NORTH DAKOTA
DEPARTMENT of HEALTH

ENVIRONMENTAL HEALTH SECTION
Gold Seal Center, 918 E. Divide Ave.
Bismarck, ND 58501-1947
701.328.5200 (fax)
www.ndhealth.gov

February 23, 2010

Ms. Mary Jo Roth
Manager, Environmental Services
Great River Energy
12300 Elm Creek Boulevard
Maple Grove, MN 55369-4718

Re: BART Permit to Construct

Dear Ms. Roth:

Pursuant to Subsection 33-15-25-02.2 of the Air Pollution Control Rules of the State of North Dakota, the Department of Health has completed final review of your Best Available Retrofit Technology (BART) analysis dated December 12, 2007. Enclosed is a Permit to Construct which establishes the BART emission limits for the Coal Creek Station located near the City of Underwood in McLean County. A public comment period was held regarding BART and other elements of the Regional Haze State Implementation Plan (SIP) from December 8, 2009 to January 8, 2010, during which comments were received by the Department and considered in our determination.

Please advise the Department within 15 days after completing the project to allow for an inspection by the Department. Compliance with the BART limits must be achieved as expeditiously as possible, but not later than five years after the Environmental Protection Agency's approval of those limits as part of North Dakota's Regional Haze SIP.

In addition, within 12 months after commencing operation of the new and/or modified equipment, a permit revision application for the project for a significant modification to Title V Permit to Operate No. T5F82006 must be submitted to the Department.

If you have any questions, please contact me at (701)328-5188.

Sincerely,

Terry L. O'Clair, P.E.
Director
Division of Air Quality

TLO/CDT:saj
Enc:
xc/enc: Gail Fallon, EPA - Region 8
First District Health Unit, Minot

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AIR POLLUTION CONTROL
PERMIT TO CONSTRUCT
FOR
BEST AVAILABLE RETROFIT TECHNOLOGY (BART)

Pursuant to the Air Pollution Control Rules of the State of North Dakota (North Dakota Administrative Code Article 33-15, Chapter 33-15-14 and Chapter 33-15-25), the North Dakota Department of Health hereby grants a Permit to Construct for the following BART source:

I. General Information:

A. **Permit to Construct Number**: PTC10005

B. **Source**:

1. **Name**: Coal Creek Station

2. **Location**: Sections 8, 9, 16, 17, T145N, R82W, McLean County, North Dakota

3. **Source Type**: Fossil-fuel fired steam electric plant with a nominal generating capacity of 1,100 megawatts.

4. **Equipment at the Facility Subject to BART**:

Unit 1 -Lignite-fired boiler (nominal 6015 x 10^6 Btu/hour heat input)

Unit 2 -Lignite-fired boiler (nominal 6022 x 10^6 Btu/hour heat input)

C. **Owner/Operator**:

1. **Name**: Great River Energy

2. **Address**: 12300 Elm Creek Boulevard
Maple Grove, MN 55369-4718

II. Permit Conditions:

The Permit to Construct only establishes the BART emission limits if, and when, EPA approves those limits as a part of the Regional Haze SIP. This permit allows the construction and initial operation of new or modified air pollution control equipment and process modifications at the source to comply with the BART limits. If new emission units are created, then a new Permit to Construct may be required in accordance with NDAC 33-15-14-02. The source shall be

operated in accordance with the terms of this Permit to Construct and the Title V Permit to Operate until a revised Title V Permit to Operate is issued. The source is subject to all applicable rules, regulations, and orders now or hereafter in effect of the North Dakota Department of Health and to the conditions specified below:

A. **Special Conditions**:

1. **Emission Limits**: The term "30-day rolling average", as used in this permit, shall be determined by calculating an arithmetic average of all hourly rates for the current boiler operating day and the previous 29 boiler operating days. A new 30-day rolling average shall be calculated for each boiler operating day. Each 30-day rolling average rate shall include start-up, shutdown, emergency and malfunction periods unless those periods are exempt by this permit. The 30-day rolling average emission rate is calculated as follows:

   - Calculate the hourly average emission rate for any hour in which any fuel is combusted in the boiler.

   - Calculate the 30-day rolling average emission rate as the arithmetic average of all valid hourly average emission rates for the 30 successive boiler operating days.

   The term "boiler operating day", as used in this permit, means any twenty-four-hour period between midnight and the following midnight during which any fuel is combusted at any time at the steam generating unit.

   a. Great River Energy shall not discharge or cause the discharge of sulfur dioxide (SO_2) into the atmosphere from Unit 1 and Unit 2 in excess of either:

      (1) 0.15 pounds per million British thermal units (lb/10^6 Btu) of heat input on a 30-day rolling average basis;

      or as an alternative

      (2) 5.0 percent of the SO_2 reaching the scrubber inlet on a 30-day rolling average basis (95.0% reduction).

      Great River Energy may average emissions from Unit 1 and Unit 2 provided the average does not exceed either 0.15 lb/10^6 Btu; or 5.0 percent of the SO_2 reaching the inlet of both scrubbers.

   b. Great River Energy shall not discharge or cause the discharge of nitrogen oxides (NO_x) into the atmosphere from Unit 1 and Unit 2 in excess of 0.17 pounds per million British thermal units (lb/10^6 Btu) of heat input per unit, on a 30-day rolling average basis.

      Great River Energy may average emissions from Unit 1 and Unit 2 provided the actual average emission rate does not exceed 0.17 pounds per million British Thermal Units (lb/10^6 Btu) of heat input on a 30-day rolling average basis.

c. Great River Energy shall not discharge or cause the discharge of filterable (non-condensible) particulate matter (PM) into the atmosphere in excess of the following:

Unit 1 - 0.07 lb/10^6 Btu
Unit 2 - 0.07 lb/10^6 Btu

Compliance with the limit is determined in accordance with the procedures in II.A.4.b.5.

d. The emission limits apply at all times including startup, shutdown, emergency and malfunction.

2. **Compliance Date**: Compliance with the emission limits and other requirements of this permit is required as expeditiously as practicable but in no event later than five years after the U.S. Environmental Protection Agency approves this permit as a part of the Regional Haze SIP. Compliance shall be demonstrated within 180 days of initial startup of the equipment required to meet the BART limits, but no later than five years after the U.S. EPA approves this permit as a part of the Regional Haze SIP.

3. **Continuous Emission Monitoring (CEM)**: The emissions from Unit 1 (main stack) and Unit 2 (main stack) shall each be measured by continuous emission monitors (CEM) for SO_2, NO_x, CO_2, and flow. The monitoring requirements under Condition II.A.4 shall be the compliance determination method for SO_2 and NO_x.

4. **Monitoring Requirements and Conditions**:

a. Requirements:

Great River Energy is only required to monitor compliance with one SO_2 limit (i.e., either the lb/10^6 Btu limit or the 95% reduction limit). If Great River Energy monitors for both limits, and compliance is indicated for one limit but not the other, no excess emissions or monitoring deviations shall be reported with respect to the other limit.

Testing and monitoring protocols used to demonstrate compliance with the emission limits of Condition II.A.1 above shall be as follows:

Pollutant/ Parameter	**Monitoring Requirement (Method)**	**Condition Number (II.A. ...)**
Particulate	Compliance Assurance Monitoring (CAM)/ Emissions Test	4.b.(6)/4.b.(5)
SO_2 (inlet)	CEM; or Coal Sampling Data & Emission Factor[a]	4.b.(1), 4.b.(2), 4.b.(3), 4.b.(7), & 4.b.(8)
SO_2 (outlet)	CEM	

Pollutant/ Parameter	Monitoring Requirement (Method)	Condition Number (II.A. ...)
NO_x	CEM	4.b.(1), 4.b.(2), 4.b.(3), & 4.b.(8)
CO_2	CEM	4.b.(1), 4.b.(2), & 4.b.(3)
Flow	Flow Monitor	4.b.(1), 4.b.(2), & 4.b.(3)

[a] Emission factor refers to the value (e.g. percentage of inlet sulfur leaving the boiler), that is determined by stack testing, which is used to calculate the scrubber SO_2 inlet rate.

b. Emission Monitoring Conditions:

(1) The monitoring shall be in accordance with the following applicable requirements of Chapter 33-15-06 of the North Dakota Air Pollution Control Rules and the Acid Rain Program. Emissions are calculated using 40 CFR 75.

(a) Section 33-15-06-04 of the North Dakota Air Pollution Control Rules, Monitoring Requirements.

(b) 40 CFR 72 and 40 CFR 75.

(2) The Department may require additional performance audits of the CEM systems.

(3) When a failure of a continuous emission monitoring system occurs, an alternative method, acceptable to the Department, for measuring or estimating emissions must be undertaken as soon as possible. The procedures outlined in 40 CFR 75, Subpart D for substitution are considered an acceptable method for the emission rate limit. The procedures of Method 19, Paragraph 12.7, are considered an acceptable method for the percent reduction requirement. Timely repair of the emission monitoring system must be made.

(4) Great River Energy shall maintain and operate air pollution control monitoring equipment in a manner consistent with the manufacturer's recommended Operations and Maintenance (O&M) procedures, or a site-specific O&M procedure (developed from the manufacturer's recommended O&M procedures). Great River Energy shall have the O&M procedures available on-site and provide the Department with a copy when requested.

(5) Within 180 days of initial startup of the equipment required to meet the BART limits, but not later than 5 years after approval of the Regional Haze SIP by the U.S. Environmental Protection Agency, Great River Energy shall conduct an emissions test to measure particulate emissions, using EPA Test Method 5B or Method 17 in 40 CFR 60, Appendix A. A test shall consist of three runs, with each run at least 120 minutes in duration and each run collecting a minimum

sample of 60 dry standard cubic feet. Other EPA approved test methods may be used provided they are approved, in advance, by the Department.

(6) Monitoring for particulate matter shall be conducted in accordance with the Compliance Assurance Monitoring (CAM) Plan developed in accordance with NDAC 33-15-14-06.10. The CAM plan revision to address the BART PM limit shall be submitted with the Title V revision application for the BART limits.

(7) In lieu of using a continuous emission monitor to determine the SO_2 reaching the wet scrubber inlets in accordance with Condition II.A.1.a., Great River Energy may use coal sampling and an emission factor established by stack testing. The requirements in 40 CFR 60, Appendix A, Method 19 shall be used to determine coal sampling and analysis requirements.

For purposes of determining compliance with the SO_2 percent reduction requirement, the reduction efficiency shall be determined as follows:

$$\% \text{ Reduction} = \frac{\text{Inlet } SO_2 \text{ Rate-Outlet } SO_2 \text{ Rate}}{\text{Inlet } SO_2 \text{ Rate}} \times 100$$

Where: The Inlet SO_2 Rate is in units of lb/10^6 Btu, lb/hr, or ppmvd @ 3% O_2 and the Outlet SO_2 Rate is in the same units as the Inlet SO_2 Rate.

(8) When averaging the emissions of Unit 1 and Unit 2, compliance shall be determined in accordance with the following:

$$\text{Average ER} = \frac{[(ER_1)(HI_1) + (ER_2)(HI_2)]}{(HI_1 + HI_2)}$$

Where:

Average ER = Average Emission Rate
ER_1 = Actual Emission Rate (lb/10^6 Btu or % Reduction) of Unit 1
ER_2 = Actual Emission Rate (lb/10^6 Btu or % Reduction) of Unit 2
HI_1 = Actual Heat Input (10^6 Btu) of Unit 1
HI_2 = Actual Heat Input (10^6 Btu) of Unit 2

Notes:
- ER and HI are 30-day rolling averages.
- 30-day rolling average for the 30 successive boiler operating days as defined in Condition II.A.1.
- % Reduction can be on either a lb/10^6 Btu, ppmvd @ 3% O_2, or pounds of SO_2 basis.

5. **Recordkeeping Requirements**:

a. Great River Energy shall maintain compliance monitoring records for Unit 1 and Unit 2 as outlined in Table 1 Monitoring Records, that includes the following information:

(1) The date, place (as defined in the permit) and time of sampling or measurement.

(2) The date(s) testing was performed.

(3) The company, entity, or person that performed the testing.

(4) The testing techniques or methods used.

(5) The results of such testing.

(6) The unit load that existed at the time of sampling or measurement.

(7) The records of quality assurance for emissions measuring systems including but not limited to quality control activities, audits and calibration drifts as required by the applicable test method.

(8) A copy of all field data sheets from the emissions testing.

(9) A record shall be kept of all major maintenance activities conducted on the emission units or air pollution control equipment.

(10) Records shall be kept as to the type of fuel usage.

Table 1 Monitoring Records

Pollutant/Parameter	**Compliance Monitoring Record**
Particulate	CAM Data & Emissions Test Data
SO_2 outlet (lb/10^6 Btu)	CEM Data
SO_2 inlet (% Reduction)	CEM Data; or Coal Sampling Data & Emission Factor for Inlet SO_2 Rate
SO_2 outlet (% Reduction)	CEM Data
NO_x	CEM Data
CO_2	CEM Data
Flow	Flow Monitor Data

b. In addition to requirements outlined in Condition II.A.5.a, recordkeeping for Unit 1 and Unit 2 shall be in accordance with the following applicable requirements of Chapter

33-15-06 and Chapter 33-15-14 of the North Dakota Air Pollution Control Rules and the Acid Rain Program.

(1) Section 33-15-06-05 of the North Dakota Air Pollution Control Rules, Reporting and Recordkeeping Requirements.

(2) 40 CFR 72 and 40 CFR 75.

(3) 40 CFR 64, Section 64.9 - Reporting and Recordkeeping Requirements, Paragraph (b) General Recordkeeping Requirements.

c. Great River Energy shall retain records of all required compliance monitoring data and support information for a period of at least five years from the date of the compliance monitoring sampling, measurement, report, or application. Support information includes all maintenance records of the emission units and all original strip-chart recordings/computer printouts and calibrations of the continuous compliance monitoring instrumentation, and copies of all reports required by the permit.

6. **Reporting**:

a. For Unit 1 and Unit 2, reporting shall be in accordance with the following applicable requirements of Chapter 33-15-06 and Chapter 33-15-14 of the North Dakota Air Pollution Control Rules and the Acid Rain Program.

(1) Section 33-15-06-05 of the North Dakota Air Pollution Control Rules, Reporting and Recordkeeping Requirements.

(2) 40 CFR 72 and 40 CFR 75.

(3) 40 CFR Part 64, Section 64.9 - Reporting and Recordkeeping Requirements, Paragraph (a) General Reporting Requirements.

(4) Quarterly excess emissions reports for Unit 1 and Unit 2 shall be submitted no later than the 30th day following the end of each calendar quarter. Excess emissions are defined as emissions which exceed the emission limits for Unit 1 and Unit 2 as outlined in Condition II.A.1. Data regarding only one of the two SO_2 limits needs to be included in the excess emissions report. Excess emissions shall be reported for the following:

Parameter	Reporting Period
SO_2 lb/10^6 Btu or % reduction	(30-day rolling average)
NO_x lb/10^6 Btu	(30-day rolling average)

b. Great River Energy shall submit a semi-annual report for all monitoring records required under Condition II.A.5 on forms supplied or approved by the Department. All

instances of deviations from the permit must be identified in the report. A monitoring report shall be submitted within 45 days after June 30 and December 31 of each year.

c. Great River Energy shall submit an annual compliance certification report within 45 days after December 31 of each year on forms supplied or approved by the Department.

d. For emission units where the method of compliance monitoring is demonstrated by either an EPA Test Method or portable analyzer, the test report shall be submitted to the Department within 60 days after completion of the test.

e. Great River Energy shall submit an annual emission inventory report on forms supplied or approved by the Department. This report shall be submitted by March 15 of each calendar year. Insignificant units/activities listed in this permit do not need to be included in the annual emission inventory report.

f. Great River Energy shall submit to the Department written semi-annual reports detailing progress toward completion of the requirements of this permit. The semi-annual reports shall be submitted no later than 45 days after June 30 and December 31 of each year. The first report shall be due following the end of the first complete semi-annual period after the permit is issued.

g. Great River Energy shall notify the Department of the actual startup date of the equipment required to meet the BART limits.

B. **General Conditions**:

1. This permit shall in no way permit or authorize the maintenance of a public nuisance or danger to public health or safety.

2. Great River Energy shall comply with all State and Federal environmental laws and rules. In addition, Great River Energy shall comply with all local building, fire, zoning, and other applicable ordinances, codes, rules and regulations.

3. All reasonable precautions shall be taken by Great River Energy to prevent and/or minimize fugitive emissions during the construction period.

4. Great River Energy shall at all times, including periods of startup, shutdown, and malfunction, maintain and operate Unit 1 and Unit 2 and all other emission units including associated air pollution equipment and fugitive dust suppression operations in a manner consistent with good air pollution control practices for minimizing emissions.

5. Any duly authorized officer, employee or agent of the North Dakota Department of Health may enter and inspect any property, premise or place at which the source listed in Item I.B. of this permit is or will be located at any time for the purpose of ascertaining the state of compliance with the North Dakota Air Pollution Control Rules and the conditions of this permit.

6. Any violation of a condition issued as part of this approval to construct is regarded as a violation of construction authority and is subject to enforcement action.

7. The conditions of this permit herein become, upon the effective date of this permit, enforceable by the Department pursuant to any remedies it now has or may in the future have, under the North Dakota Air Pollution Control Law, NDCC Chapter 23-25. Each and every condition of this permit is a material part thereof, and is not severable.

FOR THE NORTH DAKOTA
DEPARTMENT OF HEALTH

Date: 2/23/10

By: Terry O'Clair
Terry L. O'Clair, P.E., Director
Division of Air Quality