STATEMENT OF BASIS

For the issuance of Draft Air Permit # 1016-AOP-R16 AFIN: 10-00004

1. PERMITTING AUTHORITY:

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

2. APPLICANT:

Elemental Environmental Solutions LLC
500 East Reynolds Road
Arkadelphia, Arkansas 71923

3. PERMIT WRITER:

Christopher Riley

4. NAICS DESCRIPTION AND CODE:

NAICS Description: Hazardous Waste Treatment and Disposal
NAICS Code: 562211

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
7/23/2021	Renewal	Changes in calculations/rounding
03/09/2021	MM	Add SN-35 and 41-44
06/04/2021	MM	No changes in emissions
08/17/2021	MM	Add SN-45 & SN-46
10/14/2021	MM	No changes in emissions
04/01/2022	MM	No changes in emissions
05/12/2022	MM	Add SN-47

6. REVIEWER'S NOTES:

Elemental Environmental Solutions LLC (EES) operates a hazardous waste and spent potliner thermal treatment process at its facility located in Gum Springs, Arkansas. The facility has submitted a Title V renewal and six Minor Mods to do the following:

- Modify emissions for SN-34 (Waste Stream Fugitive Emissions) and 35 (Waste Storage Tank Farm) to account for increased usage
- Add NSPS Kb requirements for SN-35; and
- Add SN-41 (Bulk Solids Pits in T Enclosure), SN-42 (Fly Ash Silos), SN-43 (Lime Silo) and SN-44 (Lime Slurry Makeup System)
- Modify SN-39 annual limits from 7,300 tons per year to 36,500 tons per year
- Add a Stabilization Pit (350-TK-33) Operation (SN-45, controlled with dust collector) and a Reagent Silo (350-BN-23) (SN-46)
- Replace SO_2 testing requirements with a CEMS
- Remove the throughput limit from SN-32, as the source is permitted at equipment capacity.
- Add SN-47 (Stabilization Reagent Storage Tank) to the permit.

Permitted emission increases are 2.9 tpy PM, 2.8 tpy PM_{10}, 0.002 tpy Lead, 0.001 tpy Cadmium Compounds, 0.01 tpy Mercury, 0.0068 tpy PAH, 15.07 tpy Ammonia, 11.12 tpy Total Other Organics, 0.06164 tpy Antimony Compounds, and 0.00036 tpy Cyanide.

Permitted emission decreases are 0.09 tpy SO_2, 17.49 tpy VOC, 2.34 tpy CO, 0.08 tpy NO_X, 0.004 tpy Arsenic and Beryllium Compounds, 58.98 tpy Chlorine, 57.88 tpy Hydrochloric Acid, 0.0031 tpy Chromium Compounds, 4.93E-07 tpy Dioxins and Furans, 0.02 tpy Bromine and 0.02 tpy Single Organic Compound.

7. COMPLIANCE STATUS:

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

Facility was last inspected on March 9, 2022. Inspection found possible violations involving throughput limits at SN-39, and opacity records being unavailable or not completed. Reference document Z0004JR97.xml for the inspection letter and document Z0004KPJM.xml for facility response.

8. PSD/GHG APPLICABILITY:

a) Did the facility undergo PSD review in this permit (i.e., BACT, Modeling, etc.)? N
If yes, were GHG emission increases significant? N/A

b) Is the facility categorized as a major source for PSD? N
- *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)
01, 05-16, 18, 20-27, 32, 45	PM_{10}	CAM
Facility	All	NESHAP 40 C.F.R. § 63 Subpart EEE
32	HAPs	NSPS 40 C.F.R. § 60 Subpart IIII
33	HAPs	NESHAP 40 C.F.R. § 63 Subpart ZZZZ
19	NO_X, CO & O_2, SO_2	CEMs
34	HAPs	NESHAP 40 C.F.R. § 63 Subpart DD
37	Benzene	40 CFR 61 Subpart FF
40	CO, O_2, SO2 and NO_X	CEMS
40	Mercury	40 CFR Part 61 Subpart E
40	Beryllium	40 CFR Part 61 Subpart C

10. UNCONSTRUCTED SOURCES:

Unconstructed Source	Permit Approval Date	Extension Requested Date	Extension Approval Date	If Greater than 18 Months without Approval, List Reason for Continued Inclusion in Permit
N/A				

11. PERMIT SHIELD – TITLE V PERMITS ONLY:

Did the facility request a permit shield in this application? Y
(Note - permit shields are not allowed to be added, but existing ones can remain, for minor modification applications or any Rule 18 requirement.)

If yes, are applicable requirements included and specifically identified in the permit? Y
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
34	40 C.F.R. Part 60 Subpart VVa	Not a synthetic organic chemical manufacturing industry

12. COMPLIANCE ASSURANCE MONITORING (CAM) – TITLE V PERMITS ONLY:

List sources potentially subject to CAM because they use a control device to achieve compliance and have pre-control emissions of at least 100 percent of the major source

level. List the pollutant of concern and a brief summary of the CAM plan (temperature monitoring, CEMs, opacity monitoring, etc.) and frequency requirements of § 64.

Source	Pollutant Controlled	Cite Exemption or CAM Plan Monitoring and Frequency
01, 05-16, 18, 20-27, 32, 45	PM/PM_{10}	5 opacity exceedances in any 6 month period
19	all	COM limit for more than two consecutive hours, operates outside the range of Continuous Pressure Differential Reading, or fails two consecutive stack tests

13. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

14. AMBIENT AIR EVALUATIONS:

The following are results for ambient air evaluations or modeling.

a) NAAQS

A NAAQS evaluation is not required under 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 DEQ Air Permit Screening Modeling Instructions.

b) Non-Criteria Pollutants:

The non-criteria pollutants listed below were evaluated. Based on Division of Environmental Quality 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 Division of Environmental Quality 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 × TLV	Proposed lb/hr	Pass?
Ammonia	17.41	1.92	19.38	N
Arsenic Compounds*	0.01	0.0011	0.0243	N
Beryllium Compounds*	0.002	2.2E-04	0.0244	N
Cadmium Compounds*	0.01	0.0011	0.0492	N
Chlorine*	1.45	0.1595	16.02	N
Chromium Compounds	0.01	0.0011	0.026	N
Fluorides*	2.5	0.275	2.88	N
Hydrochloric Acid (Hydrogen Chloride)*	2.98	0.3278	16.48	N
Mercury*	0.025	0.00275	0.028	N
Polycyclic Aromatic Hydrocarbons*	0.2	0.022	0.712	N
Lead	0.05	0.0055	0.061	N
Bromine	0.6536	0.0718	4.47	N
Selenium*	0.2	0.022	0.463	N
Antimony*	0.5	0.055	0.02415	Y
Cobalt	0.02	0.0022	0.024	N
Manganese Compounds*	0.2	0.022	0.005	Y

*All marked pollutants did not increase their lb/hr values and passed under previous modeling. Refer to previous Statement of Basis for modeling information.

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 Division of Environmental Quality to be one one-hundredth of the Threshold Limit Value as listed by the ACGIH.

Pollutant	PAIL ($\mu g/m^3$) = 1/100 of Threshold Limit Value	Modeled Concentration ($\mu g/m^3$)	Pass?
Ammonia	200-Annual 3200-1 Hour	4.37=Annual 254.3=1 Hour	Y
Chromium Compounds	0.1	0.00405	Y
Lead	0.5	0.004	Y
Bromine	6.536	0.51373	Y
Cobalt	0.2	0.00168	Y

c) H_2S 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_2S Standards Y
If exempt, explain: No emissions

Pollutant	Threshold value	Modeled Concentration (ppb)	Pass?
H_2S	20 parts per million (5-minute average*)		
	80 parts per billion (8-hour average) residential area		
	100 parts per billion (8-hour average) nonresidential area		

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

$Cp = Cm\ (t_m/t_p)^{0.2}$ where

Cp = 5-minute average concentration
Cm = 1-hour average concentration
t_m = 60 minutes
t_p = 5 minutes

15. CALCULATIONS:

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
01, 05, 06, 26, 27, 30, 31	Grain Loading	0.002 gr/acf	Baghouse	99.9%	
07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 18, 20, 21, 22, 23, 24, 25	Grain Loading	0.005 gr/acf	Baghouse	99.9%	
19 and 40	MACT EEE Limits, Stack Testing (SO_2), and Waste Analysis for VOC	SO_2 Max %: 4.0 Max Flow= 15 gal/min SO_2= (0.24 lb SO_2/lb S)(510 lb S supplied/hr)= 122.4 lb/hr SO_2= 241.1 tpy NO_X testing showed max to be much lower (29.62 lb/hr & 129.7 tpy) than permitted, but	Afterburner Baghouse	99.9% 99.9%	Throughput higher than 20tph, SO_2= 0.18 lb SO_2/lb S Less than = 0.24

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
		leaving it the same as last permit.			
32	AP-42 11.19.2 MSDS AP-42 3.3	Operation lb/ton Screen=0.072 Crusher=0.015 Loading/Unloading= 0.0004 Conveyor= 0.0077 2nd Cut = 0.1% Sodium Beryllium Fluoride Based on Molecular Weight Ratio PM= 0.31 lb/MMBtu PM_{10}= 0.31 lb/MMBtu SO_2= 0.29 lb/MMBtu VOC= 0.36 lb/MMBtu CO= 0.95 lb/MMBtu NO_X= 4.41 lb/MMBtu	Primary Screen= Baghouse Crusher= Building Loading/Unloading= Baghouse Conveyor (7 drop off pts)= building	99.9% 80% 99.9% 80%	Portable Baghouse is 190HP Diesel Engine operated 8,760 hr/yr
33	AP-42 Chapter 3.3 for Combustion	<u>lb/MMBtu</u> PM=0.31 PM_{10}=0.31 SO_2=0.29 VOC=0.36 CO=0.95 NO_X=4.41	None	N/A	Calculated at 1,000 hours of operation per year
34	Table 2-9, 2-11 of EPA "Protocol for Equipment Leak & Emission		None	N/A	<u>Max VOC Concentration</u> 500 ppmv Light Liquid Valves= 42 Light Liquid Pumps= 14

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
	Estimates" Nov, 1995				Connectors= 112
35	Tanks Program	Organic Fuel Max throughput= 10,512,000 gal/yr Worst Case= 30% throughput Methyl Alcohol	Tank Vent	99%	(2)- 50,000 Gallon and (4)- 24,000 gallon Tanks
36	AP-42 Table 11.19.2	Max throughput = 200,000 ton/yr 0.0085 lb PM/ton 0.0035 lb PM_{10}/ton	None	N/A	Half of PM assumed to be PM_{10}
38		PM/PM_{10} 0.01 grains/DSCF Dioxin/Furan 1.05E-10 wt%			

16. TESTING REQUIREMENTS:

The permit requires testing of the following sources.

SN	Pollutants	Test Method	Test Interval	Justification
19	EEE	EEE See Plantwide		
19	SO_2	6C		
19	Average VOHAP concentration for off-site material streams	Sampling, Method 305 in 40 CFR part 63, Method 25D in 40 CFR part 60, Method 624 in 40 CFR part 136, Method 625 in 40 CFR part 136, Method 1624 in 40 CFR part 136, Method 1625 in 40 CFR part 136, Method 8260 in "Test		

SN	Pollutants	Test Method	Test Interval	Justification
		Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW-846, Third Edition, September 1986, as amended by Update I, November 15, 1992, or Method 8270 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW-846, Third Edition, September 1986, as amended by Update I, November 15, 1992		

17. 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)
19	Various AFS systems	CEM	Continuous	N
19	CO Concentration	CEM	Continuous	N
19	PM Concentration	COM	Continuous	N
19	NO_X Concentration	CEM	Continuous	N
19	SO_2 Concentration	CEM	Continuous	N
40	Various AFS systems	CEM	Continuous	N
40	CO Concentration	CEM	Continuous	N
40	PM Concentration	COM	Continuous	N
40	NO_X Concentration	CEM	Continuous	N

SN	Parameter or Pollutant to be Monitored	Method (CEM, Pressure Gauge, etc.)	Frequency	Report (Y/N)
40	SO_2 Concentration	CEM	Continuous	N

18. 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)
33	Maintenance/Malfunction	N/A	Monthly	N
33	Hours of Operation	1,000 Hours per year	Monthly	N

19. OPACITY:

SN	Opacity	Justification for limit	Compliance Mechanism
32, 38	5%	§18.501	Inspector Observation
01, 05, 06, 09, 10, 11, 18, 20, 21, 22, 26, 27	7%	CAM	Weekly
07, 08, 12, 13, 14, 15, 16, 23, 24, 25	10%	CAM	Weekly
19 and 40	20%	Guidance	Continuous
33	20%	Guidance	Inspector Observation

20. DELETED CONDITIONS:

Former SC	Justification for removal
N/A	

21. GROUP A INSIGNIFICANT ACTIVITIES:

The following is a list of Insignificant Activities including revisions by this permit.

Source Name	Group A Category	Emissions (tpy)						
		PM/PM_{10}	SO_2	VOC	CO	NO_x	HAPs	
							Single	Total
Five Diesel Fuel Storage Tanks	3							0.002

Source Name	Group A Category	Emissions (tpy)						
		PM/PM_{10}	SO_2	VOC	CO	NO_x	HAPs	
							Single	Total
4000, 2 @ 3000, 2000, and 1000 gallon capacity.								
Gasoline Storage Tanks #1 and #2 (SN-28)	3			0.36			0.06	0.17
Laboratory Dust Collector and Vent	5	0.0001		0.22			0.22	0.22
Lime Handling Fugitives (SN-29)	13	0.003						
Cooling Tower	13	0.22						
Cooler Conveyor Dust Collector	13	0.0001						
Leachate Tanks	13			0.0001				
Loading Silos	13	PM= 0.19 PM_{10}=0.09						
Air Duct Systems	13	0.0001						
Initial Size Reduction System	13	0.0001						
Loadout Inline Dust Collector (SN-31)	13	0.08					2.97E-05	7.61E-05
Hot Water Heater #1	13	0.01	0.01	0.01	0.1	0.12	2.09E-03	2.18E-03

Source Name	Group A Category	Emissions (tpy)						
		PM/PM_{10}	SO_2	VOC	CO	NO_x	HAPs	
							Single	Total
Hot Water Heater #2	13	0.01	0.01	0.01	0.1	0.12	2.09E-03	2.18E-03
Drum Sampling	13			0.7			0.7	0.7
Aluminum Oxide Tank w/BV	13	0.033						
Activated Carbon Tank w/BV	13	0.003						
Reagent #1 Tank (32.5% Urea solution)	13			0.15				
Total		**0.3594**	**0.02**	**0.8701**	**0.2**	**0.24**	**0.7043**	**0.7045**

22. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

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

Permit #
1016-AOP-R15

APPENDIX A – EMISSION CHANGES AND FEE CALCULATION

Fee Calculation for Major Source

Revised 03-11-16

Facility Name: EES
Permit Number: 1016-AOP-R16
AFIN: 10-00004

$/ton factor	27.27	Annual Chargeable Emissions (tpy)	753.562
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)	-131.138
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		65.5	68.5	3	3	68.5
PM_{10}		64.9	67.8	2.9		
$PM_{2.5}$		0	0	0		
SO_2		243	243	0	0	243
VOC		53.5	36.1	-17.4	-17.4	36.1
CO		109.8	107.5	-2.3		
NO_X		245.7	245.7	0	0	245.7
Lead	☑	0.21	0.212	0.002	0.002	0.212

Pollutant (tpy)	Check if Chargeable Emission	Old Permit	New Permit	Change in Emissions	Permit Fee Chargeable Emissions	Annual Chargeable Emissions
Arsenic Compounds	☐	0.0861	0.09	0.0039		
Beryllium Compounds	☐	0.0865	0.09	0.0035		
Cadmium Compounds	☐	0.21	0.22	0.01		
Chlorine	☑	100.18	41.15	-59.03	-59.03	41.15
Hydrochloric Acid	☑	100.18	42.3	-57.88	-57.88	42.3
Chromium Compounds	☐	0.0901	0.09	-0.0001		
Dioxin and Furans	☐	8.43E-07	3.50E-07	-0.000000493		
Fluorides	☑	6.49	6.49	0	0	6.49
Mercury	☐	0.11	0.12	0.01		
PAH	☐	2.9832	2.99	0.0068		
Bromine	☐	11.62	11.61	-0.01		
Selenium	☐	0.21	0.21	0		
Ammonia	☑	69.94	70.11	0.17	0.17	70.11
Single Organics	☐	11.64	11.62	-0.02		
Total Other Organics	☐	50.76	61.77	11.01		
Benzene	☐	0.26	0.26	0		
Antimony	☐	0.02	0.09	0.07		
Cyanide	☐	0	3.50E-04	0.00035		
Cobalt Compounds	☐	0	0.09	0.09		
Manganese Compounds	☐	0.02	0.09	0.07		
Nickel Compounds	☐	0.02	0.09	0.07		