that define when pumps would be turned on or off to maintain water levels at or below the threshold elevation.

Because water levels in Trout Lake would be maintained at or below a threshold elevation, no increases in peak flows to Trout Creek are anticipated. During the dewatering of the Buckeye Pit portion of the CMP, seasonal variability in creek flows might be altered and overall annual flows might increase. Increased flows could affect the biological and geomorphological characteristics of Trout Creek. During their various life stages, fish species have different habitat requirements that include substrate type, cover, and water depth and velocity. Altered flows for extended periods would likely affect water depth and velocity in the creek and could cause channel instability over time. The south pump would provide additional capacity to maintain lake levels at or below the threshold elevation and would limit increased flows to Trout Creek. Therefore, the magnitude of potential biological and geomorphological changes to Trout Creek would be expected to be minor and temporary.

The south pump would discharge from the southern end of Trout Lake to the Swan River downstream from the Trout Creek/Swan River confluence. Mag would install a rock and riprap energy dissipation structure along the bank of the Swan River to ensure that discharge flows from Trout Lake do not impact the County Road 21 bridge or cause erosion or scouring on the opposite river bank.

The maximum increase to the Swan River from the project would be 44 cfs. Large changes in the hydrology of river systems can result in changes to sediment load, geomorphology, water quality, and aquatic habitat. River ecologists have determined that the bankfull flow (channel forming flow) of a river is important for river channel shape and stability. Changes in hydrology that result in a greater than 20 percent change in bankfull flow have the potential to degrade

riverine ecosystems. Bankfull flow or channel-forming flows are those higher flows that occur approximately every one and a half years.

Data from the Charter Dam Road on the Swan River were used to calculate the o year return interval flow. Taking this information and adjusting for the additional watershed area at the downstream location where flows would be increased results in a bankfull flow of approximately 370 cfs. The additional 44 cfs from dewatering at this location would be a 12 percent increase in flows. Based on the degree of change in flow and the temporary duration of the increased flows, substantial adverse effects to river ecology are not anticipated.

e. Water Quality

This topic was addressed in the EAW under Item No. 11b.

Trout Lake, Trout Creek, and the Swan River each have multiple beneficial use designations. Of the three water bodies, Trout Lake has the most stringent water quality standards applicable to its designated beneficial uses. These include numeric standards to protect aquatic life, agriculture, and drinking water under the Clean Water Act. All measured parameters in the CMP are below Minnesota's numeric standards for Trout Lake.

Sulfate and total phosphorus concentrations were modeled in Trout Lake using anticipated dewatering rates and durations. Water quality data to support this model were obtained from the MPCA's Environmental Data Access web page, the Natural Resources Research Institute, and the Minnesota DNR. Trout Lake morphometry was obtained from the DNR GIS Data Deli web page. Total phosphorus modeling suggests that the dewatering process would improve the trophic state of Trout Lake and downstream water bodies during the dewatering process.

Other water quality parameters have been measured in the CMP, including nitrate and nitrite (NO3 + NO2), iron, manganese, total dissolved solids, mercury, and chloride. Only two of the parameters (chloride and mercury) have been measured in Trout Lake, although all measured parameters in the CMP are well below Minnesota standards for Trout Lake. Therefore, it is unlikely that dewatering of the CMP would contribute to water quality exceedances in Trout Lake. Similarly, the project would not likely cause water quality exceedance on Trout Creek or the Swan River.

Water bodies that would receive water during the CMP dewatering process have no inventoried wild rice stands. A vegetation survey conducted by the DNR in 2000 and a wild rice field survey conducted by the University of Minnesota in 2013 did not indicate that wild rice was present in Trout Lake. Furthermore, there have been no identified wild rice stands in Trout Creek or the reach of Swan River receiving flow for this project.

Indirect Sulfate Water Quality Impacts

Although sulfate would not directly impact nutrient and algal dynamics in Trout Lake, its impact on phosphorus release from sediments has been considered. In 2007, a detailed study on Trout Lake found that iron is the primary sediment constituent responsible for binding phosphorus

(Nürnberg 2007). Because Trout Lake sediments are generally enriched in iron and the water sediment interface does not presently appear to be limited by sulfate, potential increases in sulfate should not have any significant effect on phosphorus release rates (Nürnberg 2007).

Sulfate also is capable of impacting the production of methylmercury. As discussed in a technical memorandum prepared for the project (Wenck December 18, 2014), research has found that if an aquatic system is sulfate-limited, the addition of sulfate can stimulate the production of the bioaccumulative form of mercury, methylmercury. The technical memorandum further explains that, if an aquatic system's ability to produce methymercury is not sulfate-limited, additional sulfate would not result in elevated mercury methylation. Data analysis suggests that Trout Lake does not appear to be sulfate-limited and that the temporary increase of sulfate during the CMP dewatering is unlikely to stimulate mercury methylation. This conclusion is similar to those expressed in the 2007 Nürnberg report.

Mine Pit Wall Impact on Water Quality during the Dewatering Period

The CMP has been allowed to fill with water, inundating pit walls with oxygenated water, resulting in mineral dissolution. Typically, solute concentrations from pit wall and waste rock dissolution have three phases: initial flush, declining limb, and steady state period. It is unlikely that sulfate and other parameters would increase during the dewatering period because pit wall dissolution and transport kinetics have likely reached steady state over the past 30 years. This projection is supported by the consistent water quality concentrations measured in Canisteo pit over the past 10 years. Furthermore, compared to the volume being pumped during the dewatering process, the relatively small contribution from overland runoff and groundwater inflow would have a very minor impact on the total volume of water in the CMP and the volume being pumped into Trout Lake. After the initial dewatering period, maintenance dewatering would not be transferred to Trout Lake but would be used in industrial processes.

Data collected from the CMP in September 2012 indicate that pH, sulfates, and specific conductance are relatively consistent throughout the water column. After the Buckeye Pit is dewatered to an elevation of 1,220 feet MSL, the maximum depth of the King-Orwell and Homan-Plummer pits would be 195 feet and 235 feet, respectively. Because the water depths in the CMP would remain relatively deep, the previously measured parameters are expected to remain consistent throughout column after dewatering has been completed.

f. Physical Effects on Soils and Geology

This topic was addressed in the EAW under Item No. 10.

Groundwater in the area of the CMP is generally found in the unconsolidated sediments above the bedrock and its elevation is influenced by the level of water within the pit. Lowering the pit water level during the proposed dewatering activity would result in groundwater flow toward the mine pit. A groundwater flow study conducted by the USGS, in cooperation with the DNR (Jones 2002), related groundwater flow velocity to pit water elevation. The study showed that most groundwater inflow originates less than one mile from the pit boundary and that flow

velocity was sensitive to location variations in horizontal hydraulic conductivity. Groundwater flow into the mine pit was found to be proportional to pit water elevation.

A slope stability study of the mine pit walls during rising pit water levels indicated that the steepness of the pit walls controlled slope stability in the unconsolidated sediments above the bedrock (Wenck June 10, 2008). This study was revisited in 2014 to evaluate the stability of the pit walls as pit water levels are lowered (Wenck February 4, 2015). The results indicated that groundwater elevation had little effect on the stability of the mine pit walls. The pit walls would likely remain unstable at shallow depths due to the steepness of the slopes and low cohesion in the unconsolidated sandy sediments. As water levels are lowered in the CMP, surficial soils would drain to the pit creating a new temporary angle of repose for saturated soil conditions. For those areas where the water level is lowered below bedrock, the bedrock elevation would be the lowest control point for this new temporary saturated soil condition. The difference in soil saturation conditions could contribute to existing soil stability issues near an unused rail right-of-way and an area that contains an existing waste rock stockpile.

The slow rate of dewatering the CMP, which would occur over approximately three years, would allow groundwater elevations to stay in close equilibrium with the mine pit water elevation. The duration of lower water levels in the CMP would depend on the results of the exploration. If the lower water level is maintained for a long period of time, additional monitoring and potential mitigation of specific areas may be needed.

g. Groundwater and Wells

This topic was addressed in the EAW under Item No. 10a and Item No. 11a.

Groundwater

The CMP has been filling with groundwater since mining ceased in 1985. The water level increased about 2.5 to 5 feet per year, from approximately 1,260 feet MSL in 1991 to a high water level of 1,318 feet MSL in the spring of 2012. During this time, concerns of overland flow resulting from the continued water level rise from the CMP into the cities of Bovey and Coleraine have grown.

Groundwater in the area of the CMP is generally found in the unconsolidated sediments above the bedrock and its elevation is influenced by the level of water within the CMP. Lowering the CMP water level during the proposed dewatering activity would result in groundwater flow toward the CMP.

A groundwater flow study was conducted by the USGS in cooperation with the DNR (Jones 2002). The study related groundwater flow velocity to pit water elevation. The study suggested that most groundwater inflow originates less than one mile from the CMP boundary and that flow velocity was sensitive to location variations in horizontal hydraulic conductivity. Groundwater flow into the CMP was found to be proportional to pit water elevation. The CMP dewatering project is proposed to take place over a period of approximately three years. This

slow rate of dewatering would allow groundwater elevations to stay in close equilibrium with the CMP water elevation.

Wells

The CMP is adjacent to a wellhead protection area for three municipalities, Bovey, Coleraine, and Taconite. These municipalities supply water to their residents from the groundwater aquifer in the area.

The water supply wells for the cities of Bovey and Coleraine are screened in the unconsolidated sediments above the Banded Iron Formation bedrock over an interval ranging from an elevation of 1,178 feet to an elevation of 1,258 feet. The dewatering project would ultimately lower the CMP water level to an elevation of 1,220 feet MSL, within the range of elevations of the screened municipal wells. However, these wells previously were able to provide adequate water supply to Bovey and Coleraine when the CMP was at this lower water elevation in prior decades (pre-1980). Impacts to the municipal water supply wells from the temporary dewatering project are not anticipated.

The municipal water supply wells for Taconite are deeper and draw water from a bedrock aquifer over an interval from elevation 994 feet to 1,097 feet and are unlikely to be influenced by the temporary dewatering activities in the CMP.

As part of its existing appropriations permit, Mag is working with the DNR and the local municipalities to monitor the water levels in the municipal wells to determine if the current water appropriation has an impact on local groundwater supply to the municipalities. Mag would continue this effort as part of the temporary dewatering of the project. The three municipalities, the DNR, and Mag are developing contingency actions to implement in the event that the water appropriations impact the local water supply.

Upon project completion, it has not been determined if the water level elevation would be maintained or allowed to refill to the current level within the CMP. This determination would be made after the quality and suitability of the mineral reserves is assessed.

h. Stormwater

This topic was addressed in the EAW under Item No. 11b.

A small amount of stormwater runoff would be created by the proposed project, mainly from clearing vegetation along the temporary dewatering pipe corridor from the CMP to Trout Lake. The stormwater from the dewatering pipe alignment would use drainages within the existing municipal stormwater conveyance system. The existing stormwater system consists of culverts and open ditches that discharge to Trout Lake. The Minnesota Department of Transportation plans for U.S. Highway 169 indicate that there are three 65 inch reinforced concrete pipe (RCP) culverts under the highway that have a combined capacity to accommodate over 300 cfs. These large culverts under U.S. Highway 169 have sufficient capacity for the dewatering flows and stormwater needs.

If storm flows draining to the ditch cause an increase in water elevations that are greater than the capacity of the stormwater system, Mag would stop the dewatering flows until the storm flows within the ditch recede to a point where dewatering flows could resume. Initial dewatering would occur at rates less than the maximum 44 cfs to assess the system's response to the increased flows. This rate would gradually be increased up to the maximum 44 cfs if the system responds as expected. If necessary, Mag would coordinate with the cities of Bovey and Coleraine to conduct maintenance activities such as the clearing of brush and debris from channels and culverts.

Stormwater runoff is not anticipated for placement of the outflow pipe corridor from Trout Lake to the Swan River, which would be placed primarily within existing roadway right-of-way.

i. Wetlands

This topic was addressed in the EAW under Item No. 11b.

The dewatering pipe from the CMP to Trout Lake would be placed on uplands, which are all previously disturbed mine lands and stockpiles. Dewatering flows would discharge the location where the outfall enters an existing municipal stormwater system. The National Wetlands Inventory (NWI) identifies a deep water marsh at the outfall location. Aerial photography from 1939 shows that farm fields and uplands were present at the location of the existing artificial ponds (outfall location). The existing pond, identified as a deep marsh, would not be impacted by the additional water from the project dewatering flows because the water would pass through the ponds by way of the existing culvert that enters the open ditch system leading to Trout Lake.

The majority of the proposed alignment for the outflow pipe from the south end of Trout Lake to the Swan River is within existing roadway right-of-way. Placing the outflow pipe along Crooked Road and the north side of County Road 21 would reduce the potential for project impacts. The NWI does identify an area of freshwater forested/shrub wetlands along a portion of the proposed outflow pipe alignment. The outflow pipe would be designed and constructed to avoid impacts to wetlands. Potential wetland impacts resulting from the placement of the outflow pipe would be verified prior to construction. If applicable, the necessary plans and approvals would be obtained from Itasca County.

There is a potential that the proposed dewatering into Trout Lake could result in seasonal water flow increases in Trout Creek. The threshold elevation on Trout Lake and use of the south pump would prevent increases in peak flow to Trout Lake, but the additional water could result in more flow on an annual basis. This potential increase in seasonal flow could result in increased time periods for inundation of wetland communities adjacent to Trout Creek. This additional time period of inundation could result in temporary shifts in wetland plant communities. When dewatering is completed, and flows return to their pre-project state, these wetland plant communities would likely shift back to their pre-project condition.

j. Hazardous Materials

This topic was addressed in the EAW under Item No. 12.

MPCA's *What's in my Neighborhood* website identified a tank leak within a quarter mile of the project corridor between the CMP and Trout Lake. The tank leak at Hollywood Bait and Gas was discovered in 1998 and listed as closed in 1999. A warning citation was issued in 2012 by the MPCA. The proposed project would not interact with this existing contamination.

The proposed exploration of Buckeye Pit would include the use of heavy equipment and associated fuels and oils. Hazardous materials impacts associated with the use of exploration equipment are not anticipated. Fuel spills could occur during the refueling and maintenance of mining equipment. Mag would be required to submit a Spill Prevention Control and Countermeasure Plan (SPCC) to handle any potential fuel spills. No hazardous waste would be generated by the proposed project.

In order to obtain coverage under the MPCA permit, Mag would need to develop a SPCC

k. Wildlife and Habitat

This topic was addressed in the EAW under Item No. 7, Item No. 9a, Item No. 11a, and Item No. 13.

The area along the temporary dewatering pipe alignment from the CMP to the discharge location (where it enters the existing municipal stormwater system) consists of previously disturbed mine lands and provides little habitat value. The total area that would be disturbed by the dewatering pipe is small and would not impact local vegetation or wildlife populations. The outflow pipe from the southern end of Trout Lake to the Swan River would be located primarily within existing roadway right-of-way. To the extent possible, the dewatering pipe and the outflow pipe would be installed in a manner that minimizes potential impacts to vegetation and wetlands.

The volume of water removed from the CMP would decrease available area for fish within the pit. The portions of the CMP that would still have water would provide refuge for fish such that this loss of water is not anticipated to adversely affect fisheries in the CMP.

Rainbow smelt, a regulated invasive species, are present in the CMP. To prevent the spread of rainbow smelt or their eggs to downstream receiving waters, Mag would install a fish screen with a mesh slot width of less than 0.01 inches over the end of the temporary dewatering pipe at the discharge location. In addition, the intake pipe for the south pump at the southern end of Trout Lake may be attached to a floating dock with the pipe located underneath the dock and a screened exclusion area around the intake. To comply with permit conditions, the intake screen would have a slot size less than 0.25 inches, along with a through screen velocity of less than 0.50 feet per second.

l. Rare Features

This topic was addressed in the EAW under Item No.13.

A January 2015 query of the National Heritage Information System (NHIS) identified records of several state-listed species of special concern within one mile of the proposed project area. State-

listed species of special concern are not protected under the state endangered species law and permits are not required for potential disturbance or impacts to these species.

Three state-listed plants of special concern have been documented within one mile of the proposed project: the prairie moonwort (*Botrychium compestre*), the St. Lawrence grapefern (*Botrychium rugulosum*), and the least moonwort (*Botrychium simplex*).

Two state-listed mussels of special concern, the Creek Heelsplitter (*Lasmigona compressa*) and the Black sandshell (*Ligumia recta*) have been documented in the Swan River. The creek heelsplitter has been documented north of the where the south pump outfall would discharge to the Swan River. The black sandshell was documented within the reach of the Swan River where the south pump outfall pipe would discharge to the river.

Mussels can be affected by riverbed disturbance, changes in water flow, and changes in water quality, including siltation. The proposed project would temporarily increase water flow into the Swan River. Water discharged to the river would be low in nutrients and meet applicable water quality standards. Therefore, impacts to the water quality of the river are not anticipated.

There are no planned construction activities that would occur within the Swan River that would disturb the river channel or substrates where mussels might live. The energy dissipation structure for the south outfall pipe would be placed on uplands adjacent to the Swan River. With proper energy dissipation from the south outfall structure, impacts to the stream banks such as scouring, erosion, or increased sedimentation would not be expected. The proposed project would not be expected to result in conditions that would adversely affect mussels within the Swan River.

m. Traffic

This topic was addressed in the EAW under Item No. 18.

A slight temporary increase in traffic would occur during the installation of the pumps and pipes. It is expected that construction traffic would consist of two to three vehicles such as light trucks that would not significantly increase road traffic during the brief construction period. After the pumps and pipes are in place and operating, the traffic associated with project operation would be minimal and involve workers checking the pumps and/or pipes on an as needed basis (daily to weekly) to ensure proper operations. Therefore, transportation impacts are not anticipated.

n. Noise

This topic was addressed in the EAW under Item No. 17.

Construction and operation of the proposed project would produce noise near the project site. The types of equipment and operational activity would be electric pumps for the dewatering operation, noise associated with dewatering pipe construction, and the sound of the water exiting the dewatering pipe at the outfall site where it enters the drainage system that flows to Trout Lake. Users of the Mesabi Trail, which passes through the cities of Coleraine and Bovey, would be able to hear the sound of the water discharge at the outfall site.

Similar sounds would be associated with the construction and operation of the south pump and outflow pipe at the southern end of Trout Lake as well as the Swan River outfall location. The south pump would be placed near a public boat launch at the south end of Trout Lake. There would be a distance of approximately 300 feet between the south pump and the nearest residence, which is located southwest of the boat launch. Users of the boat launch may hear sounds caused by the operation of the south pump. The south pumping system (pump & electric motor) would be contained inside an enclosure that would include dampening equipment mounts and acoustic insulation to minimize exterior noise levels due to pump operation. Noise from the south pump would not exceed Minnesota's noise standards.

o. Visual Effects

This topic was addressed in the EAW under Item No. 15.

The proposed project would partially dewater the CMP, resulting in a visual effect as the water level is lowered. The visual effects would be similar to other mine views along the Mesabi Iron Range. The dewatering pump(s) would not be visible from roads or local properties. The location of the outfall site where it enters the existing drainage system that flows to Trout Lake may be visible from the Mesabi Trail, but would likely be partially obstructed by existing vegetation.

Placement of the south pump and outflow pipe would be at an existing public access on the southern end of Trout Lake resulting in minor visual impacts at the boat access. The outflow pipe would be placed within the existing right-of-way along Crooked Road and on the north side of Itasca County Road 21. The pumps and piping would be removed after the proposed project has been completed. Hence, visual impacts related to the pumps and pipe would be temporary.

A rock and riprap energy dissipation structure would be installed at the outflow site on the west bank of the Swan River. The structure might be visible from westbound traffic on the County Road 21 bridge. No residential properties are located within site distance of the Swan River outfall site. Visual impacts are expected to be minimal.

Minimal lighting would be used for operations and safety. Outdoor lighting would be used at the dewatering site and pointed downward. Potential temporary impacts from lighting are expected to be minimal.

p. Cumulative Potential Effects

This topic was addressed in the EAW under Item No. 19.

Cumulative potential effects are the combined effects of the proposed project and past, present, and reasonably foreseeable future projects, Minn. R. 4410.0200, subp. 11a (2013). The first step in identifying cumulative potential effects is to identify the geographic and temporal scope of environmental effects from the proposed project. This environmentally relevant area and timeframe can then be used to identify other projects and environmental effects that could interact with environmental effects from the project. As a practical matter, environmental effects from past and present projects represent the existing environmental conditions and are always

evaluated in the EAW. Predictions of environmental effects are limited to the project pending before the RGU and those projects that are reasonably likely to occur.

One reasonably foreseeable project was identified within the environmentally relevant area. Essar Steel Minnesota LLC (ESML), located approximately 12 miles northeast of the proposed project, has plans for future production of iron ore pellets. The facility is situated upstream from the confluence of Trout Creek and the Swan River. The ESML facility is still under construction and is not yet operating. ESML is currently dewatering existing mine pits. The dewatering water discharges to Oxide Lake, which flows to Swan Lake via Oxide Creek. The Swan River is the outlet for Swan Lake. Essar's current dewatering activity does result in additional water in the Swan River. In calculating potential effects of the project on the Swan River, water data from the river included years where discharge from ESML had been occurring.

Environmental effects from the proposed project that could combine with effects from ESML have been considered for surface water quantity and surface water quality. Consideration of each of these cumulative potential effects is discussed below.

Surface Water Quantity

The proposed project has the potential to make an incremental contribution to cumulative surface water quantity in the environmentally relevant area. However, with implementation of mine water management practices, the rate of dewatering would be limited to 44 cfs, which would result in a 12 percent increase in the 1.5 year return interval flow for the Swan River. The combined contribution of ESML's dewatering activity and the CMP temporary dewatering project were considered as part of this 12 percent increase. Furthermore, any potential effects associated with ESML operations are also regulated under its permit conditions. Therefore, any potential cumulative effects would occur within prescribed limits of specific permit conditions.

Surface Water Quality

The proposed project has the potential to make an incremental contribution to cumulative surface water quality in the environmentally relevant area. The proposed dewatering project is not anticipated to contribute to exceedances of water quality standards. The contribution of ESML in the environmentally relevant area would be subject to applicable water quality standards. Therefore, any potential cumulative effects would occur within prescribed limits of specific permit conditions.

No additional potential cumulative potential effects have been identified.

10. The following permits and approvals are needed for the project:

Unit of Government	Type of Application	Status
U.S. Army Corps of Engineers	Section 404 Permit	To be applied for – if applicable
Itasca County	Wetland Conservation Act Incidental Wetland Determination	To be applied for – if applicable
Itasca County	Wetland Conservation Act Wetland Replacement Plan	To be applied for – if applicable
Itasca County	Work in Right of Way Permit	To be applied for
Itasca County	Shoreland Alteration Permit	To be applied for – if applicable
Department of Natural Resources	Permit to Mine	To be applied for – if applicable
Department of Natural Resources	Bulk Sample Reclamation Plan Approval	To be applied for – if applicable
Department of Natural Resources	Water Appropriations	To be applied for
Department of Natural Resources	Work in Public Waters	To be applied for
Pollution Control Agency	401 Certification	To be applied for – if applicable
Pollution Control Agency	Stormwater General Permit	To be applied for if applicable

CONCLUSIONS

1. The following standards and criteria are applied by the RGU to determine whether the proposed project has the potential for significant environmental effects and requires the preparation of an EIS.

   In deciding whether a project has the potential for significant environmental effects, the following factors shall be considered:

   a. *type, extent, and reversibility of environmental effects;*
   b. *cumulative potential effects;*
   c. *extent to which the environmental effects are subject to mitigation by on-going regulatory authority; and*
   d. *the extent to which environmental effects can be anticipated and controlled as a result of other environmental studies undertaken by agencies or the project proposer, including other EISs.*

   Minn. R. 4410.1700, subp. 6-7 (2013)

2. *Type, extent, and reversibility of environmental effects*

   Based on the Findings of Fact above, the DNR concludes that the following potential environmental effects, as described in Finding of Fact No. 9, will be limited in extent, temporary, or reversible:

- Project Construction
- Land Use
- Water Quantity
- Surface Waters
- Water Quality
- Physical Effects on Soils and Geology
- Groundwater and Wells
- Stormwater
- Wetlands
- Hazardous Materials
- Wildlife and Habitat
- Rare features
- Traffic
- Noise
- Visual Effects
- Cumulative Potential Effects

3. *Cumulative potential effects.*

   Based on the Finding of Fact above, the DNR concludes that the following cumulative potential effects do not have the potential to be significant environmental effects:

   - Surface Water Quantity
   - Surface Water Quality

   The proposed project's contribution to cumulative potential effects on water resources is limited when viewed in connection with other contributions. The proposed project will comply with existing water appropriation requirements that are designed to address potential cumulative effects to water resources. The project proposer has made efforts to minimize cumulative potential effects.

4. *Extent to which environmental effects are subject to mitigation by on-going public regulatory authority.*

   The following environmental effects are subject to mitigation by DNR regulatory authority:

   - Project Construction
   - Water Quantity
   - Surface Waters
   - Water Quality
   - Physical Effects on Soils and Geology
   - Groundwater and Wells
   - Wetlands
   - Wildlife and Habitat

The following environmental effects are subject to mitigation by MPCA regulatory authority:

- Stormwater
- Wetlands
- Noise

5. *Extent to which environmental effects can be anticipated and controlled as a result of other environmental studies undertaken by public agencies or the project proposer, or other EISs.*

   The following environmental studies assist in the anticipation and controlling of potential environmental effects:

   Adams, John, Mike Liljegren, Michael Crotteau. Trout Creek Hydraulic Capacity Trout Lake Impacts, MNDNR Hydrologists, November 2008.

   Jones, Perry M.; Characterization of Ground-Water Flow Between the Canisteo Mine Pit and Surrounding Aquifers, Mesabi Iron Range, Minnesota; USGS Water-Resources Investigations Report 02-4198, 2002.

   Nürnberg, G.K. Impact of the Planned Canisteo Pit (31-1282) Diversion on Trout Lake's (31-216) Water Quality. Report Prepared for Minnesota Pollution Control Agency and Minnesota. 2007.

   Department of Natural Resources. Walsh, James F.; Well Head Protection Plan – Part 1: Wellhead Protection Area Delineation, Drinking Water Supply Management Area Delineation, Well and Aquifer Vulnerability Assessment For the City of Bovey; Minnesota Department of Health, 2007.

   Wenck Associates, Inc. Draft Report Canisteo Mine Pit Overflow: Pit Wall Stability Analysis, prepared for Western Mesabi Mine Planning Board, Itasca County, Minnesota. Prepared by Wenck Associates, Inc. June 10, 2008.

   Wenck Associates, Inc. Canisteo Mine Pit Dewatering Water Quality Impacts. Technical Memorandum. December 18, 2014.

   Wenck Associates, Inc. Hydrology and Hydraulics Summary for the Canisteo Pit drawdown analysis. Technical Memorandum. July 17, 2014.

   Wenck Associates, Inc. Updated Trout Creek Hydraulic Analysis. Technical Memorandum. December 17, 2014.

   Wenck Associates, Inc. Revised Slope Stability Analysis – Canisteo Mine Pit Complex. Technical Memorandum. February 4, 2015.

6. The DNR has fulfilled all the procedural requirements of law and rule applicable to determining the need for an environmental impact statement on the proposed Canisteo Mine Pit Temporary Dewatering Project.

7. Based on considerations of the criteria and factors specified in Minn. R. 4410.170, subp. 6 and 7 (2013) to determine whether a project has the potential for significant environmental effects, and on the Findings and Record in this matter, the DNR determines that the proposed Canisteo Mine Pit Temporary Dewatering Project does not have the potential for significant environmental effects.

ORDER

Based on the above Findings of Fact and Conclusions:

The Minnesota Department of Natural Resources determines that an Environmental Impact Statement is not required for the Canisteo Mine Pit Temporary Dewatering Project in Itasca County, Minnesota.

Any Findings that might properly be termed Conclusions and any Conclusions that might properly be termed Findings are hereby adopted as such.

Dated this 1st day of June, 2015.

STATE OF MINNESOTA
DEPARTMENT OF NATURAL RESOURCES

Barb Naramore

Barb Naramore
Assistant Commissioner