TECHNICAL REVIEW DOCUMENT
OPERATING PERMIT 03OPAD257
to be issued to:

Tri-State Generation & Transmission Association, Inc.
Frank Knutson Station

Adams County
Source ID 0011349

Prepared by Cathy Rhodes
April, 2003

I. Purpose:

This document establishes the basis for decisions made regarding the Applicable Requirements, Emission Factors, Monitoring Plan and Compliance Status of Emission Units covered within the Operating Permit proposed for this site. It is designed for reference during review of the proposed permit by the EPA, the Public and other interested parties. Conclusions made in this report are based on information provided by the applicant in the Title V application received April 1, 2003, subsequent additional information submittals, and review of Division files. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised Construction Permit.

II. Source Description:

This facility consists of two combustion turbine generators (CTGs) configured to operate in a simple-cycle mode (exhaust directly to the atmosphere). Each turbine has a nominal design rate of 840.3 mmBtu/hour (natural gas) and 905.8 mmBtu/hour (distillate fuel oil). There is one fuel oil storage tank. The facility is defined under Standard Industrial Classification 4911. A Construction Permit was issued for this facility to Tri-State Power, LLC, under the facility name of the Brighton Generating Station. For this operating permit, the permittee submitted a transfer of ownership and facility name change request.

The facility is located at 13501 Powhaton Road in Commerce City, Adams

County. The area is designated as attainment/maintenance for all pollutants. The facility is considered to be a synthetic minor source for Prevention of Significant Deterioration purposes.

Facility wide emissions are as follows:

Pollutant	Facility Potential to Emit (tons/yr)
PM	36.3
PM_{10}	36.3
NO_X	99.0
SO_2	28.4
CO	32.9
VOC	5.5
Each Individual HAP	
Total HAPs	2.0

Potential to Emit is based on permitted emission limits. The facility has not yet commenced normal operation, therefore actual emissions have not yet been established.

Note: Even though facility emissions are limited to less than 100 tons/year, this facility is subject to Title V Operating Permit requirements because it is subject to the Title IV Acid Rain requirements.

Rocky Mountain National Park is a Federal Class I designated area within 100 kilometers of this facility. There are no affected states within 50 miles of this facility.

This facility certified within the Title V permit application they are not subject to 112(r), the Accidental Release Requirements.

III. Emission Sources:

The following sources are specifically regulated under terms and conditions of the Operating Permit for this Site:

<u>Units BR1 and BR2</u> - Two (2) General Electric (GE) Model PG7121 Natural Gas/Fuel Oil Fired Combustion Turbines, design heat input rated at 840.3 MMBtu/hr (natural gas)/905.8 MMBtu/hr (distillate fuel oil). Each runs an electric generator site rated at approximately 82 MW. The turbines are equipped with advanced low NOx combustion systems and water injection is used during oil firing for NOx emissions control. CO emissions are controlled with an oxidation catalyst.

1. **Applicable Requirements –** Final Approval Construction Permit 00AD0542 was issued for these sources. The following applicable requirements have been identified for these units:

   Construction Permit 00AD0542

   - Visible emissions shall not exceed twenty percent (20%) opacity during normal operation of the source. During periods of startup, process modification, or adjustment of control equipment visible emissions shall not exceed 30% opacity for more than six minutes in any sixty consecutive minutes (Condition 4 and Colorado Regulation No. 1, Sections II.a.1 & 4). Note: The operating permit condition reflects the specific Regulation No. 1 language for this applicable requirement.)

   - Limits emissions from the turbines on a rolling twelve month basis. Special calculation procedures are required for the first year of operation. (Condition 12) (Note: The facility has been in operation for more than a year, therefore the emission calculation procedure for the first twelve months no longer applies, and is not included in the Operating Permit)

   - Limits total heat input on a quarterly basis and on a rolling twelve month basis. (Condition 11) The quarterly limit applies only for the first year of operation. The turbines have been in operation for at least a year, therefore the quarterly limit no longer applies and is not included in the Operating Permit.

   - Subject to Reasonable Available Control Technology (Condition 14):

     - PM_{10}: Pipeline quality gas, good combustion practices. When burning fuel oil: 0.034 lb/mmBtu, annual average.
     - CO: Good combustion practices and oxidation catalyst. 80% conversion to CO_2. Annual average of 0.0183 lb/mmBtu. (Note: In an August 21, 2001 letter to Tri-State, the Division indicates that the 80% requirement will be demonstrated once with the initial compliance test and will not be included in the final approval construction permit. The initial compliance test demonstrated compliance with the 80% requirement. The Operating Permit therefore does not include the 80% conversion requirement.)
     - NOx (a PM_{10} precursor): Dry low NOx combustion system at 9 ppmvd @ 15% O_2 when operating on natural gas. Water injection at 42 ppmvd @ 15% O_2 when operating on fuel oil. Concentration limits do not apply during startup and shutdown. The definitions of startup and shutdown are changed from definitions based on time to definitions based on operation of the turbines, in accordance with Division policy. The Construction Permit also includes a Nitrogen Oxides emission limit of 0.175 pound per million BTU heat input (annual average) when burning 100% distillate fuel oil. Since the permit contains an hourly ppm limit and an annual tons/year limit, the Division does not believe it is also necessary to impose a lb/mmBtu limit. A review of the files indicates ambient impact

modeling was based on the worst case hourly emission rate. Therefore, the lb/mmBtu limit is deleted from the operating permit.

Note: The Operating Permit application includes proposed RACT emission limits for periods of startup and shutdown. While the EPA requires that Best Available Control Technology (BACT) must be met during these periods of operation, no similar requirement exists for RACT, therefore no RACT limits are included in the operating permit for periods of startup and shutdown. In addition, the source is subject to the requirements of Colorado Regulation No. 7, which requires RACT for VOC sources in ozone nonattainment/maintenance areas. The preliminary analysis for the Construction Permit indicates that RACT for VOC is good combustion and the use of the catalytic oxidizer. The requirement was not included in the Construction Permit, but is included in this operating permit.

- The turbines are subject to Regulation No. 6 - Standards of Performance for New Stationary Sources, Part A - Federal Register Regulations Adopted by Reference, Subpart GG - Standards of Performance for Stationary Gas Turbines, including but not limited to:
  - $NO_X \leq$ 100 ppmvd at 15% oxygen.
  - $SO_2 \leq$ 150 ppmvd at 15% oxygen, or .8% sulfur content.
  - Fuel consumption and water-to-fuel ratio will be continuously monitored and recorded
  - Sulfur and nitrogen content of the fuel being fired in the turbines shall be monitored as specified in this Subpart GG

  (Note: The permittee sent a request to the EPA on August 21, 2001, requesting a custom fuel monitoring plan and approval for alternative compliance testing procedures. The permittee received a response approving the testing procedures, but has not yet received a response to their custom fuel monitoring request. The alternative request is included in the Operating Permit, for EPA review during the permit issuance process)

  (Condition 16)

- The turbines are also subject to the requirements in 40 CFR Part 60 Subpart A – New Source Performance Standards – General Provisions, as adopted by reference in Colorado Regulation No. 6, Part A. (Condition 16)

- The sources are subject to Regulation No. 6 – Standards of Performance for New Stationary Sources, Part B – Specific Facilities and Sources, Non-Federal NSPS, II.C & D – Standards of Performance for New Fuel-Burning Equipment – Standard for Sulfur Dioxide – Combustion Turbines (Condition 16). These are **state-only requirements**.
  - SO_2 emissions shall not exceed 0.35 lbs/mmBtu.
  - Opacity of emissions shall not exceed 20% - this limit does not apply during startup, shut-down, or malfunction

- Each turbine will be equipped with CEMs to measure NOx and CO emissions and fuel use. In addition, the source has a CEMS plan (dated December 7, 2001) that was approved by the Division on July 15, 2002. Much of the information in the CEMS plan will be included in the operating permit as permit conditions. Therefore, the operating permit will supercede the CEMS plan.

  (Condition 15)

- Compliance tests for PM, VOC, CO, SO_2 and NOx. Also to calibrate and certify the CEMs, and to develop a correlation between the emissions of VOC, NOx, and CO, for use in estimating VOC emissions (Condition 13) The source has completed these tests and demonstrated compliance with applicable requirements. Note that in lieu of developing a correlation between the emissions of VOC, NOx, and CO, an emission factor was developed for VOC during the test (see Division's August 21, 2001 letter to Tri-State).

Note that the Final Approval Construction Permit contains "Notes" which are not applicable requirements.

Other applicable requirements not included in 00AD0542

- Particulate matter emissions from each turbine combination shall not exceed the limitations in Reg 1, Section III.A.1.c. (0.1 lb/mmBtu heat input)

- Sulfur dioxide emissions shall not exceed 0.35 lbs/mmBtu, on a 3-hour rolling average (Reg 1, Section VI.B.4.c.(ii) and VI.B.2)

- Both units are subject to the Acid Rain requirements as follows:
  - Allocated SO_2 allowances are listed in 40 CFR Part 73.10(b), however, since these are new units, no allowances were allocated. SO_2 allowances must be obtained per 40 CFR Part 73 to cover SO_2 emissions for the particular calendar year.
  - There are no NO_X emission limitations since these units are not coal-fired boilers.
  - Acid rain permitting requirements per 40 CFR Part 72.
  - Continuous emission monitoring requirements per 40 CFR Part 75.
  - This source is also subject to the sulfur dioxide allowance system (40 CFR Part 73) and excess emissions (40 CFR Part 77).

Streamlining of Applicable Requirements

<u>SO_2</u>

The turbines are subject to the Regulation No. 1 and Regulation No. 6, Part B, SO_2 requirements. The Regulation No. 1 and No. 6, Part B SO_2 standards are the same, 0.35 lb/mmBtu. (Note: The Regulation No. 1 requirement specifically states that the standard is based on a three hour average. The Regulation No. 6, Part B requirement does not specify an averaging time. When Regulation No. 6,

Part B provisions were adopted, the Division intended them to reflect the Regulation No. 1 provisions for new sources. Therefore, the Division assumes the averaging time for the Regulation No. 6, Part B limit is also 3 hours.) The Regulation No. 6, Part B requirement is a state-only requirement. Regulation No. 6, Part B, Section I.A adopts by reference the 40 CFR Part 60 Subpart A general provisions. Although not specifically stated in the general provisions, the Division has concluded after reviewing EPA determinations that the NSPS standards are not applicable during startup, shutdown and malfunction, although any excess emissions during these periods must be reported in the excess emission reports. Specifically, the EPA has indicated, (4/18/75, determination control No. A007) that when 40 CFR Part 60 Subpart A Section 60.11(d) was developed "…it was recognized that sources which ordinarily comply with the standards may during periods of startup, shutdown and malfunction unavoidably release pollutants in excess of the standards." In addition, the EPA has also indicated (5/15/74, determination No. D034) that "[s]ection 60.11(d)(a) makes it clear that the data obtained from these reports are not used in determining violations of the emission standards. Our purpose in requiring the submittal of excess emissions is to determine whether affected facilities are being operated and maintained 'in a manner consistent with good air pollution control practices for minimizing emissions' as required by 60.11(d)." Therefore, the Division considers that the Regulation No. 6, Part B SO_2 requirements do not apply during periods of startup, shutdown and malfunction. Therefore, the Regulation No. 1 SO_2 requirement is more stringent than the Regulation No. 6, Part B requirement and the Regulation No. 6, Part B requirement is streamlined out of the permit.

<u>Monitoring Requirements</u>

These units are subject to several types of monitoring requirements. The construction permit requires that the stacks be equipped with continuous emission monitoring systems (CEMS) to monitor and record NOx and CO emissions and the construction permit requires that these monitors be installed, maintained, and operated according to 40 CFR Part 60, Appendix F and Subpart A. These units are also subject to the Acid Rain requirements and as such are required to monitor emissions in accordance with the requirements of 40 CFR Part 75. In addition, under the proposed revisions to NSPS Subpart GG, the source may install a NOx CEMS that meets the requirements of 40 CFR Part 75.

Since the permittee has installed Part 75 NOx (and diluent) CEMS, the permit will specifiy that the NOx (and diluent) CEMS must meet the requirements in 40 CFR Part 75. The construction permit requirement to install NOx and diluent CEMS that meet Part 60 requirements is streamlined out of the permit in favor of the Part 75 requirements.

2. **Emission Factors-** Emissions from the turbines, heaters and engines are produced during the combustion process, and are dependent upon operating conditions and specific properties of the natural gas being burned. The pollutants of concern are Nitrogen Oxides (NO_X), Carbon Monoxide (CO), Volatile Organic Compounds (VOC) and Particulate Matter (PM and PM_{10}). Small quantities of Hazardous Air Pollutants (HAPs) are also emitted dependent upon the makeup of the fuel and combustion efficiency. Emission limits from the turbines were established using manufacturers' data and stack

test data. CEMs will be used to monitor compliance with NOx and CO limits.

3. Monitoring Plan- The source shall be required to monitor compliance with the emission limits by monitoring fuel consumption and using emission factors based on heat input. The source shall be required to record fuel consumption and calculate emissions monthly.

The continuous emission monitoring systems shall be used to monitor compliance with the NO_X and CO emission limitations for the turbines.

The heat content of the fuel shall be determined monthly through either sampling and analysis or use of vendor analyses. In the absence of credible evidence to the contrary, compliance with the opacity, particulate matter and Regulation No. 1 and 6 SO_2 limits shall be presumed provided natural gas is used as fuel. When fuel oil is used for a certain amount of time, Method 9 readings will be used to monitor compliance with the opacity limits. When burning fuel oil, the emission factors used to estimate emissions are well below the 0.1 lb/mmBtu emission limit set forth in Colorado Regulation No. 1, therefore, in absence of credible evidence to the contrary, compliance with the Regulation No. 1 limit is assumed when both natural gas and distillate fuel oil are used as fuel. When burning fuel oil, compliance with the sulfur dioxide emission limits will be monitored using the fuel sulfur content and heat content analyses.

4. Compliance Status- The permittee indicated in their application that they are in compliance with all applicable requirements.

<u>Knutson Tank #1</u> - Fixed roof storage tank, measuring 32' 6" height x 89' 0" diameter, with a nominal capacity of 1.5 million gallons, for storage of Distillate Fuel Oil No. 2

Initial Approval Construction Permit 02AD0449 was issued for this source. On October 15, 2003 the EPA finalized revisions to Subpart Kb which exempts this size tank from all of Subpart Kb requirements. The emissions are below de minimis permitting levels, therefore a Construction Permit is no longer required for this source (source was permitted because it was subject to the NSPS), and the Construction Permit has been cancelled. The tank is listed as an insignificant activity in Appendix A of the operating permit. The source is subject to the Reasonably Available Control Technology requirements for VOC emissions from Storage and Transfer of VOCs, Colorado Regulation No. 7, Section III (Section V, Condition 29.a of the Operating Permit).

IV. Compliance Assurance Monitoring (CAM) Requirements

The turbines are equipped with enhanced water injection to control NO_X emissions during fuel oil use and oxidation catalyst to control CO emissions. Since the turbines are not large pollutant specific emission units (i.e. potential controlled emissions, including limits in the Construction Permit, are less than 100 tons/year criteria pollutants and less than 10/25 tons year HAPS), the applicant is not required to submit a CAM plan until the permit is renewed (if applicable). Since the operating permit will require the use of CEMs, it is

expected that CAM will not apply at time of permit renewal. Therefore, in accordance with the provisions of 40 CFR Part 64, as adopted by reference in Colorado Regulation No. 3, Part C, Section XIV, the CEM turbines are not subject to the compliance assurance monitoring (CAM) requirements.

V. Alternative Operating Scenarios

The permittee requested an Alternative Operating Scenario (AOS) in order to replace turbines. The permit contains the Division's AOS for temporary turbine replacement. Because any new turbines at this facility would be subject to a case by case RACT determination, turbines can not be permanently replaced under an AOS.

VI. Acid Rain Provisions:

Both turbines are affected units under the Acid Rain Program which is governed by 40 CFR Parts 72, 73, 75, 76, 77 and 78 and as such the source is required to have provisions for the Acid Rain requirements in its Title V permit. Units subject to the Acid Rain requirements are required to hold adequate SO_2 allowances and have NO_X limitations. This facility is not listed under 40 CFR 73.10(b)(2) and therefore must obtain SO_2 allowances as needed. Since these units are not coal-fired boilers, they do not have any NO_X limitations under the Acid Rain Program.

VII. Maximum Available Control Technology (MACT)

This facility is considered a synthetic minor source for MACT purposes (individual HAP emissions limited to <10 TPY and total HAP emissions limited to <25 TPY), therefore the MACT provisions do not apply to this facility.