

STATEMENT OF BASIS

For the issuance of Air Permit # 0573-AOP-R12 AFIN: 70-00040

1. PERMITTING AUTHORITY:

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

2. APPLICANT:

El Dorado Chemical Company
4500 North West Avenue
El Dorado, Arkansas 71730

3. PERMIT WRITER:

Joseph Hurt

4. PROCESS DESCRIPTION AND NAICS CODE:

NAICS Description: Nitrogenous Fertilizer Manufacturing
NAICS Code: 325311

5. SUBMITTALS:

4/11/2011

6. REVIEWER'S NOTES:

El Dorado Chemical Company (EDCC) owns and operates a chemical manufacturing facility located at 4500 North West Avenue in El Dorado, Arkansas. With this modification the facility requested to:

1. Incorporate the requirements of 40 CFR Part 63, Subpart CCCCCC – *National Emission Standards For Hazardous Air Pollutants For Source Category: Gasoline Dispensing Facilities*; and
2. To incorporate Reference Method 202 into particulate matter sampling requirements at the KT Plant Dryer/Cooler (SN-15) as required by Specific Condition 90 of Permit 0573-AOP-R11.

There are no permitted emission changes with this modification.

7. COMPLIANCE STATUS:

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

The last inspection, performed on January 29, 2009, indicated that the facility was still operating under an active CAO (CAO LIS 08-134). Per Ron Allen on 02/05/09 – the facility is to submit for a period of 3 months CEMs related data such as QA/QC and other related CEMs activities until March 20, 2009.

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 not PSD?

This modification did not require a PSD review.

9. SOURCE AND POLLUTANT SPECIFIC REGULATORY APPLICABILITY:

Source	Pollutant	Regulation (NSPS, NESHAP or PSD)
SN-41	PM ₁₀	PSD
SN-13	NO _x	40 CFR Part 60, Subpart G
SN-07	SO ₂ and sulfuric acid mist	40 CFR Part 60, Subpart H
SN-25	There are no specific emission limits or pollutants identified, but the rules generally regulate HAPs	40 CFR Part 63, Subpart CCCCCC

10. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

11. MODELING:

Criteria Pollutants

Pollutant	Emission Rate (lb/hr)	NAAQS Standard ($\mu\text{g}/\text{m}^3$)	Averaging Time	Highest Concentration ($\mu\text{g}/\text{m}^3$)	% of NAAQS
PM ₁₀	161.6	50	Annual	40.23089*	80.47 %
		150	24-Hour	136.49246*	91.00 %
SO ₂	600.2	80	Annual	13.29965	16.63 %
		1300	3-Hour	555.91071	42.77 %
		365	24-Hour	129.21823	35.41 %
VOC	18.5	0.12	1-Hour (ppm)	N/A	N/A
CO	24.0	10,000	8-Hour	36.35510	0.37 %
		40,000	1-Hour	89.98168	0.23 %
NO _x	592.2	100	Annual	12.34876	12.35 %
Pb	--	0.15	Rolling 3-month Period over 3 years (not to be exceeded in any 3 month period)	N/A	N/A

* - Includes background (27 $\mu\text{g}/\text{m}^3$ for annual average, 53 $\mu\text{g}/\text{m}^3$ for 24-hour average). Also includes modeling PM₁₀ with startup and shutdown limits.

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) = $0.11 \times \text{TLV}$	Proposed lb/hr	Pass?
Hexane	176.2	19.3	0.6	Yes
HNO ₃	5.1	0.567	16.8	NO

Pollutant	TLV (mg/m ³)	PAER (lb/hr) = 0.11 × TLV	Proposed lb/hr	Pass?
H ₂ SO ₄	0.2	0.022	2.89	NO
NH ₃	17.4	1.9	168.8	NO
SO ₃	1.0 ¹	0.11	0.05	Yes

1. Obtained from Texas' Effects Screening Level (ESL) document.

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 (µg/m ³) = 1/100 of Threshold Limit Value	Modeled Concentration (µg/m ³)	Pass?
HNO ₃	51.0	23.17783	YES
H ₂ SO ₄	2.0	0.46782	YES
NH ₃	174	113.24319	YES

Other Modeling:

Odor:

Odor modeling for sources emitting styrene.

Pollutant	Threshold value 1-hour average	Modeled Concentration (µg/m ³)	Pass?
Styrene	1361 µg/m ³	N/A	N/A

H₂S 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 H₂S Standards N

If exempt, explain: _____

Pollutant	Threshold value	Modeled Concentration (ppb)	Pass?
H ₂ S	20 parts per million (5-minute average*)	0.056 ppm (47.5 μg/m ³)	YES
	80 parts per billion (8-hour average) residential area	12.18 (17 μg/m ³)	YES
	100 parts per billion (8-hour average) nonresidential area	12.18 (17 μg/m ³)	YES

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

$$C_p = C_m (t_m/t_p)^{0.2} \text{ where}$$

C_p = 5-minute average concentration

C_m = 1-hour average concentration

t_m = 60 minutes

t_p = 5 minutes

12. CALCULATIONS:

SN	Emission Factor Source	Emission Factor	Control Equipment	Control Equipment Efficiency	Comments
05	Testing	PM_{10} – 13.0 lb/hr, 0.96 lb of PM_{10} per ton of ammonium nitrate produced. With SN-17's exhaust routed to SN-05 $21.6 \text{ lb/hr} \times (1-0.95) = 1.1 \text{ lb/hr PM}$	Brinks Scrubber	-	97% particulate control efficiency. 95% particulate control efficiency is used in calculations as Brinks scrubber control efficiencies for the exhaust from SN-17 passing thru Brinks scrubber.
	Engineering Estimate	$3.5 + 5.0 = 8.5 \text{ lb/hr NH}_3$	Brinks Scrubber	-	-
06	Testing	PM_{10} – 67.0 lb/hr, 0.96 lb of PM_{10} per ton of ammonium nitrate produced.	-	-	Uncontrolled. Maximum prill production rate is 54 tons/hour.
07	Testing	SO_2 – 600 lb/hr	Brinks Mist Eliminator	-	Remain the previous permitted limit
	Testing	H_2SO_4 – 0.123 lb/ton	Brinks Mist Eliminator	-	-
08	Testing	NO_x - 200.1 lb/hr Ammonia – 40.0 lb/hr	Refrigeration SCR	~98.5%	$11.5 \text{ lb/ton} \times 17.4 \text{ ton/hr} = 200.1 \text{ lb/hr}$

SN	Emission Factor Source	Emission Factor	Control Equipment	Control Equipment Efficiency	Comments
09	Testing	NO _x - 200.1 lb/hr Ammonia - 40.0 lb/hr	Refrigeration SCR	~98.5%	11.5 lb/ton x 17.4 ton/hr = 200.1 lb/hr
10	AP-42	NO _x - 10.0 lb/ton	best operation	-	-
	Highest lb/hr from Stack Test results of 2001-2004	HNO ₃ - 0.389 x 1.25 x 40/8.5 = 2.3 lb/hr + 1.1 lb/hr from car barn NO _x - 3.3 x 1.25 x 40/8.5 = 19.5 lb/hr	-	-	Maximum nitric acid production rate is 8.5 tons/hr, and maximum nitric acid blend production is 40 tons/hr. Stack test + 25% safety factor.
13	NSPS	3.0 lb/ton of acid	refrigerated absorption	-	-
14	Testing	PM ₁₀ - 44.2 lb/hr	none	-	Hourly emission rate increase as a result of a fail stack testing. 44.2 lb/hr is based on March 2, 2004 stack test data. Average + Std. Deviation = 36.18 + 8.0 38.5 tph of AN production maximum
15	Testing	PM ₁₀ - 17.0 lb/hr	none	-	38.5 tph of AN production maximum
	Testing	NH ₃ - 18.0 lb/hr	none	-	38.5 tph of AN production maximum

SN	Emission Factor Source	Emission Factor	Control Equipment	Control Equipment Efficiency	Comments
16A & 16B	AP-42	PM ₁₀ – 7.6 lb/MMSCF SO ₂ – 0.6 lb/MMSCF VOC – 5.5 lb/MMSCF CO – 84 lb/MMSCF NO _x - 280 lb/MMSCF	none	-	-
17	Testing	PM ₁₀ – 21.6 lb/hr	Pease-Anthony Scrubber	-	Routed to SN-05
	Testing	NH ₃ – 5.0 lb/hr	Pease-Anthony Scrubber	-	Routed to SN-05
18	Process Knowledge	PM ₁₀ – 0.033 lb/ton	Baghouse	-	38.5 tph of AN production maximum
19	PM – 50,556 scfm x 011677 lb/mmft ³ x 60 min/hr x 1.2 NH ₃ - 50,556 scfm x 25 ppm x 17.1 lb/lb-mol x lb-mol/385.2 ft ³ 60min/hr x 1.2	-	-	-	
21	Testing	PM ₁₀ – 0.1 lb/ton	Brinks Scrubber	-	38.5 tph of AN production maximum
	Testing	NH ₃ – 1.0 lb/ton	Brinks Scrubber	-	38.5 tph of AN production maximum

SN	Emission Factor Source	Emission Factor	Control Equipment	Control Equipment Efficiency	Comments
22	CEM	NO _x - 3.0 lb/ton	cryogenic absorption	-	-
	Process Knowledge	HNO ₃ - 10.0 lb/hr	cryogenic absorption	-	-
25	TANKS3	VOC	none	-	-
26	TANKS3	NH ₃	none	-	-
27	AP-42	PM ₁₀ - 0.0001 lb/ton	none	-	-
28	AP-42	PM ₁₀ - 0.0001 lb/ton	none	-	-
29	AP-42	HNO ₃ - 0.53 lb/1000 gallons	none	-	-
30	AP-42 Section 5.2	H ₂ SO ₄ - 0.0281 lb/1000 gallons	none	-	$L_L = 12.46 \times \text{SPM/T}$ $= 12.46 \times 1.45 \times 0.01 \times 98.06/630$
31	SOCMI	NH ₃ - 0.5 lb/hr	none	-	-
32	SOCMI	NH ₃ - 1.3 lb/hr	none	-	-
33	Process Knowledge	NO _x - 1.9 lb/hr	none	-	-
	Process Knowledge	HNO ₃ - 1.8 lb/hr	none	-	-
34	Process Knowledge	PM ₁₀ - 0.7 lb/ton x 1.16 ton/hr	none	-	-
35	Process Knowledge	PM ₁₀ - 2.0 lb/hr	baghouse	99%	-

SN	Emission Factor Source	Emission Factor	Control Equipment	Control Equipment Efficiency	Comments
38	$EF_{PM} = \text{Total liquid drift (lb/1000 gal)} \times \text{TDS Fraction (ppm)}$ $= 1.7 \text{ lb/1000 gal} \times 1,560 \text{ ppm}$ $PM_{10} = EF_{PM} \times \text{flowrate}$ $= 9,000 \text{ gpm} \times EF_{PM}$			0.17 lb/1000 gal is design drift loss percent provided by AP-42. Table 13.4-1	
39	$EF_{PM} = \text{Total liquid drift (lb/1000 gal)} \times \text{TDS Fraction (ppm)}$ $= 1.7 \text{ lb/1000 gal} \times 1,560 \text{ ppm}$ $PM_{10} = EF_{PM} \times \text{flowrate}$ $= 14,000 \text{ gpm} \times EF_{PM}$			1.7 lb/1000 gal is design drift loss percent provided by AP-42. Table 13.4-1	
40	Engineering estimate	NH ₃ – 1.6 lb/hr during loading			1.6 lb/hr per truck x 2 trucks per day
41	Stack testing	NH ₃ – 10.0 lb/hr PM/PM ₁₀ – 3.3 lb/hr	Chemical steam scrubber	-	24-hr BACT limit is 13.7 lb/hr 30-day rolling BACT limit is 3.3 lb/hr

SN	Emission Factor Source	Emission Factor	Control Equipment	Control Equipment Efficiency	Comments
42	$EF_{PM} = \text{Total liquid drift (lb/1000 gal)} \times \text{TDS Fraction (ppm)}$ $= 0.17 \text{ lb/1000 gal} \times 1,560 \text{ ppm}$ $PM_{10} = EF_{PM} \times \text{flowrate}$ $= 16,000 \text{ gpm} \times EF_{PM}$	-	-	0.17 lb/1000 gal is design drift loss percent provided by manufacturer.	
43	$EF_{PM} = \text{Total liquid drift (lb/1000 gal)} \times \text{TDS Fraction (ppm)}$ $= 1.7 \text{ lb/1000 gal} \times 1,560 \text{ ppm}$ $PM_{10} = EF_{PM} \times \text{flowrate}$ $= 2,000 \text{ gpm} \times EF_{PM}$			1.7 lb/1000 gal is design drift loss percent provided by AP-42. Table 13.4-1	
44	<p>Mass Balance for sulfur oxides and sulfuric acid.</p> <p>Stack test from similar plant plus a safety factor of 25%.</p>	Scrubber	-	-	
46	$3000 \text{ gpm} \times 0.000064 \times 1,560 \text{ ppm} = 0.2 \text{ lb/hr } PM_{10}$	-	-	0.0064% is design drift loss percent provided by manufacturer.	

13. TESTING REQUIREMENTS:

The permit requires testing of the following sources.

SN	Pollutants	Test Method	Test Interval	Justification
10	NO _x	7E	Every five years	Necessary for efficiency check on Venturi & Packed Tower Scrubber
10	HNO ₃	Approved method	Every five years	Necessary for efficiency check on Venturi & Packed Tower Scrubber
07	SO ₂	6C	Initial performance test	NSPS Requirement
05	PM ₁₀	Approved method	Every five years to do an analysis. See Specific Condition 64.	Necessary to prove that PSD has not been triggered.
17	NH ₃	Approved Method	Every five years or upon failure, pass two consecutive stack testings to go back to the five years cycle.	Necessary to prove that PSD has not been triggered.
14, 15, & 21	PM ₁₀	Method 5 or 201A, and 202	Within 180 days of issuance of permit 0573-AOP-R12 and annually thereafter for SN-14 and SN-21. Annually for SN-15.	Necessary to prove that PSD has not been triggered.
15	NH ₃	Approved method	Annually until 2 consecutive passes, then once every 5 years	Necessary to prove adherence to the non-criteria pollutant strategy.
21	NH ₃	Approved method	Annually until 3 consecutive passes, then once every 3 years	Necessary to prove adherence to the non-criteria pollutant strategy.
44	SO ₂ NO _x H ₂ SO ₄ HNO ₃	Approved method	Every five years	Necessary to prove adherence to the non-criteria pollutant strategy.
08 & 09	NH ₃	CTM-027	Every five years	Verify emissions

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	Frequency	Report (Y/N)
13 & 22	NOx emission rate	CEM	Continuously	Y
07	SO ₂ emission rate	CEM	Continuously	Y
08 & 09	NOx emission rate	CEM	Continuously	Y
41	Ammonia and particulate emission rates	Daily sampling consisting of two 12-hour composite sample	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)
08 & 09	weak nitric acid production	304,775 tons/12 months	Monthly	Y
13	weak nitric acid production	140,000 tons/12 months	Monthly	Y
22, 10, & Facility	concentrated nitric acid production	SN-22 - 118,260 tons/12 months;	Monthly	Y
10	Scrubber parameter	hydrogen peroxide concentration	Daily	N
29	nitric acid shipped	200,000 tons/12 months	Monthly	Y
07	Sulfuric acid production	200,750 ton/12 months	Monthly	Y
30	Sulfuric acid shipped	200,750 tons/12 months	Monthly	Y
All E2 Plant	Production	473,040 tons/12 months	Monthly	Y

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
05	Scrubber liquid flow rate for each scrubber Gas pressure drop across unit Scrubber liquid pH	225 gal/min (minimum) 2.5 in. H ₂ O (minimum) 0.5 – 4.5	Daily	N
15	Scrubber liquid flow rate pH Amperage	80 gal/min (minimum) 0.5 – 4.5 290 amp (minimum)	Daily	N
16A & 16B	Hours of Operation	Both boilers shall not operate at the same time for more than 240 hours per year	Monthly	Y
17	Scrubber liquid flow rate (dual scrubber) pH Amperage	120 gal/min (minimum) 0.5 – 6.0 100 amp (minimum)	Daily	N
18	Baghouse Pressure Drop	0.5 – 8.0 in H ₂ O	Daily	N
21	Liquid Gas Pressure to Top Spray Nozzles Gas Pressure Drop Across Unit pH	80 – 100 psi _g 2.5 in H ₂ O (minimum) 0.5 – 4.5	Daily	N
All KT plant	production	252,000 tons/12 months	Monthly	Y
25	usage of gasoline	40,000 gallons/12 months	Monthly	Y

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
37	minimum gas pressure	10 in. H ₂ O (minimum)	When scrubber in operation	N
38	Total Dissolve solid	1,560 ppm	Weekly	N
39	Total Dissolve solid	1,560 ppm	Weekly	N
40	Loading tonnage	no more than 468,660 tons	Monthly	N
41	BACT Limit	24-hour Average 0.223 lb/ton (13.7 lb/hr)	Daily	Y
		30-day Average 0.054 lb/ton (3.3 lb/hr)	Monthly	Y
42	Total Dissolve solid	1,560 ppm	Weekly	N
43	Total Dissolve solid	1,560 ppm	Weekly	N
46	Total Dissolve solid	1,560 ppm	Weekly	N
44	Amount of Oleum offload into the storage tank Percent strength of the Oleum Amount of mixed acid produced.	394,000 tons 30% 219,000 tons	Monthly	N
	Scrubber liquid flow rate for each scrubber Gas pressure drop across unit Scrubber liquid pH	5.0 gal/min (minimum) 10 – 35 in. H ₂ O 0.5 – 4.5	Daily	N
05, 06, 14, 15, 16A, 16B, 18, 19, & 21	PM Emissions Inventory	281.0 tpy	Monthly	Y

16. OPACITY:

SN	Opacity	Justification for limit	Compliance Mechanism
12, 18, & 35	5%	Department Guidance	Daily Observation
16A & 16B	5%	Department Guidance	Inspection
08 & 09	10%	Compliance assurance for SCR operation	Daily Observation
07 & 13	10%	NSPS limit	Daily Observation
21, 22, & 27	10%	Department Guidance	Daily Observation
14, 19, & 41	15%	Department Guidance	Daily Observation
05, 10, 11, 15, 34 & 44	20%	Previous permit	Daily Observation
06 & 28	25%	Previous permit	Daily Observation

17. DELETED CONDITIONS:

Former SC	Justification for removal
	N/A

18. GROUP A INSIGNIFICANT ACTIVITIES

Criteria Pollutants and HAPs:

Source Name	Group A Category	Emissions (tpy)						
		PM/PM ₁₀	SO ₂	VOC	CO	NO _x	HAPs	
							Single	Total
Diesel Storage Tank (500 gal)	A-3			0.001			0.001	0.001
Diesel Storage Tank (1,000 gal)	A-3			0.001			0.001	0.001
Diesel Storage Tank (2,000 gal)	A-3			0.002			0.002	0.002
Emergency Fire Pump Engine (80 Hp)	A-13	0.04	0.04	0.05	0.13	0.62	0.05	0.05
Ammonia Flares	A-13	0.01		0.01	0.01	0.01	0.01	0.01
Sulfur Unloading/Storage	A-13							

Source Name	Group A Category	Emissions (tpy)						
		PM/PM ₁₀	SO ₂	VOC	CO	NO _x	HAPs	
							Single	Total
Air Liquide Cooling Tower	A-13	1.0						
Ammonia Offloading	A-13							

Non-Criteria Pollutants:

Source Name	Group A Category	Emissions (tpy)						
		H ₂ S	NH ₃	Reserved				
Ammonia Flares	A-13		0.1					
Sulfur Unloading/Storage	A-13	0.13						
Ammonia Offloading	A-13		0.44					

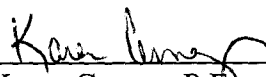
19. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

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

Permit #
0573-AOP-R11

20. 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 12-15-10

Facility Name: El Dorado Chemical Company
 Permit Number: 0573-AOP-R12
 AFIN: 70-00040

\$/ton factor	22.07	Annual Chargeable Emissions (tpy)	3657
Permit Type	Modification	Permit Fee \$	1000

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)	0
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 condensable 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	<input checked="" type="checkbox"/>	334.1	334.1	0	0	334.1
PM ₁₀	<input type="checkbox"/>	334.1	334.1	0		
SO ₂	<input checked="" type="checkbox"/>	401.9	401.9	0	0	401.9
VOC	<input checked="" type="checkbox"/>	4.9	4.9	0	0	4.9
CO	<input type="checkbox"/>	52.3	52.3	0		
NO _x	<input checked="" type="checkbox"/>	2410.3	2410.3	0	0	2410.3
Hexane*	<input type="checkbox"/>	1.2	1.2	0		
HNO ₃	<input checked="" type="checkbox"/>	67.7	67.7	0	0	67.7
H ₂ SO ₄	<input type="checkbox"/>	12.58	12.58	0		
NH ₃	<input checked="" type="checkbox"/>	438.1	438.1	0	0	438.1
SO ₃	<input type="checkbox"/>	0.18	0.18	0		