

Permit #: 28.0801-01  
Effective Date: December 8, 2016  
Expiration Date: December 8, 2021



**SOUTH DAKOTA DEPARTMENT OF  
ENVIRONMENT AND NATURAL RESOURCES  
TITLE V AIR QUALITY OPERATING PERMIT**

A handwritten signature in black ink, appearing to read "S.M. Pirner".

**Steven M. Pirner, P.E., Secretary  
Department of Environment and Natural Resources**

**Under the South Dakota Air Pollution  
Control Regulations**

Pursuant to Chapter 34A-1-21 of the South Dakota Codified Laws and the Air Pollution Control Regulations of the State of South Dakota and in reliance on statements made by the owner designated below, a permit to operate is hereby issued by the Secretary of the Department of Environment and Natural Resources. This permit authorizes such owner to operate the unit(s) at the location designated below and under the listed conditions:

A. Owner

1. Company Name and Mailing Address

Northern States Power, a Minnesota Company d.b.a. Xcel Energy  
Angus Anson Generating Plant  
414 Nicollet Mall GO-2  
Minneapolis, Minnesota 55401-1927

2. Actual Source Location if Different from Above

Angus Anson Generating Site  
7100 East Rice Street  
Sioux Falls, South Dakota 57110-7313

3. Permit Contact

Patricia Leaf, Environmental Analyst  
(612) 330-2807

4. Facility Contact

Timothy Brown, Plant Manager  
(605) 331-1230

5. Responsible Official

James Kuhn, Plant Director, RDF & Peaking  
(320) 255-8629

B. Permit Revisions or Modifications

Not applicable

C. Type of Operation

Electric peaking plant

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## 1.0 Standard Conditions

### 1.1 Operation of source

In accordance with Administrative Rules of South Dakota (ARSD) 74:36:05:16.01(8), the owner or operator shall operate the units, controls, and processes as described in Table 1-1 in accordance with the statements, representations, and supporting data contained in the complete permit application received June 1, 2015, unless modified by the conditions of this permit. Except as otherwise provided herein, the control equipment shall be operated at all times in accordance with the manufacturer's specification and in a manner that achieves compliance with the conditions of this permit. The application consists of the application forms, supporting data, and supplementary correspondence. If the owner or operator becomes aware it failed to submit any relevant facts in a permit application or submitted incorrect information in an application, such information shall be promptly submitted.

*Table 1-1 – Description of Permitted Units, Operations, and Processes*

<b>Unit</b>	<b>Description</b>	<b>Maximum Operating Rate</b>	<b>Control Equipment</b>
<b>#4</b>	1993 Westinghouse gas turbine, Model #W501D5, fired with natural gas and distillate oil. A fogging device is installed to increase the megawatt output up to the maximum operating rate during warm weather months	1,480 (high heating value) million Btus per hour heat input	Water injection system to control nitrogen oxide emissions
<b>#5</b>	1993 Westinghouse gas turbine, Model #W501D5, fired with natural gas and distillate oil. A fogging device is installed to increase the megawatt output up to the maximum operating rate during warm weather months	1,480 (high heating value) million Btus per hour heat input	Water injection system to control nitrogen oxide emissions
<b>#8</b>	2004 General Electric simple cycle combustion turbine, Model 7FA, fired with natural gas and equipped with dry low NOx combustion technology. An evaporative cooler is installed to increase the megawatt output up to the maximum operating rate during hot weather months	1,980 (high heating value) million Btus per hour input at 45° Fahrenheit; 160 megawatts, nominal	Not applicable

### 1.2 Duty to comply

In accordance with ARSD 74:36:05:16.01(12), the owner or operator shall comply with the conditions of this permit. An owner or operator who knowingly makes a false statement in any record or report or who falsifies, tampers with, or renders inaccurate, any monitoring device or method is in violation of this permit. A violation of any condition in this permit is grounds for

enforcement, reopening this permit, permit termination, or denial of a permit renewal application. The owner or operator, in an enforcement action, cannot use the defense that it would have been necessary to cease or reduce the permitted activity to maintain compliance. The owner or operator shall provide any information requested by the Secretary to determine compliance or whether cause exists for reopening or terminating this permit.

### **1.3 Property rights or exclusive privileges**

In accordance with ARSD 74:36:05:16.01(12), the State's issuance of this permit, adoption of design criteria, and approval of plans and specifications does not convey any property rights of any sort, any exclusive privileges, any authorization to damage, injure or use any private property, any authority to invade personal rights, any authority to violate federal, state or local laws or regulations, or any taking, condemnation or use of eminent domain against any property owned by third parties. The State does not warrant the owner's or operator's compliance with this permit, design criteria, approved plans and specifications, and operation under this permit, will not cause damage, injury or use of private property, an invasion of personal rights, or violation of federal, state or local laws or regulations. The owner or operator is solely and severally liable for all damage, injury or use of private property, invasion of personal rights, infringement of federal, state or local laws and regulations, or taking or condemnation of property owned by third parties, which may result from actions taken under the permit.

### **1.4 Penalty for violating a permit condition**

In accordance with South Dakota Codified Laws (SDCL) 34A-1-39 and 34A-1-47, a violation of a permit condition may subject the owner or operator to civil or criminal prosecution, a state penalty of not more than \$10,000 per day per violation, injunctive action, administrative permit action, and other remedies as provided by law.

### **1.5 Inspection and entry**

In accordance with SDCL 34A-1-41, the owner or operator shall allow the Secretary, upon presentation of credentials, to:

1. Enter the premises where a regulated activity is located or where pertinent records are stored;
2. Have access to and copy any records required under this permit;
3. Inspect operations regulated under this permit; and/or
4. Sample or monitor any substances or parameters for the purpose of assuring compliance.

### **1.6 Severability**

In accordance with ARSD 74:36:05:16.01(11), any portion of this permit that is void or challenged shall not affect the validity of the remaining permit requirements.

## **1.7 Permit termination, modification, or revocation**

In accordance with ARSD 74:36:05:46, the Secretary may recommend the Board of Minerals and Environment terminate, modify, or revoke this permit for violations of SDCL 34A-1 or the federal Clean Air Act or for nonpayment of any outstanding fee or enforcement penalty.

## **1.8 Credible evidence**

In accordance with ARSD 74:36:13:07, credible evidence may be used for the purpose of establishing whether the owner or operator has violated or is in violation of this permit. Credible evidence may consist of the following:

1. Information from the use of the following methods is presumptively credible evidence of whether a violation has occurred:
  - a. A monitoring method approved pursuant to 40 CFR § 70.6(a)(3) and incorporated in this permit; or
  - b. Compliance methods specified in an applicable plan;
2. The following testing, monitoring, or information gathering methods are presumptively credible testing, monitoring, or information-gathering methods:
  - a. Any monitoring or testing methods approved in this permit, including those in 40 CFR Parts 51, 60, 61, and 75; or
  - b. Other testing, monitoring, or information-gathering methods that produce information comparable to that produced by any method in paragraph (1) or (2)(a).

## **2.0 Permit Fees**

### **2.1 Annual air fee required**

In accordance with ARSD 74:36:05:06.01, the owner or operator shall submit an annual administrative fee and an annual fee. The fee is based on actual emissions in accordance with ARSD 74:37.

### **2.2 Annual operational report**

In accordance with ARSD 74:37:01:06, the Secretary will supply the owner or operator with an annual operational report in January of each year. The owner or operator shall complete and submit the operational report to the Secretary by March 1 of each year. The responsible official shall sign the operational report in the presence of a notary public.

### **2.3 Annual air fee**

In accordance with ARSD 74:37:01:08, the Secretary will notify the owner or operator of the required annual air emission fee and administrative fee by June 1 of each year. The fees shall accrue on July 1 and are payable to the Department of Revenue by July 31 of each year.

## **3.0 Permit Amendments and Modifications**

### **3.1 Permit flexibility**

In accordance with ARSD 74:36:05:30, the owner or operator shall have the flexibility to make changes to the source during the term of this permit. The owner or operator shall provide the Secretary written notice at least seven days in advance of the proposed change (NOTE: The Secretary will forward a copy of the written notice to EPA). The written notice shall include a brief description of the change, the date on which the change is to occur, any change in emissions, the proposed changes to the permit, and whether the requested revisions are for an administrative permit amendment, minor permit amendment, or permit modification.

The Secretary will notify the owner or operator whether the change is an administrative permit amendment, a minor permit amendment, or a permit modification. A proposed change that is considered an administrative permit amendment or a minor permit amendment can be completed immediately after the Secretary receives the written notification. The owner or operator must comply with both the applicable requirements governing the change and the proposed permit terms and conditions until the Secretary takes final action on the proposed change.

A proposed change that is considered a modification cannot be implemented until the Secretary takes final action on the proposed change or the owner or operator was issued an air quality construction permit. Permit modifications are subject to the same procedural requirements, including public comment, as the original permit issuance except that the required review shall cover only the proposed changes.

### **3.2 Administrative permit amendment**

In accordance with ARSD 74:36:05:33, the Secretary has 60 days from receipt of a written notice to verify the proposed change is an administrative permit amendment. As provided in ARSD 74:36:01:03, the Secretary considers a proposed change an administrative permit amendment if the proposed change accomplishes one of the following:

1. Corrects typographical errors;
2. Changes the name, address, or phone number of any person identified in this permit or provides a similar minor administrative change;
3. Requires more frequent monitoring or reporting;
4. The ownership or operational control changes and the Secretary determines no other change in this permit is necessary. However, the new owner must submit a certification of applicant form and a written statement specifying the date for transfer of operating permit responsibility, coverage, and liability; or
5. Any other changes the Secretary and the administrator of EPA determines to be similar to those requirements in this condition.



### **3.3 Minor permit amendment**

In accordance with ARSD 74:36:05:38, the Secretary has 90 days from receipt of a written notice or 15 days after the end of EPA's 45-day review period, whichever is later, to take final action on a minor permit amendment. Final action consists of issuing or denying a minor permit amendment or determining the proposed change is a permit modification. As provided in ARSD 74:36:05:35, the Secretary considers a proposed change to be a minor permit amendment if the proposed change:

1. Does not violate any applicable requirements;
2. Does not involve significant changes to existing monitoring, reporting, or recordkeeping requirements;
3. Does not require or change a case-by-case determination of an emission limit or other standard, a source-specific determination for temporary sources of ambient impacts, or a visibility or increment analysis; or
4. Does not seek to establish or change a permit term or condition for which the source has assumed to avoid an applicable requirement, a federally enforceable emission cap, or an alternative emission limit. An alternative emission limit is approved pursuant to regulations promulgated under section 112(i)(5) of the federal Clean Air Act.

### **3.4 Permit modification**

In accordance with ARSD 74:36:05:39, an owner or operator may apply for a permit modification. A permit modification is defined in ARSD 74:36:01:10 as a physical change in or change in the operation of a source that results in at least one of the following:

1. An increase in the amount of an air pollutant emitted by the source or results in the emission of an air pollutant not previously emitted;
2. A significant change to existing monitoring, reporting, or recordkeeping requirements in the permit;
3. The change requires or changes a case-by-case determination of an emission limit or other standard, a source-specific determination for temporary sources of ambient impacts, or a visibility or increment analysis; or
4. The change seeks to establish or change a permit term or condition for which there is a corresponding underlying applicable requirement that the source has assumed to avoid an applicable requirement, a federally enforceable emissions cap assumed to avoid classification as a modification under a provision of the Title I of the Clean Air Act, or an alternative emissions limit approved pursuant to regulations promulgated under section 112(i)(5) of the Clean Air Act.

Permit modifications are subject to the same procedural requirements, including public comment, as the original permit issuance except the required review shall cover only the proposed changes.

### **3.5 Permit revision**

In accordance with ARSD 74:36:05:40, the Secretary may reopen and revise this permit to meet requirements of SDCL 34A-1 or the federal Clean Air Act. In accordance with ARSD 74:36:05:41, the Secretary shall notify the owner or operator at least 30 days before reopening this permit. The 30-day period may be less in the case of an emergency.

### **3.6 Testing new fuels or raw materials**

In accordance with ARSD 74:36:11:04, an owner or operator may request permission to test a new fuel or raw material to determine if it is compatible with existing equipment before requesting a permit amendment or modification. A complete test proposal shall consist of the following:

1. A written proposal describing the new fuel or raw material, operating parameters, and parameters that will be monitored and any testing associated with air pollutant emissions during the test;
2. An estimate of the type and amount of regulated air pollutant emissions resulting from the proposed change; and
3. The proposed schedule for conducting the test. In most cases the owner or operator will be allowed to test for a maximum of one week. A request for a test period longer than one week will need additional justification. A test period shall not exceed 180 days.

The Secretary shall approve, conditionally approve, or deny in writing the test proposal within 45 days after receiving a complete proposal. Approval conditions may include changing the test schedule or pollutant sampling and analysis methods. Pollutant sampling and analysis methods may include, but are not limited to performance testing, visible emission evaluation, fuel analysis, dispersion modeling, and monitoring of raw material or fuel rates.

If the Secretary determines the proposed change will result in an increase in the emission of a regulated air pollutant or result in the emission of an additional regulated air pollutant, the Secretary shall give public notice of the proposed test for 30 days. The Secretary shall consider all comments received during the 30-day public comment period before making a final decision on the test.

The Secretary will not approve a test if the test would cause or contribute to a violation of a national ambient air quality standard.

## **4.0 Permit Renewal**

### **4.1 Permit effective**

In accordance with ARSD 74:36:05:07, this permit shall expire five years from date of issuance unless reopened or terminated for cause. The current permit shall not expire and shall remain in effect until the Secretary takes final action on the renewal application.

### **4.2 Permit renewal**

In accordance with ARSD 74:36:05:08, the owner or operator shall submit an application for a permit renewal at least 180 days before the date of permit expiration if the owner or operator wishes to continue to operate an activity regulated by this permit. The current permit shall not expire and shall remain in effect until the Secretary takes final action on the timely permit renewal application.

### **4.3 Permit expiration**

In accordance with ARSD 74:36:05:28, permit expiration terminates the owner's or operator's right to operate any unit covered by this permit.

## **5.0 Recordkeeping and Reporting**

### **5.1 Recordkeeping and reporting**

In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall maintain all monitoring data, records, reports, and pertinent information specified by this permit for five years from the date of sample, measurement, report, or application unless otherwise specified in this permit. The records shall be maintained on site for the first two years and may be maintained off site for the last three years. All records must be made available to the Secretary for inspection. All notifications and reports shall be submitted to the following address:

South Dakota Department of Environment and Natural Resources  
PMB 2020, Air Quality Program  
523 E. Capitol, Joe Foss Building  
Pierre, SD 57501-3182

### **5.2 Signatory requirements**

In accordance with ARSD 74:36:05:12 and 74:36:05:16.01, all applications, reports, or other information submitted to the Secretary shall be signed and certified by a responsible official or a duly authorized representative. A responsible official for a corporation is a responsible corporate officer and for a partnership or sole proprietorship is a general partner or the proprietor, respectively. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above and submitted to the Secretary; and
2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters.

The duly authorized representative must be designated prior to or together with any reports or information to be signed by a duly authorized representative. The responsible official shall notify the Secretary if an authorization is no longer accurate.

### **5.3 Certification statement**

In accordance with ARSD 74:36:05:16.01(14)(a), all documents required by this permit, including application forms, reports, and compliance certification, must be certified by a responsible official or a duly authorized representative. The certification shall include the following statement:

“I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this document and all attachments are true, accurate, and complete.”

### **5.4 Monitoring log**

In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall maintain a monitoring log. The monitoring log shall contain the following information.

1. Maintenance schedule for each piece of control equipment listed in Table 1-1. At a minimum, the maintenance schedule shall meet the manufacturer’s recommended schedule for maintenance. The following information shall be recorded for maintenance conducted:
  - a. Identify the Unit #;
  - b. The date and time maintenance was performed;
  - c. Description of the type of maintenance;
  - d. Reason for performing maintenance; and
  - e. Signature of person performing maintenance;
2. Identify each unit subject to an opacity limit in Chapter 6.0 and if the unit operates on a monthly or more frequent basis, quarterly basis, semiannual basis, or annual basis.
3. The following information shall be recorded for each visible emission reading required in permit condition 8.1:
  - a. Identify the Unit #;
  - b. The date and time the visible emission reading was performed;
  - c. If visible emissions were observed;
  - d. Description of maintenance performed to eliminate visible emissions;

- e. Visible emission evaluation if visible emissions are not eliminated; and
  - f. Signature of person performing visible emission reading and/or visible emission evaluation;
4. The following information shall be recorded within two days of each emergency exceedance:
    - a. The date of the emergency exceedance and the date the emergency exceedance was reported to the Secretary;
    - b. The cause(s) of the emergency;
    - c. The reasonable steps taken to minimize the emissions during the emergency; and
    - d. A statement the permitted equipment was at the time being properly operated.

### **5.5 Annual records**

In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall calculate and record the following amounts from January 1 to December 31 of each year:

1. The amount of natural gas and distillate oil burned in each unit listed in Table 1-1;
2. The number of hours each unit listed in Table 1-1 operated; and
3. The number of hours and the amount of natural gas and distillate oil burned in Units #4 and #5 while the water injection system was not in operation.

The amount of natural gas and distillate oil consumed shall be based on production records, consumption records, purchase records, etc. The records will be used in junction with the operational report required in permit condition 2.2.

### **5.6 Quarterly reports**

In accordance with ARSD 74:36:09 as referenced to 40 CFR § 52.21, and ARSD 74:36:06:16.01(9), the owner or operator shall submit a quarterly report related to the operation of Unit #4, #5, and #8 that contains the following information:

1. Name of the facility, permit number, reference to this permit condition, and identify the submittal as a quarterly report;
2. The quantity of formaldehyde emitted from Unit #4, #5, and #8, in tons, for each month and the 12-month rolling total for each month in the reporting period and supporting documentation (e.g., emission factor, performance test data, equations);
3. The number of hours of operation for Units #4, #5 and #8 for each month and the 12-month rolling total for each month in the reporting period and supporting documentation (e.g., hourly data, equations).
4. The time period and date that distillate oil was used to fuel Unit #4 and #5 instead of natural gas and the reason for not using natural gas;
5. Any period in which the nitrogen oxide concentration (parts per million) or air emission limit (pounds per hour) in permit condition 9.1 for Unit #4 and #5 is exceeded based on the compliance period. If an exceedance occurs, the report shall identify the following:
  - a. Identify the Unit #;

- b. The date, time, and time period of each exceedance;
- c. Magnitude of the exceedance;
- d. Cause of the exceedance; and
- e. Measures taken to bring the operations back into compliance.

In the case where no exceedance has occurred, the quarterly report shall state that no exceedance has occurred.

5. The amount of nitrogen oxide and carbon monoxide emissions from Unit #8, in tons, for each month in the reporting period and the 12-month rolling total for each month in the reporting period;
6. Any period in which the nitrogen oxide or carbon monoxide (tons per year) limit in permit condition 10.1 is exceeded based on the 12-month rolling total for Unit #8. If an exceedance occurs, the report shall identify the following:
  - a. Identify the Unit #;
  - b. The date, time, and time period of each exceedance;
  - c. Magnitude of the exceedance;
  - d. Cause of the exceedance; and
  - e. Measures taken to bring the operations back into compliance.

In the case where no exceedance has occurred, the quarterly report shall state that no exceedance has occurred.

The quarterly report shall be postmarked no later than the 30<sup>th</sup> day following the end of each calendar quarter, i.e. March 30, June 30, September 30 and December 30.

### **5.7 Annual compliance certification**

In accordance with ARSD 74:36:05:16.01(14), the owner or operator shall submit an annual compliance certification letter to the Secretary by March 1 of each year this permit is in effect (NOTE: The Secretary will forward a copy of the certification letter to EPA). The certification shall contain the following information:

1. Methods used to determine compliance, including: monitoring, recordkeeping, performance testing and reporting requirements;
2. The source is in compliance and will continue to demonstrate compliance with all applicable requirements;
3. In the event the source is in noncompliance, a compliance plan that indicates how the source has or will be brought into compliance;
4. Certification statement required in permit condition 5.3; and
5. In accordance with ARSD 74:36:16:01(9) and 40 CFR § 72.9(c)(1), the owner or operator shall include a statement that the sulfur dioxide allowances were or were not held in the account for each applicable unit that equaled or exceeded the actual sulfur dioxide emissions for the previous calendar year.

### **5.8 Reporting permit violations**

In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall report all permit violations. A permit violation should be reported as soon as possible, but no later than the first business day following the day the violation was discovered. The permit violation may be reported by telephone to the South Dakota Department of Environment and Natural Resources at (605) 773-3151 or by FAX at (605) 773-4068.

A written report shall be submitted within five days of discovering the permit violation. Upon prior approval from the Secretary, the submittal deadline for the written report may be extended up to 30 days. The written report shall contain:

1. A description of the permit violation and its cause(s);
2. The duration of the permit violation, including exact dates and times; and
3. The steps taken or planned to reduce, eliminate, and prevent reoccurrence of the permit violation.

## **6.0 Control of Regulated Air Pollutants**

### **6.1 Visibility limit**

In accordance with ARSD 74:36:12:01, the owner or operator may not discharge into the ambient air an air contaminant of a density equal to or greater than that designated as 20 percent opacity from any permitted unit, operation, or process listed in Table 1-1, unless otherwise specified in this permit. This provision does not apply when the presence of uncombined water is the only reason for failure to meet the requirement.

### **6.2 Visibility exceedances**

In accordance with ARSD 74:36:12:02, an exceedance of the opacity limit in permit condition 6.1 is not considered a violation during brief periods of soot blowing, start-up, shutdown, or malfunctions. Malfunction means any sudden and unavoidable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. A failure caused entirely or in part by poor maintenance, careless operation, preventable equipment breakdown, or any other cause within the control of the owner or operator is not a malfunction and is considered a violation.

### **6.3 Total suspended particulate matter limits**

In accordance with ARSD 74:36:06:02(1), the owner or operator shall not allow the emission of total suspended particulate matter in excess of the emission limit specified in Table 6-1 for the appropriate permitted unit, operation, and process.

**Table 6-1 – Total Suspended Particulate Matter Emission Limit**

<b>Unit</b>	<b>Description</b>	<b>Emission Limit <sup>1</sup></b>
<b>#4</b>	Combustion Turbine 2	0.3 pounds per million Btus heat input
<b>#5</b>	Combustion Turbine 3	0.3 pounds per million Btus heat input
<b>#8</b>	Combustion Turbine 4	0.3 pounds per million Btus heat input

<sup>1</sup> – Emission limit is based on high heating value

#### **6.4 Air emission exceedances – emergency conditions**

In accordance with ARSD 74:36:05:16.01(18), the Secretary will allow for an unavoidable emission exceedance of a technology-based emission limit if the exceedance is caused by an emergency condition and immediate action is taken by the owner or operator to restore the operations back to normal. An emergency condition is a situation arising from a sudden and reasonably unforeseeable event beyond the control of the owner or operator, including acts of God. An emergency shall not include an emission exceedance to the extent caused by improperly designed equipment, lack of preventive maintenance, careless or improper operation, or operator error. The owner or operator shall notify the Secretary within two working days of the incident and take all steps possible to eliminate the excess emissions. The notification must provide a description of the emergency, any steps taken to mitigate emissions, and corrective actions taken. If the notification is submitted orally, a written report summarizing the information required by the notification shall be submitted and postmarked within 30 days of the oral notification

#### **6.5 Circumvention not allowed**

In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.12, the owner or operator may not install, use a device, or use a means that conceals or dilutes an air emission that would otherwise violate this permit. This includes operating a unit or control device that emits air pollutants from an opening other than the designed stack, vent, or equivalent opening.

#### **6.6 Minimizing emissions**

In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.11(d), the owner or operator shall at all times, when practicable, maintain and operate all permitted units in a manner that minimizes air pollution emissions

### **7.0 Performance Tests**

#### **7.1 Performance test may be required**

In accordance with ARSD 74:36:11:02, the Secretary may request a performance test during the term of this permit. A performance test shall be conducted while operating the unit at or greater than 90 percent of its maximum design capacity, unless otherwise specified by the Secretary. A performance test conducted while operating at less than 90 percent of its maximum design capacity will result in the operation being limited to the percent achieved during the performance



test. The Secretary has the discretion to extend the deadline for completion of a performance test required by the Secretary if circumstances reasonably warrant but will not extend the deadline past a federally required performance test deadline.

### **7.2 Test methods and procedures**

In accordance with ARSD 74:36:11:01, the owner or operator shall conduct the performance test in accordance with 40 CFR Part 60, Appendix A, 40 CFR Part 63, Appendix A, and 40 CFR Part 51, Appendix M. The Secretary may approve an alternative method if a performance test specified in 40 CFR Part 60, Appendix A, 40 CFR Part 63, Appendix A, and 40 CFR Part 51, Appendix M is not federally applicable or federally required.

### **7.3 Representative performance test**

In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.8(c), performance tests shall be conducted under such conditions as the Secretary shall specify to the owner or operator based on the representative performance of the unit being tested. The owner or operator shall make available to the Secretary such records as may be necessary to determine the conditions of the performance tests. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test nor shall emissions in excess of the level of the applicable emission limit during periods of startup, shutdown, and malfunction be considered a violation of the applicable emission limit unless otherwise specified in this permit.

### **7.4 Submittal of test plan**

In accordance with ARSD 74:36:11:01, the owner or operator shall submit the proposed testing procedures to the Secretary at least 30 days prior to any performance test. The Secretary will notify the owner or operator if the proposed test procedures are approved or denied. If the proposed test procedures are denied, the Secretary will provide written notification outlining what needs to be completed for approval.

### **7.5 Notification of test**

In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.8(d), the owner or operator shall notify the Secretary at least 30 days prior to the start of a performance test to afford the Secretary the opportunity to have an observer present. If there is a delay in conducting the scheduled performance test, the owner or operator shall notify the Secretary as soon as possible of any delay in the original test date, either by providing at least 7 days prior notice of the rescheduled date of the performance test, or by arranging a rescheduled date with the Secretary by mutual agreement.

### **7.6 Performance test report**

In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall submit a performance test report to the Secretary within 60 days after completing the performance test or by a date designated by the Secretary. The performance test report shall contain the following information:

1. A brief description of the process and the air pollution control system being tested;

2. Sampling location description(s);
3. A description of sampling and analytical procedures and any modifications to standard procedures;
4. Test results represented in the same terminology as the permit limits;
5. Quality assurance procedures and results;
6. Records of operating conditions during the test necessary for demonstrating compliance with the permit limits, preparation of standards, and calibration procedures;
7. Raw data sheets for field sampling and field and laboratory analyses;
8. Documentation of calculations;
9. All data recorded and used to establish parameters for compliance monitoring; and
10. Any other information required by the test method.

## **8.0 Monitoring**

### **8.1 Periodic opacity monitoring**

In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall demonstrate compliance with the opacity limits in permit condition 6.1 on a periodic basis. Periodic monitoring for units that operate on a monthly or more frequent basis shall be based on Step 1 and 2.

**Step 1:** Periodic monitoring shall consist of a visible emission reading. A visible emission reading shall consist of a visual survey of each unit over a two-minute period to identify if there are visible emissions. The visible emission reading must be conducted while the unit is in operation; but not during periods of startup, shutdown, or malfunctions. Visible emission readings shall be based on the following frequency:

- a. The owner or operator shall conduct a visible emission reading once per calendar month, if during that month distillate oil is combusted;
- b. If no visible emissions are observed from a unit in six consecutive monthly visible emission readings, the owner or operator may decrease the frequency of readings from monthly to semiannually for that unit; and
- c. If no visible emissions are observed from a unit in two consecutive semiannual visible emission readings, the owner or operator may decrease the frequency of testing of readings from semiannually to annually for that unit.

A six minute visible emission test meeting the requirements of 40 CFR Part 60, Appendix A, Method 9 can replace the two-minute reading required under Step 1 and an additional six minute visible emission test as required in Step 2 does not have to be performed.

**Step 2:** If visible emissions are observed during a visible emission reading required in Step 1 from a unit at any time other than periods of startup, shutdown, or malfunction, the owner or

operator shall conduct a visible emission test to determine if the unit is in compliance with its applicable opacity limit. The visible emission test shall be for at least six minutes and conducted in accordance with 40 CFR Part 60, Appendix A, Method 9. The visible emission test must be conducted while the unit is in operation; but not during periods of startup, shutdown, or malfunctions. Visible emission tests shall be based on the following frequency:

- a. The 6-minute visible emission test must be conducted within one hour of witnessing a visible emission from a unit unless the unit has come off-line; if so, the 6 minute visible emission test must be taken after the next start-up;
- b. If the visible emission test required in Step 2(a) results in an opacity value less than or equal to 50 percent of the opacity limit for the unit, the owner or operator shall perform a 6-minute visible emission test once per month, if during that month distillate oil is combusted;
- c. If the opacity value of a 6-minute visible emission test in Step 2(b) is less than five percent for three straight monthly tests, the owner or operator may revert back to 2-minute monthly visible emission readings as required in Step 1(a);
- d. If the 6-minute visible emission test required in Step 2(a) results in an opacity value greater than 50 percent of the opacity limit but less than the opacity limit, the owner or operator shall perform a 6-minute visible emission test once per week, if during that week distillate oil is combusted; or
- e. If the 6-minute visible emission test in Step 2(d) results in an opacity value less than or equal to 50 percent of the opacity limit for four straight weekly readings, the owner or operator may revert back to a 6-minute monthly visible emission test as required in Step 2(b).

Periodic monitoring for units that operate on a quarterly shall be based on Step 3.

**Step 3:** For units that operate on a quarterly basis, monitoring shall consist of the following:

- a. Monitoring shall consist of a 2- minute visible emission reading once per quarter, if during that quarter distillate oil is combusted. A visible emission reading shall consist of a visual survey of the unit over a two-minute period to identify if there are visible emissions. The visible emission reading must be conducted while the unit is in operation; but not during periods of startup, shutdown, or malfunctions. A six minute visible emission test meeting the requirements of 40 CFR Part 60, Appendix A, Method 9 can replace the two-minute reading required under Step 3(a) and an additional six minute visible emission test as required in Step 3(b) does not have to be performed.
- b. If visible emissions are observed from a unit at any time other than periods of startup, shutdown, or malfunction, the owner or operator shall conduct a 6-minute visible emission test on that unit to determine if the unit is in compliance with its opacity limit. The 6-minute visible emission test must be conducted within one hour of witnessing visible emissions from the unit during a 2-minute visible emission reading. The 6-minute visible emission test shall be conducted in accordance with 40 CFR Part 60, Appendix A,

Method 9. The 6-minute visible emission test must be conducted while the unit is in operation; but not during periods of startup, shutdown, or malfunctions. If the unit has come off-line before the six-minute visible emission test can be performed, the test must be conducted within one hour after the unit's next start-up.

Periodic monitoring for units that operate on a semiannual or annual basis shall be based on Step 4.

**Step 4:** For units that operate on a semiannual or annual basis, monitoring shall consist of the following:

- a. Monitoring shall consist of a visible emission reading once per year, if during that six or 12-month period, distillate oil is combusted. A visible emission reading shall consist of a visual survey of the unit over a two-minute period to identify if there are visible emissions. The visible emission reading must be conducted while the unit is in operation; but not during periods of startup, shutdown, or malfunctions. A six-minute visible emission test meeting the requirements of 40 CFR Part 60, Appendix A, Method 9 can replace the two-minute reading required under Step 4(a) and an additional six minute visible emission test as required in Step4(b) does not have to be performed.
- b. If visible emissions are observed from a unit at any time other than periods of startup, shutdown, or malfunction, the owner or operator shall conduct a 6-minute visible emission test on that unit to determine if the unit is in compliance with its opacity limit. The 6-minute visible emission test must be conducted within one hour of witnessing visible emissions from the unit during a 2-minute visible emission reading. The 6-minute visible emission test shall be conducted in accordance with 40 CFR Part 60, Appendix A, Method 9. The 6-minute visible emission test must be conducted while the unit is in operation; but not during periods of startup, shutdown, or malfunctions. If the unit has come off-line before the six-minute visible emission test can be performed, the test must be conducted within one hour after the unit's next start-up.

The person conducting the two-minute visible emission reading does not have to be certified in accordance with 40 CFR Part 60, Appendix A, Method 9. If a visible emission test is required before a person is certified in accordance with permit condition 8.2, the owner or operator shall notify the Secretary within 24 hours of observing the visible emissions to schedule a visible emission test performed by a state inspector.

## **8.2 Certified personnel – visible emission tests**

In accordance with ARSD 74:36:13:07, within 180 days after permit issuance the owner or operator shall retain a person that is certified to perform a visible emission test in accordance with 40 CFR Part 60, Appendix A, Method 9. The owner or operator shall retain a certified person throughout the remaining term of this permit.

### **8.3 Re-certification of the continuous emission monitoring systems**

In accordance with ARSD 74:36:13:01 and 74:36:16:04, the owner or operator shall notify the Secretary in writing prior to making any planned changes to the continuous emission monitoring systems that invalidates its certification. If the change was unforeseen, the owner or operator shall notify the Secretary in writing within five working days after making the change.

Changes that invalidate the certification status are the replacement of an analyzer, change in location or orientation of the sampling probe or site, modification to the flue gas handling system which changes its flow characteristics, or a change that in the Secretary's judgment significantly affects the ability of the system to measure or record the pollutant concentration and volumetric gas flow.

The following changes to a continuous emission monitoring system do not invalidate the certification:

1. Routine or normal corrective maintenance;
2. Replacement of parts on the manufacturer's recommended spare parts list;
3. Software modifications in the automated data acquisition and handling system, where the modification is only for the purpose of generating additional or modified reports;
4. Temporary replacement of an analyzer with a similar analyzer;
5. A calibration gas audit on the carbon monoxide continuous emission monitoring system on Unit #8 shall be conducted in accordance with 40 CFR, Part 60, Appendix F § 5.1.2 within 24 hours of installing a temporary replacement analyzer. A two point calibration check shall be performed daily, thereafter, until the temporary replacement analyzer has been replaced with the original analyzer or the temporary replacement analyzer has been certified. A temporary replacement analyzer that is used on a unit for more than 30 operating days in a calendar year shall be certified. If the temporary analyzer is used for one hour or more during the day, that constitutes one operating day. The certification test shall be performed within 60 days of exceeding the 30 operating day limit. The results of the certification test shall be submitted to the Secretary within 60 days after completing the test.
6. A temporary "like kind" replacement analyzer, meeting 40 CFR Part 75, Appendix B criteria, shall be used if the nitrogen oxide continuous emission monitoring system on Unit #4, #5, or #8 needs service. If the temporary replacement analyzer is to be certified, the results of the relative accuracy test audit (RATA) shall be submitted to the Secretary within 60 days after completing the test.

In accordance with ARSD 74:36:13:02, as referenced to 40 CFR § 60.13(c), the owner or operator of the carbon monoxide continuous monitoring system on Unit #8 shall re-certify the continuous emission monitoring system within 90 days of completing any change which invalidates the monitor's certification status. A calibration gas audit shall be conducted in accordance with 40 CFR, Part 60, Appendix F § 5.1.2 within 24 hours of making a change that invalidates the monitor's certification status. A two point calibration check shall be performed

daily, thereafter, until the re-certification test is completed. The results of the re-certification test shall be submitted to the Secretary within 60 days after completing the test.

In accordance with ARSD 74:36:16:04, as referenced to 40 CFR § 75.20, the owner or operator shall re-certify the nitrogen oxide continuous emission monitoring system on Units #4, #5 or #8 in accordance with 40 CFR, Part 75, Appendix A. The results of the re-certification test shall be submitted to the Secretary within 60 days after completing the test.

#### **8.4 Continuous emission monitoring data**

In accordance with ARSD 74:36:16:04, as referenced to 40 CFR § 75.10(a)(2), the nitrogen oxide continuous emission monitoring system on Unit #4, #5 and #8 shall measure and record nitrogen oxide emissions in parts per million and pounds per million Btus. The data acquisition and handling system shall perform all necessary calculations to report nitrogen oxide emission rates in parts per million by volume corrected to 15% oxygen on a dry basis and in pounds per hour.

In accordance with ARSD 74:36:13:02, the continuous emission monitoring system for Units #8 shall monitor the carbon monoxide concentration in parts per million by volume on a dry basis and the emission rate in pounds per hour.

The nitrogen oxide and carbon monoxide concentrations and emission rates shall be based on one-hour averages computed from four or more data points equally spaced over each one-hour period. A one-hour period starts at the beginning of the hour and ends at the beginning of the following hour. Data recorded during monitor downtime or when Unit #4, #5 or #8 is not operating shall be considered invalid data points and not included in the data averages for that unit. For one-hour periods during monitor calibrations, quality control audits or other required maintenance, a minimum of two data points at least 15 minutes apart must be collected to consider the one-hour average valid. For one hour periods in which Unit #4, #5 or #8 is operated for 15 consecutive minutes or less, a minimum of one data point must be collected to consider the one-hour average valid for the unit. A data acquisition and handling system shall perform all necessary calculations.

## **9.0 PSD Requirements: Units #4 and #5**

### **9.1 Air emission limits for Units #4 and #5**

In accordance with ARSD 74:36:09, as referenced to 40 CFR §52.21, the owner or operator shall not allow the air emissions in excess of the emission limit specified in Tables 9-1 and 9-2 for Units #4 and #5.

**Table 9-1 – Air Emission Limits During Base Operations for Units #4 and #5  
(Greater than or equal to 90 percent of design output)**

Air Pollutant	Natural Gas <sup>1</sup>		Distillate Oil <sup>1</sup>	
	pounds/hour	tons/year	pounds/hour	tons/year
PM <sub>10</sub>	18	52.6	112	394.2
Sulfur Dioxide	87	311	554	1,839.6
Nitrogen Oxide <sup>5</sup>	128	521.2	232	862.9
Volatile Organic Compounds	11	38.1	65	227.8
Carbon Monoxide	158	556.3	160	569.4

<sup>1</sup> - Compliance with the PM<sub>10</sub>, volatile organic compound, and carbon monoxide limits will be based on stack performance tests.

**Table 9-2 – Air Emission Limits During All Operations for Units #4 and #5  
(Except during startup, shutdown, and malfunctions)**

Air Pollutant	Natural Gas <sup>1</sup>	Distillate Oil <sup>1</sup>
	ppmvd <sup>3</sup>	ppmvd <sup>3</sup>
Sulfur Dioxide	14	82
Nitrogen Oxide <sup>2, 4, 5</sup>	24	41
Volatile Organic Compounds	150	100
Carbon Monoxide	400	220

<sup>1</sup> - Compliance with the volatile organic compound and carbon monoxide limits will be based on stack performance tests;

<sup>2</sup> - The nitrogen oxide limit shall be corrected and based on 15 percent oxygen;

<sup>3</sup> - “ppmvd” means parts per million by volume on a dry basis;

<sup>4</sup> - The nitrogen oxide limit is based on a 24-hour rolling average during normal operating conditions. A 24-hour rolling average is calculated for each normal operating hour by averaging nitrogen oxide data from the past 24 operating hours taking into consideration fuels burned. Startups, shutdowns, malfunctions, and periods in which the turbine is not operating shall be excluded from determining the 24-hour rolling average; and

<sup>5</sup> - The owner or operator is exempt from the nitrogen oxide limit during ice fog and water restrictions as identified in permit condition 12.2.

The owner or operator shall operate Units #4 and #5 with the water injection system engaged at all times except during startup, shutdown and malfunctions. Startup shall be defined as the time period for safe power ascent beginning when the unit starts producing electricity and ends when the unit reaches 30 megawatts when fueling with natural gas and 12 megawatts when fueling with distillate oil. Shutdown shall be defined as the time period for safe power descent beginning when the unit reaches 30 megawatts when fueling with natural gas and 12 megawatts when fueling with distillate oil and ends when the unit is not producing electricity. Any hour for which any portion of that hour is in startup or shutdown shall be deemed a startup or shutdown hour for purposes of compliance determination calculations. The owner or operator shall not idle Units #4 and #5 at electric production rates where the water injection system cannot be engaged. Malfunctions that occur on a

regular basis or could have been avoided by preventive maintenance or could have been mitigated by a timely response by the owner or operator are considered violations.

## **9.2 Fuel sulfur content limit**

In accordance with ARSD 74:36:09, as referenced to 40 CFR §52.21, no owner or operator shall burn any fuel in Units #4 or #5, which contains sulfur in excess of 0.37 percent by weight.

## **10.0 PSD Exemption: Unit #8**

### **10.1 Prevention of significant deterioration exemption for Unit #8**

In accordance with ARSD 74:36:05:16.01(8), the owner or operator is exempt from a prevention of significant deterioration review for particulate matter 10 microns in diameter or less (PM10), nitrogen oxide, and carbon monoxide for Unit #8. The exemption is based on the air emission limits noted in Table 10-1. Any relaxation in those limits may require a full prevention of significant deterioration review.

*Table 10-1 – Air Emission Limits for Unit #8*

<b>Air Pollutant</b>	<b>Limit per 12-month rolling period <sup>1</sup></b>
Particulate matter <sup>2</sup>	3,160 hours
Nitrogen oxide <sup>3</sup>	38 tons
Carbon monoxide <sup>3</sup>	95 tons

<sup>1</sup> - Compliance with the long term limit shall be based on a 12-month rolling period. Each monthly tonnage and operating hour total shall be added to the 11 previous monthly tonnages and operating hour totals. The result shall be compared to the long term tonnage and operating hour limits;

<sup>2</sup> - The 12-month rolling period shall be based on the number of hours operated; and

<sup>3</sup> - The 12-month rolling period shall be based on tons emitted based on data collected from the continuous emission monitoring data.

### **10.2 Monthly records**

In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall calculate and record the amount of nitrogen oxide and carbon monoxide emissions, in tons, emitted into the ambient air from Unit #8 and record the number of hours Unit #8 operated during the month and during the 12-month rolling period for that month.

### **10.3 Performance specifications and quality assurance for carbon monoxide**

In accordance with ARSD 74:36:13:02, as referenced to 40 CFR § 60.13(a), the carbon monoxide continuous emission monitoring system on Unit #8 shall meet the performance specifications in 40 CFR Part 60, Appendix B, Performance Specifications 4 or 4A. In addition, the continuous emission monitoring system shall meet the quality assurance requirements in 40 CFR Part 60, Appendix F.



## **11.0 MACT Exemption**

### **11.1 Plant wide hazardous air pollutant limit**

In accordance with ARSD 74:36:05:16.01(8), the owner or operator shall not emit greater than or equal to 9.5 tons of from Unit #4, #5, and #8 per 12-month rolling period.

### **11.2 Annual operational restriction for Unit #4 and #5**

In accordance with ARSD 74:36:05:16.01(8), the owner or operator shall not operate Unit 4 and 5 greater than 6,934 hours per unit per 12-month rolling period.

## **12.0 Standards for Combustion Turbine #4, #5, and #8 – Subpart GG**

### **12.1 Nitrogen oxide emission limit**

In accordance with ARSD 74:36:07:18, as referenced to 40 CFR § 60.332(a)(1) and (b), the owner or operator shall limit the nitrogen oxide concentration in the exhaust gases from Unit #4 and #5 to less than or equal to 96 parts per million by volume on a dry basis at 15 percent oxygen, except as allowed in permit condition 12.2. The owner or operator shall limit the nitrogen oxide concentration in the exhaust gases from Unit #8 to less than or equal to 109 parts per million by volume on a dry basis at 15 percent oxygen.

In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.8(c), nitrogen oxide emissions in excess of the levels specified in this permit conditions during periods of startup, shutdown, and malfunction shall not be considered a violation. Startup, shutdown, and malfunction are defined in permit condition 9.1.

### **12.2 Exemption from nitrogen oxide limit**

In accordance with ARSD 74:36:07:18, as referenced to 40 CFR § 60.332(f) and (i), Unit #4 and #5 are exempt from the nitrogen oxide emission limit in permit condition 12.1 during the following:

1. When ice fog is deemed a traffic hazard by the owner or operator. “Ice fog” means an atmospheric suspension of highly reflective ice crystals; or
2. On a case-by-case basis as determined by the Secretary in specific geographical areas where mandatory water restrictions are required by governmental agencies because of drought conditions.

### **12.3 Sulfur dioxide emission limit**

In accordance with ARSD 74:36:07:18, as referenced to 40 CFR § 60.333, the owner or operator shall comply with one of the following sulfur dioxide emission limits:

1. The owner or operator shall not cause to be discharged into the atmosphere from Unit #4, #5, and #8 any gases which contains sulfur dioxide in excess of 0.015 percent by volume at 15 percent oxygen and on a dry basis; or

2. The owner or operator shall not burn any fuel in Unit #4, #5, and #8 which contains total sulfur in excess of 0.8 percent by weight (8,000 parts per million by weight).

#### **12.4 Demonstrating compliance with nitrogen oxide emission limit**

In accordance with ARSD 74:36:07:18, as referenced to 40 CFR § 60.334(b), the owner or operator shall install, certify, maintain, operate, and quality assure a continuous emission monitoring system on Unit #4, #5, and #8 consisting of nitrogen oxide and oxygen monitors. As an alternative to oxygen, a carbon dioxide monitor may be used to adjust the measured nitrogen oxide concentrations to 15 percent oxygen by either converting the carbon dioxide hourly averages to equivalent oxygen concentrations using Equation 12-1 or 12-2 and making the adjustments to 15 percent oxygen or by using the carbon dioxide readings directly to make the adjustments, as described in 40 CFR Part 60, Appendix A-7, Method 20. The continuous emission monitoring system shall be installed, certified, maintained and operated as follows:

1. The continuous emission monitoring system shall be installed and certified according to 40 CFR Part 60, Appendix B, Performance Specification 2 and 3 (for diluent), except as specified in permit condition 13.2 and the 7-day calibration drift is based on unit operating days, not calendar days. 40 CFR Part 60, Appendix F, Procedure 1 is not required. The relative accuracy test audit (RATA) of the nitrogen oxide and diluent monitors may be performed individually or on a combined basis. The relative accuracy tests audits of the continuous emission monitoring system may be performed either:
  - a. On a parts per million basis for nitrogen oxide and a percent oxygen basis for oxygen;
  - b. On a parts per million at 15 percent oxygen basis; or
  - c. On a parts per million basis for nitrogen oxide and a percent carbon dioxide basis for a carbon dioxide monitor that uses the procedures in 40 CFR Part 60, Appendix A-7, Method 20 to correct the nitrogen oxide data to 15 percent oxygen;
2. During each full unit operating hour, each monitor must complete a minimum of one cycle of operation (i.e., sampling, analyzing, and data recording) for each 15-minute quadrant of the hour, to validate the hour. For partial unit operating hours, at least one valid data point must be obtained for each quadrant of the hour in which the unit operates. For unit operating hours in which required quality assurance and maintenance activities are performed on the continuous emission monitoring system, a minimum of two valid data points (one in each of two quadrants) are required to validate the hour; and
3. For purposes of identifying excess emissions, continuous emission monitoring system data must be reduced to hourly averages as follows:
  - a. For each unit operating hour in which a valid hourly average is obtained for both nitrogen oxide and diluent, the data acquisition and handling system must calculate and record the hourly nitrogen oxide emissions in the units of the applicable nitrogen oxide emission limit. For any hour in which the hourly average oxygen concentration exceeds 19.0 percent oxygen, a diluent cap value of 19.0 percent oxygen may be used in the emission calculations;
  - b. A worst case International Organization for Standardization (ISO) correction factor may be calculated and applied using historical ambient data. For the purpose of this

- calculation, substitute the maximum humidity of ambient air ( $H_o$ ), minimum ambient temperature ( $T_a$ ), and minimum combustor inlet absolute pressure ( $P_o$ ) into the International Organization for Standardization correction equation; and
- c. If the owner or operator installed a nitrogen oxide continuous emission monitoring system to meet the requirements of 40 CFR Part 75 and is continuing to meet the ongoing requirements of 40 CFR Part 75, the continuous emission monitoring system may be used to meet the requirements of this permit condition, except that the missing data substitution methodology provided for at 40 CFR Part 75, Subpart D, is not required for purposes of identifying excess emissions. Instead, periods of missing continuous emission monitoring system data are to be reported as monitor downtime in the excess emissions and monitoring performance report required in permit condition 5.6.

***Equation 12-1 – Option 1 – Hourly Average Carbon Dioxide Concentration***

$$CO_{2d} = 100 \frac{F_c}{F} \frac{20.9 - O_{2d}}{20.9}$$

Where:

- $CO_{2d}$  = Hourly average carbon dioxide concentration during unit operation, percent by volume, wet basis;
- $O_{2d}$  = Hourly average oxygen concentration during unit operation, percent by volume, wet basis;
- $F, F_c$  = F-factor or carbon-based  $F_c$ -factor from Section 3.3.5 in 40 CFR Part 75, Appendix F; and
- 20.9 = Percentage of oxygen in ambient air.

***Equation 12-2 – Option 2 – Hourly Average Carbon Dioxide Concentration***

$$CO_{2w} = \frac{100}{20.9} \times \frac{F_c}{F} \left[ 20.9 \left( \frac{100 - \%H_2O}{100} \right) - O_{2w} \right]$$

Where:

- $CO_{2w}$  = Hourly average carbon dioxide concentration during unit operation, percent by volume, wet basis;
- $O_{2w}$  = Hourly average oxygen concentration during unit operation, percent by volume, wet basis;
- $F, F_c$  = F-factor or carbon-based  $F_c$ -factor from Section 3.3.5 in 40 CFR Part 75, Appendix F;
- $\%H_2O$  = Moisture content of gas in the stack, percent; and
- 20.9 = Percentage of oxygen in ambient air.

The continuous emission monitoring system shall measure and record the emissions at all times, including periods of startup, shutdown, and malfunctions. Monitor downtime is allowed for system breakdowns, repairs, calibration checks, quality assurance audits and span adjustment, and at other time periods at the discretion of the Secretary.

In accordance with ARSD 74:36:16, in accordance with 40 CFR § 75.40(a) and ARSD 74:36:07:18, as referenced to 40 CFR § 60.334(c), the owner or operator may apply to the Secretary for approval of an alternative monitoring system to determine average hourly emission data for nitrogen oxide instead of using the continuous emission monitoring system.

### **12.5 Demonstrating compliance with sulfur limit**

In accordance with ARSD 74:36:07:18, as referenced to 40 CFR § 60.334(h)(1) and (i) and ARSD 74:36:05:16.01(9), the owner or operator shall monitor the total sulfur content of the fuel fired in Unit #4, #5, and #8 using one of the following methods:

1. For distillate oil:
  - a. Conduct flow proportional oil sampling or continuous drip oil sampling in accordance with ASTM D4177-95 (Reapproved 2000) every day the unit is combusting oil. Extract oil at least once every hour and blend into a composite sample. The sample compositing period may not exceed 7 calendar days (168 hours);
  - b. Representative oil samples may be taken from the storage tank or fuel flow line manually every day that the unit combusts oil according to ASTM D4057-95 (Reapproved 2000). Use either the actual daily sulfur content or the highest fuel sulfur content recorded at that unit from the most recent 30 daily samples. If oil supplies with different sulfur contents are combusted on the same day, sample the highest sulfur fuel combusted that day;
  - c. Take a manual sample after each addition of oil to the storage tank. Do not blend additional fuel with the sampled fuel prior to combustion. Sample according to the single tank composite sampling procedure or all-levels sampling procedure in ASTM D4057-95 (Reapproved 2000);
  - d. An oil sample may be taken from the shipment tank or container upon receipt of each lot of fuel oil or the supplier's storage container which holds the lot of fuel oil. A supplier need only sample the storage container once for sulfur content so long as the fuel sulfur content does not change and no fuel is added to the supplier's storage container. A lot is defined as a shipment or delivery (e.g., ship load, barge load, group of trucks, discrete purchase of diesel fuel through a pipeline, etc.) of a single fuel; or
  - e. The owner or operator may obtain a fuel supplier certification for each load of distillate oil (diesel) purchased or received. The fuel supplier certification shall include the following information:
    - i. The name of the oil supplier;
    - ii. A statement from the oil supplier that the oil complies with the specifications under the definition of distillate oil. Distillate oil means fuel oil that complies with the specifications for fuel oil numbers 1 or 2. Specifications for fuel oils are defined in the American Society for Testing and Materials in ASTM D396-78, "Standards Specifications for Fuel Oils"; and
    - iii. A statement that the sulfur content of the oil does not exceed 0.5 weight percent sulfur.

2. For gaseous fuel:
  - a. For gaseous fuels that are not demonstrated to meet the definition of natural gas and for which the fuel is supplied without intermediate bulk storage, the sulfur content value of the gaseous fuel shall be determined and recorded once per unit operating day; or
  - b. If the gaseous fuel is demonstrated to meet the definition of natural gas, the owner or operator may elect not to monitor the total sulfur content of the gaseous fuel combusted in the turbine. "Natural gas" is defined as a naturally occurring fluid mixture of hydrocarbons (i.e., methane, ethane, or propane) produced in geological formations beneath the Earth's surface that maintains a gaseous state at standard atmospheric temperature and pressure under ordinary conditions. Natural gas must be composed of at least 70 percent methane by volume or have a gross calorific value between 950 and 1,100 British thermal units per standard cubic foot. Natural gas does not include the following gaseous fuels: landfill gas, digester gas, refinery gas, sour gas, blast furnace gas, coal-derived gas, producer gas, coke oven gas, or any gaseous fuel produced in a process which might result in highly variable sulfur content or heating value. The owner or operator shall use one of the following sources of information to make the required demonstration:
    - i. The gas quality characteristics in a current, valid purchase contract, tariff sheet or transportation contract for the gaseous fuel, specifying the maximum total sulfur content of the fuel is 20.0 grains per 100 standard cubic foot or less; or
    - ii. Representative fuel sampling data which show the sulfur content of the gaseous fuel does not exceed 20.0 grains per 100 standard cubic foot. At a minimum, the amount of fuel sampling data specified in section 2.3.1.4 or 2.3.2.4, 40 CFR Part 75, Appendix D is required.

The sulfur content of the fuel being fired in Unit #4, #5, and #8 shall be determined using total sulfur methods described in paragraph (5) of permit condition 12.7. If the sulfur content of the gaseous fuel during the most recent performance test was less than 0.4 weight percent (4,000 parts per million by volume), ASTM D4084-82, 94, D5504-01, D6228-98, or Gas Processors Association Standard 2377-86, which measure the major sulfur compounds may be used;

### **12.6 Performance test methods**

In accordance with ARSD 74:36:07:18, as referenced to 40 CFR §60.335(a), if the owner or operator conducts a performance test to demonstrate compliance with permit condition 12.1, the owner or operator shall use the following test methods:

1. 40 CFR Part 60, Appendix A-7, Method 20, ASTM D6522-00, or 40 CFR Part 60, Appendix A, Method 7E and either Method 3 or 3A, to determine nitrogen oxide and diluent concentrations;
2. Sampling traverse points are to be selected following 40 CFR Part 60, Appendix A, Method 1 or Method 20, (non-particulate procedures) and sampled for equal time intervals. The sampling shall be performed with a traversing single-hole probe or, if

feasible, with a stationary multi-hole probe that samples each of the points sequentially. Alternatively, a multi-hole probe designed and documented to sample equal volumes from each hole may be used to sample simultaneously at the required points.

3. The owner or operator may test fewer points than are specified in 40 CFR Part 60, Appendix A, Method 1 or Method 20 if the following conditions are met:
  - a. The owner or operator may perform a stratification test for nitrogen oxide and diluent pursuant to the procedures specified in 40 CFR Part 75, Appendix A, section 6.5.6.1(a) through (e);
  - b. Once the stratification sampling is completed, the owner or operator may use the following alternative sample point selection criteria for the performance test:
    - i. If each of the individual traverse point nitrogen oxide concentrations, normalized to 15 percent oxygen, is within 10 percent of the mean normalized concentration for all traverse points, then the owner or operator may use 3 points (located either 16.7, 50.0, and 83.3 percent of the way across the stack or duct, or, for circular stacks or ducts greater than 2.4 meters (7.8 feet) in diameter, at 0.4, 1.2, and 2.0 meters from the wall). The 3 points shall be located along the measurement line that exhibited the highest average normalized nitrogen oxide concentration during the stratification test; or
    - ii. If each of the individual traverse point nitrogen oxide concentrations, normalized to 15 percent oxygen, is within 5 percent of the mean normalized concentration for all traverse points, then the owner or operator may sample at a single point, located at least 1 meter from the stack wall or at the stack centroid.

### **12.7 Performance test procedures**

In accordance with ARSD 74:36:07:18, as referenced to 40 CFR §60.335(b), if the owner or operator conducts a performance test to demonstrate compliance with the nitrogen oxide emission limit in permit condition 12.1 or sulfur dioxide limit in permit condition 12.3, the owner or operator shall conduct the performance test as follows:

1. For each run of the performance test, the mean nitrogen oxides emission concentration corrected to 15 percent oxygen may be corrected by the owner or operator to International Organization for Standardization (ISO) standard conditions using Equation 12-3;

#### ***Equation 12-3 – Nitrogen oxide emission calculation***

$$NO_x = NO_{x_o} \times \left(\frac{P_r}{P_o}\right)^{0.5} \times e^{19(H_o - 0.00633)} \times \left(\frac{288^\circ K}{T_a}\right)^{1.53}$$

Where:

- $NO_x$  = emission concentration of nitrogen oxide at 15 percent oxygen and ISO standard ambient conditions, parts per million by volume, dry basis;
- $NO_{x_o}$  = mean observed nitrogen oxide concentration, parts per million by volume, dry basis, at 15 percent oxygen;

- $P_r$  = reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure or the owner or operator may use 760 mm Hg (29.92 in Hg);
  - $P_o$  = observed combustor inlet absolute pressure at test, mm Hg or the owner or operator may use the barometric pressure for the date of the test;
  - $H_o$  = observed humidity of ambient air, g  $H_2O$ /g air;
  - $e$  = transcendental constant, 2.718, and
  - $T_a$  = ambient temperature, °K.
2. The 3-run performance test shall be performed within 5 percent at 30, 50, 75, and 90-to-100 percent of peak load or at four evenly-spaced load points in the normal operating range of Unit #4, #5, and #8, including the minimum point in the operating range and 90-to-100 percent of peak load, or at the highest achievable load point if 90-to-100 percent of peak load cannot be physically achieved in practice;
  3. The performance evaluation of the continuous emission monitoring system may either be conducted separately as described in paragraph (4) of this permit condition or as part of the initial performance test of the unit;
  4. The owner or operator may conduct the initial performance test in the following alternative manner:
    - a. Perform a minimum of 9 reference method runs, with a minimum time per run of 21 minutes, at a single load level, between 90 and 100 percent of peak or the highest physically achievable load;
    - b. Use the test data both to demonstrate compliance with the applicable nitrogen oxide emission limit in permit condition 12.1 and to provide the required reference method data for the relative accuracy test audit (RATA) of the continuous emission monitoring system described in permit condition 12.4; and
    - c. The requirement to test at three additional load levels is waived.
  5. If the owner or operator is required to periodically determine the sulfur content of the fuel combusted in Unit #4, #5, and #8, a minimum of three fuel samples shall be collected during the performance test. The owner or operator shall analyze the samples for the total sulfur content of the fuel using:
    - a. For liquid fuels, ASTM D129-00, D2622-98, D4294-02, D1266-98, D5453-00 or D1552-01; and
    - b. For gaseous fuels, ASTM D1072-80, 90 (Reapproved 1994); D3246-81, 92, 96; D4468-85 (Reapproved 2000); or D6667-01. The applicable ranges of some ASTM methods mentioned above are not adequate to measure the levels of sulfur in some fuel gases. Dilution of samples before analysis (with verification of the dilution ratio) may be used, subject to the prior approval of the Secretary.

The fuel analyses may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency.

### **12.8 Operational records – combustion turbines**

In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.7(b), the owner or operator shall maintain the following records related to the operation of Unit #4, #5, and #8:

1. Occurrence and duration of any startup, shutdown, or malfunction related to Unit #4, #5, and #8;
2. Any malfunction of the water injection system for Unit #4 and #5; and
3. Any periods during which the continuous emission monitoring system is inoperable for Unit #4, #5, and #8.

### **12.9 Changing fuels for Unit #4, #5, and #8**

In accordance with ARSD 74:36:07:18, as referenced to 40 CFR § 60.330, Unit #4 and #5 shall be fueled solely with natural gas and distillate oil and Unit #8 shall be fueled solely with natural gas. The owner or operator shall apply for and obtain approval from the Secretary before other fuels can be used.

### **12.10 Quarterly excess emissions and monitor downtime report**

In accordance with 74:36:07:18, as referenced to 40 CFR §60.334(j), the owner or operator shall submit a quarterly excess emissions and monitor downtime report for Units #4, #5, and #8.

Excess emissions shall be reported for all periods of unit operation, including startup, shutdown and malfunction. The quarterly report shall contain the following information:

1. Name of the facility, permit number, reference to this permit condition, and identify the submittal as a quarterly report;
2. If the owner or operator is required to periodically determine the sulfur content of the fuel:
  - a. For samples of gaseous fuel or distillate oil samples obtained using daily sampling, flow proportional sampling, or sampling from unit's storage tank, an excess emission occurs each unit operating hour included in the period beginning on the date and hour of any sample for which the sulfur content of the fuel being fired exceeds 0.8 weight percent and ending on the date and hour that a subsequent sample is taken that demonstrate compliance with the sulfur limit;
  - b. If the option to sample each delivery of distillate oil has been selected, the owner or operator shall immediately switch to one of the other oil sampling options (i.e., daily sampling, flow proportional sampling, or sampling from the unit's storage tank) if the sulfur content of a delivery exceeds 0.8 weight percent. The owner or operator shall continue to use one of the other sampling options until all of the oil from the delivery has been combusted, and shall evaluate excess emissions according to paragraph (2)(a) of this permit condition. When all of the fuel from the delivery has been burned, the owner or operator may resume using the as-delivered sampling option;
  - c. If the owner or operator obtains a fuel supplier certification to demonstrate compliance with the sulfur limit, a copy of the fuel supplier certification for each load



- of distillate oil delivered during the reporting period. Excess emissions occurs if the sulfur content on the fuel supplier certification exceeds 0.8 weight percent;
- d. A period of monitor downtime begins when a required sample is not taken by its due date. A period of monitor downtime also begins on the date and hour of a required sample, if invalid results are obtained. The period of monitor downtime shall include only unit operating hours, and ends on the date and hour of the next valid sample;
3. For nitrogen oxide and diluent continuous emission monitoring systems:
- a. An hour of excess emissions shall be any unit operating hour in which the 4-hour rolling average nitrogen oxide concentration exceeds the applicable emission limit in permit condition 12.1. A “4-hour rolling average nitrogen oxide concentration” is the arithmetic average of the average nitrogen oxide concentration measured by the continuous emission monitoring system for a given hour (corrected to 15 percent oxygen and, if required in paragraph (1) of permit condition 12.7, to International Organization for Standardization standard conditions) and the three unit operating hour average nitrogen oxide concentrations immediately preceding that unit operating hour;
  - b. A period of monitor downtime shall be any unit operating hour in which sufficient data are not obtained to validate the hour, for either nitrogen oxide concentration or diluent (or both);
  - c. Each report shall include the ambient conditions (temperature, pressure, and humidity) at the time of the excess emission period. The owner or operator does not have to report ambient conditions if the owner or operator opts to use the worst case International Organization for Standardization correction factor as specified in paragraph (3)(b) of permit condition 12.4, or if the owner or operator is not using the International Organization for Standardization correction in Equation 12-3;
  - d. If the nitrogen oxide concentration in permit condition 12.1 is exceeded based on a four hour rolling average, the report shall identify the following:
    - i. Identify the Unit #;
    - ii. The date, time, and time period of each exceedance;
    - iii. Magnitude of the exceedance;
    - iv. Cause of the exceedance; and
    - v. Measures taken to bring the operations back into compliance.In the case where no exceedance has occurred, the quarterly report shall state that no exceedance has occurred;
  - e. Any period in which the continuous emission monitoring system is inoperable and did not collect a valid one-hour average while the unit was operational. The following information shall be submitted:
    - i. Identify the Unit #;
    - ii. The date, time and time period of each period during which the continuous monitoring system was inoperative and did not collect a valid one-hour period;
    - iii. The reason the continuous emission monitoring system is down; and

- iv. The measures taken to bring the continuous emission monitoring system on line again and measures taken to prevent the reason the system went down from occurring again.  
In the case when there was no time in which the continuous monitoring system was inoperable and did not collect a valid one-hour period while the unit was operational, the quarterly report shall state that the continuous monitoring system was operational at all times;
- f. For any period in which a temporary monitor is used, the following information shall be submitted:
  - i. Identify the Unit #;
  - ii. The date and time the temporary monitor was used; and
  - iii. The number of days the temporary monitor was used during each month of the quarter.  
If a temporary monitor was not used, the quarterly report shall state that no temporary monitor was used during the reporting period.
- 4. Each period during which an exemption is in effect because of ice fog or mandatory water restriction. For each period, the ambient conditions existing during the period, the date and time the water injection system was deactivated, and the date and time the water injection system was reactivated shall be reported;

The quarterly report shall be postmarked no later than the 30<sup>th</sup> day following the end of each calendar quarter. The quarterly report requirements may be combined with other quarterly report(s) required by this permit.

## **13.0 Acid Rain Program**

### **13.1 Operating in accordance with acid rain permit application.**

The owner or operator shall operate each applicable unit in accordance with the standard requirements set forth in the phase II acid rain permit application submitted May 29, 2015 (see Attachment A).

### **13.2 Performance specifications and quality assurance for nitrogen oxide**

In accordance with ARSD 74:36:16:04, as referenced to 40 CFR § 75.1, the nitrogen oxide continuous emission monitoring system on Unit #4, #5, and #8 shall meet the performance specifications in 40 CFR Part 75, Appendix A. In addition, the nitrogen oxide continuous emission monitoring systems shall meet the quality assurance requirements in 40 CFR Part 75 Appendix B.