

## STATEMENT OF BASIS

For the issuance of Draft Air Permit # 0573-AOP-R11 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:

10/1/2009

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. This is the second Title V Renewal for the facility. With this modification the facility requested to:

1. Update emission limits for SN-25, SN-28, SN-30, SN-33, SN-40, and SN-44.
2. Remove Specific Conditions # 44 and # 46 which required EDCC to install, test, and operate SO<sub>2</sub> removal technology in accordance with Consent Administrative Order, LIS 03-175.
3. Limit the Oleum concentration to a maximum of 30%.
4. Correct various compliance mechanisms to add consistency and clarification.

EDCC also submitted a PSD application to revise the BACT limit at SN-41. The facility shall retain the BACT limit for the scrubber at 0.054 lb particulate per ton of AN solution for normal operations based on a 30-day rolling average. The facility now has a startup

and shutdown BACT limit for the scrubber which was set at 0.223 lb particulate per ton of AN solution. The facility is not requesting to increase annual emissions from SN-41.

With this renewal, the total permitted emission changes include increases of 0.1 tpy of PM/PM<sub>10</sub>, 0.4 tpy of VOC, and 0.1 tpy of NO<sub>x</sub>, and a decrease of 6.4 tpy of SO<sub>2</sub>.

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.)? Y

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 is a Title V renewal application. The facility submitted a PSD application to revise the BACT limit for SN-41. After reviewing the materials submitted, the facility shall comply with a 30-day rolling average BACT limit of 0.054 lb PM<sub>10</sub> per ton of ammonium nitrate produced (3.3 lb/hr). Additionally, the facility shall comply with a short-term 24-hour BACT limit of 0.223 lb PM<sub>10</sub> per ton of ammonium nitrate produced (13.7 lb/hr).

9. SOURCE AND POLLUTANT SPECIFIC REGULATORY APPLICABILITY:

Source	Pollutant	Regulation (NSPS, NESHAP or PSD)
SN-13	NO <sub>x</sub>	NSPS, Subpart G
SN-41	PM <sub>10</sub>	PSD
SN-07	SO <sub>2</sub> and sulfuric acid mist	NSPS, Subpart H

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 <sub>10</sub>	161.6	50	Annual	40.23089*	80.47 %
		150	24-Hour	136.49246*	91.00 %
SO <sub>2</sub>	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 <sub>x</sub>	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 PM<sub>10</sub> with startup and shutdown limits.

## Non-Criteria Pollutants:

1<sup>st</sup> 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 ( $\text{mg}/\text{m}^3$ ), as listed by the American Conference of Governmental Industrial Hygienists (ACGIH).

Pollutant	TLV ( $\text{mg}/\text{m}^3$ )	PAER (lb/hr) = $0.11 \times \text{TLV}$	Proposed lb/hr	Pass?
Hexane	176.2	19.3	0.6	Yes
HNO <sub>3</sub>	5.1	0.567	16.8	NO

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

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

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

Other Modeling:

Odor:

Odor modeling for sources emitting styrene.

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

H<sub>2</sub>S 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<sub>2</sub>S Standards N

If exempt, explain: \_\_\_\_\_

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

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

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

C<sub>p</sub> = 5-minute average concentration

C<sub>m</sub> = 1-hour average concentration

t<sub>m</sub> = 60 minutes

t<sub>p</sub> = 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 $21.6 \text{ lb/hr} \times (1 - 0.95) = 1.1$ 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	$3.5 + 5.0 = 8.5$ 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 <sub>x</sub> - 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 <sub>x</sub> - 10.0 lb/ton	best operation	-	-
	Highest lb/hr from Stack Test results of 2001-2004	HNO <sub>3</sub> - 0.389 x 1.25 x 40/8.5 = 2.3 lb/hr + 1.1 lb/hr from car barn NO <sub>x</sub> - 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 <sub>10</sub> - 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
15	Testing	PM <sub>10</sub> - 17.0 lb/hr	none	-	-
	Testing	NH <sub>3</sub> - 18.0 lb/hr	none	-	-

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



SN	Emission Factor Source	Emission Factor	Control Equipment	Control Equipment Efficiency	Comments
22	CEM	NO <sub>x</sub> - 3.0 lb/ton	cryogenic absorption	-	-
	Process Knowledge	HNO <sub>3</sub> - 10.0 lb/hr	cryogenic absorption	-	-
25	TANKS3	VOC	none	-	-
26	TANKS3	NH <sub>3</sub>	none	-	-
27	AP-42	PM <sub>10</sub> - 0.0001 lb/ton	none	-	-
28	AP-42	PM <sub>10</sub> - 0.0001 lb/ton	none	-	-
29	AP-42	HNO <sub>3</sub> - 0.53 lb/1000 gallons	none	-	-
30	AP-42 Section 5.2	H <sub>2</sub> SO <sub>4</sub> - 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 <sub>3</sub> - 0.5 lb/hr	none	-	-
32	SOCMI	NH <sub>3</sub> - 1.3 lb/hr	none	-	-
33	Process Knowledge	NO <sub>x</sub> - 1.9 lb/hr	none	-	-
	Process Knowledge	HNO <sub>3</sub> - 1.8 lb/hr	none	-	-
34	Process Knowledge	PM <sub>10</sub> - 0.7 lb/ton x 1.16 ton/hr	none	-	-
35	Process Knowledge	PM <sub>10</sub> - 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 <sub>3</sub> – 1.6 lb/hr during laoding			1.6 lb/hr per truck x 2 trucks per day
41	Stack testing	NH <sub>3</sub> – 10.0 lb/hr PM/PM10 – 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 <sub>x</sub>	7E	Every five years	Necessary for efficiency check on Venturi & Packed Tower Scrubber
10	HNO <sub>3</sub>	Approved method	Every five years	Necessary for efficiency check on Venturi & Packed Tower Scrubber
07	SO <sub>2</sub>	6C	Initial performance test	NSPS Requirement
05	PM <sub>10</sub>	Approved method	Every five years to do an analysis. See Specific Condition 64.	Necessary to prove that PSD has not been triggered.
17	NH <sub>3</sub>	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.
15, 14, & 21	PM <sub>10</sub>	Method 5	Every five years	Necessary to prove that PSD has not been triggered.
15	NH <sub>3</sub>	Approved method	Yearly	Necessary to prove adherence to the non-criteria pollutant strategy.
21	NH <sub>3</sub>	Approved method	Every five years	Necessary to prove adherence to the non-criteria pollutant strategy.
44	SO <sub>2</sub> NO <sub>x</sub> H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub>	Approved method	Every five years	Necessary to prove adherence to the non-criteria pollutant strategy.
08 & 09	NH <sub>3</sub>	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	NO <sub>x</sub> emission rate	CEM	Continuously	Y
07	SO <sub>2</sub> emission rate	CEM	Continuously	Y
08 & 09	NO <sub>x</sub> 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		
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 <sub>2</sub> 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 <sub>2</sub> O	Daily	N
21	Liquid Gas Pressure to Top Spray Nozzles Gas Pressure Drop Across Unit pH	80 – 100 psi <sub>g</sub> 2.5 in H <sub>2</sub> 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 <sub>2</sub> 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 <sub>2</sub> 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 <sub>10</sub>	SO <sub>2</sub>	VOC	CO	NO <sub>x</sub>	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							



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Source Name	Group A Category	Emissions (tpy)						
		PM/PM <sub>10</sub>	SO <sub>2</sub>	VOC	CO	NO <sub>x</sub>	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 <sub>2</sub> S	NH <sub>3</sub>	Reserved				
Ammonia Flares	A-13		0.1					
Sulfur Unloading/Storage	A-13	0.13						
Ammonia Offloading	A-13		0.44					

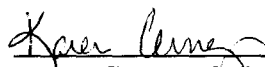
19. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

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

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20. CONCURRENCE BY:

The following supervisor concurs with the permitting decision.

  
\_\_\_\_\_  
Karen Cerney, P.E.