

CDPHE – Air Pollution Control Division
Construction Permit Application
Preliminary Analysis: Colorado Springs Utilities, Martin Drake Power Plant

I. Applicant Information

Company Name	Colorado Springs Utilities – Martin Drake Power Plant
Permit Number	10EP402
Source Location	700 South Conejos Street Colorado Springs, El Paso County, Colorado
AIRS ID	041-0004-006
Date	December 22, 2016
Review Engineer	Danielle Walker

II. Facility Description & Description of Project

Colorado Springs Utilities (CSU) Martin Drake Power Plant operates a steam and power generation facility consisting of three (3) boilers and the associated equipment for coal and ash handling. The boilers fire coal as the primary fuel and use natural gas as backup and during startup. The three boilers utilize low-sulfur, high heating value sub-bituminous coal and Drake Units 6 and 7 will use Flue Gas Desulfurization (FGD) like systems to reduce SO₂ emissions. The FGDs will be installed and fully operational no later than December 31, 2017. Drake Unit 7's FGD became fully operational in May 2016 and Drake Unit 6's scrubber is currently under construction at the time of this permit issuance.

CSU requested a Construction Permit modification for the Martin Drake Power Plant on May 20, 2016, with an application update on August 22, 2016 to incorporate a facility wide sulfur dioxide (SO₂) emission limitation required by 40 CFR Part 51, Subpart BB, Data Requirements Rule (DRR) for the 2010 1-hour Sulfur Dioxide (SO₂) Primary National Ambient Air Quality Standard (NAAQS).

The requested changes are being made to construction permit 10EP402, which covers Drake Unit 7 (Point 006). The only exceptions are the addition of a facility-wide SO₂ emission limit requirement and a shutdown date requirement for Drake Unit 5 (Point 004). Construction Permit 10EP402 was first issued on December 13, 1973 as Construction Permit P-10,402. In 2007 the permit was renamed as 10EP402.

Please note that the facility will permanently shut down Drake Unit 5 no later than December 31, 2016 and only Drake Units 6 and 7 will be operational starting January 1, 2017. A requirement for Colorado Springs Utilities to submit a cancellation form for Drake Unit 5 has been included in the Construction Permit to ensure shutdown on or before January 1, 2017.

This facility is currently operating under Title V Operating Permit 95OPEP107 which was last renewed on November 1, 2002 and last revised on April 13, 2004 and under Construction Permit 12EP1786 which was issued on July 16, 2013.

The following table summarizes general information for the boilers at the facility:

	Drake Unit 5 (To be canceled no later than 12/31/2016)	Drake Unit 6	Drake Unit 7
Placed in Service	1962	1968	1974
Boiler Rating – MMBtu/hr (Coal)	548	861	1,336
Boiler Rating – MMBtu/hr (Natural Gas)	514	850	1,310
Electrical Power Rating, Gross Megawatts	51	85	142
Pollution Control Device	Fabric Filter (particulate)	Fabric Filter (particulate) Flue Gas Desulfurization- like System (SO ₂)	Fabric Filter (particulate) Flue Gas Desulfurization- like System (SO ₂) Ultra Low NO _x Burners and Over Fire Air (NO _x)

III. Application Completeness Review

The application for this modification was received on May 20, 2016 with additional information received on August 22, 2016. The Division worked with the applicant following the submittal to develop appropriate SO₂ emission limitations. The initial application is determined complete on the date it was received.

IV. Emissions Summary

The Potential to Emit and actual emissions of SO₂ at the facility **before** this modification, are as follows:

Unit	SO ₂ Emissions (tpy)	
	PTE	2015 Actual Emissions
Drake Unit 5	2,880	580.1
Drake Unit 6	4,527	1,447.7
Drake Unit 7	7,022	1,931.7
Total	14,429	3,959.5

The Potential to Emit (PTE) values in the table above are based on the original Title V permit application. The 2015 actual emissions are from the Division's Inventory system for the year 2015.

The emission limits of SO₂ **after** the Construction Permit modification are as follows:

Unit	SO ₂ Emissions (tpy)	
	2017 PTE	2018 PTE
Drake Unit 5	0	0
Drake Unit 6	1,995	1,430
Drake Unit 7		
Total	1,995	1,430

Drake Unit 5 will be permanently shut down on or before January 1, 2017.

The emission limitation of 1,995 tons of SO₂ per year requested in the modification is a facility wide SO₂ limit and applies to Drake Units 6 and 7 as well as all other SO₂ emission sources at the facility.

This permit action results in a decreased amount of SO₂ emissions for the year 2017 (almost 2,000 tons or about a 50% decrease) and future years when compared to the facility 2015 actual emissions. This permit action also results in reduced Potential to Emit (PTE) for this facility by over 12,000 tons per year of SO₂ emissions (or about a 90% decrease by 2018).

V. **Applicable Requirements**

HAP Emissions

This facility is a major source of Hazardous Air Pollutants (HAP). This facility is a major source of HAP emissions for the purpose of 40 CFR Part 63, Subpart UUUUU.

Prevention of Significant Deterioration (PSD)

This facility is located in an area designated attainment for all pollutants, except for sulfur dioxide. The facility is within a specific boundary designated unclassifiable for SO₂ as of June 30, 2016. It is categorized as a major stationary source (Potential to Emit > 100 Tons/year for CO, NOX, SO₂, PM, and PM₁₀). Future modifications at this facility resulting in a significant net emissions increase (see Reg 3, Part D, Sections II.A.27 and 44) for any pollutant as listed in Regulation No. 3, Part D, Section II.A.44 or a modification which is major by itself (i.e. a Potential to Emit of > 100 TPY of any pollutant listed in Regulation No. 3, Part D, Section II.A.44) may result in the application of the PSD review requirements.

Note that this modification results in a decrease of SO₂ emissions and is not subject to PSD review requirements.

VI. **New Requirements**

The Division has included the following new requirements in the Construction Permit. The following requirements were not previously included in the Title V Operating Permit for the Martin Drake Power Plant.

40 CFR Part 51, Subpart BB – Data Requirements for Characterizing Air Quality for the Primary SO₂ NAAQS

The Data Requirements Rule (DRR) was published in the Federal Register on August 21, 2015. The DRR was established for air agencies to characterize the air quality around large SO₂ sources that emit 2,000 tons per year or greater. Air agencies were required to identify applicable sources based on the most recently available annual SO₂ emissions data for each source. Under the DRR, states have three options to characterize the current air quality in areas with large SO₂ sources: (1) establish a federally enforceable requirement to limit SO₂ to under 2,000 tons per year by January 13, 2017, (2) conduct air quality modeling by January 13, 2017, (3) begin operating an appropriate monitoring network by January 1, 2017.

The DRR required the Division to submit a list of sources to EPA by January 15, 2016 that identifies all the applicable SO₂ sources. Colorado Springs Utilities, Martin Drake Power Plant had emissions that exceeded 2,000 tons per year of SO₂ in 2014 and was included in the January 15, 2016 submittal to EPA. To demonstrate compliance with the DRR, the Division is establishing a facility wide, federally enforceable limitation to less than 2,000 tons per year of SO₂ for the Martin Drake Power Plant which will be federally enforceable by January 13, 2017.

Under Colorado Regulation No. 3, Part B, Section II.A.7 it states: "A source that is voluntarily applying for a permit to create state-only or federally enforceable permit conditions, as appropriate, to limit the potential to emit criteria, pollutants, GHG or hazardous air pollutants may request to obtain such limits in a construction permit." Colorado Springs Utilities voluntarily requested a facility wide SO₂ emission limit for the Martin Drake Power Plant below 2,000 tons per year on May 23, 2016 with an application update submitted on August 22, 2016. The Division is establishing the federally enforceable limitation through issuance of this Construction Permit 10EP402.

By July 1, 2016, the Division was required to submit to EPA "a description of the planned emission limitation, including identification of the level of the limitation being planned". This submittal included the SO₂ emission limitation for the Martin Drake Power Plant.

Colorado Springs Utilities, Martin Drake Power Plant will be taking a federally enforceable facility-wide emission limitation for SO₂ of 1,995 tons per year. This limitation will be effective starting January 13, 2017 and thereafter. This emission limitation will result in about 50% less actual SO₂ emissions based on the 2015 actual emissions and about 90% less potential to emit emissions in the future. In 2018 the Potential to Emit of SO₂ emissions will be reduced to 1,430 tons per year when the Regional Haze Limits become effective.

To ensure compliance with the emission limitations, monthly and annual records of the emission rates shall be maintained by the applicant and made available to the Division for review upon request. Note that the monthly emission limitations are only required for the first twelve (12) months of operation while the annual limit is effective for calendar year 2017 and thereafter. Monthly limitations do not directly correspond to the annual limitation and should be considered separately; the Martin Drake Power Plant cannot exceed either the monthly or annual limitations. Compliance with the monthly and annual emissions of SO₂ shall be determined by recording the facilities annual emissions for SO₂ on a rolling twelve (12) month total starting with January 2017. After twelve (12) months of data are collected, i.e. after December 2017, the twelve (12) month rolling average will be compared

to the 1,995 tons per year SO₂ limit. By the end of each month thereafter a new twelve month total shall be calculated based on the previous twelve month's data.

Note that the rolling twelve month total requirement will start January 1, 2017. The calculation shall not include emissions data prior to January 1, 2017 because the emission controls used to comply with the new emission limit will not be fully operational on both Drake Units 6 and 7 until after January 1, 2017.

Compliance with the SO₂ emission limitation will be monitored using the Continuous Emission Monitoring System (CEMS). The CEMS requirements are referenced in Construction Permit 10EP402, Condition 16 and are specified in the Title V Operating Permit 98OPEP107 in Section II, Condition 7 (April 13, 2004 issuance).

40 CFR Part 63, Subpart UUUUU – National Emission Standards for Hazardous Air Pollutants for Coal- and Oil- Fired Electric Utility Steam Generating Units

The final rule for 40 CFR Part 63, Subpart UUUUU was last revised in the Federal Register on April 6, 2016. In August 2016 the most recent revisions of Subpart UUUUU were adopted by the Colorado Air Quality Control Commission (AQCC) into Colorado Regulation No. 8, Part E. This subpart applies to all coal or oil fired Electric Utility Steam Generating Units (EGU). An EGU under Subpart UUUUU is defined as “a fossil fuel-fired combustion unit of more than 25 megawatts electric (MWe) that serves a generator that produces electricity for sale. A fossil fuel-fired unit that cogenerates steam and electricity and supplies more than one-third of its potential electric output capacity and more than 25 MWe output to any utility power distribution system for sale.” Drake Unit 7 is an existing coal fired EGUs designed to burn coal with a heating value greater than or equal to 8,300 Btu/lb. To classify as an existing EGU, the EGU must have commenced construction on or before May 3, 2011. Drake Unit 7 was placed in operation in 1974. Existing EGUs are required to be in compliance with this subpart no later than April 16, 2015. The initial notification was received by the Division on August 14, 2012 and the notification of compliance was received by the Division on October 13, 2015.

Subpart UUUUU sets emission limits for mercury, PM, HCL and work practice standards for existing coal fired EGUs in Table 2, and 3. For existing coal fired EGUs the subpart establishes alternative emission standards for SO₂, individual non-mercury metal air toxics, and total non-mercury air toxics in Table 2.

The appropriate requirements from Subpart UUUUU that are applicable to Drake Unit 7 have been included in the Construction Permit.

A request to incorporate the applicable requirements associated with 40 CFR Part 63, Subpart UUUUU in to the Operating Permit 95OPEP107 was received by the Division on May 17, 2016.

Please note that Drake Unit 5 (until unit shutdown on or before January 1, 2017) and Drake Unit 6 are subject to the requirements of 40 CFR Part 63, Subpart UUUUU. The Subpart UUUUU requirements for Drake Unit 5 and 6 have not been included in the Construction Permit because this Construction Permit is for Drake Unit 7. The Subpart UUUUU requirements are still applicable to Drake Unit 5 and 6.

40 CFR Part 63, Subpart A – General Provisions

Since Drake Unit 7 is subject to 40 CFR Part 63, Subpart UUUUU, it is subject to the 40 CFR Part 63 Subpart A General Provisions. The applicable general provisions are discussed in detail in Table 9 to 40 CFR Part 63, Subpart UUUUU.

Colorado Regulation No. 6, Part B, Section VIII – Standards of Performance for Coal-Fired Electric Steam Generating Units

On October 18, 2007 mercury requirements for electric utility steam generating units were adopted by the Colorado Air Quality Control Commission (AQCC), the requirements were included in the Colorado Regulations under Colorado Regulation No. 6, Part B, Section VIII to specify mercury emission limitations for coal fired utility steam generating units. On February 19, 2015, the Division adopted revisions to the Colorado Regulation No. 6, Part B, Section VIII requirements that align the state-only mercury requirements with the federal mercury requirements for coal-fired electric steam generating units (EGUs). In 2012 EPA promulgated the Mercury and Air Toxics Standards (MATS) (40 CFR Part 63, Subpart UUUUU) which addresses mercury emission limits, work practice standards, monitoring, recordkeeping, and reporting requirements for new and existing affected coal-and oil-fired EGUs. The Commission has aligned the state-only provisions of Colorado Regulation No. 6, Part B, Section VIII with the related provisions in Subpart UUUUU

Colorado Regulation No. 6, Part B, Section VIII is a state only mercury requirement for electric steam generating units. Drake Unit 7 is considered an existing low emitter under Section VIII. An existing unit is defined in Section VII.B.4 as “an Hg Budget Unit that commenced operation prior to January 1, 2007”. Drake Unit 7 commenced operation in 1974. A low emitter is defined under Section VIII.B.10 as “an Hg budget unit with actual Hg emissions of no more than 29 pounds per year, as determined by data collected through the required Hg monitoring pursuant to 40 CFR Part 63, Subpart UUUUU as incorporated by reference into Colorado Regulation No. 8, Part E”. Drake Unit 7 has actual Hg emissions lower than 29.0 pounds per year at the time of this permit issuance.

Low emitter units were required to submit a complete permit application to the Division to incorporate the applicable requirements of Section VII by July 1, 2012. The Martin Drake Power Plant’s permit application was received by the Division prior to July 1, 2012.

Low emitter status is demonstrated through the required Hg monitoring pursuant to 40 CFR Part 63, Subpart UUUU. Low emitter units are required to comply with the Hg monitoring and recordkeeping requirements of 40 CFR Part 63, Subpart UUUUU. The owner or operator is required to submit quarterly reports to the Division demonstrating the pounds per year of Hg emitted and the operating hours of the boiler.

Please note that Drake Unit 5 (until cancellation on December 31, 2016) and Drake Unit 6 are subject to the requirements of Section VIII. The Section VIII requirements for Drake Unit 5 and 6 have not been included in the Construction Permit because this Construction Permit is for Drake Unit 7. The Section VIII requirements are still applicable to Drake Unit 5 and 6.

Colorado Regulation No. 3, Part F - Regional Haze Limits – Best Available Retrofit Technology (BART) and Reasonable Progress (RP)

The Regional Haze Limits were adopted by the Colorado Air Quality Control Commission (AQCC) into Colorado Regulation No. 3, Part F in January 2011. The Regional Haze Limits

apply to existing stationary facilities (BART eligible sources). An existing stationary facility is a source that is listed in Colorado Regulation No. 3, Part F, Section II.I and was not in operation prior to August 7, 1962 and was in existence on August 7, 1977 and has the potential to emit of 250 tons per year or more of any visibility impairing air pollutant (SO₂, NO_x, and particulate matter). The Martin Drake Power Plant falls under the listed source in Section II.I.1 for fossil-fueled fired steam electric plants of more than 250 million British thermal units per hour heat input that generate electricity for sale.

Drake Unit 7 is subject to the NO_x, SO₂, and particulate limitations under Colorado Regulation No. 3, Part F, Regional Haze Requirements, Best Available Retrofit Technology. The 30-day public comment period for the Martin Drake Power Plant Regional Haze Compliance Schedule closed on January 16, 2015. The Division finalized the specific compliance dates on March 16, 2015. Drake Unit 7 at the Martin Drake Power Plant is required to demonstrate compliance with the NO_x, SO₂, and particulate emission limitations as follows:

NO_x – December 31, 2014
SO₂ – December 31, 2017
Particulate – November 4, 2013

The appropriate monitoring/compliance and recordkeeping and reporting requirements from Colorado Regulation No. 3, Part F have been included in the Construction Permit in Condition 19.

Please note that Drake Unit 5 (until unit shutdown on or before January 1, 2017) and Drake Unit 6 have NO_x, SO₂, and particulate limitations under Colorado Regulation No. 3, Part F, Regional Haze Requirements, Best Available Retrofit Technology. The Regional Haze Requirements for Drake Unit 5 and 6 have not been included in the Construction Permit because this Construction Permit is for Drake Unit 7. The Regional Haze Requirements are still applicable to Drake Unit 5 and 6.

Cancelation of Drake Unit 5

Colorado Springs Utilities shall submit a cancelation form to the Division for permanent shutdown of Drake Unit 5 on or before January 1, 2017.

Operating and Maintenance (O&M) Plan

An O&M plan is required for the FGD-like systems used to reduce SO₂ emissions. O&M plans are required for all control equipment and control practices at major sources (Colorado Regulation No. 3, Part B, Section III.G.7.a).

Incorporation into Operating Permit

Colorado Springs Utilities is required to incorporate the requirements of this construction permit into the existing operating permit for the facility. The application to modify the operating permit is due within one year of the issuance date of the of this modified construction permit. Additional information on application due dates can be found on the Division's PS Memo 09-01 "Title V Operating Permit Application Due Dates".

VII. Existing Requirements

The Division has incorporated the following requirements into this construction permit for Drake Unit 7. Please note the following requirements are already applicable requirements under the current Title V Operating Permit for this facility and apply to Drake Unit 5 (until cancellation on December 31, 2016) and 6.

Fuel Consumption

The amount of fuel consumed on an annual basis shall be monitored and recorded as specified in the Construction Permit Condition 6 and in the Title V Operating Permit 95OPEP107, Section II, Condition 2.1 (April 13, 2004 issuance).

Heat Content and Fuel Sampling

The heat content shall be calculated from the emissions recorded by the carbon dioxide CEMS or as specified in the fuel sampling plan. The fuel sampling plan, which was submitted to the Division on October 31, 2006, has been included in the Construction Permit as Appendix A.

Opacity

Drake Unit 7 is subject to the opacity requirements of Colorado Regulation No. 1, Section II.A.1 and II.A.4. Compliance with the opacity requirements shall be demonstrated using the Continuous Opacity Monitoring (COM) System as specified in Construction Permit 10EP402, Condition 21 and as specified in the Title V Operating Permit 95OPEP107, Section II, Condition 7 (April 13, 21004 issuance).

Odor

This facility is subject to the odor requirements of Colorado Regulation No. 2.

Title IV Acid Rain Requirements

This facility is subject to the Acid Rain Requirements of Title IV of the Clean Air Act. The Title IV permit can be found in Section V of the Title V Operating Permit 95OPEP107.

Colorado Regulation No. 1, Section III.A.1 – Emission Control Regulations for Particulate Matter for the State of Colorado

Colorado Regulation No. 1, Section III.A.1 applies to all fuel burning equipment. Fuel burning equipment is defined as “Any furnace, boiler, or other equipment and appurtenances thereto, burning fuel solely for the purpose of producing heat, but not including: (1) internal combustion engines, or (2) combustion sources that are a part of a manufacturing process where the emissions are intermixed with the process emissions” (Colorado Common Provisions Regulation).

Drake Unit 7 is classified as fuel burning equipment with a designed heat input greater than 500×10^6 Btu per hour and is subject to the requirement of Section III.A.1.c. This unit is not allowed to exceed the particulate emission rate limitation of 0.1 lbs per 10^6 Btu heat input. Compliance with the particulate matter limitation is specified in Construction Permit 10EP402, Condition 22 and as specified in the Title V Operating Permit 95OPEP107, Section II, Condition 2.4 (April 13, 2004 issuance).

Colorado Regulation No. 1, Section VI.A.3 – Emission Control Regulations for Sulfur Dioxide Emissions for the State of Colorado

Colorado Regulation No. 1, Section VI.A.3 applies to existing sources of sulfur dioxide at coal-fired operations including coal-fired steam generation. An existing source is defined as a source that was constructed or modified prior to August 11, 1977.

Drake Unit 7 is classified as an existing source and is subject to the requirements of Section VI.A.3.a for coal fired operations. Drake Unit 7 is a unit with a heat input from coal or coal-based by-product fuels equal to or greater than 300 million Btu per hour and is subject to a sulfur dioxide limitation of 1.2 pounds of sulfur dioxide per million Btu of heat input. Compliance with the sulfur dioxide emission limitation is specified in Construction Permit 10EP402, Condition 23 and specified in the Title V Operating Permit 95OPEP107, Section II, Condition 2.5 (April 13, 2004 issuance).

Continuous Emission Monitoring (CEM) System

Drake Unit 7 is equipped with a Continuous Emission Monitoring System (CEMS) to monitor opacity, sulfur dioxide, carbon monoxide, nitrogen oxides, and volumetric flow. The CEMS is required to meet the requirements specified in Construction Permit 10EP402, Condition 16 and the requirements specified in the Title V Operating Permit 95OPEP107, Section II, Condition 7 (April 13, 2004 issuance).

Stack Testing for Particulate Matter

A particulate matter stack test shall be performed on Drake Unit 7 in accordance with the requirements of the APCD Compliance Test Manual to demonstrate compliance with the particulate emission limit/standards. The schedule of testing for Drake Unit 7 is based on the results of each particulate test. If the most recent stack test results are less than or equal to 50% of the emission limitation, another stack test is required in five (5) years. If the most recent stack test results indicate that emissions are more than 50% but less than or equal to 75% of the emission limitation, another test is required within three (3) years. If the most recent test results indicate that emissions are greater than 75% of the emission limitation, an annual test is required.

The last stack test for particulate matter on Drake Unit 7 took place on May 21-23, 2013 and the test results indicated that emissions were less than or equal to 50% of the emission limitation; the next stack test is required within five years from May 23, 2013.

VIII. Modeling/Public Notice Requirements

When determining modeling applicability for the incorporation of the facility wide federally enforceable SO₂ emission limitation, the net emission increase in facility wide emissions of SO₂ is analyzed. Incorporation of the SO₂ emission limitation results in a decrease of SO₂ emissions from the facility and does not trigger the SO₂ or any other pollutant's modeling threshold.

This facility is voluntarily asking for a federally-enforceable SO₂ emission limitation. As per Colorado Regulation No. 3, Part B, Section III.C public notice is required for this permit action. This Public Notice is specific to the portions of the construction permit affected by the modification.