

STATEMENT OF BASIS

for the issuance of Draft Air Permit # 0573-AOP-R7

1. PERMITTING AUTHORITY:

Arkansas Department of Environmental Quality
8001 National Drive
Post Office Box 8913
Little Rock, Arkansas 72219-8913

2. APPLICANT:

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

3. PERMIT WRITER:

Siew Low

4. PROCESS DESCRIPTION AND NAICS CODE:

NAICS Description: Nitrogenous Fertilizers Manufacturing; All Other Basic Inorganic Chemical Manufacturing
NAICS Code: 325311; 325188

5. SUBMITTALS: May 30, 2006, July 5, 2006, July 10, 2006, July 24, 2006, September 13, 2006

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 permitting action includes:

1. Route the exhaust from Pease Anthony (Venturi) Scrubber on the E2 HDAN Plant Cooling Train (SN-17) to the Ammonium Nitrate E2 Brinks Scrubber (SN-05) for additional control.
2. Removal of PM₁₀ stack testing requirements for SN-17.
3. Decrease the PM₁₀ hard-wired emission factor for the E2 Plant from 1.10 to 0.967 lb of PM₁₀ per ton of ammonium produced.
4. Ammonia testing remains at the exhaust of SN-17 prior to the inlet of SN-05. This is because Permit Appeal Resolution (for the issuance of Air Permit 573-AOP-R6) agreed that testing at SN-05 was technically infeasible.
5. 95% particulate control efficiency is used in calculations as Brinks scrubber control efficiencies for the exhaust from SN-17 passing thru Brinks scrubber. This is

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conservative compare to the provided information from MECS showing Brinks scrubber has particulate control efficiency above 98%.

7. **COMPLIANCE STATUS:** The following summarizes the current compliance status of the facility including active/pending enforcement actions and recent compliance activities and issues.

Last date of inspection was August 30, 2005. The facility was in compliance at the time of this inspection.

8. **APPLICABLE REGULATIONS:**

A. Applicability

Did the facility undergo PSD review in this permit (i.e., BACT, Modeling, et cetera) (Y/N) Y

Has this facility underwent PSD review in the past (Y/N) Y Permit # 0573-AOP-R6

Is this facility categorized as a major source for PSD? (Y/N) Y

≥ 100 tpy and on the list of 28 (100 tpy)? (Y/N) Y

≥ 250 tpy all other (Y/N) _____

B. PSD Netting

Was netting performed to avoid PSD review in this permit? (Y/N) N

C. Source and Pollutant Specific Regulatory Applicability

Source	Pollutant	Regulation [NSPS, NESHAP (Part 61 & Part 63), or PSD <u>only</u>]
SN-13	NO _x	NSPS Subpart G
SN-41	PM ₁₀	PSD

9. **EMISSION CHANGES:**

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The following table summarizes plantwide emission changes associated with this permitting action.

Plantwide Permitted Emissions (ton/yr)			
Pollutant	Air Permit 0573-AOP-R6	Air Permit 0573-AOP-R7	Change
PM/PM ₁₀	333.3	333.3	0
SO ₂	2526.8	2526.8	0
VOC	4.5	4.5	0
CO	52.3	52.3	0
NO _x	2410.2	2410.2	0
H ₂ SO ₄	39.6	39.6	0
NH ₃	309.6	309.6	0
HNO ₃	75.3	75.3	0
Hexane	1.2	1.2	0

10. MODELING:

A. Criteria Pollutants

Pollutant	Emission Rate (lb/hr)	NAAQS Standard (µg/m³)	Averaging Time	Highest Concentration (µg/m³)	% of NAAQS
PM ₁₀	161.4	50	Annual	27.2*	54%
		150	24-hour	132.5*	88%
SO ₂	601.7	80	Annual	13.8	17%
		1,300	3-hour	494.7	38%
		365	24-hour	140.7	38%
NO _x	592.0	100	Annual	13.97	19%
VOC	18.5	0.12	1-hour (ppm)	NA	0%

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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
CO	12.0	10,000	8-hour	NA	0%
		40,000	1-hour	NA	0%

* - Background ($24 \mu\text{g}/\text{m}^3$) is added to the modeled concentration.

B. 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 PAER was deemed by the Department 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?
HNO ₃	5.15	0.5665	20.0	No
H ₂ SO ₄	0.2	0.022	9.1	No
NH ₃	17.41	1.915	88.6	No
Hexane	1762	193	0.6	Yes

2nd Tier Screening (PAIL)

SCREEN3 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 ($\mu\text{g}/\text{m}^3$) = 1/100 of Threshold Limit Value	Modeled Concentration ($\mu\text{g}/\text{m}^3$)	Pass ?
HNO ₃	51.5	28.6	Yes
H ₂ SO ₄	2	1.96	Yes
NH ₃	174.1	169.0	Yes

11. CALCULATIONS:

SN	Emission Factor Source (AP-42, Testing, etc)	Emission Factor and units (lbs/ton, lbs/hr, etc)	Control Equipment Type (if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc)
SN-05	Testing	<p>PM₁₀ – 13.0 lb/hr, 0.96 lb of PM₁₀ per ton of ammonium nitrate produced.</p> <p>With SN-17's exhaust routed to SN-05 21.6 lb/hr x (1-0.95) =1.1 lb/hr PM</p>	Brinks Scrubber	-	<p>97% particulate control efficiency.</p> <p>95% particulate control efficiency is used in calculations as Brinks scrubber control efficiencies for the exhaust from SN-17 passing thru Brinks scrubber.</p>
SN-05	Engineering Estimate	3.5 +5.0 = 8.5 lb/hr NH ₃	Brinks Scrubber	-	-
SN-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.
SN-07	Testing	SO ₂ – 600 lb/hr	Brinks Mist Eliminator	-	-
SN-07	Testing	H ₂ SO ₄ – 7.5 lb/hr	Brinks Mist Eliminator	-	360 ton/day x 0.5 lb/ton
SN-08	Testing	NO _x - 200.1 lb/hr	Refrigeration SCR	~98.5%	11.5 lb/ton x 17.4 ton/hr = 200.1 lb/hr

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SN	Emission Factor Source (AP-42, Testing, etc)	Emission Factor and units (lbs/ton, lbs/hr, etc)	Control Equipment Type (if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc)
SN-09	Testing	NO _X - 200.1 lb/hr	Refrigeration SCR	~98.5%	11.5 lb/ton x 17.4 ton/hr = 200.1 lb/hr
SN-10	AP-42	NO _X - 10.0 lb/ton	best operation	-	-
SN-10	Stack Test Data	HNO ₃ – 0.389 lb/hr NO _X 3.3 lb/hr	-	-	Permitted lb/hr is stack test data plus 25% safety factor.
SN-13	NSPS	3.0 lb/ton of acid	refrigerated absorption	-	-
SN-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
SN-15	Testing	PM ₁₀ – 17.0 lb/hr	none	-	-
SN-15	Testing	NH ₃ – 18.0 lb/hr	none	-	-
SN-16A	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	-	-
SN-16B	AP-42	PM ₁₀ – 7.6 lb/MMSCF	none	-	-

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SN	Emission Factor Source (AP-42, Testing, etc)	Emission Factor and units (lbs/ton, lbs/hr, etc)	Control Equipment Type (if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc)
		SO ₂ – 0.6 lb/MMSCF VOC – 5.5 lb/MMSCF CO – 84 lb/MMSCF NO _x - 280 lb/MMSCF			
SN-17	Testing	PM ₁₀ – 21.6 lb/hr	Pease-Anthony Scrubber	-	Routed to SN-05
SN-17	Testing	NH ₃ – 5.0 lb/hr	Pease-Anthony Scrubber	-	Routed to SN-05
SN-18	Process Knowledge	PM ₁₀ – 0.033 lb/ton	Baghouse	-	-
SN-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	-	-	-
SN-21	Testing	PM ₁₀ – 0.1 lb/ton	Brinks Scrubber	-	-
SN-21	Testing	NH ₃ – 1.0 lb/ton	Brinks Scrubber	-	-
SN-22	CEM	NO _x - 3.0 lb/ton	cryogenic absorption	-	-
SN-22	Process Knowledge	HNO ₃ – 10.0 lb/hr	cryogenic absorption	-	-
SN-25	TANKS3	VOC	none	-	-
SN-26	TANKS3	NH ₃	none	-	-

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SN	Emission Factor Source (AP-42, Testing, etc)	Emission Factor and units (lbs/ton, lbs/hr, etc)	Control Equipment Type (if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc)
SN-27	AP-42	PM ₁₀ – 0.0001 lb/ton	none	-	-
SN-28	AP-42	PM ₁₀ – 0.0001 lb/ton	none	-	-
SN-29	AP-42	HNO ₃ – 0.53 lb/1000 gallons	none	-	-
SN-30	AP-42	H ₂ SO ₄ – 0.0334 lb/1000 gallons	none	-	-
SN-31	SOCMI	NH ₃ – 0.5 lb/hr	none	-	-
SN-32	SOCMI	NH ₃ – 1.3 lb/hr	none	-	-
SN-33	Process Knowledge	NO _X – 1.9 lb/hr	none	-	-
SN-33	Process Knowledge	HNO ₃ – 1.8 lb/hr	none	-	-
SN-34	Process Knowledge	PM ₁₀ – 0.7 lb/ton x 1.16 ton/hr	none	-	-
SN-35	Process Knowledge	PM ₁₀ – 2.0 lb/hr	baghouse	99%	-
SN-37	Process knowledge	3 gal HNO ₃ /car x 2 car/day, 37.65 lb HNO ₃ /car x efficiency x 1 vent period/106 minutes.	Scrubber	80%	-
SN-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

SN	Emission Factor Source (AP-42, Testing, etc)	Emission Factor and units (lbs/ton, lbs/hr, etc)	Control Equipment Type (if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc)
SN-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
SN-40	Engineering estimate	NH ₃ – 1.6 lb/hr during loading			1.6 lb/hr per truck x 2 trucks per day
SN-41	Stack testing	NH ₃ – 10.0 lb/hr PM/PM ₁₀ – 3.3 lb/hr	Chemical steam scrubber	-	The facility will conduct a continuous engineering study to verify emission rate.
SN-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.
SN-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
SN-44	Mass Balance for sulfur oxides and sulfuric acid. Stack test from similar plant plus a safety factor of 25%.		Scrubber	-	-

13. TESTING REQUIREMENTS:

This permit requires stack testing of the following sources.

SN(s)	Pollutant	Test Method	Test Interval	Justification For Test Requirement
SN-10	NO _x	7E	Every five years	Necessary for efficiency check on Venturi & Packed Tower Scrubber
SN-10	HNO ₃	approved method	Every five years	Necessary for efficiency check on Venturi & Packed Tower Scrubber
SN-07	SO ₂	6C	Every five years	Necessary for efficiency check on operation of the sulfuric acid plant
SN-07	H ₂ SO ₄	8	Every five years	Necessary for efficiency check on operation of the sulfuric acid plant
SN-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.
SN-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.
SN-41	PM ₁₀ NH ₃	Approved Method	Particulate testing starts after the completion of the engineering study. See Specific Condition 69 Every five years	To verify emission rates Necessary to prove adherence to the non-criteria pollutant strategy.
SN-15, SN-14, and SN-21	PM ₁₀	Modified 5	Every five years	Necessary to prove that PSD has not been triggered.
SN-15	NH ₃	approved method	Yearly	Necessary to prove adherence to the non-criteria pollutant strategy.

SN(s)	Pollutant	Test Method	Test Interval	Justification For Test Requirement
SN-21	NH ₃	approved method	Every five years	Necessary to prove adherence to the non-criteria pollutant strategy.
SN-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.

14. MONITORING OR CEMS

The following are parameters that must be monitored with CEMs or other monitoring equipment (temperature, pressure differential, etc), frequency of recording and whether records are needed to be included in any annual, semiannual or other reports.

SN	Parameter or Pollutant to be Monitored	Method of Monitoring (CEM, Pressure Gauge, etc)	Frequency*	Report (Y/N)**
SN-13, SN- 22	NOx emission rate	CEM	Continuously	Y
SN-07***	SO ₂ emission rate	CEM	Continuously	Y
SN-08, SN- 09	Inlet and outlet temperatures	Temperature probes and an electronic data logger (Until CEM is fully installed and operated)	Continuously	Y
SN-08, SN-09	NOx emission rate	CEM	Continuously	Y

* Indicate frequency of recording required for the parameter (Continuously, hourly, daily, etc.)

** Indicates whether the parameter needs to be included in reports.

*** Applicable if the plant is operated at a rate greater than 300 tpd

15. RECORD KEEPING REQUIREMENTS

The following are items (such as throughput, fuel usage, VOC content of coating, etc) that must be tracked and recorded, frequency of recording and whether records are needed to be included in any annual, semiannual or other reports.

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SN	Recorded Item	Limit (as established in permit)	Frequency*	Report (Y/N)**
SN-08 SN-09	weak nitric acid production	292,320 tons/12 months	monthly	Y
SN-08 SN-09	Inlet and outlet temperatures	See Specific Condition #3	continuously	Y
SN-08 and 09	start-up and shutdown emissions of NOx lb/hr and opacity over limits	see S.C. 5	daily	Y
SN-13	weak nitric acid production	140,000 tons/12 months	monthly	Y
SN-22 SN-10 Facility	concentrated nitric acid production	SN-22 - 118,260 tons/12 months; SN-10 - 62,900 tons/12months; facility - 126,056 tons/12 months	monthly	Y
SN-10	Scrubber parameter	hydrogen peroxide concentration	daily	N
SN-22	start-up and shutdown emissions of NOx lb/hr and opacity over limits	see S.C. 30 & 31	daily	Y
SN-29	nitric acid shipped	200,000 tons/12 months	monthly	Y
SN-07	daily production	300 TPD w/o CEM 360 TPD w/ CEM	daily	Y
SN-30	sulfuric acid shipped	126,000 tons/12 months	monthly	Y
All E2 Plant	Production	473,040 tons/12 months	Monthly	Y
SN-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
SN-17	Scrubber liquid flow rate (dual scrubber) pH Amperage	120 gal/min (minimum) 0.5 – 6.0 100 amp (minimum)	daily	N

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SN	Recorded Item	Limit (as established in permit)	Frequency*	Report (Y/N)**
All KT plant	production	252,000 tons/12 months	monthly	Y
SN-25	usage of gasoline	40,000 gallons/12 months	monthly	Y
SN-37	minimum gas pressure	10 in. H ₂ O (minimum)	When scrubber in operation	N
SN-38	Total Dissolve solid	1,560 ppm	weekly	N
SN-39	Total Dissolve solid	900 ppm	weekly	N
SN-40	Loading tonnage	no more than 468,660 tons	monthly	N
SN-42	Total Dissolve solid	1,560 ppm	weekly	N
SN-43	Total Dissolve solid	1,560 ppm	weekly	N
SN-44	Amount of Oleum offload into the storage tank Percent strength of the Oleum Amount of mixed acid produced.	394,000 tons 65% 219,000 tons	monthly	N

* Indicate frequency of recording required for the item (Continuously, hourly, daily, etc.)

** Indicates whether the item needs to be included in reports

16. OPACITY

SN	Opacity %	Justification (NSPS limit, Dept. Guidance, etc)	Compliance Mechanism (daily observation, weekly, control equipment operation, etc)
SN-08 SN-09	10%	Compliance assurance for SCR operation	daily observation
SN-13	10%	NSPS limit	daily observation
SN-10	20%	Previous permit	daily observation
SN-01A SN-01B	10%	Previous permit	daily observation
SN-22	10%*	Previous permit	daily observation
SN-07	15%	Previous permit	daily observation
SN-12 SN-18	5%	Department Guidance	daily observation

SN	Opacity %	Justification (NSPS limit, Dept. Guidance, etc)	Compliance Mechanism (daily observation, weekly, control equipment operation, etc)
SN-21	10%	Previous permit	daily observation
SN-14	15%	Previous permit	daily observation
SN-05 SN-11 SN-15	20%	Previous permit	daily observation
SN-06 SN-27 SN-28	25%	Previous permit	daily observation
SN-41	15%	Department Guidance	daily observation

* - except for startup and shutdown situations covered by S.C. 30 & 31

17. DELETED CONDITIONS:

The following Specific Conditions were included in the previous permit, but deleted for the current permitting action.

Former SC	Justification for removal
61	Exhaust of SN-17 is routed to SN-05. PM testing requirement is now at SN-05.

18. VOIDED, SUPERSEDED OR SUBSUMED PERMITS

List all active permits for this facility which are voided/superseded/subsumed by issuance of this permit.

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19. CONCURRENCE BY:

The following supervisor concurs with the permitting decision:

David Triplett, P.E.