

Attachment C

Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: David Brymer
Air Quality Planning Division

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From: Matthew Kovar, Megan Cox
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Subject: Modeling Analysis of Lead for Exide Technologies, Frisco Battery Recycling Plant
(RN100218643)

1.0 Project Identification Information.

On November 12, 2008, the U.S. Environmental Protection Agency (EPA) finalized the new 0.15 microgram per cubic meter ($\mu\text{g}/\text{m}^3$) NAAQS for lead based on a rolling three-month average (73 *Federal Register* 66964). In general, the rule requires source-oriented ambient air lead monitoring by January 1, 2010, at sites with actual annual lead emissions of one or more tons per year. Exide Technologies, Frisco Battery Recycling Plant was identified as having emissions at or above this level based on the reported 2007 TCEQ Emissions Inventory and/or 2006 Toxics Release Inventory. The rule further requires that this monitoring be conducted at or near the maximum off-site ambient air lead concentration, as predicted by modeling, that results from sources with annual lead emissions of one or more tons.

The TCEQ conducted air dispersion modeling of all the lead emission sources at the site using the most current modeling parameters and associated permitted allowable emissions rates. The TCEQ will use the dispersion modeling results to determine the optimal location of any required source-oriented monitors.

Since monitoring already exists at and near the Exide Technologies site, and monitored values exceeding the new lead standard have been recorded, the dispersion modeling results will also be used to determine the proposed boundaries of a lead non-attainment area.

ArcReader Published Map:

<\\Msgiswrk\apd\MODEL PROJECTS\Lead NAAQS Analysis 2009\Lead NAAQS Analysis Results.pmf>

2.0 Report Summary. The predicted maximum ground level concentration (GLCmax) is 1.42 $\mu\text{g}/\text{m}^3$ for a rolling three-month average. The location of the GLCmax is the same as the location of monitor 480850009 on the north property line of the Exide Technologies site. Predicted concentrations exceeding the NAAQS extended approximately 1.3 kilometers (km) to the north, 0.8 km to the south, 0.8 km to the west, and 0.4 km to the east of the site property

line. All predicted concentrations greater than the NAAQS are located within Collin County. Table 1 lists the predicted concentrations at the current monitor locations and proposed monitor location near the intersection of 1st Street and Ash Street.

Table 1. Modeling Results for Lead			
Monitor ID	Averaging Time	GLC ($\mu\text{g}/\text{m}^3$)	Standard ($\mu\text{g}/\text{m}^3$)
480850009	rolling three-month	1.42	0.15
480850003	rolling three-month	0.81	0.15
480850007	rolling three-month	0.49	0.15
Proposed	rolling three-month	0.52	0.15

- 3.0 Land Use and Terrain. A land use/land cover analysis was performed using AERSURFACE consistent with guidance given in the AERMOD Implementation Guide (March 19, 2009). The recommended input data, the National Land Cover Data 1992 archives (NLCD92), were used for this analysis.

Terrain elevations within the modeling domain were determined using AERMAP (Version 09040). The input data used for this analysis were United States Geological Survey (USGS) digital elevation models (DEMs) for Little Elm, Frisco, Lewisville East, and Hebron data sets.

- 4.0 Modeling Emissions Inventory. The modeled emission source parameters and emission rates were provided by Exide Technologies. The source locations were validated by ADMT using aerial photography. The source emission rates modeled were consistent with the maximum allowable emission rates authorized through permits 3048A and 1147A. The emission source coordinates are in the UTM Zone 14 North, North American Datum of 1927 (NAD27) coordinate system.

Table 2. On-Property Point Source Parameter Information						
ID	Easting (meters)	Northing (meters)	Stack Height (meters)	Stack Temp (K)	Stack Exit Velocity (meters/sec)	Stack Diameter (meters)
11	702713.06	3668796.5	16.764	369.26	12.0396	0.3048
12	702713.25	3668793.75	16.764	369.26	8.5039	0.3048
13	702713.25	3668791.5	15.8496	391.48	13.1674	0.3048
14	702721	3668792.75	16.764	327.59	27.9624	0.5334

Table 2. On-Property Point Source Parameter Information						
ID	Easting (meters)	Northing (meters)	Stack Height (meters)	Stack Temp (K)	Stack Exit Velocity (meters/sec)	Stack Diameter (meters)
15	702725.31	3668807.5	16.764	349.82	14.1732	0.381
16	702717.88	3668803	17.3736	369.26	13.4722	0.253
17	702728.88	3668779.5	16.764	355.37	14.0208	0.381
18	702628.13	3668767.75	30.6324	303.71	5.1206	1.6154
21	702626.88	3668739.25	31.242	304.82	16.5811	1.521
22	702685.69	3668804.25	22.86	0	15.1486	0.8108
23	702637.38	3668764.5	6.096	0	1.8288	0.3048
24	702721.88	3668782.5	16.4592	369.26	11.491	0.381
25	702721.75	3668777.75	16.4592	358.15	9.4488	0.381
26	702736.31	3668782.75	9.144	355.37	11.5824	0.1524
37	702682.56	3668810	22.86	298.15	19.6901	1.6764
38	702620.19	3668771.75	33.8328	315.37	16.7945	1.3716
39	702544.5	3668727.75	10.668	0	0.0009	1.524
45	702623.06	3668713.75	32.1564	0	14.0238	1.8044
48	702585	3668771	11.2776	0	1.6764	0.1707

Table 3. Area Source Parameter Information						
ID	Easting (meters)	Northing (meters)	Release Height (meters)	Easterly Length (meters)	Northerly Length (meters)	Degrees from north (°)
10	702642.65	3668770.8	4.572	28.956	24.384	-2
27	702733.81	3668767.5	4.572	0.9144	0.9144	0
28	702756.31	3668782	4.572	0.9144	0.9144	0
35	702654.26	3668740.35	4.572	22.86	30.48	-2
36	702645.75	3668754.8	4.572	32.004	15.24	-2
41	702518.28	3668768.73	0.3048	94.488	21.336	40

Table 3. Area Source Parameter Information						
ID	Easting (meters)	Northing (meters)	Release Height (meters)	Easterly Length (meters)	Northerly Length (meters)	Degrees from north (°)
42	702625.1	3668693.38	0.3048	80.772	44.196	-2
43	702702.77	3668745.25	0.3048	62.484	39.624	-2
44	702590.79	3668760.22	3.9929	24.384	41.148	-2
52	702631.81	3668765.63	4.572	21.336	16.764	-2
53	702615.56	3668762.28	1.8288	16.764	19.812	-2

Table 4. On-Property Source Allowable Emission Rates			
Scenario ID	Pollutant	Averaging Time	Emission Rates (lb/hr)
10	Lead	1-hr	0.27
11	Lead	1-hr	0.05
12	Lead	1-hr	0.03
13	Lead	1-hr	0.05
14	Lead	1-hr	0.03
15	Lead	1-hr	0.05
16	Lead	1-hr	0.02
17	Lead	1-hr	0.05
18	Lead	1-hr	0.12
21	Lead	1-hr	0.25
22	Lead	1-hr	0.08
23	Lead	1-hr	0.03
24	Lead	1-hr	0.006
25	Lead	1-hr	0.004
26	Lead	1-hr	0.001
27	Lead	1-hr	0.001

Table 4. On-Property Source Allowable Emission Rates			
Scenario ID	Pollutant	Averaging Time	Emission Rates (lb/hr)
28	Lead	1-hr	0.001
35	Lead	1-hr	0.27
36	Lead	1-hr	0.01
37	Lead	1-hr	0.16
38	Lead	1-hr	0.29
39	Lead	1-hr	0.12
41	Lead	1-hr	0.07
42	Lead	1-hr	0.07
43	Lead	1-hr	0.07
44	Lead	1-hr	0.03
45	Lead	1-hr	0.35
48	Lead	1-hr	0.06
52	Lead	1-hr	0.01
53	Lead	1-hr	0.32

5.0 Building Wake Effects (Downwash). Input data to Building Profile Input Program Prime (BPIP-PRM Version 04274) were provided by Exide Technologies. The building locations were validated by ADMT using aerial photography.

6.0 Meteorological Data.

Surface Station and ID: Dallas/Fort Worth, TX (Station #: 03927)

Upper Air Station and ID: Stephenville, TX (Station #: 13091)

Meteorological Dataset: 1985, 1987, 1988, 1989, 1990

Profile Base Elevation: 551 feet

The AERSURFACE analysis conducted of the area surrounding the Exide Technologies site resulted in a calculated roughness length of 0.129 meters. Since the AERSURFACE analysis used land cover data from 1992 and since the area near the site has become more developed and urbanized since 1992 based on comparing the land cover data to 2008 aerial photography, a representative roughness length for the area would be approximately 0.5 meters. For this reason,

the meteorological data set used for this analysis was developed using a roughness length of 0.5 meters.

- 7.0 Receptor Grid. The receptor grid used in the modeling analysis consisted of receptors with 100 meter spacing and extended approximately 5 kilometers (km) from the Exide Technologies site property line in all directions. Discrete receptors were used for the locations of the three existing monitoring stations and the location of a proposed monitoring station near the intersection of 1st Street and Ash Street. The purpose of the receptor grid was to determine a representative maximum ground-level concentration and the extent of ground-level concentrations at or above half of the lead NAAQS standard.
- 8.0 Model Used and Modeling Techniques. AERMOD (Version 07026) was used in a refined screening mode. For refined screening, National Weather Service (NWS) meteorological raw input data are used with generalized surface characteristics of the application site. Since the current version of AERMOD is not capable of calculating rolling three-month average concentrations, the EPA post processor LeadPost was used. The input values to LeadPost are monthly average values at each receptor in the POSTFILE output format from AERMOD.

For this analysis, only emission sources at the Exide Technologies site were considered. The nearest source of lead emissions outside the modeling domain is approximately 20 km from the Exide Technologies site with reported 2007 lead annual emissions approximately one percent of the annual lead emissions reported by Exide Technologies. The largest nearby source of lead emissions is approximately 50 km from the Exide Technologies site with annual reported emissions approximately ten percent of the annual emissions reported by Exide Technologies. Due to the great distance to the Exide Technologies site and the small reported emission, no other sources of lead emissions would have a significant contribution near the Exide Technologies site or the modeling domain used for this analysis.