



ATLASBX Lead Emissions Modeling Analysis

Prepared by:
Permit Modeling Unit
Regulatory Development and Complex Sources Section
Air Permitting Program
Air Pollution Control Division

Haidar Alrawi, P.E.

September 18, 2018

ATLASBX - Introduction

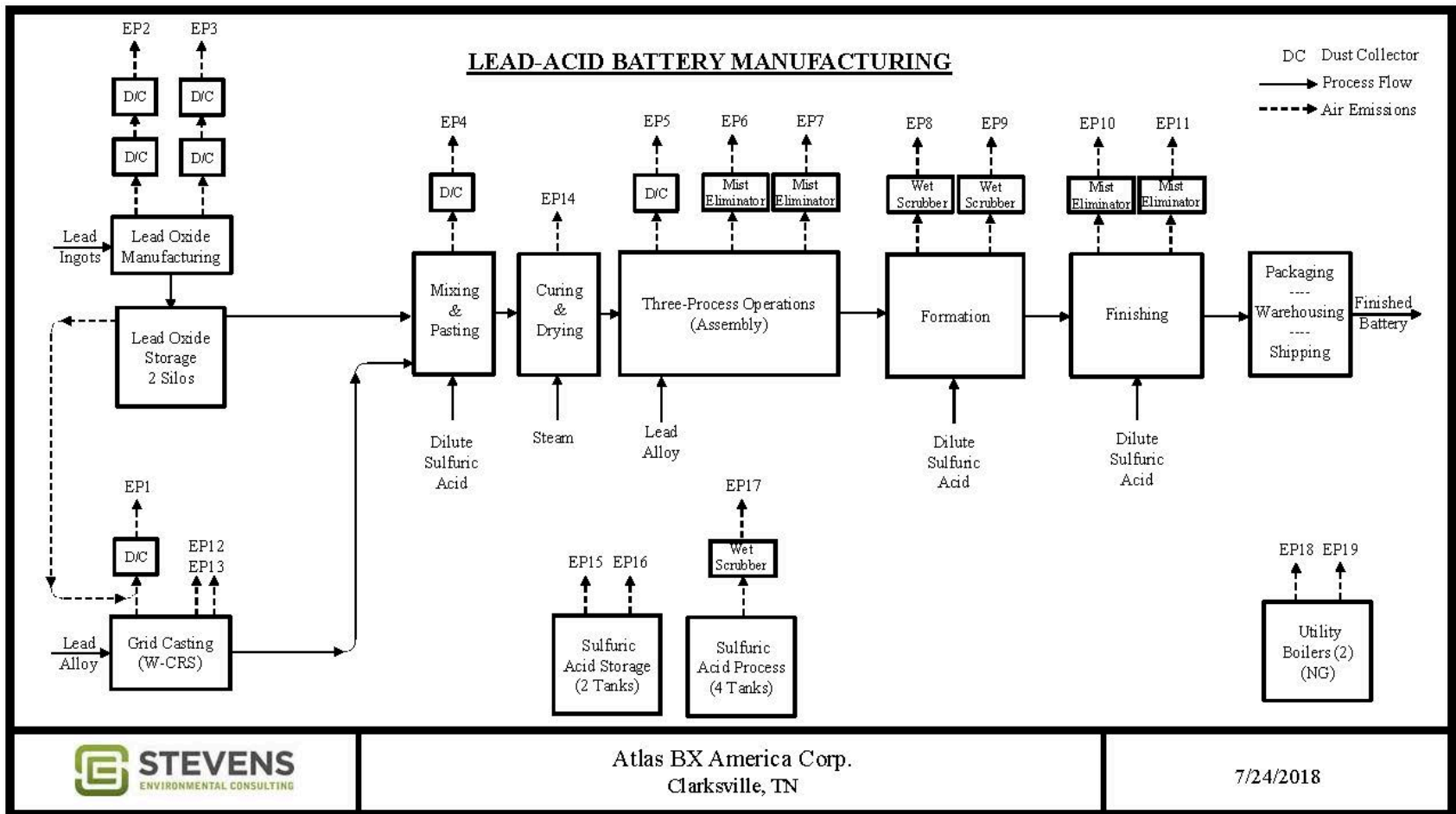
- A proposed lead-acid battery manufacturing facility to be constructed on International Blvd. in Clarksville, Montgomery County, Tennessee.
- Air pollution construction air permit application submitted April 25, 2018.
- Proposed construction of the facility is planned to begin in August 2018.
- Potential emissions will not exceed the major source thresholds related to Prevention of Significant Deterioration (PSD) Review stipulated at 40 CFR 52.21 or the Part 70 Title V Operating Permit Program. Subsequently, the facility will not be classified as a Major Source with respect to these permitting programs and, therefore, will not require PSD Review or issuance of a Part 70 Title V Operating Permit.
- Facility is subject to the emission standards, monitoring, recordkeeping and reporting requirements outlined in the following federal rules:
 - NSPS, 40 CFR 60, Subpart KK - Standards of Performance for Lead-Acid Battery Manufacturing Plants; and
 - NESHAP, 40 CFR 63, Subpart P - National Emission Standards for Hazardous Air Pollutants for Lead Acid Battery Manufacturing Area Sources.
- Facility submitted a Dispersion Modeling Report summarizing the lead impact analysis conducted for this facility in accordance with TAPCR Chapter 1200-3-22-.04(3). Additional emission sensitivity modeling analysis conducted by the APC Division in accordance with EPA and TDEC guidelines demonstrates compliance with the National Ambient Air Quality Standard (NAAQS) for lead, 0.15 ug/m³.

APC Division Review

Lead (Pb) Modeling Methodology

- ❑ Using EPA's latest AERMOD model (ver. 18081).
- ❑ Application of stack downwash and actual terrain heights .
- ❑ Using 5-year (2013-2017) actual meteorology comprising of Clarksville (surface) and Nashville (upper-air) data.
- ❑ Including all ATLASBX Pb source emissions and including Pb emissions from the nearby Hankook Tire facility.
- ❑ Allocating source sensitivity compliant emissions for ATLASBX permit limits.
- ❑ Adding a representative background concentration to the max overall impact to account for natural and other source Pb contributions.
- ❑ Generating impact for the maximum monthly average period from the 5-year met data record.
- ❑ Calculating the max 3-month rolling average from the 5-year met data set using EPA's LEADPOST post-processor for the max monthly values; And
- ❑ Comparing the obtained overall max 3-month rolling average impact to the Pb NAAQS for compliance demonstration after the addition of a representative background concentration.

Lead (Pb) Emissions Process Diagram



Modeled Lead (Pb) Emissions Sources

Table 1 -Stack Parameters

ID	Desc	Height	Diam	Exit Vel	Exit Temp	Emission Rate	Emission Rate	Emission Rate	X1	Y1
		[m]	[m]	[m/s]	[K]	GPS	PPH	TPY	[m]	[m]
EP1	GRID CASTING	12.05	0.8	15.25	324.15	0.00224	0.01777778	0.07786667	478428.82	4047773.36
EP2	LEADOX10	14.25	0.6	23.5306	357.15	0.00168	0.01333333	0.0584	478386.22	4047782.63
EP3	LEADOX20	14.25	0.6	23.5306	357.15	0.00194	0.015396825	0.067438095	478385.70	4047778.71
EP4	MIXING & PASTING	24.9	1.2	16.21	317.15	0.000138	0.001095238	0.004797143	478349.00	4047775.48
EP5	ASSEMBLY10	24.9	1.3	15.07	309.15	0.000875	0.006944444	0.030416667	478245.01	4047787.84
EP6	ASSEMBLY21 - MST ELIMINATOR	12.00912	0.5334	11.1862	310.15	0	0	0	478269.37	4047782.54
EP7	ASSEMBLY22 - MST ELIMINATOR	12.00912	0.5334	11.1862	310.15	0	0	0	478269.37	4047782.54
EP8	FORMATION10 - WETS CRUBBER	23.89632	1.4935	10.4699	310.92778	0	0	0	478296.70	4047777.23
EP9	FORMATION20 - WETS CRUBBER	23.89632	1.4935	10.4699	310.92778	0	0	0	478296.70	4047777.23
EP10	FINISHING10 - MST ELIMINATOR	13.716	0.3048	34.2595	308.15	0.00125	0.009920635	0.043452381	478321.51	4047775.35
EP11	FINISHING20 - MST ELIMINATOR	13.716	0.3048	34.2595	308.15	0	0	0	478321.51	4047775.35
EP14	CURING & DRYING	13.99032	0.4999	8.50392	366.48333	0	0	0	478376.89	4047756.10
EP17	SULFURIC ACID - WET SCRUBBER	7.62	0.6096	2.286	297.03889	0.00053	0.004206349	0.01842381	478271.14	4047761.33
H2	HANKOOK RUBBER MIXING OP	32.004	1.585	8.28932	293.15	1.30E-05	0.000102998	0.000451133	477698.13	40466958.77
H6	HANKOOK TIRE GRINDING OP	11.52	0.305	13.705	0	1.52E-05	0.000120998	0.00052997	477875.10	4046638.58
Total	EP1 -H6					0.008681	0.068899	0.301776		
Total	EP1 -EP5					0.006873	0.054548	0.238919		
Total	H2 -H6					0.000028	0.000224	0.000252		

NOTES:

K = Temp in degree Kelvin; GPS = grams per second; PPH = pounds per hour; TPY = tons per year; m = meters; m/s = meters per second

Table 2 – Modeled Emission Rates for Compliance with the Pb NAAQS

ATLASBX Emissions Point	Emissions Rate (lb/hr)
EP1-EP7	0.055
EP8-EP11and EP14	0.01
EP17	0.0042
Total	0.069

NOTES:

NAAQS = National Ambient Air Quality Standard.

Table 3 – Maximum Source Pb Impacts and Location

Emissions Unit	Stack	Emissions Rate (lb/hr)	Max Monthly Avg. Impact (ug/m3)	Max 3-Month Rolling Avg. Impact (ug/m3)
All	All	0.069	0.16	0.12
Max Impact UTM Receptor Location (XY-m)			478358.80, 4047927.00	478358.80, 4047927.00
Distance to Max Impact (m)			180 N	180 N

NOTES:

lb/hr = pound per hour; ug/m3 = micrograms per cubic meter.

Table 4- Max 3-Month Pb Impact Comparison to the Pb NAAQS

Emissions Unit	Stack	3-Month Avg. Rolling Max Impact (ug/m3)	Background Concentration (ug/m3)	Total Impact (ug/m3)	Pb NAAQS (ug/m3)	Exceed Pb NAAQS?
All	All	0.12	0.02	0.14	0.15	NO

In conclusion and as shown in Table 4, the overall (max modeled impact plus background) impact concentration for the applicable 3-month rolling average is below the national and Tennessee Ambient Air Quality Standard (NAAQS) for lead (Pb).

Figure 1 – ATLASBX Source Location



Figure 2 – Maximum Monthly Avg. Pb Impact (ug/m3)

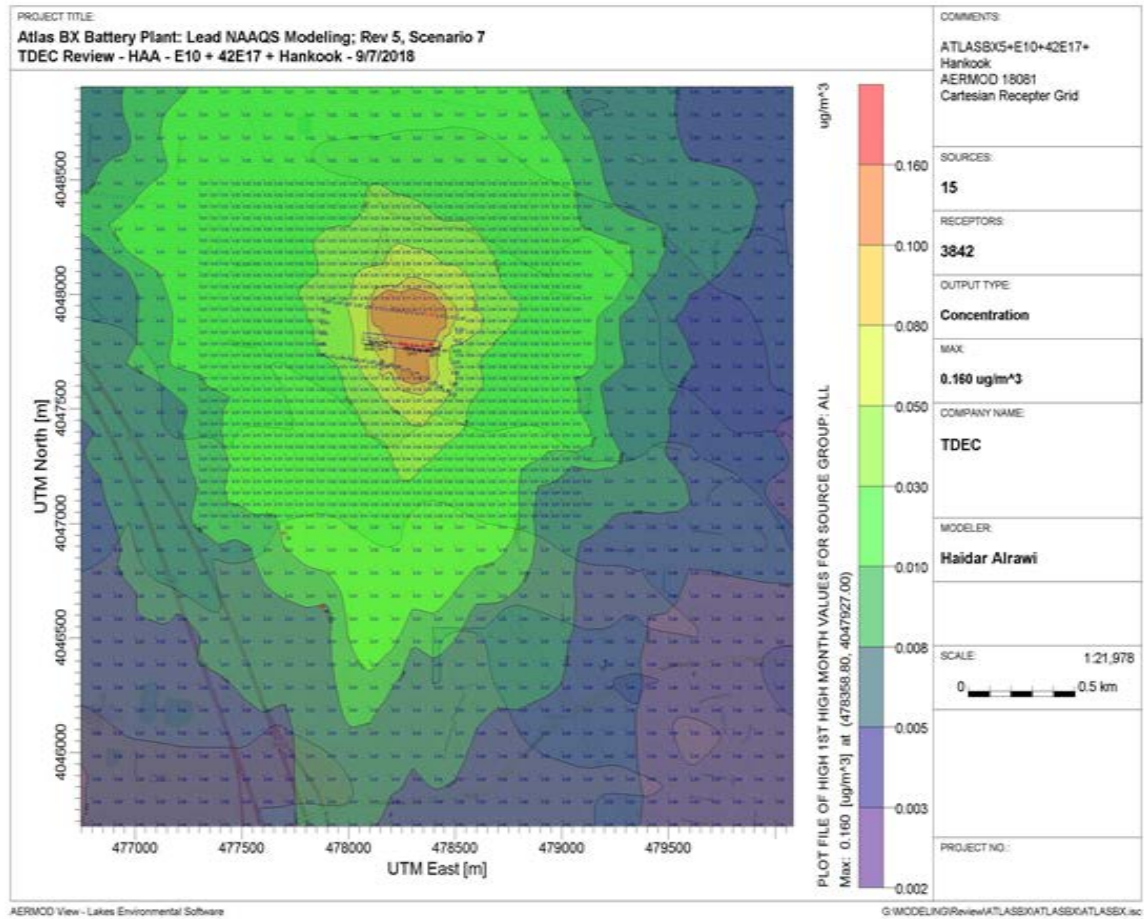
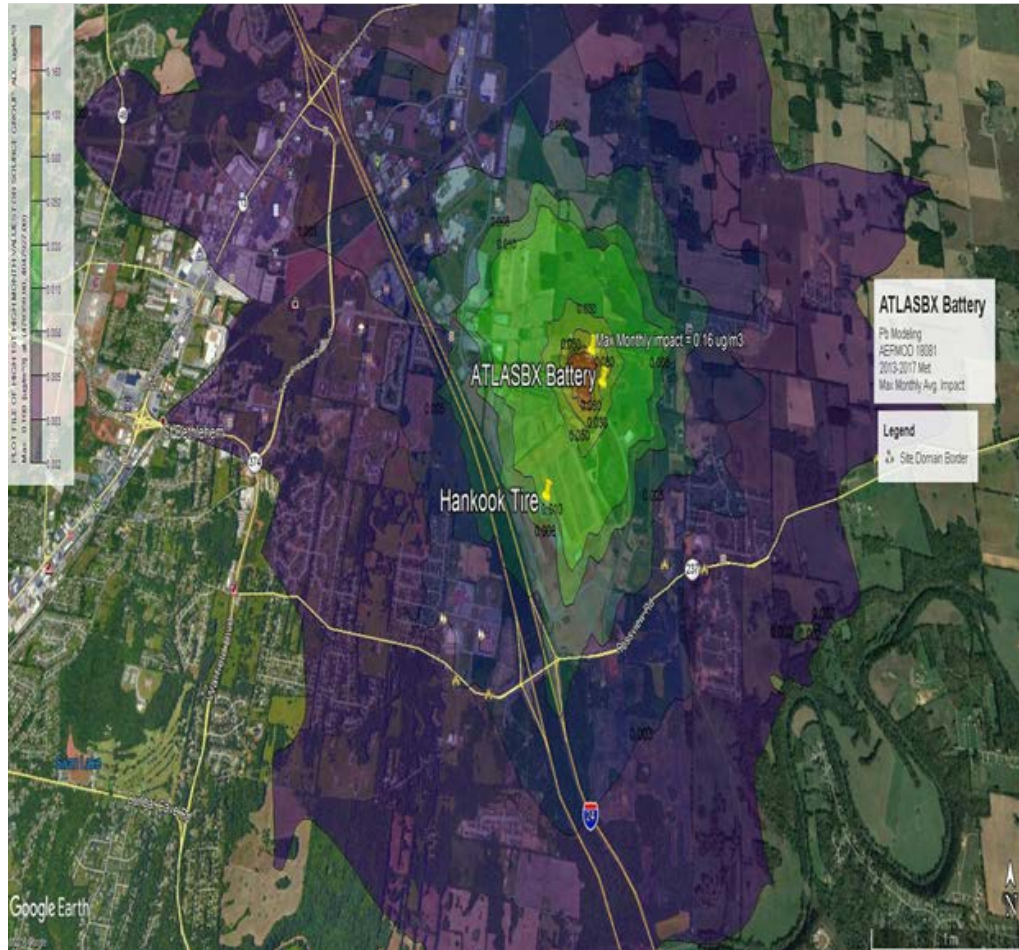


Figure 3 – Maximum Monthly Avg. Pb Impact (ug/m3) – Shown in Google Earth



**Figure 4 – Maximum Rolling 3-Month Avg. Pb Impact
(ug/m3) – EPA Lead Processor (LEADPOST)**

LEADPOST SUMMARY

Overall maximum 3-month averaged concentration

<u>Month</u>	<u>Year</u>	<u>X</u>	<u>Y</u>	<u>Elevation</u>
June	2014	478358.80	4047927.00	155.31

Group Concentration

ALL 0.120067E+00

Monthly average concentrations for maximum 3-month average concentration

ALL 0.815700E-01 April 2014

ALL 0.118420E+00 May 2014

ALL 0.160210E+00 June 2014

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Tennessee Permit Modeling

<https://www.tn.gov/environment/program-areas/apc-air-pollution-control-home/apc/air-quality-modeling.html>

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MEMORANDUM

TO: Greg Forte, Julie Verissimo, John Fuss and Company File
West TN Permit Program

FROM: Haidar Al-Rawi

SUBJECT: Lead (Pb) Ambient Impact Refined Modeling Assessment
ATLASBX Lead Acid Battery Manufacturing
Clarksville, Montgomery County, TN

Source 63-0385

DATE: September 21, 2018

ADDENDUM to the ATLASBX Lead (Pb) Modeling Analysis

The Division conducted two additional emission sensitivity modeling runs (#23 and #24) for compliant permit limits and both indicated a protection of the Pb NAAQS (0.15 ug/m³) for the following allocated emission rates:

Table 1: Emission Scenario Run #23

ATLASBX Emissions Point	Emissions Rate (lb/hr)	Overall Max 3-Month Avg. Impact (+BG) (ug/m3)
EP6 and EP7	0.005	0.14545 or 0.14
EP14	0.008	
EP8/9	0.001	
EP10/11	0.001	
EP17	0.0042	
Total (EP14 + EP8/9 +EP10/11+EP17)	0.0142	

Table 2: Emission Scenario Run #24

ATLASBX Emissions Point	Emissions Rate (lb/hr)	Overall Max 3-Month Avg. Impact (+BG) (ug/m3)
EP6 and EP7	0.005	0.14689 or 0.14
EP14	0.008	
EP8/9	0.00	
EP10/11 (worst case stack parameters than EP8/9)	0.002	
EP17	0.0042	
Total (EP14 + EP8/9 +EP10/11+EP17)	0.0142	

Therefore, based on the worst case emissions modeling scenario the following controlling emission points need to be limited as follows:

Table 3: Recommended Permit Limits

ATLASBX Emissions Point	Emissions Limit (lb/hr)
EP6 and EP7	0.005
EP14	0.008
EP17	0.0042

This will conclude the Division modeling analysis and review for this source.