

STATEMENT OF BASIS

For the issuance of Draft Air Permit # 0573-AOP-R20 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:

Shawn Hutchings

4. NAICS DESCRIPTION AND CODE:

NAICS Description: Nitrogenous Fertilizer Manufacturing
NAICS Code: 325311

5. ALL SUBMITTALS:

The following is a list of ALL permit applications included in this permit revision.

Date of Application	Type of Application (New, Renewal, Modification, Deminimis/Minor Mod, or Administrative Amendment)	Short Description of Any Changes That Would Be Considered New or Modified Emissions
5/5/2017	Modification	PSD only due to reevaluation of previous PSD limits.
8/18/2017	Minor Modification	New Emergency Engine

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. The modification was a PSD modification to adjust the final BACT limits for SN-59 after the end of the demonstration period. During the review it was determined based on changes to control methods more information may be necessary to determine the correct NO_x limit for the source. The demonstration period was extended for 12-months from the date of this

permit. The ammonia BACT limit was removed as ammonia is not a PSD pollutant. Ammonia emission rates were raised to allow proper control of NO_x from the source, with the ammonia rates also to be evaluated during the NO_x demonstration period. This permit also incorporates a minor modification to add an emergency generator, SN-68.

7. COMPLIANCE STATUS:

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

The facility currently has one active CAO due to the N₂O abator malfunction, and one pending for due to excess emission from SN-09.

The facility's last inspection also listed the following concerns: According to the facility's 2016 ACC report, which covers the facility's operations from 11/2015 through 10/2016, the facility denotes several conditions in which there were multiple deviations. The facility states there were 14 deviations involving NO_x exceedances during SSM events (SC-18); 34 deviations involving NO_x exceedances during SSM events (SC-32); 1 deviation in which RATA results were submitted late (SC-70); 67 deviations involving SO₂ exceedances during SSM events (SC-91g); 876 deviations in which the 3-hour operating limit was exceeded (SC-199); 1 deviation in which the Subpart Db notification was submitted without fully complying with the requirements (SC-255); 26 deviations in which the NH₃ 24-hr. average was exceeded (Interim Condition 1-SN-41 (SC-105)); 1 deviation in which no NOC was submitted as required (PC-16); 1 deviation in which no tune up or energy assessment was completed during the time frame required (PC-24); 1 deviation in which the Subpart DDDDD was submitted without fully complying with the requirements (PC-32); 1159 deviations in which SN-53 exceeded the 3-hr. avg. limit (SC-204); 1 deviation in which the PM-10 limit was exceeded (SC-118); 1 deviation in which no letter was submitted on SN-16A/B reporting cease of use (SC-436); 487 deviations in which SN-53 exceeded the 3-hr. operating limit (SC-204); 63 deviations in which SO₂ was exceeded during SSM events (SC-93g); 6 deviations in which SN-41 exceeded NH₃ rate (SC-107); 12 deviations in which flare monthly visual logs were not maintained (SC-209); 4 deviations in which natural gas usage was exceeded (SC-216); and, 1 deviation in which Subpart Db was submitted without full compliance (SC-237).

8. PSD/GHG APPLICABILITY:

a) Did the facility undergo PSD review in this permit (i.e., BACT, Modeling, etc.)? Y
If yes, were GHG emission increases significant? 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 for 8(b), explain why this permit modification is not PSD.

9. SOURCE AND POLLUTANT SPECIFIC REGULATORY APPLICABILITY:

Source	Pollutant	Regulation (NSPS, NESHAP or PSD)
SN-41	PM ₁₀	PSD
SN-49, SN-53, SN-54, SN-56, SN-57, & SN-61	SO ₂ VOC CO NO _x GHG Opacity	PSD
SN-50	VOC CO GHG	PSD
SN-51	VOC CO GHG	PSD
SN-59	NO _x GHG Opacity	PSD
SN-61	NO _x	40 CFR Part 60, Subpart Db
SN-13	NO _x	40 CFR Part 60, Subpart G
SN-59	NO _x	40 CFR Part 60, Subpart Ga
SN-07	SO ₂ and sulfuric acid mist	40 CFR Part 60, Subpart H
SN-65 and 66	There are no specific emission limits or pollutants identified, but the rules generally regulate HAPs	40 CFR Part 63, Subpart ZZZZ
SN-48, SN49, SN-54, & SN-61		40 CFR Part 63, Subpart DDDDD
SN-25		40 CFR Part 63, Subpart CCCCC
SN-65	CO, PM, NMHC + NO _x	40 CFR Part 60, Subpart IIII
SN-66	CO, VOC, NO _x	40 CFR Part 60, Subpart JJJJ

10. PERMIT SHIELD – TITLE V PERMITS ONLY:

Did the facility request a permit shield in this application? N

(Note - permit shields are not allowed to be added, but existing ones can remain, for minor modification applications or any Regulation 18 requirement.)

If yes, are applicable requirements included and specifically identified in the permit? N

If not, explain why.

For any requested inapplicable regulation in the permit shield, explain the reason why it is not applicable in the table below.

Source	Inapplicable Regulation	Reason
None requested.		

11. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

12. AMBIENT AIR EVALUATIONS:

Include the results for any ambient air evaluations or modeling. Include NSR/PSD permits and permits that require an evaluation in accordance with revisions to the Arkansas State Implementation Plan, National Ambient Air Quality Standards, Infrastructure SIPs and NAAQS SIP per Ark Code Ann. § 8-4-318, dated March 2017 and the ADEQ Air Permit Screening Modeling Instructions.

a) Reserved.

b) Non-Criteria Pollutants:

The non-criteria pollutants listed below were evaluated. Based on Department procedures for review of non-criteria pollutants, emissions of all other non-criteria pollutants are below thresholds of concern.

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/m³), 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?
Ammonia	17	3.5	1,840.4	No

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 ($\mu\text{g}/\text{m}^3$) = 1/100 of Threshold Limit Value	Modeled Concentration ($\mu\text{g}/\text{m}^3$)	Pass?
Ammonia	173	129	Y

13. CALCULATIONS:

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
05A and B	Vendor Specification	PM ₁₀ – 0.085 mg/acf	Brinks Scrubber	-	-
	Engineering Estimate	0.8 lb/hr NH ₃	Brinks Scrubber	99.5%	-
07	NSPS limit	SO ₂ – 92.0 lb/hr	Brinks Mist Eliminator	-	Remain the previous permitted limit
	Testing	H ₂ SO ₄ – 0.123 lb/ton	Brinks Mist Eliminator	-	-
08	Testing	NO _x - 52.2 lb/hr Ammonia – 40.0 lb/hr	Refrigeration SCR	-98.5%	
09	Testing	NO _x - 52.2 lb/hr Ammonia – 40.0 lb/hr	Refrigeration SCR	-98.5%	-
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%

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
					safety factor.
13	NSPS	3.0 lb/ton of acid	refrigerated absorption	-	-
18	Process Knowledge	PM ₁₀ – 0.033 lb/ton	Baghouse	-	-
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	-	-	-	
25	TANKS 4.0.9	VOC	none	-	-
26	TANKS 4.0.9	NH ₃	none	-	-
27	Testing	PM 4.8E-7 lb/ton	none	-	-
28	Testing	PM 4.8E-7 lb/ton	none	-	-
30	AP-42 Section 5.2	H ₂ SO ₄ – 0.0034 lb/1000 gallons	none	-	-
31	SOCMI	NH ₃ – 0.5 lb/hr	none	-	-
32	SOCMI	NH ₃ – 1.6 lb/hr	none	-	-
33	Process Knowledge	NO _x – 0.1 lb/hr	none	-	-
	Process Knowledge	HNO ₃ – 0.1 lb/hr	none	-	-
34	Process Knowledge	PM ₁₀ – 0.7 lb/ton x 1.46 ton/hr	none	-	-
35A	Testing	PM ₁₀ – 0.1	baghouse	99%	-

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
		lb/hr			
35B	AP-42	PM 19.7 lb/hr	none		
38	$EF_{PM} = \text{Total liquid drift (lb/1000 gal)} \times \text{TDS Fraction (ppm)}$ $= 0.0834 \text{ lb/1000 gal} \times 1,560 \text{ ppm}$ $PM_{10} = EF_{PM} \times \text{flowrate}$ $= 9,000 \text{ gpm} \times EF_{PM}$			-	
40	TANKS Program	NH ₃ – 0.22lb/hr			-
41	Stack testing	NH ₃ – 10.0 lb/hr PM/PM10 – 4 lb/hr	Chemical steam scrubber	-	24-hr BACT limit is 13.8 lb/hr 30-day rolling BACT limit is 3.4 lb/hr
44	Mass Balance for sulfur oxides and sulfuric acid. Stack test from similar plant plus a safety factor of 25%.	Scrubber	-	-	
46	0.00013 lb/1000 gal	-	-	0.001% is design drift loss percent provided by manufacturer.	
13	NSPS EPA/DOJ	NO ₂ (3-hr): 3.0 lb/ton NO ₂ (3-hr): 1.0 lb/ton (excluding SSM) NO ₂ (rolling 365-days):	SCR	95%	After installation of SCR and Tail gas preheater

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
	Vendor Info	0.6 lb/ton NH ₃ : 20 ppm			
65 and 66, 68	AP-42 or NSPS	varied	none	--	
67	AP-42	0.02 lb/ton	None		
14 and 21	Vendor Specification	0.085 mg/acf PM	Scrubber	99.5 for ammonia	

14. 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
05A and B	PM ₁₀	Approved method	Initial and alternating annually.	Necessary to prove that PSD has not been triggered.
14, & 21	PM, PM ₁₀ , PM _{2.5}	Method 5 or 201A, and 202	Annually until 2 consecutive passes, then once every 5 years	Necessary to prove that PSD has not been triggered.
21	NH ₃	Approved	Annually until 3 consecutive	Necessary to prove adherence

SN	Pollutants	Test Method	Test Interval	Justification
		method	passes, then once every 3 years	to the non-criteria pollutant strategy.
44	SO ₃ 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 or equivalent	Every five years	Verify emissions
59	NH ₃	CTM-027 or equivalent	Annually until 2 consecutive passes, then once every 5 years	Necessary to prove adherence to the non-criteria pollutant strategy.
49	PM PM ₁₀ PM _{2.5} SO ₂ VOC CH ₄ CO CO ₂ N ₂ O	Method 5 & 202 Method 201A & Method 202 Method 6C Method 25A Method 18 Method 10 Method 3A Method 320, ASTM D6348-03 or other approved method	Annually until 2 consecutive passes, then once every 5 years	Verify emissions
50	VOC CO ₂	25A 3A	One Time Test	Verify emissions
50	Methanol	18 or 25A	Annually until 2 consecutive passes, then once every 5 years	Verify emissions
51	VOC Pre and Post Control CO NH ₃	25A 10 320	One Time Test	Verify emissions

SN	Pollutants	Test Method	Test Interval	Justification
51	Methanol CO ₂	18 or 25A 3A	Annually until 2 consecutive passes, then once every 5 years	Verify emissions
61	PM PM ₁₀ PM _{2.5} SO ₂ VOC CO NO _x	Method 5 & 202 Method 201A & Method 202 6C 25A 10 7E	Annually until 2 consecutive passes, then once every 5 years	Verify emissions
13	NH ₃	CTM-027 or equivalent	Annually until 2 consecutive passes, then once every 5 years	Necessary to prove adherence to the non-criteria pollutant strategy.

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)
13	NO _x	CEM	Continuously	Y
07	SO ₂ emission rate	CEM	Continuously	Y
08 & 09	NO _x	CEM	Continuously	Y
41 and 63	Ammonia and particulate emission rates	Daily sampling consisting of two 12-hour composite sample	Continuously	Y
59	NO _x and N ₂ O	CEM	Continuously	Y
49	NO _x	CEM	Continuously	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)
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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
38, 46, 52, 60	Total Dissolve solid	1,560 ppm	Weekly	N
59	weak nitric acid production	461,725 tons/12 months	Monthly	Y
47	strong nitric acid production	5.2 tons per hour	Hourly	Y
47	strong nitric acid production	45,625 tons/12 months	Monthly	Y
10	Scrubber parameter	hydrogen peroxide concentration	Daily	N
07	Sulfuric acid production	200,750 ton/12 months	Monthly	Y
	Sulfuric acid production	550 tons of 100% sulfuric acid per day	Daily	Y
	Sulfuric acid emission limit	4.0 lb of SO ₂ per ton of acid production, expressed as 100% H ₂ SO ₄ , and based on a 3-hr average.	Continuously and averaged every 3-hours	N
	Annual SO ₂ Emissions (tpy on a calendar basis)	N/A	Annually	N
30	Sulfuric acid shipped	200,750 tons/12 months	Monthly	Y
All E2 Plant	Production	525,600 tons/12 months	Monthly	Y
05A and B	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)	Daily	N

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
		0.5 – 6.0		
41	BACT Limit PM	24-hour Average 0.223 lb/ton	Daily	Y
		30-day Average 0.054 lb/ton	Monthly	Y
All KT plant	Production	394,200 tons/12 months	Monthly	Y
14	Scrubber liquid flow rate	225 gal/min (minimum)	Daily	N
	Gas Pressure Drop Across Unit	2.5 in H ₂ O (minimum)		
	pH	0.5 – 6.0		
	Exhaust Flow Rate	131,452 acfm (maximum)		
18	Baghouse Pressure Drop	0.5 – 8.0 in H ₂ O	Daily	N
21	Scrubber liquid flow rate	225 gal/min (minimum)	Daily	N
	Gas Pressure Drop Across Unit	2.5 in H ₂ O (minimum)		
	pH	0.5 – 6.0		
	Exhaust Flow Rate	131,452 acfm (maximum)		
63	PM emissions	24-hour Average 0.223 lb/ton	Daily	Y
		30-day Average 0.054 lb/ton	Monthly	Y
	AN Production	547,500 tons/12 months	Monthly	Y
49	NH ₃ production	565,750 tons/12 months	Monthly	Y
	Natural gas usage	7,076.7 MMscf per 12 months	Monthly	Y
53	Natural gas usage	9.0 MMscf per 12 months	Monthly	Y
	Hours of operation	No more than 3 hours during any	Daily	Y

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
		24-hour period unless HRU outage		
51	Scrubber parameters	30 gpm 2 in H ₂ O	Daily	N
56	Natural gas usage	8.2 MMscf per 12 months	Monthly	Y
57	Natural gas usage	1.5 MMscf per 12 months	Monthly	Y
54	Natural gas usage	18.63 MMscf per 12 months	Monthly	Y
54, 56, 57	Flare maintenance	No limit	As required	Y
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
44	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 – 7.5	Daily	N
25	usage of gasoline	40,000 gallons/12 months	Monthly	Y
29	Nitric Acid Shipped	250,000 tons/12 months	Monthly	Y
40	AN Loading tonnage	65,000,000 tons/12 months	Monthly	Y
58	Ammonia Loading	226,300 tons/12 months	Monthly	Y
65 and 66	Hours of operation	100 hours per calendar year	Monthly	Y
65 and 66	Engine maintenance	Change oil and filter every 500 hours of operation, or	As needed	N

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
		annually, whichever comes first; Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first; and Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.		
67	Prills Unloaded	36,500 tons per 12 months	Monthly	Y

17. OPACITY:

SN	Opacity	Justification for limit	Compliance Mechanism
08 & 09	10%	Compliance assurance for SCR operation	Daily Observation
07 & 13	10%	NSPS limit	Daily Observation
54, 61	5%	Department Guidance	Natural Gas Combustion
49, 59	0%	BACT limit	Daily Observation
53, 56, 57	0%	BACT limit	Natural Gas Combustion
05A and B, 18, 35A, 47, 63	5%	Department Guidance	Weekly Observation
52, 60	5%	Department Guidance	Weekly TDS
21, 27, 28	10%	Department Guidance	Daily Observation
14, 19	15%	Department Guidance	Daily Observation
34, 44	20%	Previous permit	Daily Observation
10, 38, 46	20%	Department Guidance	Weekly TDS
35B & 67	20%	Department Guidance	-
65	20%	Department Guidance	Annual Observation
66	5%	Department Guidance	Annual Observation

Total	A-13	5.49	0.01	2.26	0.01	0.01	0.13	0.54	0.01	0.01
Sulfuric Acid Solution Storage Tanks	B-21									

21. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

The following is a list of all active permits voided/superseded/subsumed by the issuance of this permit.

Permit #
0573-AOP-R19

APPENDIX A – EMISSION CHANGES AND FEE CALCULATION

Fee Calculation for Major Source

Revised 03-11-16

El Dorado Chemical Company
 Permit #: 0573-AOP-R20
 AFIN: 70-00040

\$/ton factor	23.93	Annual Chargeable Emissions (tpy)	2160.44
Permit Type	Modification	Permit Fee \$	5625.943

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	<input type="checkbox"/>
If Hold Active Permit, Amt of Last Annual Air Permit Invoice \$	0
Total Permit Fee Chargeable Emissions (tpy)	235.1
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		122.1	122.2	0.1	0.1	122.2
PM ₁₀		101.7	101.8	0.1		
PM _{2.5}		95.7	95.7	0		
SO ₂		403.4	403.5	0.1	0.1	403.5
VOC		40.3	40.4	0.1	0.1	40.4
CO		157.3	157.7	0.4		
NO _x		721.3	783	61.7	61.7	783
CO _{2e}	<input type="checkbox"/>	1293490	1293490	0		

