

**TECHNICAL REVIEW DOCUMENT**  
**for**  
**RENEWAL**  
**of**  
**OPERATING PERMIT 95OPEP007**  
to be issued to:

Colorado Springs Utilities  
**George Birdsall Power Plant**  
El Paso County  
Source ID 0410003

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**I. PURPOSE**

This document will establish the basis for decisions made regarding the applicable requirements, emissions factors, monitoring plan and compliance status of emission units covered by the renewed operating permit proposed for this site. The original Operating Permit was issued June 5, 1997, and expires on June 5, 2002. This document is designed for reference during the review of the proposed permit by the EPA, the public, and other interested parties. The conclusions made in this report are based on information provided in the renewal application submitted June 1, 2001; previous inspection reports, as well as telephone conversations with the applicant. Please note that copies of the Technical Review Document for the original permit and any Technical Review Documents associated with subsequent modifications of the original Operating Permit may be found in the Division files as well as on the Division website at <http://www.cdphe.state.co.us/ap/Titlev.html>.

**II. SOURCE DESCRIPTION**

The Birdsall Power Plant, located in Colorado Springs, consists of three steam driven electrical generating units and the associated equipment. Two of the steam generator/turbine units are rated at 18.5 megawatts gross turbine output and the third steam generator/turbine unit is rated at 24 megawatts gross turbine output. None of the electrical generating units are subject to the requirements of Title IV, the Acid Rain Program.

There are no Federal Class I designated areas within 100 kilometers of the plant, and no affected states within 50 miles. Florissant Fossil Beds is a Federal land area within 100 kilometers of the facility. Florissant Fossil Beds has been designated by the State to have the same sulfur dioxide increment as Federal Class I areas.

The area in which the plant operates is designated as attainment for all criteria pollutants. The plant is categorized as an existing major stationary source for particulate matter (PM), sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>) and carbon monoxide (CO) emissions. Future addition of new sources and modifications of existing sources at this facility resulting in a significant net emissions increase for any pollutant as listed in

Regulation No. 3, Part A, Section I.B.58 or a modification which is major by itself will result in the application of the Prevention of Significant Deterioration (PSD) review requirements.

The facility is one of the Colorado Springs electricity generating plants. The facility’s boilers are operated in response to peak electrical demands which must be met by the Colorado Springs Utilities (CSU) electrical generation facilities. However, the recent increase in demand for electricity has resulted in a significant increase the operating time of the units. As a peaking unit, the facility is subject to frequent startups and generally operates for a small amount of time in any year. The limited operating time results in low actual annual emissions. The primary features of the facility are three steam boilers, with their associated turbine-generator and cooling tower. The boilers can burn either pipeline natural gas or fuel oil. The fuel oil may be No. 2 distillate, a mixture of No. 1 and No. 2 distillate, specification used oil, or a mixture of all three. There is an auxiliary heating boiler for heating building. A list of the insignificant sources of emissions is provided in Appendix A of the permit.

Specification used oil is another name for waste oil. 40 CFR Part 279 §279.11 sets upper limits for certain constituents/compounds in the oil to avoid classification as a hazardous material. Purchase specifications are used to identify and sample the oil being purchased to avoid purchasing a hazardous material. Purchase and usage of the specification used oil since the initial operating permit was issued has provided additional information regarding the typical ash, sulfur and heat content for the specification used oil. For the previous Operating Permit, CSU requested the flexibility to use No. 2 distillate or specification used oil, or a mixture of the two. The initial permit was subsequently modified to allow No. 1 distillate to be used. Only one storage tank is provided for the fuel oil being used. The addition of each shipment of oil changes the quality of the fuel oil being fired. A Division approved fuel oil sampling program is used to track the quality of the stored fuel oil. A modification of the program was submitted with the renewal application and is approved by the Division.

Several of the published AP-42 emission factors have changed since the previous Operating Permit was issued. The Division accepts the use of the updated AP-42 factors. The following table presents the tabulation of the emissions for the facility based on the updated emission factors.

	<b>POTENTIAL TO EMIT, Tons Per Year</b>					
<b>Source</b>	<b>PM</b>	<b>PM<sub>10</sub></b>	<b>SO<sub>2</sub></b>	<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>CO</b>
<b>Unit #1</b>						
NG	7.29	7.29	0.58	268.66	5.28	80.60
FO	22.96	16.01	546.69	166.96	1.39	34.78
Spec Oil	299.23	238.45	525.57	130.64	6.88	34.38

	<b>POTENTIAL TO EMIT, Tons Per Year</b>					
<b>Source</b>	<b>PM</b>	<b>PM<sub>10</sub></b>	<b>SO<sub>2</sub></b>	<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>CO</b>
<b>Unit #2</b>						
NG	7.29	7.29	0.58	268.66	5.28	80.60
FO	22.96	16.01	546.69	166.96	1.39	34.78
Spec Oil	299.23	238.45	525.57	130.64	6.88	34.38
<b>Unit #3</b>						
NG	10.09	10.09	0.80	371.90	7.31	111.57
FO	31.78	22.15	756.43	231.11	1.93	48.15
Spec Oil	414.21	330.07	727.52	180.83	9.52	47.59
<b>Aux Boiler</b>						
NG	0.35	0.35	0.03	4.66	0.26	3.92
FO	1.12	0.78	24.95	6.76	0.07	1.70
Spec Oil	14.55	11.59	25.55	6.35	0.33	1.67
<b>TOTALS</b>	<b>1,027.22</b>	<b>341.66</b>	<b>1875.36</b>	<b>915.98</b>	<b>23.61</b>	<b>276.69</b>
Actual Emissions 1999 Data Year	1.29	1.29	0.73	47.10	0.93	14.11

Shaded values in table used to calculate total PTE

It may be noted that the high Potential-To-Emit values for most of the pollutants for Birdsall are dominated by the possible use of Specification Used Oil. This dominance results from the potential for the Specification Used Oil to contain high ash and sulfur concentrations compared to distillate fuel oil. As noted previously, the Birdsall plant is primarily used as a peaking plant resulting in limited annual operation of the boilers. In addition, fuel oil (Specification Used Oil) is primarily a backup fuel. The combination of the limited operating time and limited fuel oil use results in the actual annual emissions being only a fraction of the potential emissions. It is unlikely that the boilers will be operated for long periods of time on fuel oil (Specification Used Oil).

The facility remains not subject to the requirements of Section 112(r)(7), the Accidental Release Plan Program of the Clean Air Act.

None of the sources have pre-control emissions that exceed or are equivalent to the major source threshold and use a control device to achieve compliance with an emission limitation or standard to which they are

subject. Therefore, none of the sources are subject to the provisions of the Compliance Assurance Monitoring (CAM) program as set forth in 40 CFR Part 64 as adopted by reference into Colorado Regulation No. 3, Part C, Section XIV.

The renewal application and recent inspection reports identify the facility to be in compliance with all the applicable requirements.

### III. EMISSION FACTOR AND FUEL PARAMETER UPDATES

Emissions factors listed in the EPA Publication “Supplement B to Compilation of Air Pollution Emission Factors” had been updated for natural gas and distillate combustion since the previous version of this Operating Permit had been issued. The emission factors listed in this Operating Permit were updated accordingly.

Operating experience had identified the need to make minor changes to the fuel heat contents and some of the associated fuel usage rates.

### IV. ONE TIME COMPLIANCE DEMONSTRATIONS

The combination of the emission factor and the design capacity of the boilers precludes exceeding the short term particulate emission standard while burning distillate fuel or natural gas as demonstrated by the following calculations:

$$\text{Distillate Fuel: } \frac{3.3 \text{ lb}}{1000 \text{ gal}} \times \frac{\text{gal}}{136,000 \text{ Btu}} = 0.0243 \frac{\text{lb}}{\text{MMBtu}} < 0.11 \frac{\text{lb}}{\text{MMBtu}}$$

$$\text{Natural Gas: } \frac{7.6 \text{ lb}}{\text{MMscf}} \times \frac{\text{scf}}{986 \text{ Btu}} = 0.008 \frac{\text{lb}}{\text{MMBtu}} < 0.11 \frac{\text{lb}}{\text{MMBtu}}$$

Likewise, the design capacity assures compliance with the sulfur dioxide short term standard for distillate fuel with reasonably expected heat content values as demonstrated by the following calculation. The Title V application stated that the distillate had a Federal limit of 0.5% sulfur. This Federal limit was included as an applicable requirement to ensure that the emission standard would not be exceeded.

$$\text{Distillate Fuel: } \frac{157 \times 0.5 \text{ lb}}{1000 \text{ gal}} \times \frac{\text{gal}}{136,000 \text{ Btu}} = 0.58 \frac{\text{lb}}{\text{MMBtu}} < 0.8 \frac{\text{lb}}{\text{MMBtu}}$$

CSU only needs to retain a file copy of the above calculations for demonstrating this compliance in the absence of any other credible evidence.

## **V. COOLING TOWERS**

The method for estimating the particulate emissions from the cooling towers was changed by CSU for the renewal of the Operating Permit. The previous method used a general approach provided by AP-42 at the time the previous Operating Permit was issued. CSU considered the method was overly conservative for their cooling towers and based the new estimation method on information more relevant to the Birdsall cooling towers. The Division accepts the new estimation method. The values for the revised estimates of the particulate emissions for each cooling tower are below the 2 tons per year criteria pollutant APEN reporting threshold. The estimated chloroform emissions from each cooling tower are below the 2 tons per year criteria pollutant APEN reporting threshold as volatile organic compound emissions, but are above the APEN reporting threshold for non-criteria reportable pollutants. The Division has no authority to regulate non-criteria reportable pollutants. The end result is the cooling towers are subject to the APEN reporting requirements for non-criteria reportable pollutants, but do not require a construction permit.

## **VI. MISCELLANEOUS**

The Title V permit has been modified to reflect the standardized format now currently in use by the Division, and wording approved by EPA.

From time to time published emission factors are changed based on new or improved data. A logical concern is what happens if the use of the new emission factor in a calculation results in a source being out of compliance with a permit limit. For this operating permit, the emission factors or emission factor equations included in the permit are considered to be fixed until changed by a modification of the permit. Obviously, factors dependent on the fuel sulfur content or heat content can not be fixed and will vary with the test results. The formula for determining the emission factors is, however, fixed. It is the responsibility of the permittee to be aware of changes in the factors, and to notify the Division in writing of impacts on the permit requirements when there is a change in factors. Upon notification, the Division will work with the permittee to address the situation.

As noted in the Technical Review Document for the previous Operating Permit the Division believed the Operating Permits would be improved if the Potential-To-Emit (PTE) values were shown in the permit for grandfathered sources. The PTE of a grandfathered source is set by the design capacity, and the values represent an operating limit, not a regulatory limit. The inclusion of these values provides anyone reviewing the permit with a perspective on the maximum emissions for a source.