STATEMENT OF BASIS

For the issuance of Draft Air Permit # 1987-AOP-R6 AFIN: 30-00337

1. PERMITTING AUTHORITY:

Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, Arkansas 72118-5317

2. APPLICANT:

Arkansas Electric Cooperative Corporation - Magnet Cove Generating Station
410 Henderson Road
Malvern, Arkansas 72104

3. PERMIT WRITER:

Jeremy Antipolo

4. NAICS DESCRIPTION AND CODE:

NAICS Description: Fossil Fuel Electric Power Generation
NAICS Code: 221112

5. ALL SUBMITTALS:

Date of Application	Type of Application (New, Renewal, Modification, Deminimis/Minor Mod, or Administrative Amendment)	Short Description of Any Changes That Would Be Considered New or Modified Emissions
8/19/2016	Minor Modification	A stand-by diesel-fired generator engine (SN-18) and a fuel tank to supply the generator were added.

6. REVIEWER'S NOTES:

Arkansas Electric Cooperative Corporation – Magnet Cove Generating Station (AECC) is located in Malvern, Hot Spring County, Arkansas. AECC is a cogeneration facility consisting of two natural gas-fired combustion turbines with heat recovery steam generator (each equipped with fired duct burner) coupled with a single steam turbine and associated equipment. Cooling towers are also included in permitted emissions.

This permitting action includes the addition of a stand-by diesel fired generator engine (SN-18) and the addition of a fuel tank for the engine. The modification increases permitted emissions at

AECC: 0.1 tons per year (tpy) for PM/PM_{10}, VOC, and SO_2; 0.3 tpy CO; 3.1 tpy NO_X; and 0.08 tpy total HAP. A correction is also included in this permitting action, changing Propylene oxide to Propylene.

7. COMPLIANCE STATUS:

The following summarizes the current compliance of the facility including active/pending enforcement actions and recent compliance activities and issues.

There are neither active nor pending enforcement actions at this time.

8. PSD APPLICABILITY:

a) Did the facility undergo PSD review in this permit (i.e., BACT, Modeling, etc.)? N

b) Is the facility categorized as a major source for PSD? Y

- *Single pollutant ≥ 100 tpy and on the list of 28 or single pollutant ≥ 250 tpy and not on list*

If yes, explain why this permit modification is not PSD.

9. SOURCE AND POLLUTANT SPECIFIC REGULATORY APPLICABILITY:

Source	Pollutant	Regulation (NSPS, NESHAP or PSD)
SN-01 and SN-02	NO_x	NSPS Subpart GG – *Standards of Performance for Stationary Gas Turbines*
	NO_x and SO_2	NSPS Db – Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units and 40 CFR Part 75 – *Acid Deposition Control*
	VOC, CO, NO_x and PM_{10}	PSD
SN-16 and SN-17	HAP	NESHAP Subpart ZZZZ – *National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*
SN-18	PM, VOC, CO, NO_x	NSPS Subpart IIII – *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*

10. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

11. AMBIENT AIR EVALUATIONS:

a) Reserved.

b) Non-Criteria Pollutants:

The non-criteria pollutants listed below were evaluated. Based on Department procedures for review of non-criteria pollutants, emissions of all other non-criteria pollutants are below thresholds of concern.

1st Tier Screening (PAER)

Estimated hourly emissions from the following sources were compared to the Presumptively Acceptable Emission Rate (PAER) for each compound. The Department has deemed the PAER to be the product, in lb/hr, of 0.11 and the Threshold Limit Value (mg/m^3), as listed by the American Conference of Governmental Industrial Hygienists (ACGIH).

Pollutant	TLV (mg/m^3)	PAER (lb/hr) = 0.11 × TLV	Proposed lb/hr	Pass?
Ammonia	17.4	1.91	91.60	No
Acrolein	0.23	0.025	0.20	No
Cadmium	0.002	0.00022	0.2	No
PAH	52	5.72	0.23	Yes

*Formaldehyde, Benzene, Acrolein, PAH, Propelyene Oxide, and Toluene emissions all raised 0.02 lb/hr, but per policy modeling was not repeated for Emergency Engines.

2nd Tier Screening (PAIL)

AERMOD air dispersion modeling was performed on the estimated hourly emissions from the following sources, in order to predict ambient concentrations beyond the property boundary. The Presumptively Acceptable Impact Level (PAIL) for each compound has been deemed by the Department to be one one-hundredth of the Threshold Limit Value as listed by the ACGIH.

Pollutant	PAIL ($\mu g/m^3$) = 1/100 of Threshold Limit Value	Modeled Concentration ($\mu g/m^3$)	Pass?
Ammonia	174.1	8.46	Y

Pollutant	PAIL ($\mu g/m^3$) = 1/100 of Threshold Limit Value	Modeled Concentration ($\mu g/m^3$)	Pass?
Acrolein	2.29	0.35	Y
Cadmium	0.02	0.02	Y

*Formaldehyde, Benzene, Acrolein, PAH, Propelyene Oxide, and Toluene emissions all raised 0.02 lb/hr, but per policy modeling was not repeated for Emergency Engines.

c) H_2S Modeling:

A.C.A. §8-3-103 requires hydrogen sulfide emissions to meet specific ambient standards. Many sources are exempt from this regulation, refer to the Arkansas Code for details.

Is the facility exempt from the H_2S Standards N
If exempt, explain: N/A (no H_2S emissions)

Pollutant	Threshold value	Modeled Concentration (ppb)	Pass?
H_2S	20 parts per million (5-minute average*)		
	80 parts per billion (8-hour average) residential area		
	100 parts per billion (8-hour average) nonresidential area		

*To determine the 5-minute average use the following equation

$Cp = Cm\ (t_m/t_p)^{0.2}$ where

Cp = 5-minute average concentration
Cm = 1-hour average concentration
t_m = 60 minutes
t_p = 5 minutes

12. CALCULATIONS:

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
01-02	Vendor data for criteria	emission factors can be found in the permit BACT determinations	SCR, and low-NO_x oxidation catalyst	70% 22%	HAP testing showed some pollutants needed higher limit than AP-42 so they have been increased, others were non-detectable but have been left in the permit at 0.1 lb/hr
	10 ppm for ammonia slip				
	Acetaldehyde and benzene emission rates are based on testing				
	HAPs				
04-15	AP-42	see application	drift eliminator		0.0005 % drift 1500 ppmw TDS
16,17	AP-42	PM/PM_{10} 0.31 lb/MMBtu SO_2 0.29 lb/MMBtu VOC 0.35 lb/MMBtu CO 0.95 lb/MMBtu NO_X 4.41 lb/MMBtu 1,3 Butadiene 3.91E-05 lb/MMBtu Acrolein 9.25 E-05 lb/MMBtu Benzene 9.33E-4 lb/MMBtu Formaldehyde 1.18E-03 lb/MMBtu PAH 1.68E-04 lb/MMBtu Propylene 2.58E-3 lb/MMBtu Toluene 4.09E-4 lb/MMBtu Xylene 2.85E-4			1.86 MMBtu/hr and 2.73 MMBtu/hr for 16 and 17 respectively

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
		lb/MMBtu			
18	Manufacturer data, AP-42 Table 3.3-2	PM/PM_{10} 0.02 g/kWh SO_2 0.02 g/kWh VOC 0.04 g/kWh CO 0.6 g/kWh NO_X 6.2 g/kWh 1,3 Butadiene 3.91E-05 lb/MMBtu Acetaldehyde 7.67 E-04 lb/MMBtu Acrolein 9.25 E-05 lb/MMBtu Benzene 9.33E-4 lb/MMBtu Formaldehyde 1.18E-03 lb/MMBtu PAH 1.68E-04 lb/MMBtu Propylene 2.58E-3 lb/MMBtu Toluene 4.09E-4 lb/MMBtu Xylene 2.85E-4 lb/MMBtu			17.8 MMBtu/hr

13. TESTING REQUIREMENTS:

The permit requires testing of the following sources.

SN	Pollutants	Test Method	Test Interval	Justification
1 of SN-01 through 02	PM/PM_{10}	5+201/ 202	5 yr	Confirmation of BACT limit(s)
	VOC	25A	5 yr	Confirmation of BACT limit(s)
1 of SN-01 through 02	NH_3	206	5 yr	verify compliance
1 of SN-01 through 02	HAPs	18	initial	verify compliance if/when duct

SN	Pollutants	Test Method	Test Interval	Justification
				burners are started

14. MONITORING OR CEMS:

The permittee must monitor the following parameters with CEMS or other monitoring equipment (temperature, pressure differential, etc.)

SN	Parameter or Pollutant to be Monitored	Method (CEM, Pressure Gauge, etc.)	Frequency	Report (Y/N)
01 & 02	NO_x	CEMS	Continuously	Y
01 & 02	CO	CEMS	Continuously	Y

15. RECORDKEEPING REQUIREMENTS:

The following are items (such as throughput, fuel usage, VOC content, etc.) that must be tracked and recorded.

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
01-02	sulfur content of fuel	0.015% by volume at 15% oxygen on a dry basis	Daily	Y
01-02	combined hours of duct burner fire	5,000 hr/yr total	Monthly	Y
01-02	Startup/Shutdown	N/A	Each Occurrence	N
04-15	TDS or conductivity	1,500 ppmw	Monthly or If conductivity weekly	Y
16,17	Operating hours	500 hours each, calendar annual	Monthly	N
18	Operating hours	500 hours, rolling 12-month	Monthly	N

16. OPACITY:

SN	Opacity	Justification for limit	Compliance Mechanism
01-02	5%	Dept. Standard while	Use of natural gas

SN	Opacity	Justification for limit	Compliance Mechanism
		firing natural gas	
04-15	20%	Standard for cooling towers	TDS limit
16-17	20%	[Regulation 19 §19.503 and 40 CFR Part 52, Subpart E]	Use of fuel oil #2
18	20%	[Regulation 19 §19.503 and 40 CFR Part 52, Subpart E]	Use of fuel oil #2

17. DELETED CONDITIONS:

Former SC	Justification for removal
PC #8	Clean Air Interstate Rule (CAIR) was replaced by Transport Rule as proposed on July 6, 2010 by the US EPA.

18. GROUP A INSIGNIFICANT ACTIVITIES:

Source Name	Group A Category	Emissions (tpy)						
		PM/PM_{10}	SO_2	VOC	CO	NO_x	HAPs	
							Single	Total
320 gallon Diesel Tank	A-3			0.0007				
One Process Heater (natural gas & rated less than 10 MMBtu/hr)	A-1	0.33	0.03	0.24	3.61	4.29		8.11E-02
Miscellaneous Oil Storage	A-13			0.00001				
Sodium Hydroxide Storage	A-4							
EDGE (SN-17) Diesel Storage	A-3			0.01				
Stand-by Engine (SN-18) Diesel Fuel Tank	A-3			0.0006				

19. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

List all active permits voided/superseded/subsumed by the issuance of this permit.

Permit #
1987-AOP-R5

APPENDIX A – EMISSION CHANGES AND FEE CALCULATION

Fee Calculation for Major Source

Revised 03-11-16

Facility Name: Arkansas Electric Cooperative Corporation - Magnet Cove Generating Station
Permit Number: 1987-AOP-R6
AFIN: 30-00337

$/ton factor	23.93	Annual Chargeable Emissions (tpy)	945.94
Permit Type	Minor Mod	Permit Fee $	500

Minor Modification Fee $	500
Minimum Modification Fee $	1000
Renewal with Minor Modification $	500
Check if Facility Holds an Active Minor Source or Minor Source General Permit	☐
If Hold Active Permit, Amt of Last Annual Air Permit Invoice $	0
Total Permit Fee Chargeable Emissions (tpy)	3.94
Initial Title V Permit Fee Chargeable Emissions (tpy)	

HAPs not included in VOC or PM: *Chlorine, Hydrazine, HCl, HF, Methyl Chloroform, Methylene Chloride, Phosphine, Tetrachloroethylene, Titanium Tetrachloride*

Air Contaminants: *All air contaminants are chargeable unless they are included in other totals (e.g., H2SO4 in condensible PM, H2S in TRS, etc.)*

Pollutant (tpy)	Check if Chargeable Emission	Old Permit	New Permit	Change in Emissions	Permit Fee Chargeable Emissions	Annual Chargeable Emissions
PM		240.3	240.4	0.1		
PM_{10}		240.3	240.4	0.1	0.1	240.4
$PM_{2.5}$		0	0	0		
SO_2		13.6	13.7	0.1	0.1	13.7
VOC		70.7	70.8	0.1	0.1	70.8
CO		616.2	616.5	0.3		
NO_X		299.8	302.9	3.1	3.1	302.9
1,3-Butadiene	☐	0.02	0.03	0.01		

Pollutant (tpy)	Check if Chargeable Emission	Old Permit	New Permit	Change in Emissions	Permit Fee Chargeable Emissions	Annual Chargeable Emissions
Acetaldehyde	☐	4.4	4.41	0.01		
Acrolein	☐	0.52	0.53	0.01		
Benzene	☐	4.42	4.43	0.01		
Cadmium	☐	0.5	0.5	0		
Formaldehyde	☐	3.82	3.83	0.01		
Hexane	☐	1.3	1.3	0		
Lead	☐	0.5	0.5	0		
PAH	☐	0.52	0.53	0.01		
Propylene Oxide	☐	0.52	0	-0.52		
Toluene	☐	0.52	0.53	0.01		
Xylene	☐	0.02	0.03	0.01		
Ammonia	☑	311.6	311.6	0	0	311.6
Ammonium Sulfate	☑	6	6	0	0	6
Propylene	☑	0	0.54	0.54	0.54	0.54