ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
Air Quality Division
1110 W. Washington Street Phoenix, AZ 85007 Phone: (602) 771-2338

SIGNIFICANT PERMIT REVISION TO AIR QUALITY CONTROL PERMIT

(As required by Title 49, Chapter 3. Article 2, Section 49-426, Arizona Revised Statutes)

This air quality control permit does not relieve applicant of responsibility for meeting all air pollution regulations

1. PERMIT TO BE ISSUED TO (Business license name of organization that is to receive permit)
   Arizona Electric Power Cooperative

2. NAME (OR NAMES) OF OWNER OR PRINCIPALS DOING BUSINESS AS THE ABOVE ORGANIZATION

3. MAILING ADDRESS **P. O. Box 670**
   Benson, AZ 85602

4. EQUIPMENT LOCATION/ADDRESS **3525 N. Highway 191 South**
   Cochise, Cochise County, AZ 85606

5. FACILITIES OR EQUIPMENT DESCRIPTION **Electric Power Generating Facility**

6. THIS PERMIT ISSUED SUBJECT TO THE FOLLOWING *Conditions as described in the attached revision*

7. ADEQ SIGNIFICANT REVISION NUMBER **59195 (Revision to Permit # 55412)** PERMIT CLASS **I**

SIGNIFICANT REVISION ISSUED THIS 13th DAY OF May, 2014

SIGNATURE

Eric C. Massey, Director, Air Quality Division
TITLE

SIGNIFICANT PERMIT REVISION DESCRIPTION

This Significant Permit Revision No. 59195 to Operating Permit No. 55412 is to be issued to the Arizona Electric Power Cooperative (AEPCO) for its Apache Generating Station to authorize a change for Steam Unit 2 (ST2) from coal to combusting pipeline natural gas, and to authorize a change in air pollution control for Steam Unit 3 (ST3) to selective non-catalytic reduction (SNCR) and the use of low NO_x burners. Additionally, this revision sets specific emission limits for Steam Unit 1 (ST1) in stand alone operation and for ST1 and Gas Turbine 1 (GT1) in combined Cycle mode. The proposed changes satisfy all requirements for a significant permit revision under Arizona Administrative Code, Title 18, Chapter 2, Section 320 (A.A.C. R18-2-320.A).

The following attachment has been added as follows:

ATTACHMENT "E"

SPECIFIC CONDITIONS

Addenda (Significant Revision #59195) to Operating Permit # 55412

For

Arizona Electric Power Cooperative, Inc. - Apache Generating Station

I. Best Available Retrofit Technology Applicability and Effective Date

Attachment "E" shall become effective on the effective date of the Administrator's action approving it as part of the state implementation plan.

Where multiple emission limits, standards or requirements apply to a unit, the most stringent limit, standard or requirement controls.

II. Best Available Retrofit Technology for Steam Unit 1

A. Applicability

1. The BART limit for Steam Unit 1 will apply when Steam Unit 1 operates in stand-alone operation or when Steam Unit 1 and Gas Turbine 1 operate in combined cycle operation.

2. The BART limit does not apply to:

   a. Gas Turbine 1 in stand-alone simple cycle operation; or

   b. Steam Unit 1 and Gas Turbine 1 in combined warming/drying operation when Steam Unit 1 burners are shut off and Steam Turbine 1 is not producing electricity.

B. Best Available Retrofit Technology Limits

1. Steam Unit 1 shall combust only pipeline natural gas.

2. Steam Unit 1 shall not emit more than 0.00064 lb SO_2/MMBtu heat input in stand-alone operation or in combined cycle operation with Gas Turbine 1.

averaged over 30 boiler operating days.

3. Steam Unit 1 shall not emit more than 0.0075 lb PM_{10}/MMBtu heat input in stand-alone operation or in combined cycle operation with Gas Turbine 1, averaged over 30 boiler operating days.

4. Effective December 5, 2017, Steam Unit 1 shall not emit NO_X in stand-alone operation in excess of 0.056 lb/MMBtu heat input, averaged over 30 boiler operating days.

5. Effective December 5, 2017, Steam Unit 1 and Gas Turbine 1 in combined cycle operation shall not emit NO_X in excess of 0.10 lb/MMBtu heat input, averaged over 30 boiler operating days.

6. Effective December 5, 2017, Steam Unit 1 in stand-alone operation and Steam Unit 1 and Gas Turbine 1 in combined cycle operation shall not emit NO_X in excess of 1205 lb/day, averaged over 30 calendar days.

7. The Permittee may comply with the limits in Section II through any combination of process adjustments or add-on controls, provided that such combination achieves the emission limit (on a 30-day rolling average basis), complies with applicable regulations and permits and the Permittee obtains any necessary preconstruction or operating approvals.

III. Best Available Retrofit Technology for Steam Units 2 and 3

A. Compliance with Best Available Retrofit Technology Limits on NO_X emissions from Steam Units 2 and 3

1. Compliance during a boiler operating day when both units are operating is demonstrated when either of the following conditions is met:

a. The combined NO_X emissions of Steam Units 2 and 3 meet the combined limit in Condition III.D; or

b. Each unit meets its individual NO_X limit in Conditions III.B and III.C.

2. Compliance during a boiler operating day when only one unit is operating is demonstrated when the operating unit meets its individual NO_X limit specified in Condition III.B or III.C.

3. Except as provided in Conditions III.B.2 and III.C.2, the Permittee may comply with the limits in Section III through any combination of process adjustments or add-on controls (or use of pipeline quality natural gas in lieu of coal in Steam Unit 3), provided that such combination achieves the emission limit (on a 30-day rolling average basis), complies with applicable regulations and permits, and the Permittee obtains any necessary preconstruction or operating approvals.

B. Best Available Retrofit Technology Limits for Steam Unit 2

1. Effective December 5, 2016, Steam Unit 2 shall not emit SO_2 in excess of 0.15 lb/MMBtu heat input, averaged over 30 boiler operating days and shall not emit PM_{10} in excess of 0.03 lb/MMBtu heat input (filterable only), averaged over 30 boiler operating days.

2. Effective December 5, 2017, Steam Unit 2 shall burn only pipeline quality natural gas except in the event of an emergency as defined in Section III.E.

3. Effective December 5, 2017, Steam Unit 2 shall not emit NO_X in excess of 0.085 lb/MMBtu heat input, averaged over 30 boiler operating days, SO_2 in excess of 0.00064 lb/MMBtu heat input, averaged over 30 boiler operating days, and PM_{10} in excess of 0.01 lb/MMBtu heat input (filterable + condensable), averaged over 30 boiler operating days.

4. Effective December 5, 2018, Steam Unit 2 shall not emit PM_{10} in excess of 0.008 lb/MMBtu heat input (filterable + condensable), averaged over 30 boiler operating days.

C. Best Available Retrofit Technology Limits for Steam Unit 3

1. Effective December 5, 2016, Steam Unit 3 shall not emit SO_2 in excess of 0.15 lb/MMBtu heat input, averaged over 30 boiler operating days and shall not emit PM_{10} in excess of 0.03 lb/MMBtu heat input (filterable only), averaged over 30 boiler operating days.

2. Effective no later than December 5, 2017, Steam Unit 3 shall install, operate and maintain low NO_X burners, overfire air, and selective non-catalytic reduction (SNCR) technology. The SNCR shall operate at all times that Steam Unit 3 is in operation and exhaust gas temperatures equal or exceed the manufacturer's recommended minimum temperature for operation of the SNCR technology.

3. Effective December 5, 2017, Steam Unit 3 shall not emit NO_X in excess of 0.23 lb/MMBtu heat input, averaged over 30 boiler operating days.

D. Best Available Retrofit Technology Limits for Combined Operation of Steam Units 2 and 3

Effective December 5, 2017, in lieu of the individual limits set forth for NO_X in Conditions III.B.3 and III.C.3, the combined NOx emissions of Steam Units 2 and 3, averaged over 30 boiler-operating days, shall not exceed the limit established in the following equation:

$$Limit = \frac{\left[\left(Unit\ 2\ MMBtu_{Gas} \times 0.085\ \frac{lb}{MMBtu_{Gas}}\right) + \left(Unit\ 2\ MMBtu_{Coal} \times 0.37\ \frac{lb}{MMBtu_{Coal}}\right) + \left(Unit\ 3\ MMBtu \times 0.23\ \frac{lb}{MMBtu}\right)\right]}{Unit\ 2\ MMBtu + Unit\ 3\ MMBtu}$$

E. Emergency Provision for Steam Unit 2

1. The Permittee will not operate Steam Unit 2 on coal after December 5, 2017 except in the event of a supply disruption caused by natural gas supplier or transporter pipeline failure, freeze-up or pipeline compression failure that reduces gas volume or gas pressure below that necessary for Apache Generating Station gas generation. The Permittee must discontinue coal firing as expeditiously as possible after restoration of natural gas service at levels supporting continuous firing of Steam Unit 2 and in no event more than 48 hours after restoration of such service.

2. During any such period of coal operation and for such period thereafter as provided in Section III.E.3, the Permittee shall comply with the emission limits set forth in Condition III.B.1 for PM_{10} and SO_2 and shall minimize NO_X emissions by use of good combustion practices and not to exceed 0.37

lb/MMBtu, averaged over 30 boiler-operating days.

3. Effective with the next boiler operating day after natural gas operation is restored for NO_X and SO_2, and within 90 boiler operating days after natural gas operation is restored for PM_{10}, the Permittee shall resume compliance with the applicable emissions limits set forth in Conditions III.B or III.D, as applicable.

IV. Compliance Determination

A. Continuous Emissions Monitoring System.

1. At all times, the Permittee shall maintain, calibrate, and operate a CEMS, in full compliance with the requirements found at 40 CFR Part 75, to accurately measure SO_2, NO_X, diluent, and stack gas volumetric flow rate from Steam Units 2 and 3. Steam Unit 2 is not subject to the requirements of this Condition IV.A for SO_2 upon its conversion to pipeline natural gas, but shall then comply with Condition IV.C.4.

2. At all times, the Permittee shall maintain, calibrate, and operate a CEMS, in full compliance with the requirements found at 40 CFR Part 75, to accurately measure NO_X, diluent, and stack gas volumetric flow rate from Steam Unit 1.

3. Except as provided herein, all valid CEMS hourly data shall be used to determine compliance with the emission limitations for NO_X and SO_2 (when applicable) in Sections II and III for each unit. When the CEMS is out-of-control as defined by Part 75, that CEMS data shall be treated as missing data and not used to calculate the emission average of the affected unit. Each required CEMS must obtain valid data for at least 90 percent of the unit operating hours, on an annual basis.

4. The Permittee shall comply with the quality assurance procedures for CEMS found in 40 CFR Part 75. In addition to these Part 75 requirements, relative accuracy test audits shall be calculated for both the NO_X and SO_2 pounds per hour measurement and the heat input measurement. The CEMs monitoring data shall not be bias adjusted.

5. Heat input for Steam Unit 1 and Gas Turbine 1 shall be measured in accordance with Part 75 fuel gas measurement procedures found in 40 CFR Part 75, Appendix D.

B. Compliance Determinations for NO_X.

1. Effective December 5, 2017, the 30-day rolling average NO_X emission rate for each of the following: stand-alone operation of Steam Unit 1, combined cycle operation of Steam Unit 1 and Gas Turbine 1, Steam Unit 2, Steam Unit 3, and combined Steam Units 2 and 3, shall be calculated for each calendar day that the unit operates in accordance with the following procedure:

   a. Step One: For each unit, sum the hourly pounds of NO_X emitted during the current boiler-operating day and the preceding twenty-nine (29) boiler operating days, to calculate the total pounds of NO_X emitted over the most recent thirty (30) boiler-operating day period for each unit, except that for Steam Unit 1 and Gas Turbine 1 during the combined warming/drying operation described in Condition II.A.2.b, all emissions are excluded;

b. Step Two: For each unit, sum the hourly heat input, in MMBtu, during the current boiler operating day and the preceding twenty nine (29) boiler-operating days, to calculate the total heat input, in MMBtu, over the most recent thirty (30) boiler-operating day period for each unit. For Steam Unit 1 and Gas Turbine 1 operating in combined cycle operation, MMBtu from both units shall be included in this calculation; but for Steam Unit 1 and Gas Turbine 1 operating in combined drying/warming operation, MMBtu from neither unit shall be included;

c. Step Three: For each unit, divide the total pounds of NO_X emitted by that unit from step one by the total heat input for that unit from step two to calculate each unit's 30-day rolling average NO_X emission rate, in pounds of NO_X per MMBtu, for each calendar day. This is the final step for determining whether Steam Unit 1 in stand-alone operation complies with the limits in Condition II.B.4; whether Steam Unit 1 and Gas Turbine 1 in combined cycle operation comply with the limits in Condition II.B.5. and whether Steam Units 2 and 3 comply with the limits in Conditions III.B or III.C;

d. Step Four: If demonstrating compliance for Steam Units 2 and 3 with the combined limit in Section III.D, sum together the total pounds of NO_X emitted from Steam Units 2 and 3 over each unit's most recent thirty (30) boiler-operating day period (the most recent 30 boiler operating day periods for different units may be different);

e. Step Five: Sum together the total heat input from Steam Units 2 and 3 over each unit's most recent thirty (30) boiler-operating day period;

f. Step Six: Divide the total pounds of NO_X emitted from step four for Steam Units 2 and 3 by the total heat input from step five for Steam Units 2 and 3, to calculate the combined 30-day rolling average NO_X emission rate for Steam Units 2 and 3, in pounds of NO_X per MMBtu, for each calendar day.

2. Effective December 5, 2017, for purposes of determining compliance with the limit in Condition II.B.6, the 30-day rolling average NO_X pound/day emission rate for stand-alone operation of Steam Unit 1 or combined cycle operation of Steam Unit 1 and Gas Turbine 1 shall be calculated for each calendar day in which either stand-alone or combined cycle operation occurs in accordance with the following procedure:

a. Sum the hourly pounds of NO_X emitted on that calendar day and the hourly pounds of NO_X emitted during the preceding twenty-nine (29) calendar days to calculate the total pounds of NOX emitted over the most recent thirty (30) calendar day period, except that for Steam Unit 1 and Gas Turbine 1 during the combined warming/drying operation described in Condition II.A.2.b, all emissions are excluded;

b. Divide the sum by 30 to calculate the 30-day rolling calendar day average pound/day emission rate for Steam Unit 1 in stand-alone operation and Steam Unit 1 and Gas Turbine 1 in combined cycle operation for comparison with the limit in Condition II.B.6

3. For purposes of determining compliance with the limit in Condition II.B.4, only NO_X emissions generated and the heat input of fuel burned during periods when

Steam Unit 1 is operating in stand-alone operation shall be counted in the calculations required by Conditions IV.B.1.a through c.

4. For purposes of determining compliance with the limit in Condition II.B.5, only NO_X emissions generated and the heat input of fuel burned during periods when Steam Unit 1 and Gas Turbine 1 are operating in combined cycle operation shall be counted in the calculations required by Conditions IV.B.1.a through c.

5. Except as otherwise provided in this Condition IV.B, each 30-day rolling average NO_X emission rate shall include all emissions and all heat input that occur during all periods within any boiler-operating day, including emissions from startup, shutdown, and malfunction.

6. Compliance is demonstrated if:

   a. For Steam Unit 1:

      i. In stand-alone operation it meets its NO_X limit in Condition II.B.4 as calculated in Condition IV.B.1 step three; OR

      ii. In combined cycle operation with Gas Turbine 1 it meets the combined cycle NO_X lb/ton limit in Condition IV.B.5 as calculated in Condition IV.B.1 step three AND it meets the NO_X lb/day limit in Condition II.B.6 as calculated in Condition IV.B.2; OR

      iii. It is not operating during that calendar day.

   b. For Steam Units 2 and 3:

      i. Each operating unit meets its individual NO_X limit in Condition III.B or III.C respectively as calculated in step three; OR

      ii. The combined Steam Units 2 and 3 average meets its combined NO_X limit in Condition III.D as calculated in step six; OR

      iii. The unit is not operating during that calendar day.

7. If a valid NO_X pounds per hour or heat input is not available for any hour for a unit, that heat input and NO_X pounds per hour shall not be used in the calculation of the 30-day rolling average, except that if only NO_X pounds per hour data are available, it may be used to calculate compliance with the pound per day limit in Condition II.B.6, if applicable, in accordance with Condition IV.B.2.

C. Compliance Determinations for SO_2

1. Effective December 5, 2016, the 30-day rolling average SO_2 emission rate for Steam Units 2 and 3 shall be calculated for each calendar day on which the unit operates in accordance with the following procedure:

   a. Step One: Sum the total pounds of SO_2 emitted from the unit during the current boiler-operating day and the previous twenty-nine (29) boiler-operating days;

   b. Step Two: Sum the total heat input to the unit in MMBtu during the

current boiler-operating day and the previous twenty-nine (29) boiler-operating day:

c. Step Three: Divide the total number of pounds of SO_2 emitted during the thirty (30) boiler-operating days by the total heat input during the thirty (30) boiler-operating days. A new 30-day rolling average SO_2 emission rate shall be calculated for each new boiler-operating day.

2. Each 30-day rolling average SO_2 emission rate shall include all emissions and all heat input that occur during all periods within any boiler-operating day, including emissions from startup, shutdown, and malfunction.

3. If a valid SO_2 pounds per hour at the outlet of the FGD system or heat input is not available for any hour for a unit, that heat input and SO_2 pounds per hour shall not be used in the calculation of the 30-day rolling average.

4. Compliance is demonstrated if each operating unit meets its individual SO_2 limit in Condition III.B or III.C respectively as calculated in step three OR if the unit is not operating during that calendar day.

5. Steam Unit 1 and Steam Unit 2 (after conversion to pipeline natural gas) shall demonstrate compliance with the SO_2 limits through use of pipeline quality natural gas.

6. If Steam Unit 2 operates on coal pursuant to an emergency as defined in Condition III.E of this Attachment after its SO_2 CEMS is removed, the Permittee will demonstrate compliance with the SO_2 limits in Condition III.E.2 by calculating emissions based on the sulfur content of the coal on a lb/MMBtu basis multiplied by the number of MMBtu fired on coal multiplied by the overall sulfur removal efficiency of the Sulfur Dioxide Absorption System (SDAS) unit and converted to SO_2 and units of the standard.

D. Compliance Determinations for PM_{10}

1. Compliance with the particulate matter emission limitation for Steam Units 2 and 3 shall be derermined from annual performance stack tests. Within one hundred eighty (180) days of the compliance deadline specified in Conditions III.B or III.C of this Attachment the Permittee shall conduct a stack test on Steam Unit 2 and 3 to measure PM_{10} using EPA Method 5, in 40 CFR part 60, Appendix A, or Method 201A/202 in 40 CFR Part 51, Appendix M.

2. Steam Unit 2, after conversion to pipeline natural gas, shall demonstrate compliance with its limits in Conditions III.B.1, III.B.3 and III.B.4 within 90 days of the effective dates specified in Conditions III.B.1, III.B.3 and III.B.4 respectively. Compliance for Steam Unit 2 shall be demonstrated using EPA Method 5, in 40 CFR part 60, Appendix A and Method 202, in 40 CFR Part 51, Appendix M, or EPA Method 201A/202 in 40 CFR Part 51, Appendix M.

3. After completion of the initial performance testing required in Conditions IV.D.1 and IV.D.2, compliance shall be determined in accordance to the following procedures:

a. For Steam Unit 1 and Steam Unit 2, the Permittee shall demonstrate compliance through use of pipeline quality natural gas.

b. For Steam Unit 3, the Permittee shall conduct a stack test on an annual basis to measure PM_{10} using EPA Method 5, in 40 CFR part 60, Appendix A, or Method 201A/202 in 40 CFR Part 51, Appendix M.

4. A test protocol shall be submitted to ADEQ a minimum of 30 days prior to the scheduled testing. The protocol shall identify which method(s) will be used to demonstrate compliance. Each test shall consist of three runs, with each run at least 120 minutes in duration and each run collecting a minimum sample of 60 dry standard cubic feet. Results shall be reported in lb/MMBtu using the calculation in 40 CFR Part 60 Appendix A Method 19.

5. In addition to required stack tests, the owner/operator shall monitor particulate emissions for compliance with the emission limitations in accordance with any applicable Compliance Assurance Monitoring (CAM) plan developed and approved in accordance with 40 CFR Part 64. The averaging time for any other demonstration of PM_{10} compliance or exceedance shall be based on a 6-hour average.

V. Recordkeeping, Reporting and Miscellaneous Provisions

A. Recordkeeping

The Permittee shall maintain the following records for at least five (5) years:

1. All CEMS data, including the date, place, and time of sampling or measurement; parameters sampled or measured; and results.

2. Daily 30-day rolling emission rates for NO_X and SO_2, when applicable, for each unit, calculated in accordance with Section IV.

3. A log of each day when a unit does not operate.

4. Records of quality assurance and quality control activities for emissions measuring systems including, but not limited to, any records required by 40 CFR Part 75 and Section IV.

5. Records of all major maintenance activities conducted on Steam Units 1, 2 or 3, their associated air pollution control equipment, and CEMS.

6. Any other records required by 40 CFR Part 75.

7. A record of a current valid purchase contract, tariff sheet, transportation contract, or other acceptable documentation specifying the maximum total sulfur content of the pipeline natural gas. This record shall be updated annually.

B. Reporting

1. The Permittee shall notify the Director and EPA Region 9 within two weeks after completion of installation of combustion controls or Selective Non-Catalytic Reactors on any of the units subject to this Attachment.

2. Within 30 days after the applicable compliance date(s) in Conditions II.B, III.B, III.C and III.D, and within 30 days of every second calendar quarter thereafter (i.e., semi-annually), the Permittee shall submit a report that lists the daily 30-day rolling emission rates for NO_X and SO_2 for each unit, calculated in accordance

with Section IV of this Attachment. Included in this report shall be the results of any relative accuracy test audit performed during the two preceding calendar quarters. The Permittee may request, and the Department may authorize in writing, different semiannual reporting dates to harmonize with other semiannual reporting under the then-effective permit.

C. Equipment Operations.

At all times, including periods of startup, shutdown, and malfunction, the Permittee shall, to the extent practicable, maintain and operate the unit including associated air pollution control equipment in a manner consistent with good air pollution control practices for minimizing emissions. Pollution control equipment shall be designed and capable of operating properly to minimize emissions during all expected operating conditions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Director, which may include, but is not limited to, monitoring results, review of operating and maintenance procedures, and inspection of the unit.

~~D. Affirmative Defense for Malfunctions~~

~~The following regulations are incorporated by reference and made part of this permit and state implementation plan:~~

~~1. R18-2-101, paragraph 6;~~

~~2. R18-2-310, sections (A), (B), (D) and (E) only; and~~

~~3. R18-2-310.01.~~

E. Definitions

Terms not defined below shall have the meaning given to them in the Clean Air Act or the Department's regulations implementing the Clean Air Act. For purposes of this Attachment:

Boiler-operating day:

Means a 24-hour period between 12 midnight and the following midnight during which any fuel is combusted at any time in the unit. For Steam Unit 1, boiler operating day does not include any day in which the only operation is the combined warming/drying operation with Gas Turbine 1 as defined in Condition II.A.2.b. For purposes of the limit in Condition II.B.4, "boiler operating days" shall include only those days during which Steam Unit 1 operates in stand-alone mode. For purposes of the limit in Condition II.B.5, "boiler operating days" shall include only those days during which Steam Unit 1 and Gas Turbine 1 operate in combined cycle mode.

Flue Gas Desulfurization System or FGD:

Means a pollution control device that employs flue gas desulfurization technology, including an absorber utilizing lime, fly ash, or limestone slurry, for the reduction of sulfur dioxide emissions.

Operating Hour:

Means any hour that fossil fuel is fired in the unit, except that for Steam Unit 1, operating hour does not include any hour in which the only operation is the combined warming/drying operation with Gas Turbine 1 as defined in Condition II.B.2.b.

Valid Data:

Means data recorded when the CEMS is not out-of-control as defined by Part 75.