

STATEMENT OF BASIS

for the issuance of Final Air Permit # 0573-AOP-R8

1. PERMITTING AUTHORITY:

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

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: 6/28/07, 9/7/07, 9/25/07, 10/16/07, 10/23/07, 10/24/07, 11/16/07, 12/10/07, 1/14/08, 2/5/08, 2/21/08, 3/3/08, 4/28/08, 5/5/08, 5/21/08, 5/30/08, 6/3/08, 6/20/08, 7/1/08, 7/2/08, 7/3/08, 7/7/08, 7/21/08, and 8/15/08.

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:

Sulfuric Acid Plant (SN-07)

1. To address Permit Condition #52 of Air Permit 0573-AOP-R7 and ADEQ Consent Administrative Order, LIS 03-175 which require EDCC to actually reduce SO₂ emissions to be equal to or less than the NSPS Subpart H standard of 4.0 pounds of SO₂ per ton of acid produced on a 100% H₂SO₄ basis. EDCC is installing a double absorption technology (install three heat exchangers, one mist eliminator, one acid pump, one converter, one absorption tower, and one pump tank to existing unit).
2. To increase the daily sulfuric acid production capacity from 360 ton/day (131,400 ton/year) to 550 ton/day (200,750 ton/year);
3. To add a Startup, Shutdown, Malfunction Plan for SN-07;

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E2 Plant

4. To address Permit Condition # 68 of Air Permit 0573-AOP-R7;
5. To monitor PM/PM₁₀ emissions from SN-41 on a continuous basis;
6. To add a SSMP for SN-41;

East and West Nitric Acid Plants

7. To address ADEQ Consent Administrative Order, LIS 06-167;
8. To incorporate ammonia emissions to account for "ammonia slippage" resulting from treatment of NO_x emissions in the SCR units (SN-08 and SN-09);
9. To install an additional auxiliary air compressor in the East and West nitric acid plant process area;
10. To add a SSMP for SN-08 and SN-09;

Direct Strong Nitric Acid Plant and DM Weatherly Nitric Acid Plant

11. To install an additional auxiliary air compressor in the DM Weatherly Nitric Acid Plant;
12. To add a SSMP for SN-22 and SN-13.

Nitric Acid Vent Collection System and Car Barn Scrubber

13. To remove the Car Barn Scrubber (SN-37) and route the nitric acid emissions to Nitric Acid Vent Collection System (SN-10).

Sulfuric Acid Loading

14. To increase acid loading rate from 131,400 ton per year to 200,750 ton per year;

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 March 16, 2007. The facility was found out of compliance because excessive CEMs downtime at SN-08, SN-22, and SN-07.

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) _____

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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
SN-07	SO ₂ and sulfuric acid mist	NSPS Subpart H

9. EMISSION CHANGES:

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

Plantwide Permitted Emissions (ton/yr)			
Pollutant	Air Permit 0573-AOP-R7	Air Permit 0573-AOP-R8	Change
PM/PM ₁₀	333.3	333.3	0
SO ₂	2526.8	411.3	-2115.5
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	19.15	-20.45
NH ₃	309.6	434.0	+124.4
HNO ₃	75.3	67.6	-7.7
Hexane	1.2	1.2	0

10. MODELING:

A. 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	161.4	50	Annual	32.0*	64%
		150	24-hour	91.3*	60.8%
SO ₂	601.7	80	Annual	12.5	15%
		1,300	3-hour	444	34%
		365	24-hour	119	32%
NO _x	592.0	100	Annual	13.97	19%
VOC	18.5	0.12	1-hour (ppm)	NA	0%
CO	12.0	10,000	8-hour	NA	0%
		40,000	1-hour	NA	0%

* - Background (24 $\mu\text{g}/\text{m}^3$ for annual average, 39 $\mu\text{g}/\text{m}^3$ for 24-hour average) are included 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	16.8	No
H ₂ SO ₄	0.2	0.022	4.72	No
NH ₃	17.41	1.915	168.8	No
Hexane	1762	193	0.6	Yes

2nd Tier Screening (PAIL)

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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 ($\mu\text{g}/\text{m}^3$) = 1/100 of Threshold Limit Value	Modeled Concentration ($\mu\text{g}/\text{m}^3$)	Pass ?
HNO ₃	51.5	4.8	Yes
H ₂ SO ₄	2	0.95	Yes
NH ₃	174.1	56.2	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	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 lb/hr x (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.
SN-05	Engineering Estimate	3.5 +5.0 = 8.5 lb/hr NH ₃	Brinks Scrubber	-	-

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-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	-	Remain the previous permitted limit
SN-07	Testing	H ₂ SO ₄ – 0.123 lb/ton	Brinks Mist Eliminator	-	-
SN-08	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
SN-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
SN-10	AP-42	NO _x - 10.0 lb/ton	best operation	-	-
SN-10	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.
SN-13	NSPS	3.0 lb/ton of acid	refrigerated absorption	-	-
SN-14	Testing	PM ₁₀ - 44.2 lb/hr	none	-	Hourly emission

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					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 SO ₂ – 0.6 lb/MMSCF VOC – 5.5 lb/MMSCF CO – 84 lb/MMSCF NO _x - 280 lb/MMSCF	none	-	-
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	-	-	-

SN	Emission 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)
		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	-	-
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 Section 5.2	H ₂ SO ₄ - 0.0281 lb/1000 gallons	none	-	L _L = 12.46 x SPM/T =12.46 x 1.45 x 0.01 x 98.06/630
SN-31	SOCMI	NH ₃ - 0.5 lb/hr	none	-	-
SN-32	SOCMI	NH ₃ - 1.3 lb/hr	none	-	-

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SN	Emission 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-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-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-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	-	-
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	$EF_{PM} = \text{Total liquid drift (lb/1000 gal)} \times \text{TDS Fraction (ppm)}$ $= 1.7 \text{ lb/1000 gal} \times 1,560 \text{ ppm}$				1.7 lb/1000 gal is design drift loss percent provided

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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)
		$PM_{10} = EF_{PM} \times \text{flowrate}$ $= 2,000 \text{ gpm} \times EF_{PM}$			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	Initial performance test	NSPS Requirement
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-15, SN-14, and	PM ₁₀	Modified 5	Every five years	Necessary to prove that PSD has not been triggered.

SN(s)	Pollutant	Test Method	Test Interval	Justification For Test Requirement
SN-21				
SN-15	NH ₃	approved method	Yearly	Necessary to prove adherence to the non-criteria pollutant strategy.
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.
SN-08 and SN-09	NH ₃	CTM-027	Every five years	Verify emissions

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	NO _x emission rate	CEM	Continuously	Y
SN-07	SO ₂ emission rate	CEM	Continuously	Y
SN-08, SN-09	NO _x emission rate	CEM	Continuously	Y
SN-41	Ammonia and particulate emission rates	Daily two 12-hour composite sample	Continuously	Y

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

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

15. RECORD KEEPING REQUIREMENTS

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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.

SN	Recorded Item	Limit (as established in permit)	Frequency*	Report (Y/N)**
SN-08				
SN-09	weak nitric acid production	304,775 tons/12 months	monthly	Y
SN-13	weak nitric acid production	140,000 tons/12 months	monthly	Y
SN-22				
SN-10	concentrated nitric acid production	SN-22 - 118,260 tons/12 months;	monthly	Y
Facility				
SN-10	Scrubber parameter	hydrogen peroxide concentration	daily	N
SN-29	nitric acid shipped	200,000 tons/12 months	monthly	Y
SN-07	Sulfuric acid production	200,750 ton/12 months		
SN-30	sulfuric acid shipped	200,750 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
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

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SN	Recorded Item	Limit (as established in permit)	Frequency*	Report (Y/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	394,000 tons	monthly	N
	Percent strength of the Oleum	65%		
	Amount of mixed acid produced.	219,000 tons		

* 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-07	10%	Previous permit	daily observation
SN-12 SN-18	5%	Department Guidance	daily observation
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

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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
4 and 5	CEMs has been installed.
30, 31, and 32	SSMP will be prepared and implemented.
50	With the double absorption technology at the sulfuric acid plant, the sulfuric acid mist emissions have been significantly reduced.


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:



Karen Cerney, P.E.

