

12 Environmental Issues

GENERAL DISCUSSION

Otter Tail employees are involved with other groups in a variety of organizations to keep informed on various environmental issues. Edison Electric Institute (EEI), the Utility Air Regulatory Group, MAPP, and the Lignite Energy Council all provide information exchange on environmental issues. On an individual basis, employees participate in EPRI conferences, Air and Waste Management Conferences, and MPCA task forces and other informational meetings. Otter Tail, along with other government and industrial entities, funds various types of research projects such as the Energy and Environment Research Center's (EERC) Coal-Ash Research Resources Consortium (CARRC), the Center for Air Toxic Metals (CATM) and the Plains CO₂ Reduction Partnership (PCOR). The CARRC was established to evaluate potential beneficial uses of coal combustion by-products. CATM is devoted to the study of the emission, control, and fate of hazardous air pollutants with primary emphasis on mercury. PCOR is a diverse group of public and private sector stakeholders working together to better understand the technical and economic feasibility of capturing and storing CO₂ emissions from stationary sources of CO₂ in the northern Great Plains and adjacent areas.

ENVIRONMENTAL EXTERNALITIES

The Commission states in its Order Establishing Environmental Cost Values, Docket E-999/CI-93-583, that utilities shall use the values adopted in the Order in resource selection proceedings by providing estimates of the cost of resource options at the following three levels: (1) the direct cost of resources without regard to environmental externalities, (2) the direct cost plus the minimum values in the ranges specified, and (3) the direct cost plus the maximum values in the range specified. The order also states that these values shall not apply to the decisions regarding the dispatch of electric power from existing facilities. On April 27, 2005, the Commission issued a notice of updated environmental externality values. These values were used in this analysis.

All of Otter Tail's affected generating facilities fall in either the Rural or Within 200 miles of Minnesota categories. These values were used for applying externalities to Otter Tail's generating facilities. Coyote Station, located near Beulah, North Dakota, lies beyond 200 miles from the Minnesota border so

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it is exempt from environmental externality values. Big Stone Plant, near Big Stone City, South Dakota, is not subject to carbon dioxide externalities as per the Commission's ruling. The Hoot Lake Plant, in Fergus Falls, MN is subject to all externalities. As of the year 2000, all sulfur dioxide environmental externality values went to zero dollars. Due to the complexities involved in tracking the source of purchased power, no attempt was made to estimate emissions associated with short-term opportunity purchases from unknown sources. Most of the company's current long-term purchases are from hydro facilities located in Manitoba.

SULFUR DIOXIDE AND NITROGEN OXIDES

Acid Rain Program

The Clean Air Act Amendments of 1990 (CAAA) imposed requirements on power plants in an effort to reduce national emissions of sulfur dioxide (SO₂) and nitrogen oxides (NO_x) for the purpose of reducing acid deposition.

The national SO₂ emission reduction goals are achieved through a market-based system under which power plants are allocated "emissions allowances" that will require plants to either reduce their emissions or acquire allowances from others to achieve compliance. Each allowance is an authorization to emit one ton of SO₂. Sulfur dioxide allowance requirements are currently being met by all of Otter Tail's generating facilities by burning low sulfur subbituminous coal at its Big Stone and Hoot Lake Plants. Coyote Station, a lignite-fired unit, is equipped with a spray dryer and fabric filter for control of sulfur dioxide and particulate emissions. Coyote Station is able to operate within its SO₂ allowance allocation by removing more SO₂ from the flue gases than would otherwise be required by existing emission permit requirements. Based on current projections from the Acid Rain Program and the recently signed Clean Air Interstate Rule, Otter Tail should not encounter an allowance deficit until late into the planning period. With the regulatory uncertainty that exists with regard to environmental issues, the company has not yet identified a plan for meeting those allowance deficits.

The national NO_x emission reduction goals are achieved by imposing mandatory emission rate standards on individual sources. Hoot Lake Plant unit 2 is governed by the CAAA phase I early opt-in provision

until January 1, 2008. Low NO_x burners were installed on Hoot Lake Plant unit 3 at a minimal cost. An over-fire air system was installed at Big Stone Plant and it successfully reduced that unit's NO_x emissions below CAAA requirements. Coyote Station did not require any changes in order to meet the CAAA NO_x emission requirements.

Clean Air Interstate Rule

On March 10, 2005 the Environmental Protection Agency (EPA) signed a rule to reduce interstate transport of fine particulate matter and ozone called the Clean Air Interstate Rule (CAIR). CAIR provides a Federal framework to substantially reduce sulfur dioxide and nitrogen oxides across 28 states and the District of Columbia, including Minnesota. EPA anticipates that states will achieve this primarily by reducing emissions from the power generation sector. The first phase of NO_x reductions will cover 2009 – 2014 and the first phase of SO₂ reductions will cover 2010 – 2014; the second phase of reductions for NO_x and SO₂ covers 2015 and thereafter.

States must achieve the required emission reductions using one of two compliance options: 1) meet the state's emission budget by requiring power plants to participate in an EPA-administered interstate cap and trade system that caps emissions in two stages, or 2) meet an individual state emissions budget through measures of the state's choosing. CAIR includes a model cap and trade program that States can choose to adopt to comply with the first option. The model cap and trade program would surrender SO₂ allowances already allocated under the Acid Rain Program at a 2:1 ratio during the first phase, and a 2.86:1 ratio during the second phase. For NO_x, states would allocate their state budgets according to a heat-input based allowance allocation methodology described in CAIR. State budgets for NO_x were set by determining a statewide historical heat input and multiplying by 0.15 lb/mmbtu for the first phase and 0.125 lb/mmbtu for the second phase.

Since states have until September 11, 2006 to submit plans for approval to EPA on how they plan to comply with the CAIR rule, it is unknown the exact effect this rule will have on the Hoot Lake Plant.

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HAZARDOUS AIR POLLUTANTS

Mercury

The Commission declined to impose specific filing requirements for mercury in its Order Establishing Environmental Cost Values. To highlight the importance of the mercury issue generally, however, the Commission did impose a more general requirement that the utilities qualitatively explain in their filings how mercury emissions were considered in their evaluation of resource options.

Otter Tail's base plan acts to minimize mercury emissions in a number of ways. First of all there is a diverse mix of resources. The peaking resource would be fueled primarily by natural gas and fuel oil and operate very few hours a year. A significant percentage of the proposed plan comes from renewable resources and conservation. Any new baseload coal-fired resource would be subject to mercury emission regulations in place at the time of construction. In addition, the company participates in and sponsors research relating to mercury emissions from existing coal-fired plants as noted in Table 12-A.

Table 12-A Mercury Emissions			
Project Name	Combustion/Mercury Control Technology/	Principle Investigator	Project Budget
Mercury Control Technologies for Electric Utilities Burning Lignite Coals Phase II	PC units – fabric filter	EERC	\$2,600,000 to \$4,800,000
Center for Air Toxic Metals	Various basic research	EERC	\$1,300,000
Pilot and Full-Scale Demonstration of Advanced Mercury Control Technologies for Lignite-Fired Power Plants	Various technologies	EERC	\$1,300,000
Enhancing Carbon Reactivity in Mercury Control in Lignite-Fired Systems	Enhance capability of carbon sorbents using a variety of emission control technologies	EERC	\$5,800,000
Large-Scale Mercury Control Technology Testing for Lignite-Fired Utilities – Oxidation Systems for Wet FGD	Wet flue gas desulfurization systems.	EERC	\$2,150,000

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The 1999 Mercury Reduction Act set a goal for reducing mercury emissions to air and water from Minnesota sources by 60 percent from 1990 levels by 2000, and by 70 percent from 1990 levels by 2005. Otter Tail has agreed to participate in the MPCA Voluntary Mercury Contamination Reduction Initiative. The following is a summary of the Company's accomplishments through 2004:

- Otter Tail joined with the local City of Fergus Falls and Otter Tail County to reduce the amount of mercury disposed of in the local solid waste stream. Currently solid waste from the city and several surrounding counties is burned at the Fergus Falls waste to energy incinerator. By removing the products containing mercury from the waste stream, there should be a significant decrease in mercury emissions from the incinerator.

The first step in the plan was to introduce a ban on the sale of mercury fever thermometers in the City of Fergus Falls. The concept was introduced to the City Council of Fergus Falls on November 6, 2000 and was well received. The ordinance passed and was effective December 30, 2000. Since that time the Minnesota Legislature has passed a statewide ban of mercury thermometers.

- Otter Tail County has conducted mercury thermometer exchange programs. During 2000 a locally conducted exchange in Fergus Falls in October netted the collection of 373 thermometers, which resulted in the recycling of 11.4 pounds of mercury thermometers and a few switches.

During 2001 Otter Tail donated 576 digital thermometers to Otter Tail County for their exchange program. \$1,782 was spent to purchase the thermometers. Collections were held in eight communities from spring through the fall of 2001. There were 1,111 participants with 798 mercury thermometers collected. This amounted to about 15 pounds of mercury recovered and removed from possible exposure to the environment.

- Education on the proper handling and disposal of mercury wastes is also part of the Mercury reduction plan. During February 2001, Otter Tail personnel participated in electrical contractor training and discussed disposal options to approximately 100 electrical contractors.

On March 15, 2005, EPA issued the first-ever federal rule to permanently cap and reduce mercury

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emissions from coal-fired power plants. The Clean Air Mercury Rule (CAMR) establishes “standards of performance” limiting mercury emissions from new and existing coal-fired power plants and creates a market-based cap-and-trade program that will reduce nationwide utility emissions of mercury in two distinct phases. The first phase cap in 2010 is 38 tons and emissions will be reduced by taking advantage of “co-benefit” reductions – that is, mercury reductions achieved by reducing SO₂ and NO_x emissions under CAIR. In the second phase, due in 2018, coal-fired power plants will be subject to a second cap, which will reduce emissions to 15 tons upon full implementation. New coal-fired power plants (“new” means construction starting on or after Jan. 30, 2004) will have to meet stringent new source performance standards in addition to being subject to the caps.

In CAMR, EPA has assigned each state and two tribes an emissions budget for mercury, and each state must submit a State Implementation Plan revision detailing how it will meet its budget for reducing mercury from coal-fired power plants. States may join the trading program by adopting the model trading rule in state regulations, or they may adopt regulations that mirror the necessary components of the model trading rule. Since states have until September 2006 to submit plans for approval to EPA on how they plan to comply with the CAMR rule, it is unknown the exact effect this rule will have on Otter Tail Power Company. Adding to the uncertainty of the outcome of mercury regulation is the lawsuits that were immediately filed against CAMR after the rule was published in the *Federal Register* on May 18, 2005.

Non-Mercury Hazardous Air Pollutants

The CAAA called for EPA studies on the effects of emissions of listed hazardous air pollutants (HAP) by electric steam generating plants. Completed in 1998, the studies indicated that either there was no significant concern from a public health standpoint for these HAP or that further analyses were needed. Additionally, as part of the recent Clean Air Mercury Rule, EPA concluded that regulation of any non-mercury HAP was not appropriate or necessary, and also stated that it has neither discovered new information or received such information on any hazards to public health that invalidates this conclusion.

REGIONAL HAZE PROGRAM

The Commission's Order in the Company's 2002 resource plan filing (Docket No. E-017/RP-02-1168) requires the Company to provide a more detailed analysis of the Hoot Lake Plant Unit 3's and the Big Stone Plant's effects on Minnesota Class I areas of the Boundary Waters Canoe Area Wilderness and Voyager's National Park. Otter Tail has assumed this PUC order item originated with regional haze in mind since EPA's regional haze rule addresses visibility impairment at Class I areas. However, the regional haze rule provisions for identifying sources subject to best available retrofit technology (BART) have not been finalized. The type of Class I area analysis that will be required, if any, of Hoot Lake Plant Unit 3 and Big Stone Plant is dependent upon EPA finalizing those provisions. Additionally, EPA has not yet developed any modeling protocol guidelines for the proposed BART air quality assessment model. It is still impractical for the Company to attempt to model impacts on Class I areas when the modeling protocol has not yet been established. Following is a more detailed regulatory background and discussion of the regional haze rule.

According to the first regional haze rule promulgated on July 1, 1999, states were required to assess the degree of visibility improvement resulting from the application of BART at all sources in the region of a Class I area. This application of "group BART" was challenged in court, and on May 24, 2002 the D.C. Circuit vacated and remanded the rule's BART provisions. On May 5, 2004 new BART guidelines and revisions to the regional haze rule were proposed to respond to the court ruling. Under the proposed BART guidelines, Hoot Lake Plant Unit 3 and Big Stone Plant are classified as BART-eligible sources. The guidelines further describe the options by which a State can determine if a BART-eligible source will be subject to BART. Per a consent decree, these provisions are scheduled to be finalized by June 15, 2005. As of this writing, the provisions have been signed but Otter Tail has not received a copy.

Depending on the format of the final rule and the BART determination options available, it is uncertain what type of Class I area analysis, if any, will be necessary to determine which sources are subject to BART. If the individual exemption process is followed, the proposed air quality assessment model is CALPUFF. EPA acknowledged in the final rule that the application of CALPUFF becomes more demanding for distances greater than 200km from a Class I area, and therefore they proposed that a written modeling protocol be developed for these sources. This unique situation is applicable to Otter

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Tail since the closest Class I area to Hoot Lake Plant Unit 3 and Big Stone Plant is the Rainbow Lakes Wilderness Area in Wisconsin, which is over 400 km from Big Stone and around 325-350 km from Hoot Lake Plant. Otter Tail believes any type of Class I area modeling at these extreme distances could be significantly complicated considering that EPA has not yet provided any guidelines for developing a modeling protocol.

EPA is also considering alternative approaches to the CALPUFF model to serve as a first step in the individual exemption process. One of these approaches involves the use of look-up tables, where if a BART-eligible source has emissions less than the total shown on the table for a given distance from a Class I area, the State could exempt the source from BART. According to a look-up table referenced by the proposed rule, Hoot Lake Plant Unit 3 could be exempted from BART.

Finally, it should be noted that once the BART guidelines and criteria for BART-alternative programs are finalized, EPA will make a determination whether the Clean Air Interstate Rule makes greater progress in reducing regional haze than BART. This determination could potentially exempt any BART-eligible units subject to CAIR from BART. Hoot Lake Plant unit 3 is a BART-eligible unit included in the CAIR, and would therefore be exempted from BART if this provision were realized.

NATIONAL AMBIENT AIR QUALITY STANDARDS

The EPA revised the National Ambient Air Quality Standards for particulate matter and ground-level ozone. None of the counties where Otter Tail generating facilities are located have been classified as “non-attainment” areas for ozone or particulate matter of 2.5 microns or less.

The Company has improved the fine particulate emissions control at the Big Stone Plant by replacing a major portion of the plant’s electrostatic precipitator in the third quarter of 2002. The replacement technology is an Advanced Hybrid™ technology installed as part of a demonstration project co-funded by the Department of Energy’s National Energy Technology Laboratory Power Plant Improvement Initiative. The technology is designed to capture at least 99.99% of the fly ash particulates emitted from the boiler. The Energy Department cost share is \$6.5 million for the \$13.4 million project. The

Company's share of the project was approximately \$2.86 million. The remaining portion was funded by the Big Stone Plant co-owners and other industry participants.

Initial test data demonstrated the emissions design parameters were met. The Department of Energy's National Energy Technology Laboratory, consultants, equipment vendors and the Utility have assessed the operational performance of the unit and its balance-of-plant impacts as part of the ongoing effort to refine the demonstration technology. As a result of the assessment finding, the Big Stone Plant co-owners replaced the remaining four precipitator fields with Advanced Hybrid™ technology during the plant's spring 2005 maintenance outage.

PENDING FEDERAL AND STATE EMISSIONS REDUCTION ACTIONS

The Commission's Order for the Company's 2002 resource plan filing (Docket No. E-017/RP-02-1168) directed Otter Tail to describe its plans for complying with emissions reductions laws and to report on how environmental initiatives influence the availability of its coal-fired units throughout the planning horizon. As of this writing, neither the U. S. Congress nor any of the states in Otter Tail Power Company's service territory have adopted new emission reduction requirements. A number of draft regulatory proposals have been issued for public comment, and they are awaiting publication as a final rule. The following is a list and brief description of those EPA rules that are of most interest to Otter Tail:

- Prevention of Significant Deterioration ((PSD) and Non-Attainment New Source Review (NSR): equipment Replacement Provision of the Routine Maintenance, Repair and Replacement Exclusion – FR Vol. 68 No. 207 October 27, 2003 – Rule Effective date: December 26, 2004 but stayed by the U. S. Court of Appeals pending further review. This rule would provide additional regulatory certainty by clarifying what types of equipment repairs and replacements are excluded from New Source Review requirements under provisions of the existing routine maintenance, repair and replacement exclusion.
- Standards of Performance for New and Existing Stationary Sources: Electric Generating Units – FR Vol. 70 No. 95 May 18, 2005 – this rule establishes the first-ever rule to reduce mercury emissions from power plants.

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- Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Commonly referred to as the Clean Air Interstate Rule) FR Vol. 70, No 91 May 12, 2005 – the rule targets substantial reductions of SO₂ and NO_x across a multi-state region, including Minnesota. The model rule is based on a cap and trade approach that would be administered in a manner similar to the existing Acid Rain SO₂ allowance program.
- Proposed Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations – FR Vol. 69 No. 87, May 5, 2004 – Target Publication Date per Consent Decree: June 15, 2005. The rule proposes several options that States may use to determine which BART-eligible sources “may reasonably be anticipated to cause or contribute to any impairment of visibility in any mandatory Class I Federal area.” Sources subject to BART would be required to meet SO₂ and NO_x emission rate limits as prescribed by each State.

It is evident from these and other emissions reduction proposals that there is a fundamental desire on the part of regulators to reduce emissions. What is unfortunate is that in absence of comprehensive federal emissions reduction legislation, the emissions reductions are piecemeal, subject to numerous court challenges and litigation, and result in considerable uncertainty.

As a solution to these current problems Otter Tail Power Company supports the Bush Administration’s Clear Skies legislation. Clear Skies offers the following advantages:

- It introduces certainty into the decision-making process for Otter Tail Power Company.
- It allows for successful integration of environmental programs into long-range planning such as scheduling of outages for equipment installation and timing of emission reduction technologies to coincide with other plant construction.
- It allows for long-term planning for capital requirements.
- It reduces the financial impact to the consumer as compared with the current piecemeal approach under the existing Clean Air Act.

A number of proposals are being discussed that would require additional air emissions reductions. Otter Tail is monitoring this regulatory activity and has begun evaluating emission reduction compliance strategies. However, there is no regulatory certainty at this time and that uncertainty is apt to continue

into the immediate future.

The U. S. Senate has not ratified the Kyoto Protocol and it is unlikely to do so without commitments to limit CO₂ emissions from developing countries. Otter Tail continues to follow this issue but has not spent a great amount of time investigating its impacts given the uncertainty of any significant legislation in the immediate future.

MINNESOTA STATUTES §216.1692 EMISSIONS REDUCTION RIDER

The Commission's Order with respect to the Company's 2002 resource plan filing (Docket No. E-017/RP-02-1168) requires the Company to discuss any evaluations of potential emission reduction projects at the Hoot Lake Plant Unit #3 that would qualify under MN Stat. §216B.1692. The statute provides a means for a utility to seek an emissions reduction rider to rate tariffs to seek recovery of qualifying projects, outside of a general rate case, at existing large electric generating power plants located within the state.

During 2002, the Company did review the rate tariff potential of the statute relative to the Hoot Lake #3 facility. The discussions included a review of the Xcel Energy proposal at the time for repowering of two generating facilities and adding a scrubber at a third facility. It was noted that these projects would free up thousands of SO₂ allowances. These three units have almost 33,000 allowances allocated to them, and freeing up 80% of those allowances had an annual value of over \$5,000,000 at that time. Today, in 2005, the value of those freed up allowances could exceed \$15.5 million annually.

The Otter Tail Hoot Lake #3 situation is different in a number of aspects. First, only about 50% of the generating unit is allocated to MN customers. Otter Tail would be required to file general rate cases in the other two states in which the Company serves to recover the other half of the investment. Hoot Lake #3 already has relatively low emissions for both NO_x and SO₂. A number of potential projects was discussed, including:

- Installation of low-NO_x burners – These were already in the budget at the time (they have since been installed) at a cost of \$300,000-\$400,000. It was also questioned as to whether this project

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would qualify under the language of the statute.

- Repowering of the entire Hoot Lake Plant – This would be a significant investment which could increase total capability. It would have been impractical to repower just the #3 unit without doing the #2 unit. Such a project would require transmission studies to determine additional transmission needed. Also, the nearest natural gas pipeline able to support this load is well over 100 miles away and would require a significant additional investment to natural gas infrastructure. A repowering away from the current coal-fired boilers would likely cause the demise of the Otter Tail Valley Railroad as the Hoot Lake Plant represents over 50% of the railroad's annual freight loading.
- Boiler modifications with emissions control for NO_x and SO₂ removal. It was estimated that this would cost \$50,000,000 or more.

A Company effort to reduce emissions would likely begin with the Big Stone Plant. At the time it was felt that greater results with a lower per unit cost could be obtained at this facility. Big Stone Plant does not qualify under the statute since it is located outside of the state. A number of conclusions were reached. It was felt that it would be much better if all three states had similar provisions. It would be much easier for a multi-state utility that operates as a single entity, such as Otter Tail, to make use of such provisions. There are risks associated with moving ahead early on emissions reduction projects. It is possible that future regulations may impose limits that cannot be attained with the emission reduction project and capital investment could be wasted as additional work would be required. Otter Tail noted the June 30, 2006 sunset provision in the statute and the pending Clear Skies Initiative at that time. It was decided to wait for the results of the Clear Skies Initiative and re-evaluate at that time, prior to the expiration of the statute. At this time, Congress has failed to Act on Clear Skies or any other emissions proposal.