Cleveland-Cliffs

November 6, 2008

Mr. Todd Biewen
Air Assessment and Environmental Data Management Section
Environmental Analysis and Outcomes Division
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Re: BART Determinations for BART-Affected Electric Generating Units in Minnesota
Northshore Mining Company / Silver Bay Power Company

Dear Mr. Biewen:

This letter is written in response to your August 28, 2008 letter regarding BART determinations which relied on the Clear Air Interstate Rule as substitution for BART. Your letter outlined three specific questions which are restated below with Silver Bay Power's responses directly following each one.

1. *Mobotec's ROFA/Rotamix technology is identified as a potential control technology for both NOx and SO2, but lacks an assessment regarding feasibility and cost. Given the successful application of the technology at Minnesota Power's Taconite Harbor facility, please include the ROFA/Rotamix technology in a revised BART analysis.*

While Silver Bay Power understands that the Mobotec installation at Taconite Harbor has shown some measure of emissions reductions, it is also understood that it also faces some challenges to achieve the reductions anticipated, especially on a long-term basis.

With that being said, please find attached a letter update to the 2006 BART analysis for Unit 2 that considers the Mobotec ROFA/Rotamix technology and its potential applicability for Silver Bay Power Unit 2. As noted in the update, the initial BART determination from 2006 does not change after the evaluation of the Mobotec technology.

2. *For each control technology scenario considered (NOx, SO2 and particulate matter) please identify the source of the cost estimate (for example, whether an EPA cost calculator, engineering estimate or vendor quote was used).*

Attached is a table entitled "Northshore Power House Unit #2 BART Emission Control Cost Analysis: Cost Basis Summary." This table outlines the source of the cost estimates for the control technologies considered in the 2006 BART analysis for Unit 2.

3. *Describe the age and condition of Unit 2, and its expected useful life. These conditions can be weighed in the MPCA's BART determination process.*

The 'expected useful life' is difficult to estimate. The design engineers originally targeted designs for a 30 year unit life, but history throughout the industry has demonstrated that units which have been reasonably operated and maintained can have much longer useful life.

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That said, Unit 2 began operation in 1963 and already has over 40 years of service life. Although Silver Bay Power's assessment is that the unit is in decent condition today, as wear increases, it will be difficult to predict the expected life of Unit 2 going forward—a fact that MPCA should consider in making its BART determination.

Silver Bay Power urges MPCA to consider Silver Bay's unique situation and hold off on any BART designations for its Unit 2 for numerous reasons, including, but not limited to:

1. Silver Bay Power remains in the unique situation as having the only non-utility cogeneration units operating in Minnesota that were subject to the previous version of CAIR. As such, Silver Bay does not have the opportunity to pass through its pollution control costs via the utility ratemaking process. Being singled out in this manner will particularly harm Silver Bay Power where the BART determination is not cost effective and Silver Bay's large private customer has significantly curtailed its production and related electricity demand;

2. MPCA has already stated that it will get all the reductions it needs from the power industry under the old CAIR. It is well known that revised CAIR rules or a forthcoming alternative, is in the making and a priority for the new administration. The whole goal of cap and trade systems under the old CAIR is to make the most reductions in the most cost effective manner. Silver Bay Power has already presented (on multiple occasions) creative and voluntary reductions which may provide greater business benefit and greater environmental benefit. Locking in a BART determination today that could hamstring the facility's ability to make more favorable alternatives work in the near future;

3. Unit 2 began operation in 1963 and already has over 40 years of service life. Although Silver Bay Power's assessment is that the unit is in decent condition today, as wear increases, it will be difficult to predict the expected life of Unit 2 going forward. As such, MPCA should also consider the life cycle benefit before designating BART technologies with significant capital costs.

Silver Bay Power looks forward to an open dialogue with MPCA that could explore these options. If you have any questions regarding this information, please contact me at (218) 226-6076

Sincerely,

Scott A. Gischia, P.E.
Section Manager, Environmental Services

Cc: M. Mlinar, Northshore Mining Company
B. Bundschuh, Silver Bay Power
D. Cartella, Cliffs Natural Resources

Northshore Power House Unit #2
BART Emission Control Cost Analysis
Cost Basis Summary

Cost Estimate Item	Basis
Table A-4: PM Control - Wet ESP	
Direct Capital Cost	Total Direct Capital Cost Cost Estimated, 19% as compared to dry ESP cost. Calculations per EPA Air Pollution Control Cost Manual 6th Ed 2002, Section 6 Chapter 3
Maintenance Labor	ESP Maintenance costs Eq 3.45 EPA Cont Cost Manual Section 6 Chapter 3
Maintenance Materials	ESP Maintenance Materials Eq 3.45 EPA Cont Cost Manual Section 6 Chapter 3
Retrofit	CUECost Workbook Version 1.0, USEPA Document Page 2.
Table A-5: PM Control - Dry ESP	
Direct Capital Cost	Total Direct Capital Cost Cost Estimated using the Integrated Air Pollution Control Sytem Program Version 5a, EPA May 1999
ESP Electrical Cost Estimate	Calculations per EPA Air Pollution Control Cost Manual 6th Ed 2002, Section 6 Chapter 3. Used an ESP SCA grid factor of 553 ft2/1000 acfm
Maintenance Labor	ESP Maintenance costs Eq 3.45 EPA Cont Cost Manual Section 6 Chapter 3
Maintenance Materials	ESP Maintenance Materials Eq 3.45 EPA Cont Cost Manual Section 6 Chapter 3
Retrofit	CUECost Workbook Version 1.0, USEPA Document Page 2.

Northshore Power House Unit #2
BART Emission Control Cost Analysis
Cost Basis Summary

Cost Estimate Item	Basis
Table A-6: PM Control -Baghouse	
Direct Capital Cost	Total Direct Capital Cost Cost Estimated using the Integrated Air Pollution Control Sytem Program Version 5a, EPA May 1999 Model input scaled to 312 MW (=192 MW * 801500 ACFM / 493400 ACFM)
Replacement Parts and Equipment	Calculations per EPA Air Pollution Control Cost Manual 6th Ed 2002, Section 6 Chapter 1
Utiilities	Compressed air for baghouse assumed to be 2 scfm / 1000 acfm EPA Air Pollution Control Cost Manual 6th Ed 2002, Section 6 Chapter 1.5.1.8
Utiilities	Bag replacement at 10 min/bag EPA Cost Cont Manual 6th ed Section 6 Chapter 1.5.1.4 lists replacement times from 5 - 20 min per bag.
Retrofit	CUECost Workbook Version 1.0, USEPA Document Page 2.
Table A-7: SO2 Control - Wet ESP	
Direct Capital Cost	Total Direct Capital Cost Cost Estimated, 19% as compared to dry ESP cost.
ESP Electrical Cost Estimate	Calculations per EPA Air Pollution Control Cost Manual 6th Ed 2002, Section 6 Chapter 3
Maintenance Labor	ESP Maintenance costs Eq 3.45 EPA Cont Cost Manual Section 6 Chapter 3
Maintenance Materials	ESP Maintenance Materials Eq 3.45 EPA Cont Cost Manual Section 6 Chapter 3
Retrofit	CUECost Workbook Version 1.0, USEPA Document Page 2.

Northshore Power House Unit #2
BART Emission Control Cost Analysis
Cost Basis Summary

Cost Estimate Item	Basis
Table A-8: SO2 Absorber	
Direct Capital Cost	Original estimate was from Durr. Use 0.6 Powerlaw factor to adjust price to stack flow rate from bid basis of 500,000 acfm.
Reagent Use & Other Operating Costs	Liquid/Gas ratio = 38 L/G = Gal/1,000 acf.
Water Make-up Rate	Water Makeup Rate/Wastewater Discharge = 2.0% of circulating water rate.
Evaporation Rate	Evaporation rate calculated from steam table in Basic Principles and Calculations in Chemical Engineering Third Edition.
Retrofit	CUECost Workbook Version 1.0, USEPA Document Page 2.
Table A-9: SO2 Control - Spray Dryer and Baghouse	
Direct Capital Cost	Stone and Webster 2002 total direct installed cost estimate adjusted for inflation
Baghouse Filter Cost	Calculations per EPA Air Pollution Control Cost Manual 6th Ed 2002, Section 6 Chapter 1
Utiilities	Compressed air for baghouse assumed to be 2 scfm / 1000 acfm EPA Air Pollution Control Cost Manual 6th Ed 2002, Section 6 Chapter 1.5.1.8
Utiilities	Bag replacement at 10 min/bag EPA Cost Cont Manual 6th ed Section 6 Chapter 1.5.1.4 lists replacement times from 5 - 20 min per bag.
Utiilities	Bag replacement costs for baghouse need to be updated. Bag costs from EPA example calculations were used.
Retrofit	CUECost Workbook Version 1.0, USEPA Document Page 2.

Northshore Power House Unit #2
BART Emission Control Cost Analysis
Cost Basis Summary

Cost Estimate Item	Basis
Table A-10: SO2 Control - Dry Sorbent Injection and Baghouse	
Purchase Equipment	Total Direct Capital Cost Cost Estimated using the Integrated Air Pollution Control Sytem Program Version 5a, EPA May 1999
Baghouse Filter Cost	Calculations per EPA Air Pollution Control Cost Manual 6th Ed 2002, Section 6 Chapter 1
Utiilities	Compressed air for baghouse assumed to be 2 scfm / 1000 acfm EPA Air Pollution Control Cost Manual 6th Ed 2002, Section 6 Chapter 1.5.1.8
Utiilities	Bag replacement at 10 min/bag EPA Cost Cont Manual 6th ed Section 6 Chapter 1.5.1.4 lists replacement times from 5 - 20 min per bag.
Installation	Stone and Webster 2002 total direct installed cost estimate adjusted for inflation adjusted for costs already included
Retrofit	CUECost Workbook Version 1.0, USEPA Document Page 2.
Table A-11: NOx Control - Selective Catalytic Reduction (SCR) with Reheat	
Direct Capital Cost	Estimation Equipment Cost per EPA Air Pollution Control Cost, Manual 6th Ed. 2002, Section 4.2 Chapter 2.
Utiilities	Calculations per EPA Air Pollution Control Cost Manual 6th Ed 2002, Section 4.2 Chapter 2.
Retrofit	CUECost Workbook Version 1.0, USEPA Document Page 2.
Ammonia Usage	Ammonia usage based on estimate from Vogt Power and scaled linearly using stack flow rate.
Table A-12: Cost of Flue Gas Re-Heating (Thermal Oxidizer)	
Direct Capital Cost	Equipment cost estimate EPA Air Pollution Control Cost Manual 6th Ed 2002, Section 3.2 Chapter 2.5.1
Utiilities	Calculations per EPA Air Pollution Control Cost Manual 6th Ed 2002, Section 3.2 Chapter 2
Table A-13: NOx Control - Selective Non-Catalytic Reduction (SNCR)	
Direct Capital Cost	Estimated Equipment Cost per Alstom report March, 2006. Installation cost included.
Reagent Use & Other Operating Costs	Reagent Use per EPA Air Pollution Control Cost Manual 6th Ed 2002, Section 4.2 Chapter 1 Eq 1.22
Reagent Use & Other Operating Costs	Water use per EPA Air Pollution Control Cost Manual 6th Ed 2002, Section 4.2 Chapter 1 Eq 1.25

Northshore Power House Unit #2
BART Emission Control Cost Analysis
Cost Basis Summary

Cost Estimate Item	Basis
Utiilities	SNCR Electrical Demand per EPA Air Pollution Control Cost Manual 6th Ed 2002, Section 4.2 Chapter 1 Eq 1.23
Maintenance Total	SNCR Maintenance Costs EPA Air Pollution Control Cost Manual 6th Ed 2002, Section 4.2 Chapter 1 Eq 1.21
Table A-14: NOx Control - LNB (Low NOx Burners) + Over Fire Air (OFA)	
Direct Capital Cost	Total Direct Capital Cost Cost Estimated using the Integrated Air Pollution Control Sytem Program Version 5a, EPA May 1999
Maintenance Labor	Assumed 0.1 hr/shift operatior and maintenance labor for LNB

Northshore Power House Unit #2
BART Emission Control Cost Analysis
Cost Basis Summary

Cost Estimate Item	Basis
Table A-15: NOx Control - LNB (Low NOx Burners)	
Direct Capital Cost	Total Direct Capital Cost Cost Estimated using the Integrated Air Pollution Control Sytem Program Version 5a, EPA May 1999
Maintenance Labor	Assumed 0.1 hr/shift operatior and maintenance labor for LNB
Table A-16: NOx Control - LNB (Low NOx Burners) + Over Fire Air (OFA) + reburn	
Direct Capital Cost	Total Direct Capital Cost Cost Estimated using the Integrated Air Pollution Control Sytem Program Version 5a, EPA May 1999
Maintenance Labor	Assumed 0.2 hr/shift operatior and maintenance labor for LNB and reburn
Direct Capital Cost	Assumed cost of low NOX burner costs for reburn burner costs. LNB were estimated at $100,000 per burner
Table A-2A: SO2 and NOx Control - ROFA-Rotamix + FSI	
Direct Capital Cost	Purchased equipment cost estimate from vendor
Total Capital Investment	Total Capital Investment cost estimates from vendor