STATEMENT OF BASIS

For the issuance of Draft Air Permit # 2123-AOP-R1 AFIN: 29-00506

1. PERMITTING AUTHORITY:

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

2. APPLICANT:

   American Electric Power Service Corporation (John W. Turk Jr. Power Plant)
   3711 Highway 355 South
   Fulton, Arkansas 71838

3. PERMIT WRITER:

   Joseph Hurt

4. PROCESS DESCRIPTION AND NAICS CODE:

   NAICS Description: Electric Bulk Power Transmission and Control
   NAICS Code: 221121

5. SUBMITTALS:

   8/13/2012

6. REVIEWER'S NOTES:

   Southwestern Electric Power Company (SWEPCO), a unit of American Electric Power (AEP), is constructing a new coal-fired electric power generating facility near Fulton, Arkansas, in Hempstead County. This facility is named the John W. Turk, Jr. Power Plant. The main steam generating unit will consist of one ultra-supercritical pulverized coal boiler powering a single steam turbine designed for base load operation with a nominal net power output of 600 megawatts. This boiler will burn sub-bituminous coal and natural gas.

   With this modification, the following changes were made to the permit:

   1. Numerous administrative corrections have been requested in a red line version of the permit submitted with the application, all of which were accepted except for three changes;

2. The size of the emergency diesel generator engine (SN-03) has change from a 2 MW unit to a 1.325 MW unit. Corrected emissions calculations, emission rate tables (ERTs), and HAP ERTs were submitted to update the permitted emission rates of the permit;
3. Only one fire pump diesel engine (SN-04) was installed instead of two. Instead of two 300 Hp engines, only one 460 Hp engine was installed at the facility. Corrected emissions calculations, emission rate tables (ERTs), and HAP ERTs were submitted to update the permitted emission rates of the permit;
4. Numerous administrative corrections to the material handling systems are being requested in a red line version of the permit submitted with application;
5. A 4,000 gallon above ground gasoline storage tank (SN-TK-01) is being added;
6. Numerous insignificant activities are being added;
7. The scenario for firing coal with sulfur greater than 0.45% by weight (wet basis) has been removed; and
8. Federal requirements from all NSPSs and NESHAPs have been updated.

The facility also requested to remove or modify Specific Conditions 10, 18, and 19 of Permit 2123-AOP-R0. These conditions, now Specific Conditions 10, 61, and 62, remain as written in Permit 2123-AOP-R0.

This permitting action also incorporates the facility's Acid Rain permit application and the facility's Clean Air Interstate Rule (CAIR) permit application. The permitted emission increases include 0.01 tpy of SO_2, 0.02 tpy of Benzene, 0.01 tpy of 1,3-Butadiene, 0.01 tpy of Hexane, 0.01 tpy of Lead, 0.02 tpy of Sulfuric Acid, 0.02 tpy of Toluene, 0.01 tpy of 2,2,4-Trimethylpentane, and 0.01 tpy of Xylene. The permitted emission decreases include 0.61 tpy of PM, 0.56 tpy of PM_{10}, 0.58 tpy of VOC, 1.1 tpy of CO, 2.3 tpy of NO_x, and 0.03 tpy of Beryllium.

7. COMPLIANCE STATUS:

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

The inspector conducted a phone interview on July 8, 2011. At the time the power plant was nearing 65% completion with an expected first commercial operations starting sometime in the 4th quarter of 2012. The application submitted on August 13, 2012 updated the permit to include equipment actually installed at the facility. Sources SN-03 and SN-04 as installed are different than the originally authorized. The Emergency Diesel Generator Engine (SN-03) changed in size from a 2 MWHr to a 1.325 MWHr unit. Only one Diesel Fire Pump Engine (SN-04) was installed instead of two. Instead of two 300 Hp engines only one 460 Hp engine was installed. The emissions from SN-03 and SN-04 have decreased with this modification. With the issuance of this permit, the facility will come into compliance.

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, or*
- *CO_2e potential to emit ≥ 100,000 tpy and ≥100 tpy/≥250tpy of combined GHGs?*

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

See reviewer's notes.

9. GHG MAJOR SOURCE (TITLE V):

Indicate one:
☒ Facility is classified as a major source for GHG and the permit includes this designation
☐ Facility does not have the physical potential to be a major GHG source
☐ Facility has restrictions on GHG or throughput rates that limit facility to a minor GHG source. Describe these restrictions: _____

10. SOURCE AND POLLUTANT SPECIFIC REGULATORY APPLICABILITY:

Source	Pollutant	Regulation (NSPS, NESHAP or PSD)
01	all	PSD
	HAPs	40 CFR 63.43 case by case MACT (112(g))
	PM, SO_2, NO_x	40 CFR 60, Subpart Da
02	all	PSD
	HAPs	40 CFR 63.43 case by case MACT (112(g))
	NO_x	40 CFR 60, Subpart Db
	all	40 CFR Part 63, Subpart DDDDD
03	all	PSD
	PM, fuel specifications	40 CFR 60, Subpart IIII
	N/A	40 CFR 63, Subpart ZZZZ
04	PM, fuel specifications	40 CFR 60, Subpart IIII
EP-01 through EP-08, EP-10, TP-11, TP-12, TP-18 and TP-20	opacity	40 CFR 60, Subpart Y

11. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

12. MODELING:

Criteria Pollutants[1,2]

Examination of the source type, location, plot plan, land use, emission parameters, and other available information indicate that modeling is not warranted at this time.

Pollutant	Emission Rate (lb/hr)	NAAQS Standard ($\mu g/m^3$)	Averaging Time	Highest Concentration ($\mu g/m^3$)	% of NAAQS
PM_{10}	171.7	150	24-Hour	19.68	29.52 %
SO_2	480.6	80	Annual	0.49	0.62 %
		1300	3-Hour	10.38	0.79 %
		365	24-Hour	4.22	1.16 %
CO	933.2	10,000	8-Hour	12.9	0.13 %
		40,000	1-Hour	23.7	0.06 %
NO_x	503.3	100	Annual	0.91	0.91 %
Pb	0.1060	0.15	Rolling 3-month Period over 3 years (not to be exceeded in any 3 month period)	0.0002 (Highest monthly value)	0.13 %

1. Modeling is based on draft for Permit 2123-AOP-R0. Some emission rates decreased after draft permit; revised modeling was not necessary. Refinements to modeling were also conducted after the draft period including road locations and additional sources. No significant changes in impacts resulted.
2. No significant changes were requested for Permit 2123-AOP-R1; therefore revised modeling was not necessary.

Non-Criteria Pollutants:

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?
Acetaldehyde	44.05	4.954	0.25	Y
Acrolein	0.229	0.025	0.13	N
Antimony	0.5	0.055	0.15	N
Arsenic	0.01	0.001	0.52	N
Benzene	1.597	0.176	1.21	N
Benzyl Chloride	5.177	0.569	0.27	N
Beryllium	0.002	0.00022	0.02	N
1,3-Butadiene	4.425	0.487	0.23	Y
Cadmium	0.01	0.001	0.03	N
Carbon Disulfide	31.141	3.426	0.05	Y
Chloroform	48.826	5.371	0.03	Y
Chromium	0.5	0.055	0.19	N
Chromium VI	0.05	0.006	0.06	N
Cobalt	0.2	0.002	0.04	N
Cyanide	5.19	0.571	0.94	N
Dichlorobenzene	60.127	6.614	0.01	Y
Dimethyl Sulfate	0.516	0.057	0.02	Y
Dioxins & Furans	0.001	0.0001	0.01	N
Formaldehyde	18.421	2.026	0.18	N
Hexane	1762.372	193.861	0.66	Y
Hydrogen Chloride	2.983	0.328	3.60	N
Hydrogen Fluoride	0.409	0.045	1.20	N
Lead	0.05	0.006	0.1060	N
Manganese	0.2	0.022	1.12	N

Pollutant	TLV (mg/m^3)	PAER (lb/hr) = 0.11 × TLV	Proposed lb/hr	Pass?
Mercury	0.025	0.003	0.010340	N
Methyl Hydrazine	0.019	0.002	0.07	N
Nickel	0.1	0.011	0.12	N
Phenol	19.245	2.117	0.01	Y
Phosphorous	0.1	0.011	2.40	N
POM	0.2	0.022	0.04	N
Propionaldehyde	47.526	5.228	0.15	Y
Selenium	0.2	0.022	0.25	N
Sulfuric Acid	0.2	0.022	25.20	N
Toluene	188.405	20.725	0.87	Y
2,2,4-Trimethylpentane	1401	154	0.21	Y
Xylene	434.192	47.761	0.21	Y
Ammonia	17.413	1.91	37.50	N

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?
Acrolein	2.3	5.38E-04	Y
Antimony	5	7.43E-04	Y
Arsenic[1]	0.1	0.001	Y
Benzene	15.971	13.92155	Y
Benzyl Chloride	16	1.3E-03	Y
Beryllium	0.02	3.9E-05	Y

Pollutant	PAIL ($\mu g/m^3$) = 1/100 of Threshold Limit Value	Modeled Concentration ($\mu g/m^3$)	Pass?
Cadmium	0.02	9.02E-05	Y
Chromium	5	8.58E-04	Y
Chromium VI	0.5	2.49E-04	Y
Cobalt	0.2	1.26E-04	Y
Cyanide	51.9	4.64E-03	Y
Dioxins & Furans	0.01	5E-05	Y
Formaldehyde	15	6.48E-04	Y
Hydrogen Chloride	29.8	0.0861	Y
Hydrogen Fluoride	24.6	0.0267	Y
Lead	0.5	7.74E-04	Y
Manganese	2.0	5.5E-03	Y
Mercury	0.1	1.97E-04	Y
Methyl hydrazine	0.19	3.16E-04	Y
Nickel	1.0	5.25E-04	Y
Phosphorous	1.0	1.19E-02	Y
POM	0.02	8.0E-05	Y
Sulfuric Acid[1]	2.0	1.19E-01	Y
Selenium	2.0	1.19E-03	Y
Ammonia[1]	174	0.18575	Y

1. Modeling was not performed for Arsenic, Sulfuric Acid, or Ammonia with the original permit. Sulfuric Acid emissions are approximately 100 times greater than the Selenium emissions from the main stack. Arsenic emissions are approximately 26 times greater than Beryllium. Ammonia emissions are approximately 250 times greater than Antimony. Therefore, the modeled concentration for Arsenic, Sulfuric Acid, and Ammonia were multiplied by 26, 100, and 250, respectively.

Other Modeling:

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 Y
If exempt, explain: No H_2S emissions

13. CALCULATIONS:

SN	Emission Factor Source	Pollutant	Emission Factor	Control Equipment	Control Equipment Efficiency	Comments
01	BACT	PM/PM_{10} (filterable)	0.012 lb/MMBtu	Baghouse	99.9	
		PM/PM_{10} (total)	0.025 lb/MMBtu	Baghouse	99.9	
		SO_2	0.08 lb/MMBTU 0.065/lbMMBTU	Dry Flue Gas Desulfurization	80-90+	
		VOC	0.00078 lb/MMBtu	Proper Design/Operation		
		CO	0.15 lb/MMBtu	Proper Design/Operation		
		NO_x	0.067 lb/MMBTU/0.05 lb/MMBTU annual	SCR	70-90	
		Pb	1.6E-5 lb/MMBtu	Baghouse	99.9	
		H_2SO_4 Mist	0.0042 lb/MMBtu	DFGD with Baghouse		
02	BACT	PM (total)	0.004 lb/MMBTU	Natural Gas Combustion		
		SO_2	0.0006 lb/MMBtu	Natural Gas Combustion		
		VOC	0.0055 lb/MMBtu	Proper Design/Operation		
		CO	0.036 lb/MMBTU	Proper Design/Operation		

SN	Emission Factor Source	Pollutant	Emission Factor	Control Equipment	Control Equipment Efficiency	Comments
		NO_x	0.11 lb/MMBtu	Low NO_x Burner and Flue Gas Recirculation		
		Pb	N/A	Natural Gas combustion		
03 and 04	BACT	NO_x + NMHC	6.4 g/kWh	Proper Design/Operation Low Sulfur Diesel 100 hrs/yr		
		SO_2	0.007 g/kWh			
		PM	0.2 g/kWh			
		CO	3.5 g/kWh			
EP-01 – EP-08, EP-10, TP-18, TP-20	AP-42	PM/PM_{10}	various	Water and Surfactant Spray		
TP-12	Design	PM/PM_{10}	0.01 gr/dscf	filter		
TP-22 TP-23	design	PM/PM_{10}	9.4E-05 lb/ton	none		
EP-15 - EP-18 EP-21 - EP-24	Design	PM/PM_{10}	0.01 gr/dscf	filter		
F-01 – F-06	EPA Guidance	PM/PM_{10}	3.9 lb/day/acre	None	N/A	
CT-01	BACT	Drift rate	0.0005%	Drift Eliminators	N/A	
RD-01	AP-42	PM/PM_{10}	1.07 lb/VMT	Watering and chemical suppression	90	
TK-01	TANKS	VOC	Varies	N/A	N/A	Based on 25,000 gallons of gasoline per year.

14. TESTING REQUIREMENTS:

The permit requires testing of the following sources.

SN	Pollutants	Test Method	Test Interval	Justification
01	VOC PM/PM_{10} HF HCl H2SO4 Ammonia Lead (Pb)	various	annual	BACT/NSPS/ Verify Emission Rates
01	Other Non-Criteria	TBD	Once	Verify Emission Rates/MACT
02	PM CO	various	Once	NSPS/MACT
	NO_x	7E	Initial and once every five years.	Verify emission rates
EP-01 through EP-08, EP-10, and TP-12	Opacity	Method 9	Initial	NSPS

15. 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	Opacity CO NO_x SO_2 CO_2 Mercury	COMS CEMS	Continuous	Y
01	Bag Leaks	Bag Leak Detector	Continuous	Y

16. 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	Mercury Emissions	1.7 lb/TBtu per 12-month period	Monthly	Y
01	Bag Leak Detector Readings	None specified	Monthly	Y
01	BTU input	6000 MMBtu/hr 24-hour average	Continuous	Y
01	SO_2 emissions	0.065 lb/MMBtu (30-day rolling average)	Monthly	Y
		480.0 lb/hr (24-hr rolling average)	Monthly	Y
01	NO_x emissions	0.067 lb/MMBtu (24-hr rolling average normal operations)	Monthly	Y
		420.0 lb/hr (24-hr rolling average)	Monthly	Y
		0.05 lb/MMBtu (12-month rolling average)	Monthly	Y
01	CO	0.15 lb/MMBtu (30-day rolling average)	Monthly	Y
02	Fuel Used	272.1 MMscf/12 month	Monthly	Y
03	Hours of operation	500 per year	Monthly	Y
04	Hours of operation	100 per year	Monthly	Y
F-06	Maximum area of the solid waste disposal area	50 acres	Semi-annually	Y
CT-01	Total Dissolved Solids (TDS)	7500 ppm	Weekly	Y

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
TK-01	Gasoline throughput	25,000 gallons per 12-month	Monthly	Y
Welsh Unit 2	SO_2 emissions	2,165 lb/hr (24-hr rolling average)	Semi-annually	Y

17. OPACITY:

SN	Opacity	Justification for limit	Compliance Mechanism
01	10	Good Operations	COM
02	10	Good Operations	COM
03	20% in acceleration mode 15% in Lugging mode 50% during peaks (as measured according to 40 CFR 86, Subpart I)	Good Operations	Method 9
04	20	Dept. Guidance	Weekly observations
SN-EP-01 through EP-08, EP-10, TP-12 and TP-18 through TP-20	20	NSPS	Method 9
SN-TP-22	20	Dept. Guidance	Daily Observations
EP-15 through EP-24	10	Dept. Guidance	Weekly observations
SN-F-01 through F-06	20	Dept. Guidance	Weekly observations

18. DELETED CONDITIONS:

Former SC	Justification for removal
Various	Several federal rules have been updated since the initial permit; therefore these conditions were removed and updated to be consistent with the current requirements.

19. GROUP A INSIGNIFICANT ACTIVITIES

Source Name	Group A Category	Emissions (tpy)						
		PM/PM_{10}	SO_2	VOC	CO	NO_x	HAPs	
							Single	Total
Diesel or Propane Space Heaters (20 Total)	A-1	0.002	1.1E-05	0.0036	0.025	0.09	0.0036	0.0036
10,000 gallon Diesel Storage Tanks (3 Total)	A-3			0.005			0.005	0.005
700 gallon Diesel Storage Tank	A-3			0.0001			0.0001	0.0001
572 gallon Diesel Storage Tank	A-3			0.0002			0.0002	0.0002
Boiler Feed Pump Lube Oil Reservoir (2,906 gal)	A-3			0.0008			0.0008	0.0008
Emissions from laboratory equipment & vents	A-5	No VOCs are used in the plant's laboratory.						
Turbine Lube Oil Storage Tank (16,800 gal)	A-13			0.007			0.007	0.007
Turbine Lube Oil Reservoir and Storage Tank (11,624 gal)	A-13			0.03			0.003	0.003

20. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

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

Permit #
2123-AOP-R0

21. CONCURRENCE BY:

The following supervisor concurs with the permitting decision.

Karen Cerney, P.E.

APPENDIX A – EMISSION CHANGES AND FEE CALCULATION

Fee Calculation for Major Source

Revised 08-20-12

Facility Name: American Electric Power Service Corporation (John W. Turk Jr. Power Plant)
Permit Number: 2123-AOP-R1
AFIN: 29-00506

$/ton factor	22.97	Annual Chargeable Emissions (tpy)	4445.88
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)	-3.48
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	☑	801.56	800.95	-0.61	-0.61	800.95
PM_{10}	☐	732.26	731.7	-0.56		
SO_2	☑	2102.69	2102.7	0.01	0.01	2102.7
VOC	☑	23.08	22.5	-0.58	-0.58	22.5
CO	☐	3951	3949.9	-1.1		
NO_X	☑	1336.6	1334.3	-2.3	-2.3	1334.3
Acetaldehyde*	☐	0.96	0.96	0		
Acrolein*	☐	0.5	0.5	0		
Antimony**	☐	0.66	0.66	0		
Arsenic**	☐	2.25	2.25	0		
Benzene*	☐	2.17	2.19	0.02		
Benzyl Chloride*	☐	1.15	1.15	0		
Beryllium**	☐	0.08	0.05	-0.03		
1,3-Butadiene*	☐	0.02	0.03	0.01		
Cadmium**	☐	0.09	0.09	0		
Carbon Disulfide**	☐	0.22	0.22	0		
Chloroform*	☐	0.1	0.1	0		
Chromium**	☐	0.77	0.77	0		

Pollutant (tpy)	Check if Chargeable Emission	Old Permit	New Permit	Change in Emissions	Permit Fee Chargeable Emissions	Annual Chargeable Emissions
Chromium VI**	☐	0.23	0.23	0		
Cobalt**	☐	0.13	0.13	0		
Cyanide**	☐	4.11	4.11	0		
Dichlorobenzene*	☐	0.01	0.01	0		
Dimethyl Sulfate*	☐	0.08	0.08	0		
Dioxins & Furans	☐	0.01	0.01	0		
Formaldehyde*	☐	0.44	0.44	0		
Hexane*	☐	0.41	0.42	0.01		
Hydrogen Chloride	☑	15.77	15.77	0	0	15.77
Hydrogen Fluoride	☑	5.26	5.26	0	0	5.26
Lead**	☐	0.42	0.43	0.01		
Manganese**	☐	4.81	4.81	0		
Mercury	☐	0.044735	0.044735	0		
Methylhydrazine*	☐	0.28	0.28	0		
Nickel**	☐	0.47	0.47	0		
Phenol*	☐	0.03	0.03	0		
Phosphorous**	☐	10.51	10.51	0		
POM*	☐	0.07	0.07	0		
Propionaldehyde*	☐	0.63	0.63	0		
Selenium**	☐	1.06	1.06	0		
Sulfuric Acid	☐	110.38	110.4	0.02		
Toluene*	☐	0.02	0.04	0.02		
2,2,4-Trimethylpentane	☐	0	0.01	0.01		
Xylene*	☐	0.02	0.03	0.01		
Ammonia	☑	164.4	164.4	0	0	164.4