STATE OF MINNESOTA
MINNESOTA POLLUTION CONTROL AGENCY

IN THE MATTER OF THE PROPOSAL TO ISSUE AN AIR EMISSION PERMIT TO MESABI NUGGET, LLC, FOR CONSTRUCTION OF AN IRON NUGGET PRODUCTION FACILITY HOYT LAKES, MINNESOTA

FINDINGS OF FACT CONCLUSIONS OF LAW AND ORDER

The above-entitled matter came before the Minnesota Pollution Control Agency (MPCA) at an MPCA Citizens' Board Meeting held in St. Paul, Minnesota, on July 26, 2005. After reviewing the record before it and allowing opportunity for public comment, the MPCA finds, concludes, and orders as follows:

FINDINGS OF FACT

This matter involves the application of Mesabi Nugget, LLC, (Mesabi Nugget) for issuance of an air emission permit authorizing construction of an iron nugget facility (the Project). The MPCA must decide whether, under applicable statutes and rules, it should issue the permit and, if so, under what terms and conditions.

DESCRIPTION OF THE PROJECT

1. The Project is an iron nugget manufacturing facility which will produce iron nuggets from iron ore concentrate. The Project will have the capacity to produce 600,000 metric tons of iron nuggets per year. The nuggets will be approximately 96 to 98 percent iron, and can be fed directly into electric arc furnaces (mini-mills) as well as to blast furnaces at conventional integrated steel manufacturing facilities. Raw materials for nugget manufacturing consist of iron ore concentrate from the Northshore Mining Company's taconite facility in Silver Bay, Minnesota, various coals, fluxes, and binders. The pollutants that will be emitted from the Project include sulfur dioxide, particulate matter, particulate matter smaller than ten microns, nitrogen oxides, volatile organic compounds, carbon monoxide, lead, fluorides, sulfuric acid mist, and a number of hazardous air pollutants (HAPs), including metal HAPs, inorganic salt HAPs, and volatile organic HAPs. Sources of emissions include a rotary hearth furnace (RHF), green ball dryers, coal and flux pulverizer/dryers, material handling and storage, a backup generator, and cooling towers.

2. The Project will employ a wet scrubber to control emissions of sulfur dioxide, particulate matter, particulate matter less than ten microns in diameter, lead, fluorides, sulfuric acid mist, metal HAPs, and inorganic salt HAPs from the RHF. An air infiltration system will be used to control carbon monoxide, volatile organic compounds, and volatile organic HAPs from the RHF. Several baghouses will be used to control emissions of particulate matter and particulate matter less than ten microns in diameter. Particulate matter emissions from the dryers, pulverizers, and materials transfer operations will be controlled by baghouses. Particulate emissions from storage piles and roads will be controlled with a fugitive dust control plan.

3. The Project is an air emission source that is required by State rules to have an Air Emission Permit. For air emission sources, these rules are found in Minn. R. ch. 7007.

4. Since 1980, federal regulations under the Clean Air Act require preconstruction permits for construction of certain new sources and modifications. These federal regulations are known as the New Source Review (NSR) regulations and are found at 40 CFR 51 Appendix S and 40 CFR 52.21. Minn. R. 7007.4000 has been approved by U. S. Environmental Protection Agency (EPA) as meeting the requirements of 40 CFR 51 Appendix S. The MPCA has been delegated the authority to implement and enforce 40 CFR 52.21 in Minnesota and does so through Minn. R. ch. 7007. Consequently, if proposed new construction is subject to one or both of the federal preconstruction permit programs, the source submits an application to the MPCA under Minn. R. ch. 7007. These regulations were substantially amended in 1992 as they apply to electric generating facilities and in 2002 as they apply to modifications at existing facilities. The most recent amendment to the NSR regulations allowed for emission units to acquire Clean Unit status under certain circumstances. Mesabi Nugget requested Clean Unit status for a number of Project emission units. However, on June 24, 2005, the U.S. District Court of Appeals for the District of Columbia Circuit vacated the Clean Units provisions of the NSR regulations.

5. A new source is subject to the NSR permitting requirements if it meets the federal definition of a major stationary source. For an iron nugget facility, NSR permitting requirements apply if the potential-to-emit any pollutant exceeds 100 tons per year or more. Minn. R. ch. 7007 applies if the potential-to-emit exceeds 100 tons per year.

6. In 1990, Congress amended the Clean Air Act (42 U.S.C.7401 *et seq.*). The amendments established, among other things, additional air emission permitting conditions. In 1992, the EPA promulgated regulations, referred to as Part 70 regulations, implementing the new federal permitting provisions (40 CFR pt. 70).

7. A source is subject to the Part 70 permitting requirements if it meets the federal definition of a major stationary source under Part 70 which, for an iron nugget facility, is a potential-to-emit any pollutant of 100 tons per year or more, 10 tons per year of any hazardous air pollutant, or 25 tons per year of all hazardous air pollutants combined.

8. In 1993, the MPCA revised its permitting rules to incorporate the new Part 70 requirements (Minn. R. ch. 7007).

9. The potential emissions from the Project exceed 100 tons of several pollutants, including sulfur dioxide, particulate matter, particulate matter smaller than ten microns, nitrogen oxides, volatile organic compounds, carbon monoxide, fluorides, and sulfuric acid mist. Emissions of manganese, a hazardous air pollutant, exceed the 10 ton per year level, while total hazardous air pollutant emissions exceed the 25 ton per year level.

PUBLIC NOTICE OF THE PERMIT

10. Minn. R. 7007.0050 to 7007.1850 apply to the issuance of air emission permits and describe the process the MPCA must follow in reviewing an application for a permit. Minn. R. 7007.0850 to 7007.0950 contain procedural requirements for public notice and comment, review by other states, and review and objection by EPA which apply to this proposed permit. Subpart 1 of Minn. R.

7007.0850 requires the MPCA Commissioner to prepare a Technical Support Document setting forth the legal and factual basis for the proposed draft permit conditions. Subpart 2 requires the MPCA to give public notice of the preliminary determination to issue a permit, including information on how copies of relevant documents can be obtained, the activities involved in the permit action, the emission changes, the comment procedures, any scheduled meetings or hearings, and hearing request procedures. Minn. R. 7007.0900 requires the MPCA to provide notice to affected states. Minn. R. 7007.0950 specifies the procedures for EPA review.

11. On May 13, 2005, pursuant to Minn. R. 7007.0850, subp. 2, the MPCA Commissioner issued a public notice of the preliminary decision to issue the permit. The notice was published as required by MPCA's rules, and included the information required. The notice of the preliminary determination to issue the permit provided for a comment period ending June 13, 2005. In accordance with Minn. R. 7007.0850, subps. 1 and 2, a draft permit and technical support document were made available to the public. In addition, a public information meeting for this proposed permit was held in Hoyt Lakes, near the proposed Project location, on May 25, 2005.

APPLICABLE STANDARDS

12. The MPCA has enacted ambient air quality standards, establishing maximum allowable concentrations of pollutants in the outdoor environment (Minn. R. 7009.0080). The rules are designed to protect public health and welfare and are companions to federal ambient air quality standards (40 CFR pt. 50). The MPCA rules prohibit any person from emitting pollutants that cause or contribute to a violation of an ambient air quality standard (Minn. R. 7009.0020).

13. The MPCA also has adopted standards of performance that establish emission limits and other performance requirements for specific sources of air pollutants (Minn. R. ch. 7011). If, however, modeling or monitoring shows that the standards of performance will not prevent a violation of an ambient air quality standard, an emission source will be required to meet more stringent performance standards that will protect ambient air quality.

14. The EPA has adopted standards for performance which apply to specific types of equipment and industrial operations, generally referenced as the New Source Performance Standards (40 CFR pt. 60). The Project as proposed is subject to 40 CFR pt. 60, subp. Y – Standards of Performance for Coal Preparation Plants - regarding the pulverization of coal at the Project location.

15. The EPA has adopted the Prevention of Significant Deterioration regulation, generally referred to as Prevention of Significant Deterioration (PSD) (40 CFR pt. 52.21). The Project is subject to the PSD regulation.

16. The EPA has delegated the MPCA the authority to implement the Prevention of Significant Deterioration regulation. In addition, the MPCA has adopted the PSD regulation by reference (Minn. R. 7007.3000).

17. The EPA has adopted standards of performance for source categories that are major for hazardous air pollutants, generally referred to as the National Emission Standards for Hazardous Air Polluants (NESHAPs) (40 CFR pt. 63). Where provisions for a source category have not yet been

promulgated, the permitting authority must conduct a case-by-case determination of the Maximum Achievable Control Technology (MACT) (40 CFR 63, Supb. B). The Project is subject to 40 CFR 63, Subp. B.

18. The MPCA has adopted the provisions of 40 CFR 63, Subp. B by reference (Minn. R. 7007.3010).

19. The PSD regulation requires that a new major stationary source apply the best available control technology (BACT) for each pollutant that it would have the potential to emit in significant amounts. (40 CFR 52.21(j)(2).)

20. The PSD regulation requires a demonstration from the owner or operator of the proposed source that the allowable emission increases from the proposed source, in conjunction with all other applicable emissions increases or reductions, would not cause or contribute to air pollution in violation of (1) any national ambient air quality standard; or (2) any applicable maximum allowable increase over the baseline concentration in any area. (40 CFR 52.21(k).).

21. The PSD regulation requires the Administrator (i.e., the MPCA) to provide written notification of any permit application for a proposed major stationary source, that may affect a Class I area, to the Federal land manager and the Federal official charged with direct responsibility for any lands within that area. The notification shall include an analysis of the proposed source's anticipated impacts on visibility in the Federal Class I area. The Administrator shall also provide the Federal Land Manager (FLM) a copy of the preliminary determination (i.e., draft permit conditions). (40 CFR 52.21 (p)(1).)

22. The PSD regulation charges the FLM with direct responsibility for management of federal lands; provides them an affirmative responsibility to protect the air quality related values (including visibility); and requires them to consult with the Administrator on whether the proposed source will have an adverse impact on air quality related values.

23. The EPA has adopted a requirement for states to enact operating permit programs (40 CFR pt. 70). One EPA-required program element is a requirement to issue permits to each major stationary source under Part 70 which has a potential-to-emit any pollutant of 100 tons per year or more, 10 tons per year of any hazardous air pollutant, or 25 tons per year of all hazardous air pollutants combined. (40 CFR 70.3(a)(1).) Permits issued under the Part 70 regulation must contain periodic monitoring (40 CFR 70.6(a)(3)(B)).

24. The MPCA has adopted an operating permit program that meets the requirement of the federal regulation. (Minn. R. ch. 7007). The requirement to issue permits to each major stationary source is found at Minn. R. 7007.0200, subp. 2.A. The periodic monitoring requirement is found at Minn. R. 7007.0800, subp. 4.

25. In addition to containing limits designed to assure compliance with ambient air standards, the draft permit contains limits required by state standards of performance as follows: (1) Minn. R. 7011.1100 - 7011.1150 for Coal Handling Facilities; (2) Minn. R. 7011.0700 - 7011.0735 for particulate matter emissions from equipment not covered by a specific regulation; (3) Minn. R. 7011.0600 - 7011.0625 for Fossil Fuel Burning Direct Heating Equipment; (4) Minn. R. 7011.2300 for Stationary Internal Combustion Engines; (5) Minn. R. 7017.0110 for Visible Emissions from

New Facilities; (6) Minn. R. 7010.0115 to Prevent Particulate Matter from Becoming Airborne; (7) Minn. R. 7017.2001 – 7017.2060 for Performance Tests; and (8) Minn. R. 7017.1000 – 7017.1020 for Continuous Monitors.

26. The permit also requires a mercury reduction effort with a goal of reducing emissions by fifty percent. This requirement is based on Minn. Laws Ch. 220, Sec. 1(d) (2004).

PUBLIC COMMENTS AND MPCA CONSIDERATION OF PUBLIC COMMENTS

27. During the public notice period of the draft permit, members of the public expressed a variety of opinions and concerns about the Project ranging from full support of the Project to opposition to the Project.

28. The MPCA staff has reviewed each of the comments and has provided a detailed response to each. The responses of MPCA staff are set out in the Responses to Comments document (Attachment 6).

29. Significant comments were received in the following six areas: (1) whether the permit is protective of visibility and increment in Class I areas; (2) whether the method in which technologies were selected to control emissions met the requirements of a BACT review; (3) whether the appropriate BACT limits were set for the rotary hearth furnace, the green ball dryer, pulverizer/dryers, the product separator, and fugitive emissions; (4) whether all required BACT limits were imposed; (5) whether the MACT limits for mercury and other HAPs are stringent enough; and (6) whether the conditions in the permit, including the required mercury reduction effort, demonstrate that the MPCA permitting process assures the lowest mercury emissions reasonably possible. These comments are identified below, along with an MPCA response to each comment.

30. The MPCA also concurs with the reasoning of MPCA staff in its Responses to Comments document (Attachment 6) and adopts that reasoning by reference in these findings.

COMMENTS RE: VISIBILITY AND MPCA RESPONSE

31. The Forest Service and others submitted comments stating that the proposed facility adversely affects visibility at the Boundary Waters Canoe Area Wilderness (BWCAW).

32. The PSD regulation gives the FLM "affirmative responsibility" to protect the air quality related values (including visibility) of National Parks and Wilderness Areas and consider, in consultation with the "Administrator" (i.e., the MPCA), whether a proposed source or modification will have an adverse impact on such values. (See 40 CFR 52.21(p).)

33. The MPCA acknowledges and will address the FLM's concerns prior to permit issuance. The MPCA agrees that the emission analysis conducted for the draft permit shows predicted adverse visibility impacts at the BWCAW. In response to the letter from the FLM for the BWCAW, the MPCA has modified the permit to add visibility mitigation plan language developed in conjunction with the FLM's input and review. One option available to Mesabi Nugget under that revised permit language is the acquisition and retirement of Acid Rain (Title IV) allowances from power

plants in amounts that would mitigate the iron nugget facility's actual emissions. These allowances represent Sulfur Dioxide (SO_2) emissions that the power plant could otherwise use to offset its own emissions.

34. Ideally, however, the emissions from the Mesabi Nugget facility would be shown to have no adverse impacts on any Class I area, including the BWCAW. The revised permit language offers a second option to Mesabi Nugget, allowing the company to reduce the emission rates of visibility-impairing pollutants from the facility and demonstrate to the FLM and the MPCA that the impacts from the facility are acceptable. Those emission rates would become permit conditions. To encourage movement in that direction, the permit requires the testing of nitrogen oxide (NO_X) control technologies at the rotary hearth furnace in addition to a wet scrubber optimization study. Those conditions are designed to maximize the removals of sulfur dioxide, NO_X, and other pollutants.

35. Mesabi Nugget submitted a comment disagreeing with the MPCA consideration of modifications to the final permit to require emission reduction or acquisition of acid rain allowances or credits from power plant or other emitters in response to potential regional visibility impacts.

36. Mesabi Nugget states: "We contend that the FLM guidelines and the MPCA related position must recognize the shutdown of the LTVSMC facilities. Common sense comprehends that the shutdown of these dirtier furnaces and start-up of the cleaner MNC facility is an environmental improvement, and specifically a visibility improvement for the entire region (including the BWCAW). As such, Mesabi Nugget expects that the MPCA will recognize the shutdown of the LTV facility, reflect this in their response to the FLM or other related comments, and not encumber the Mesabi Nugget PSD permit with emissions reductions or mandates that Mesabi Nugget buy credits to achieve a specific "Q/d" ratio since the LTVSMC closures already supplies a "Q/d" reduction of 112 relative to the BWCAW."

37. The PSD regulation is a pre-construction review program requiring that potential air quality impacts be identified and mitigated prior to permit issuance.

38. The PSD regulation gives the FLM "affirmative responsibility" to protect the air quality related values (including visibility) of National Parks and Wilderness Areas and consider, in consultation with the "Administrator" (i.e., the MPCA), whether a proposed source or modification will have an adverse impact on such values.. The FLMs have developed guidance (Federal Land Manager's Air Quality Related Values Workgroup (FLAG) Report) on what analyses are used for assessing impacts with respect to air quality related values. One of the analyses is for assessing single source impacts to visibility compared to natural background. Under this technical evaluation, single source impacts, as the name implies, assess the proposed source's impacts on visibility and the evaluation does not assess impacts from other sources, be they increases or decreases in emissions. In the case of Mesabi Nugget, the MPCA received a comment letter from the FLM for the U.S. Forest Service who is responsible for the BWCAW. The letter states that the analyses performed in support of the draft permit show impacts to visibility that are adverse. The MPCA acknowledged and did address the FLM's concerns with revisions of the draft permit to address those FLM concerns.

39. Ideally, the emissions from the Mesabi Nugget facility would be shown to have no adverse impacts on any Class I area, including the BWCAW. The MPCA has added language to the permit reflecting the proposal developed in cooperation with the FLM to mitigate the adverse effects that have been identified. The permit also allows Mesabi Nugget to develop an alternative proposal that would need to be presented to the MPCA and the FLM. The MPCA believes that these conditions provide flexibility to Mesabi Nugget in addressing the visibility issue.

COMMENTS RE: CLASS I INCREMENT AND MPCA RESPONSE

40. The Forest Service and others submitted comments stating that the draft permit failed to convincingly demonstrate that the Class I increments at the BWCAW were protected. In particular, screening modeling (modeling performed assessing the impact from the facility alone) indicated concentrations surpassing the Class I significant impact levels (SILs) for the 3- and 24-hour SO_2 and the 24-hour particulate matter (PM_{10}) increments, and that an assessment that considered the changes in emissions from other facilities was needed.

41. One commenter opined that the comparison of the proposed emissions from the Mesabi Nugget facility to that of the former LTV facility was insufficient, while others stated that the emission reduction at the former LTV site was used incorrectly. While one commenter indicated that the screening modeling required Mesabi Nugget to conduct a cumulative analysis to prevent future increment problems, another commenter indicated that something short of a cumulative Class I increment modeling analysis could demonstrate protection of the Class I increments.

42. In areas where the air quality meets the National Ambient Air Quality Standards, PSD allows some degradation of air quality relative to a local baseline period. The baseline period is set for a certain area (in Minnesota, it is the county in which a facility will be modified or built) by the submittal of the first PSD permit for the area. After that submittal, changes in air quality are always measured against the air quality during the baseline period.

43. The screening modeling performed in support of the draft permit predicted concentrations over the SILs for the 3- and 24-hour SO_2 and the 24-hour PM_{10} increments. When a SIL is exceeded, the Federal Land Manager frequently requests a modeling exercise to show the cumulative impact of all emission changes at the facilities in the areas. Not all facilities within a given distance are included in the analysis; the sources included in the analysis are a matter of rule, policy, and case-by-case assessments.

44. While acknowledging that the SILs were exceeded in the screening modeling in the technical support document (TSD) for the draft permit, the MPCA determined that Mesabi Nugget's analysis showed the shutdown of the LTV facility more than offset the emissions from the new Nugget facility. Since this was insufficient to persuade the FLM for the BWCAW (one of the commenters) that the Class I increments were protected, Mesabi Nugget has prepared a spreadsheet analysis (a "Q/d" analysis) that includes facilities within 100 kilometers of the BWCAW. Q/d is the ratio of the emissions from a particular facility over the distance of that facility to the Class I area. Since the impacts of the facility are a function of its emissions and the distance from the Class I area, Q/d provides a rough measure of the impact of a facility's emissions on the Class I area. This analysis supports the MPCA's determination that the Class I increments are protected.

45. In its spreadsheet analysis, Mesabi Nugget included the shutdown of the LTV furnaces. The shutdown of the furnaces at the LTV taconite facility reduced emissions in St. Louis County and at the BWCAW and improved air quality relative to the baseline date. This is generally referred to as "expanding increment." EPA's PSD guidance recognizes that increment can be expanded; the "negative emissions" from the shutdown of the furnaces are properly included in a cumulative increment analysis.

46. The MPCA finds that the Class I increments at the BWCAW and at Voyageurs National Park are protected and that no further analysis is needed. The spreadsheet analysis prepared by Mesabi Nugget is modeled on an exercise on which the MPCA and the FLM for the BWCAW cooperated. Though the analysis is less rigorous than a modeled cumulative analysis, the results – basically, that the Class I increments have probably expanded over the years – support the MPCA's determination that the Class I increments at the BWCAW are protected.

47. Since Voyageurs National Park is farther away from the Mesabi Nugget site than the BWCAW, the MPCA determined that protection of the Class I increments at the BWCAW is also protective of the increments at Voyageurs Nationals Park.

COMMENTS RE: SELECTION OF BACT FOR NOX AT THE GREEN BALL DRYER AND MPCA RESPONSE

48. The MPCA received a comment noting that Mesabi Nugget did not submit a BACT analysis for NO_X emissions from the Green Ball Dryer (GBD).

49. The purpose of the GBD is to remove moisture from the raw materials that enter the RHF. The primary source of heat for this process will be air that recovers heat from the off-gases of the RHF. During startup, this source of heat is not available, so the GBD will also be equipped with natural gas-fired low-NO_X burners. Limits in the permit restrict the amount of fuel that can be burned, resulting in relatively NO_X low emissions from this unit (~30 tons per year).

50. PSD requires that a BACT analysis be performed for NO_X emissions from the GBD. In the MPCA's engineering judgment, however, any add-on controls would have been cost-prohibitive due to the low emissions from Mesabi Nugget's proposed design. The MPCA did not add a requirement for the control of NO_X emissions to the permit.

COMMENTS RE: SELECTION OF BACT FOR FUGITIVE EMISSIONS AND MPCA RESPONSE

51. Comments identified fugitive dust as a concern, suggesting a need for tighter and more specific standards, as well as standards for fugitive emission that affect off-site areas. One comment stated that fugitive emissions from storage piles need a content restriction.

52. The MPCA finds that the submittal of a fugitive dust control plan (work practices) and an opacity limit as the BACT for fugitive storage piles and material transfer operations. These MPCA determinations are consistent with determinations available from the RACT/BACT/LAER Clearinghouse (RBLC).

53. No specific content restriction is needed. This is consistent with determinations available from the RBLC for fugitives from storage piles. If the characteristics of the materials stored in a storage pile change greatly, however, a permit amendment may be needed.

54. The existing permit conditions are appropriate for ensuring that particulates from fugitive storage piles and material transfer operations are well-controlled and meet BACT.

COMMENTS RE: SELECTION OF BACT FOR PM AND PM10 AT THE RHF AND MPCA RESPONSE

55. One comment was received concerning the choice of BACT for PM and PM_{10} at the RHF. The comment acknowledges that a wet scrubber and a wet electrostatic precipitator (wet ESP) can achieve the same control efficiency, but voiced a concern that the environmental impacts of a wet scrubber were not considered.

56. One aspect of the BACT analysis is the environmental analysis. Frequently, this analysis is confined to the amount of pollution that can be removed or otherwise eliminated by a control technology. However, other factors can be brought into the analysis, particularly when the applicant is attempting to eliminate a more costly technology that results in greater emission reductions. In this case, the comment indicates that the less costly control option (the wet scrubber) achieves the same control efficiency as a more costly option (a wet ESP), but raises a concern that certain environmental costs have been omitted from the analysis.

57. The MPCA affirms its selection of the wet scrubber as the appropriate technology to control PM and PM_{10}. A significant factor in choosing this control technology is that the wet scrubber is superior in controlling other pollutants in addition to PM and PM_{10} (i.e., SO_2, acid gases, lead, and metal HAPs). When multiple pollutants can be removed by one piece of control equipment, the BACT analysis does simply consider the best control for each pollutant. An assessment of the overall effectiveness of the control equipment was made. Based on this assessment, the wet scrubber clearly out-performs the wet ESP.

COMMENTS RE: SELECTION OF BACT FOR NOX AT THE RHF AND MPCA RESPONSE

58. The MPCA received comments criticizing its NO_X BACT determination for the RHF. The comments challenged the cost analysis for the post-scrubber selective catalytic reduction (SCR). Comments addressed the cost of reheating; the sales tax; catalyst disposal costs; overhead costs; engineering/supervision costs and construction/field expenses; piping costs; catalyst life; and indirect operating costs. One comment questioned the omission of post-scrubber selective non-catalytic reduction (SNCR) from the BACT analysis. Another comment questioned the MPCA conclusion that SNCR upstream of the wet scrubber was infeasible.

59. One criterion in a BACT analysis is the determination of the cost-effectiveness of the control technology. Controls can be eliminated from consideration if the cost of control exceeds a threshold established by the permitting authority (e.g., the MPCA). The cost of control is usually measured as the annual cost, in dollars, per ton of pollutant removed. Case-by-case factors may affect the cost-effectiveness threshold.

60. The RHF operates with a reducing atmosphere; the intention is to create conditions under which the oxygen in iron oxide is transferred to carbon atoms to form elemental iron and carbon monoxide. Due to the need for this special atmosphere, a number of technologies often used to reduce NO_X emissions during combustion are infeasible. A number of add-on controls were also deemed infeasible because of the high particulate and acid gas content of the off-gas. One option that was examined was the installation and operation of SCR downstream of the wet scrubber. Mesabi Nugget calculated the cost of controlling NO_X emissions with SCR downstream of the wet scrubber to exceed $11,000 per ton. This was determined to exceed the MPCA's cost guidelines.

61. The MPCA evaluates each BACT cost analysis on a case-by-case basis by comparing the estimated cost effectiveness (dollar per ton of pollutant controlled or removed) with the most recent BACT cost analyses in the RBLC. The RBLC is a database maintained by EPA; the database is populated with data submitted by air quality regulatory bodies from each of the 50 states.

62. Because the proposed Project is a first in the United States, the RBLC was not populated with cost information that was directly applicable. Because this analysis is conducted on a case-by-case basis and the Project is unique, the MPCA relied upon broad guidelines for evaluating the cost effectiveness of the proposed Project. These guidelines are based on a broad review of the RBLC for all projects for all pollutants. Under these guidelines, a cost effectiveness of less than $6,000 per ton is probably cost effective and a cost effectiveness greater than $10,000 per ton is probably not cost effective. Based on these guidelines, the cost analyses demonstrated that further control was not cost effective.

63. Mesabi Nugget also identified a factor that discouraged the adoption of post-scrubber SCR as BACT. Metal particles from the off-gas may pass through the scrubber and contaminate the SCR catalyst. In addition, this analysis confirmed a previous finding by the MPCA; the reheating costs of the off-gas – in particular, the cost of natural gas – contribute roughly 50 percent of the annualized cost of control.

64. The MPCA took a closer look at the cost analysis based on the concerns raised in the comments. The values Mesabi Nugget used to estimate the sales tax; catalyst disposal; piping costs; and indirect operating costs may have been too high. However, the estimates for the cost of reheating; engineering/supervision costs and construction/field expenses; and indirect operating cost appear appropriate. The overestimated costs are relatively minor items. Even after reconsidering the items for which the costs may have been high, the MPCA finds that a post-scrubber SCR would be cost-prohibitive, as the amount of natural gas required to re-heat the off-gas stream drives the cost of control out of the cost-effective range.

65. SNCR was not considered as a viable alternative for post-scrubber application . The optimum operating range for SNCR is between 1600 and 2000º Fahrenheit, well above the post-scrubber temperatures and even above the temperatures required for SCR. Obviously, heating the off-gases to these temperatures would also drive the operating costs well above those for SCR.

66. In the BACT analysis, the permittee presented information indicating that the use of SNCR upstream of the wet scrubber would create a fouling problem for heat exchangers used in the process. Based on this information, the MPCA determined that SNCR upstream of the wet scrubber was infeasible.

67. EPA guidance supports such a determination, stating that "[i]nnovative control that have not been demonstrated on any source type similar to the proposed source need not be considered in the BACT analysis." (See *1990 DRAFT New Source Review Workshop Manual*, page B.21.) Notwithstanding this determination, the MPCA responded to the commenters' concerns over NO_X emissions and potential impacts on visibility in Class I areas. The permit has been revised to require the permittee to complete a NO_X control study that includes testing SNCR upstream of the scrubber. The MPCA can use its authority to revise permit limits downward if the NO_X control study indicates that SNCR or other controls are feasible and effective in reducing NO_X emissions. Language has been added to the Facility conditions in the permit to provide other means to ensure protection of Class I visibility. (See Findings 31 to 39 above.)

COMMENTS RE: SELECTION OF BACT FOR SO2 AT THE RHF AND MPCA RESPONSE

68. The MPCA received comments about the manner in which the BACT analysis for SO_2 at the RHF was conducted.

69. The base case for the BACT analysis allowed a coal sulfur content of 1.0 percent by weight, above levels than that of many coals currently available. This is justified because this process needs coal primarily for its role as a reductant, where it accepts oxygen from iron oxide in order to create elemental iron. The coal properties of interest to the company extend beyond British thermal units per hour (Btu/hr) (heat) content, which is likely to be a major factor for power plants. The required make-up of the coal for reductant purposes places a restriction on the types of coals that can be used.

70. The MPCA also wanted the company to conduct "experiments" after the process started up to investigate methods of reducing the facility's mercury emissions. Flexibility in the sulfur content of the coal provides a greater chance of finding a coal with a lower mercury content that met the company's processing needs.

71. The manufacturing process also imposes restrictions on the type of controls that can be used to control SO_2 emissions. The pressure in the RHF is a significant concern to Mesabi Nugget; pressure fluctuations caused by control equipment could potentially create unsafe conditions. This was a driving force for the choice of a wet scrubber as BACT. Other control technologies, including those mentioned in the comments, increase the pressure drop downstream of the furnace relative to the wet scrubber and, in doing so, affect the pressure in the RHF. Due to the safety concerns, only the wet scrubber and a wet electrostatic precipitator were considered feasible options for BACT. This pressure drop consideration also affected the consideration of combinations of control equipment. Increasing the number of pieces of control equipment also increases the pressure drop.

72. For these reasons, the MPCA finds the determination of a wet scrubber as BACT for the RHF is justified. However, a number of steps have been taken to ensure lower SO_2 emissions.

73. First, the revised permit reduces the maximum coal sulfur content from 1.0 to 0.85 percent by weight. Second, the MPCA has revised the permit to require a wet scrubber removal efficiency of at least 90 percent. Finally, the permit retains the requirement for a wet scrubber optimization study. The study is intended to identify conditions under which the wet scrubber can achieve removal efficiencies above the minimum requirement of 90 percent.

COMMENTS RE: SELECTION OF BACT LIMITS FOR FUGITIVE EMISSIONS AND MPCA RESPONSE

74. *Mesabi Nugget made the following comment regarding the opacity limit for road dust:* "It is not practical or possible to conduct opacity measurements on roads with the volume of vehicle traffic expected and described in the permit application. Mesabi Nugget expects that the requirement be changed to compliance with the fugitive dust control plan, already submitted to the MPCA."

75. RBLC lists a number of roads for which opacity limits have been set as BACT. The MPCA determined that a road that is complying with the fugitive dust control plan will be able to measure and meet the opacity limits of the permit. The inclusion of opacity limits for roads as BACT in the RBLC supports the imposition of an opacity limit for roads at the Mesabi Nugget facility.

COMMENTS RE: SELECTION OF OPACITY BACT LIMITS FOR BAGHOUSE EMISSIONS AND MPCA RESPONSE

76. Mesabi Nugget made the following comment regarding opacity limits for baghouse emissions: "Opacity limitations of 5% were included in the draft permit on a number of emissions units controlled by baghouses. Mesabi Nugget expects these limitations to be increased to 20%, in keeping with cited Minnesota Rules."

77. The general performance standards in Minnesota Rules do require an opacity of 20 percent for the equipment referenced in the comment. However, the opacity limits cited are the result of a BACT analysis and are indicative of the performance a well-functioning baghouse in this application can achieve. The MPCA will not raise the limits because the current opacity limitations are required by the BACT analysis.

COMMENTS RE: SELECTION OF LEAD BACT LIMIT AND MPCA RESPONSE

78. Mesabi Nugget made the following comment regarding the proposed lead BACT limit: "… Mesabi Nugget proposed in our BACT report that PM-10 be considered as a surrogate for metals, including lead. …. Mesabi Nugget expects the lead limit to be removed, and that compliance with the PM-10 limitation, including the requirements for parametric monitoring of the wet scrubber for pressure drop and liquid flow rate be deemed sufficient, as it is in several federal regulations."

79. The MPCA notes that a number of the (federal) National Emission Standards for Hazardous Air Pollutants (NESHAPs) include the use of surrogate parameters, such as the one noted by Mesabi Nugget. Although this is permissible for NESHAPs, the PSD program requires that, for a new major stationary source, a BACT analysis be performed for each PSD pollutant for which the stationary source is major for each emission unit that emits that pollutant.

80. The MPCA finds that the lead BACT limit should not and will not be removed and a stack test will be required to be performed for lead to demonstrate compliance with the BACT limit. Data collected by parametric monitoring for PM_{10} may be used by the MPCA as an indicator of ongoing compliance.

COMMENTS RE: SELECTION OF VOLATILE ORGANIC COMPOUNDS (VOCs) BACT LIMIT AND MPCA RESPONSE

81. Mesabi Nugget made the following comment regarding the proposed VOC BACT limit: "Mesabi Nugget proposed in our BACT report that CO be considered as a surrogate for VOC as well as for organic HAPs. … Mesabi Nugget expect the VOC limit to be removed, and that compliance with the CO limitations, including the requirement to install and operate a CO continuous emissions monitor (CEM) is deemed sufficient, as it is in several federal regulations."

82. The MPCA notes that a number of the (federal) NESHAPs include the use of surrogate parameters, such as the one noted by Mesabi Nugget. Although this is permissible for NESHAPs, the PSD program requires that, for a new major stationary source, a BACT analysis be performed for each PSD pollutant for which the stationary source is major for each emission unit that emits that pollutant. The MPCA finds that the VOC BACT limit should not and will not be removed and a stack test is required to be performed for VOCs to demonstrate compliance with the BACT limit. Data collected by the carbon monoxide (CO) CEM may be used by the MPCA as an indicator of ongoing compliance.

COMMENTS RE: SELECTION OF BACT LIMITS FOR RHF AND MPCA RESPONSE

83. A number of comments indicated disagreement with the BACT limits for the RHF that were set in the permit. One commenter indicated that all the limits at the RHF were too high. Another commenter expressed general concern over the suitability of the limits to this process, since the iron nugget process has not been demonstrated in practice and, thus, no technologies have been tested to demonstrate control of its emissions. Due to this, the commenter urged the MPCA to include in the permit a re-opener clause through which a limit could be revised to reflect actual performance.

84. The commenters also expressed disagreement with the inclusion of a clause that would allow the PM and PM_{10} limits at the RHF to be raised, particularly through an administrative amendment procedure. Those comments asserted the limit was illegal in its current form.

85. The set of comments addressed here did not debate the technology selected but indicate that the limits are inappropriate. In most cases, the comment proposed no alternative limit. In the one exception, the comment asserted that a PM limit of 0.010 grain/dry standard cubic feet (gr/dscf) replace the 0.015 gr/dscf because modern bag house filters can achieve that limit.

86. 40 CFR 52.21(j) requires a control technology review to apply the BACT when a new stationary source is constructed. EPA has developed guidance on implementing this requirement. The BACT analysis begins with the selection of the control technology. Once the control technology is selected, a limit is set by assessing the level of control that can be accomplished at the emissions unit with that particular method of control. Tools used to inform the process of setting a limit include actual data at the facility; data from similar facilities, which can include pilot plant data; and engineering calculations and judgment.

87. The Mesabi Nugget facility will be the first of its kind in the world. No first-hand information is available on how well specific control technologies work for the RHF. However, some emission information is available for the RHF from pilot plant operations. The limits for particulate matter (PM and PM_{10}) and lead at the RHF are based on pilot plant data, assuming that the scaled-up wet scrubber will be able to attain the same concentrations achieved there. Conversations with vendors have indicated that a wet scrubber can be designed and operated to achieve similar concentrations, for these pollutants, to those achieved at the pilot plant.

88. Sulfur dioxide, sulfuric acid mist, and fluoride limits at the RHF are based on the range of materials that Mesabi Nugget believes it may use. Mesabi Nugget plans to test a variety of raw materials in an effort to reduce emissions of mercury and possibly other pollutants. The RHF limits for carbon monoxide, nitrogen oxide, and volatile organic compounds are engineering estimates based on pilot plant data, anticipated process variation and testing error (e.g., the ten percent error range assumed in stack testing); scale-up ratios; and other scale-up considerations (e.g., changes in air flow dynamics at different scales).

89. The PM and PM_{10} limits at the RHF contain a methodology that allows for the limit to be raised administratively, based on new information from stack testing. This methodology has been used by EPA Region 2 and upheld by the Environmental Appeals Board of the EPA. The intent of the language is to encourage Mesabi Nugget to achieve the best control achievable while recognizing that the actual emission rate cannot be known until testing is completed.

90. The MPCA set emission and opacity limits for the RHF according to EPA guidance and MPCA practice using its best professional, technical judgment. However, the MPCA acknowledges that the exact uncontrolled emission rates of pollutants from the proposed Mesabi Nugget facility are unknown, as are the exact capabilities of the control equipment that the permit requires. Testing performed after the facility is in operation will provide more information. For that reason, the MPCA inserted language that highlights MPCA's authority to re-open the permit to modify the permit once information becomes available (e.g., the permit may be re-opened to lower a limit if the data indicate a lower limit can be achieved). Any changes to the permit will follow the public participation procedures defined in Minn. R. ch. 7007.

91. The MPCA will examine test results closely, particularly those related to the required scrubber optimization study and the study of controls of NO_X.

92. The particulate matter from the RHF is controlled by a wet scrubber. Comparisons of PM control by a wet scrubber with the performance of baghouses are inappropriate since a baghouse was determined to be infeasible in this application.

COMMENTS RE: SELECTION OF PM BACT LIMITS FOR GBD, PRODUCT SEPARATOR AND COAL PULVERIZER AND MPCA RESPONSE

93. Comments allege that the PM limits (0.015 gr/dscf) for the GBD, the Product Separator, and the Coal Pulverizer Units are too high. A limit of 0.10 [sic?] gr/dscf is recommended for the coal pulverizer units.

94. The product separator, the green ball dryer, and the coal pulverizer units each burn natural gas to dry materials that they are processing. The MPCA determined that baghouses, low-NO_X burners, and the use of natural gas were BACT for these units.

95. Two of these four units are subject to the emission limit of 0.031 gr/dscf in the federal Standards of Performance for Coal Preparation Plants (40 CFR 60, Subpart Y). A similar type of unit is an Ore Dryer, to which the Taconite NESHAP (40 CFR 63, Subpart RRRRR) applies a "new source" limit of 0.025 gr/dscf. No comparable units were identified in a search of the RBLC.

96. Using stack testing information from the pilot plant, Mesabi Nugget indicated that the majority of the particulate matter emitted at the coal pulverizers is condensable (not filterable). PM is primarily filterable material, while PM_{10} limit includes both filterable and condensable particulate.

97. This information supports the position that the PM limits that were in the draft permit at these units are too high. In response to this analysis, the MPCA revised the "front-catch" (i.e., filterable-only) limits at the GBD, the Product Separator, and the Coal Pulverizers from 0.015 gr/dscf to 0.010 gr/dscf. PM_{10} limits will be set at 0.015 gr/dscf, reflecting the condensable fraction measured in testing for this pollutant.

98. Since the flux pulverizers have similar characteristic and controls, these new, lower limits will be extended to those emission units as well.

COMMENTS RE: SELECTION OF OPACITY BACT LIMITS FOR GBD AND PRODUCT SEPARATOR AND MPCA RESPONSE

100. Some commenters asserted that the opacity limits at the GBD and the product separator are too high (and that this level of opacity "would create a very visible plume").

101. The opacity limit applies to the gases just as they leave the stack (the point where pollutant concentrations will be the highest). At this point, at least ninety percent of the light will pass through a plume meeting the limit of ten percent (the opacity limit in the permit). Based on MPCA's technical experience with opacity regulation, a ten percent opacity does not create a "very visible plume."

102. Although the comments asserted that the opacity limits were too high, no specific opacity level was recommended and the comment provided no guidance on an acceptable level.

103. The opacity limits are set as part of MPCA's BACT analysis and based on that analysis, the MPCA finds that the existing opacity limit of ten percent at these two units is reasonable.

COMMENTS RE: SELECTION OF BACT CONTROL EFFICIENCY FOR WET SCRUBBER AND MPCA RESPONSE

104. The Forest Service commented that: "Although we agree that the wet scrubber represents BACT, we believe it can perform better. The application proposes a control efficiency of 90%. We've seen many permits issued recently for boilers fired on eastern coal that had scrubber control efficiencies exceeding 95% [for sulfur dioxide]. We feel the control efficiency for the scrubber should be increased and included as a limit in the permit."

105. The permit has been revised to include a 90 percent removal efficiency for SO_2 by the wet scrubber. A wet scrubber optimization study is also required, during which Mesabi Nugget is required to maximize the removal efficiencies of several pollutants, including SO_2. The permit also contains a re-opener clause, which will allow the MPCA to open the permit and increase the required removal efficiency if the wet scrubber demonstrates a better removal efficiency in practice.

COMMENTS RE: SELECTION OF CO BACT LIMIT FOR THE GBD AND MPCA RESPONSE

106. Two comments suggested that the safety factor for the GBD's CO emission limit may be too high.

107. One section of the TSD describes the development of the CO limit for the green ball dryer. The MPCA inadvertently inserted a discussion that applied instead to the CO limit for the RHF into that section.

108. In regard to the safety factor applied to the CO limit, several factors affected the setting of the CO limit for the RHF. Three considerations contribute to the increase in the CO limit for the RHF from the data measured during the pilot plant tests. First, the limit must be set at a level that allows for some process variations, recognizing the potential for uncertainty in the stack test results. Second, the scale-up of the facility includes an increase of the ratio between the process feed rate and the flow rate of gases. The amount of CO generated is associated with the process feed rate, so if there is an increase in the amount of CO generated per volume of gases, the concentration of CO will rise. Third, as the size of the equipment increases, the possibility of incomplete mixing of the off-gas and the injected air increases. The RHF limit for CO reflects the contributions of these factors. The MPCA concludes that the safety factor in the limit is justified by the rationale stated above.

COMMENTS RE: LACK OF VOC, NOX AND CO BACT LIMITS FOR THE GBD AND MPCA RESPONSE

109. Some comments pointed out that the draft permit contained PM and opacity limitations as well as the restrictions on the use of natural gas, but it did not include limitations for other PSD pollutants emitted by the GBD.

110. Although the natural gas limitations effectively limit the emissions of CO, VOCs, and NO_X, operational conditions can adversely affect the emission rates of these pollutants. The MPCA revised the permit to include pound per hour and pound per million Btu limits for VOCs and NO_X and a pound per hour and a concentration limit for CO.

COMMENTS RE: LACK OF BACT LIMITS AND MPCA RESPONSE

111. Commenters noted that a number of emission units lack required BACT limits for certain pollutants. Among the commenters alleged omissions are exceptions from BACT during startup, shutdown, and malfunction for a number of BACT limits; no required removal efficiencies limits for pollutants controlled by the wet scrubber; and the lack of limits on combustion pollutants and PM_{10} for units using natural gas to dry materials.

112. 40 CFR 52.21(j)(2) requires a new major stationary source to apply BACT for each pollutant subject to regulation under the Clean Air Act (other than HAPs) that it would have the potential to emit in significant quantities. According to 40 CFR 52.21(b)(12), "[b]est available control technology means an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques…. If the Administrator determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of best available control technology. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means which achieve equivalent results."

113. EPA's guidance on the BACT applicability (New Source Review Workshop Manual, DRAFT 1990) indicates that "[t]he BACT requirement applies to each individual new or modified affected emissions unit and pollutant emitting activity at which a net emissions increase would occur. Individual BACT determinations are performed for each pollutant subject to a PSD review emitted from the same emission unit. Consequently, the BACT determination must separately address, for each regulated pollutant with a significant emissions increase at the source, air pollution controls for each emission unit or pollutant emitting activity."

114. The Manual also indicates that "[i]n general, it is best to express the emission limits in two different ways, with one value serving as an emissions cap (e.g., lbs/hr.) and the other ensuring continuous compliance at any operating condition (e.g., lbs/MMBtu)."

115. In the context of this regulatory program, the Mesabi Nugget facility will be a new major stationary source under the PSD rules for the following pollutants: sulfur dioxide, particulate matter, particulate matter less than ten microns in diameter, nitrogen oxides, carbon monoxide, volatile organic compounds (as a surrogate for ozone), lead, fluorides, and sulfuric acid mist. Each unit that has the potential to emit one or more of these pollutants must undergo a BACT determination for each pollutant emitted.

116. In summary, BACT limits are needed at all units for each PSD pollutant they emit. For this reason, the permit has been revised to eliminate the exceptions from BACT limits during startup, shutdown, and malfunction, as well as to impose limits on PM_{10} and the combustion pollutants (NO_X, CO, and VOCs) at emission units where natural gas is used.

117. Additional BACT limits have also been added where, in the draft permit, only an overall limit was imposed and an emission rate was omitted. In particular, removal efficiency requirements for the wet scrubber and a pound per hour limit for CO at the rotary hearth furnace have been added.

COMMENTS RE: MACT LIMITS AND MPCA RESPONSE

118. The MPCA received comments about the setting of limits under the NESHAP regulation, particularly with regard to mercury emissions. One comment indicated that a MACT analysis for mercury should be performed prior to permit issuance; another comment suggested cutting the permit limit for mercury in half; yet another comment requested a change in the form of the limit for mercury. A comment was also received suggesting a more restrictive permit limit at the rotary hearth furnace for Particulate Matter emissions, a surrogate parameter for emissions of metal HAPs. Other comments suggested that the use of a surrogate parameter "hid" the dangers from HAP emissions and urged individual limits for these pollutants. One comment demanded a no-discharge dioxin limit in the permit.

119. Part 63 of the Code of Federal Regulations contains the NESHAPs. This set of rules address a list of pollutants (the Hazardous Air Pollutants, or HAPs) primarily through standards set for new and existing facilities in specific source categories. Standards developed under the NESHAP regulation are also referred to as MACT standards. The Clean Air Act Amendments of 1990 described how EPA was to set the standards. For new major facilities in a specific source category, the Act requires that "[t]he maximum degree of reduction in emissions that is deemed achievable for new sources in a category or subcategory shall not be less stringent than the emission control that is achieved in practice by the best controlled similar source, as determined by the Administrator." *Section 112(d)(3) of the Clean Air Act.*

120. The facility proposed by Mesabi Nugget will be a major source of HAPs, with potential emissions of an individual HAP (manganese) exceeding the 10-ton annual threshold and emissions of all HAPs, combined, also exceeding the 25-ton annual threshold. However, the iron nugget process proposed by Mesabi Nugget has not yet been demonstrated in practice. EPA has not developed a set of standards for this source category. In this situation, the conditions of 40 CFR 63 Subpart B must be followed; a case-by-case determination of the MACT is required.

121. EPA has delegated to Minnesota the authority to implement 40 CFR 63 Subpart B, which the state typically conducts during the permitting process. The methodology described in Subpart B follows the requirements of the Act. A case-by-case MACT determination does not consider the risk posed by the HAPs, but focuses on controls achieved in practice. (A portion of the NESHAPs addresses risk, but those provisions do not apply to this initial determination of MACT.)

122. In accordance with 40 CFR 63 Subpart B and guidance from the EPA, the MPCA performed a case-by-case MACT analysis. A MACT analysis for a new source category (Iron Nugget Production) involves the identification of the best controlled facility in that source category. Since no other facilities exist, the best controlled facility in the Iron Nugget Production source category is the facility proposed to be built near Hoyt Lakes, Minnesota. Most of those controls for hazardous air pollutants at the facility result from MPCA's BACT determinations.

123. Many of the NESHAPs that have been promulgated combine similar pollutants and monitor one of those pollutants or another pollutant for which a testing methodology has been established. This permit followed that form. In performing the MACT determination for Mesabi Nugget, the MPCA used particulate matter (front-catch) as a surrogate parameter for metal HAPs. At the temperatures

anticipated in the wet scrubber or in a baghouse, the metal will be in solid (i.e., particulate) form and will tend to associate with other particulate matter. For that reason, front-catch (or filterable) particulate matter works well as a surrogate parameter for metal HAPs.

124. Volatile HAPs are a subset of the volatile organic compounds driven off the fuels in the rotary hearth furnace or formed during combustion in the RHF. Effective post-furnace combustion by the air infiltration system ensures that volatile HAPs are reduced. The same control system reduces the concentrations of VOCs and carbon monoxide, so proper operation of the air infiltration system can be assured by monitoring CO downstream of the control device. Thus, low CO concentrations (i.e., compliance with the BACT limit for CO concentration) provide assurance that volatile organic HAPs are controlled; measuring the CO concentration is a good surrogate for measuring control of volatile HAPs. The permit requires that a continuous emission monitor for carbon monoxide be installed and operated.

125. Similarly, sulfur dioxide emissions are used as a surrogate for acid gas emissions (hydrochloric and hydrofluoric acids) from the RHF. These molecules all behave as acids and have an affinity for water solutions, particularly those with an alkaline pH. The permit requires a continuous emission monitor for SO_2 emissions from the RHF, so the effectiveness of the scrubber to remove acid gas HAPs can be determined on an ongoing basis.

126. One comment requests that the mercury standard be set per unit of production, rather than as a maximum pound per hour limit. While this is the form of the limit that EPA uses most frequently, there are circumstances in which an overall pound per hour limit has been set as MACT. One such case is the National Emission Standard for Hazardous Air Pollutants for Ferroalloys Production: Ferromanganese and Silicomanganese (40 CFR 63, Subpart XXX). In that NESHAP, the particulate limits for the furnaces are set in pounds per hour only. As with the "Iron Nugget Production" source category, that limit applies to only one facility.

127. The MPCA made no changes to the permit as a result of these comments. The methodology used to set MACT limits does not require emissions of HAPs (such as requested for dioxin) to be eliminated or reduced to an arbitrary level (such as requested for mercury and metal HAPs). The process simply requires that a new facility be controlled to the same level as the best facility in that source category. In this case, the best-controlled facility in the Iron Nugget Production category is the proposed facility.

128. In setting the mercury limit, it is important to realize that the relationship between production rate and mercury emissions has not been well-established. However, the maximum pound per hour limit provides a backstop below which the facility must be operated under all circumstances. As the facility is operated, more data will become available. If several iron nugget facilities are built, EPA will likely use that data to develop and promulgate a NESHAP for Iron Nugget Production. Since more than one iron nugget facility will then exist, the mercury limit will probably change form to be one that can be applied at a variety of sizes of facilities. For the first facility, that is not needed.

COMMENT RE: THE PROPOSED MERCURY REDUCTION PROGRAM AND MPCA RESPONSE

129. Commenters requested the best control process for Mesabi Nugget baseline; an accountable and enforceable reduction effort; and a quicker pace for the mercury reduction program. Also, a comment requested a change to the performance test requirement indicating that the mercury reduction goal is at least a 50 percent reduction.

130. The permit limits the pound per hour mercury emissions from the facility so the annual total mercury emissions may not exceed 75 pounds. This reflects the mercury emissions from the facility after the furnace off-gas passes through a wet scrubber, which removes a small fraction of the mercury.

131. The Mesabi Nugget project was exempted from environmental review under legislation passed in 2004 (Laws of Minnesota Chapter 220). However, this law required the MPCA to "strive … to assure the lowest mercury emissions reasonably possible" in the permit process. This legislation and the MPCA's own concern about the level of mercury emissions from this facility led the MPCA to require Mesabi Nugget to fill out the MPCA's HG-2003 form. This form requires an investigation into potential control technologies. After its review of the form, the MPCA discussed a number of the control alternatives identified in that document with Mesabi Nugget. However, no control technologies were determined to be "reasonably possible" at this time.

132. Still, the MPCA believed that additional research should be conducted to identify potential options and then test them in practice. The MPCA drafted permit language requiring that Mesabi Nugget undertake a number of activities designed to lead to reduction in mercury emissions of at least 50 percent.

133. The permit requires that Mesabi Nugget present the MPCA (at least) three options that can be implemented at the RHF to reduce mercury emissions. Prior to preparing this report, Mesabi Nugget must have performed the necessary research at its facility to determine how well the tested technologies work in practice. The MPCA allowed 18 months for this research to be performed.

134. The MPCA fulfilled the requirements of the state's legislation by examining existing technologies for removing mercury from the off-gases from the rotary hearth furnace. The MPCA found that the current mercury control technology, the wet scrubber, removes ionic mercury very well. In this evaluation, however, no proven control technology was identified that could effectively remove the elemental mercury that comprises the majority of the mercury generated at the rotary hearth furnace. To identify such a control technology, the MPCA requires that Mesabi Nugget conduct a mercury reduction effort. The mercury reduction effort is intended to identify controls that reduce emissions of elemental mercury by at least 50 percent. The baseline on which the reduction effort is based will be measured using the current set of controls (i.e., the wet scrubber).

135. After the facility is able to operate under steady-state conditions (i.e., after the Initial Performance Test Trigger Date), Mesabi Nugget must initiate a research effort that results, in part, in a report that presents three options to the MPCA. Eighteen months is not an extremely long period in which to conduct that research and prepare a report.

136. The option approved by the MPCA will be implemented by Mesabi Nugget. Any changes to the mercury emission limits will be made through the major amendment process with its public participation requirements. All submitted public documents resulting from this effort will be available by request from the MPCA.

137. The permit language related to the performance test requirement was changed to read: "Conduct a performance test for mercury at least 60 days after but not more than 180 days after implementing the selected option to implement the goal of achieving at least a fifty percent reduction in baseline mercury emissions."

FINAL DETERMINATION ON WHETHER TO ISSUE PERMIT

138. Minn. R. 7007.1000, subp. 1, states:

> ***Preconditions for issuance.*** *The agency shall issue a permit or permit amendment, or reissue a permit only if it determines that all of the following conditions have been met:*
>
> *A. The agency has received a complete application for a permit, permit amendment, or permit reissuance, except that a complete application need not be received before issuance of a general permit under part 7007.1100, subpart 4.*
>
> *B. The agency has complied with the public participation procedures for permit issuance, if required by part 7007.0850.*
>
> *C. The agency has complied with the procedures for notifying and responding to affected states, if required by part 7007.0900.*
>
> *D. If the administrator's review is required by part 7007.0950, the administrator has received a copy of the permit and any notices required and has not objected to issuance of the permit within the time period specified, or the administrator has objected but the objection has been resolved to the administrator's satisfaction.*
>
> *E. The conditions of the permit provide for compliance with all applicable requirements and the requirements of parts 7007.0100 to 7007.1850, or include a schedule to achieve such compliance.*
>
> *F. The permit does not reflect a variance from any federally enforceable applicable requirement or requirement of parts 7007.0100 to 7007.1850.*
>
> *G. The agency anticipates that the applicant will, with respect to the stationary source and activity to be permitted, comply with all conditions of the permit.*
>
> *H. All applicable provisions of Minnesota Statutes, chapter 116D, and the rules adopted under Minnesota Statutes, chapter 116D, have been fulfilled.*

Each of these preconditions is addressed in turn below.

139. **Receipt of Application.** The requirement of Subitem A has been met. For the purposes of Part 70 and PSD review, a complete application was received from Mesabi Nugget, LLC on May 11, 2005.

140. **Public Participation Procedures.** The requirement of Subitem B has been met. The public participation described in finding 11 demonstrates compliance with the public participation procedures applicable to this permit under Minn. R. ch. 7007.

141. **Affected States.** The requirement of Subitem C, to notify and respond to affected states under Minn. R. 7007.0900 has been met.

142. **EPA Review.** The requirement of subitem D has been met. EPA Region 5 office has been included on all public notice mailings. At the start of the public notice for comment on the draft permit, a copy of the draft permit and technical support document was sent to EPA Region 5. For proposed new construction or modifications, EPA must comment during the 30-day public comment period.

143. **Permit Covers All Applicable Requirements.** The requirement of Subitem E has been met. Compliance with the permit provides for compliance with all "applicable requirements," as that term is defined in the MPCA's rule at Minn. R. 7007.0100, subp. 7, to which the Project would be subject. The permit also provides for compliance with all the requirements of Minn. R. 7007.0050 to 7007.1850, in particular by requiring that any changes or modifications to the Project be performed in compliance with Minn. R. 7007.1150 to 7007.1500.

144. **No Variance.** The requirement of Subitem F is met. The permit does not reflect a variance from any federally enforceable applicable requirement, or the requirements of Minn. R. ch. 7007.

145. **Compliance Anticipated.** The requirement of Subitem G is met. The MPCA anticipates that Mesabi Nugget will comply with the conditions of the permit. The limitations are technologically feasible and clearly expressed, and the permit includes monitoring and reporting requirements to insure the enforceability of the permit's conditions.

146. **Compliance with Chapter 116D.** All applicable provisions of Subitem H have been met. The emissions from the Project, as controlled by the terms of the permit, are not likely to cause pollution, impairment or destruction in accordance with Minn. Stat. § 116D.04, subd. 6. In addition, by legislative act, the Project is exempt from environmental review under Minn. Stat. chapter 116D and Minn. R. chapter 4410.

147. Minn. R. 7007.1000, subp. 2 provides seven grounds on which the MPCA can refuse to issue the permit. The MPCA finds that that none of the grounds for denial apply to this permit action.

CONCLUSIONS OF LAW

148. All procedural requirements applicable to the issuance of the proposed Air Emission Permit have been met.

149. The findings of the MPCA justify issuance of the permit and do not support denial of the application for a permit.

150. Any finding more properly considered a conclusion shall be considered a conclusion. Any conclusion more properly considered a finding shall be considered a finding.

ORDER

The Minnesota Pollution Control Agency approves issuance of the attached Air Emission Permit No. 13700318-001 to Mesabi Nugget, LLC.

IT IS SO ORDERED

_____

Commissioner Sheryl A. Corrigan
Chair, Citizens' Board
Minnesota Pollution Control Agency

_____

Date