REVISIONS TO THE STATE OF TEXAS AIR QUALITY IMPLEMENTATION PLAN FOR THE CONTROL OF LEAD AIR POLLUTION

COLLIN COUNTY LEAD NONATTAINMENT AREA

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
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COLLIN COUNTY ATTAINMENT DEMONSTRATION STATE IMPLEMENTATION PLAN REVISION FOR THE 2008 LEAD NATIONAL AMBIENT AIR QUALITY STANDARD

2011-001-SIP-NR

Adoption
May 30, 2012

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EXECUTIVE SUMMARY

On October 15, 2008, the United States Environmental Protection Agency (EPA) substantially strengthened the National Ambient Air Quality Standard (NAAQS) for lead. The new standard, 0.15 micrograms per cubic meter ($\mu g/m^3$) measured as a rolling three-month average, is at least 10 times more stringent than the previous standard of 1.5 $\mu g/m^3$ measured as a quarterly average. On October 14, 2009, the governor of Texas submitted to the EPA a recommendation that a portion of Collin County, surrounding the Exide Technologies' (Exide) battery recycling plant located in Frisco, Texas, be designated as a lead nonattainment area. This recommendation was based on 2006 through 2008 monitoring data, air dispersion modeling, and analysis of additional factors as prescribed by the EPA. On October 12, 2010, the governor of Texas submitted an updated recommendation, which reflected a permit amendment, lowering Exide's maximum permitted allowable emission rate and the resulting smaller nonattainment area. On November 22, 2010, the EPA designated the final recommended portion of Collin County as nonattainment for the 2008 lead NAAQS effective December 31, 2010 (75 FR 71033).

Section 191(a) of the Federal Clean Air Act (FCAA) requires that states with lead nonattainment areas submit to the EPA an attainment demonstration state implementation plan (SIP) revision within 18 months of the effective designation date. The state is required to submit an attainment demonstration SIP revision for lead by June 30, 2012, and to demonstrate that the area will reach attainment of the 2008 lead NAAQS by December 31, 2015.

This SIP revision demonstrates attainment using air dispersion modeling that includes control strategies already in use at the Exide site as well as additional measures being adopted concurrently with this SIP revision. This SIP revision also contains FCAA-required elements, including a reasonably available control measure and a reasonably available control technology analysis, demonstration of reasonable further progress, and a contingency plan.

The control measures and contingency measures included in this SIP revision will be enforceable through an Agreed Order between the Texas Commission on Environmental Quality and Exide (see Appendix A: *Agreed Order 2011-0521-MIS*). To ensure compliance with the 2008 lead NAAQS, the Agreed Order is being adopted concurrently with this SIP revision. The Agreed Order provides enforceable measures to reduce emissions necessary for the Collin County lead nonattainment area to attain the 2008 lead NAAQS as expeditiously as practicable, but no later than December 31, 2015, and contains contingency measures designed to ensure continued compliance with the standard.

SECTION V: LEGAL AUTHORITY

A. General

The Texas Commission on Environmental Quality (TCEQ) has the legal authority to implement, maintain, and enforce the National Ambient Air Quality Standards (NAAQS) and to control the quality of the state's air, including maintaining adequate visibility.

The first air pollution control act, known as the Clean Air Act of Texas, was passed by the Texas Legislature in 1965. In 1967, the Clean Air Act of Texas was superseded by a more comprehensive statute, the Texas Clean Air Act (TCAA), found in Article 4477-5, Vernon's Texas Civil Statutes. The legislature amended the TCAA in 1969, 1971, 1973, 1979, 1985, 1987, 1989, 1991, 1993, 1995, 1997, 1999, 2001, 2003, 2005, 2007, 2009, and 2011. In 1989, the TCAA was codified as Chapter 382 of the Texas Health and Safety Code.

Originally, the TCAA stated that the Texas Air Control Board (TACB) was the state air pollution control agency and the principal authority in the state on matters relating to the quality of air resources. In 1991, the legislature abolished the TACB effective September 1, 1993, and its powers, duties, responsibilities, and functions were transferred to the Texas Natural Resource Conservation Commission (TNRCC). With the creation of the TNRCC, the authority over air quality is found in both the Texas Water Code and the TCAA. Specifically, the authority of the TNRCC is found in Chapters 5 and 7. Chapter 5, Subchapters A - F, H - J, and L, include the general provisions, organization, and general powers and duties of the TNRCC, and the responsibilities and authority of the executive director. Chapter 5 also authorizes the TNRCC to implement action when emergency conditions arise and to conduct hearings. Chapter 7 gives the TNRCC enforcement authority. In 2001, the 77th Texas Legislature continued the existence of the TNRCC until September 1, 2013, and changed the name of the TNRCC to the Texas Commission on Environmental Quality (TCEQ). In 2009, the 81st Texas Legislature, during a special session, amended section 5.014 of the Texas Water Code, changing the expiration date of the TCEQ to September 1, 2011, unless continued in existence by the Texas Sunset Act. In 2011, the 82nd Texas Legislature continued the existence of the TCEQ until 2023.

The TCAA specifically authorizes the TCEQ to establish the level of quality to be maintained in the state's air and to control the quality of the state's air by preparing and developing a general, comprehensive plan. The TCAA, Subchapters A - D, also authorize the TCEQ to collect information to enable the commission to develop an inventory of emissions; to conduct research and investigations; to enter property and examine records; to prescribe monitoring requirements; to institute enforcement proceedings; to enter into contracts and execute instruments; to formulate rules; to issue orders taking into consideration factors bearing upon health, welfare, social and economic factors, and practicability and reasonableness; to conduct hearings; to establish air quality control regions; to encourage cooperation with citizens' groups and other agencies and political subdivisions of the state as well as with industries and the federal government; and to establish and operate a system of permits for construction or modification of facilities.

Local government authority is found in Subchapter E of the TCAA. Local governments have the same power as the TCEQ to enter property and make inspections. They also may make recommendations to the commission concerning any action of the TCEQ that affects their territorial jurisdiction, may bring enforcement actions, and may execute cooperative agreements with the TCEQ or other local governments. In addition, a city or town may enact and enforce ordinances for the control and abatement of air pollution not inconsistent with the provisions of the TCAA and the rules or orders of the commission.

Subchapters G and H of the TCAA authorize the TCEQ to establish vehicle inspection and maintenance programs in certain areas of the state, consistent with the requirements of the Federal Clean Air Act; coordinate with federal, state, and local transportation planning agencies to develop and implement transportation programs and measures necessary to attain and maintain the NAAQS; establish gasoline volatility and low emission diesel standards; and fund and authorize participating counties to implement vehicle repair assistance, retrofit, and accelerated vehicle retirement programs.

B. Applicable Law

The following statutes and rules provide necessary authority to adopt and implement the state implementation plan (SIP). The rules listed below have previously been submitted as part of the SIP.

Statutes

All sections of each subchapter are included, unless otherwise noted.

TEXAS HEALTH & SAFETY CODE, Chapter 382	September 1, 2011
TEXAS WATER CODE	September 1, 2011

Chapter 5: Texas Natural Resource Conservation Commission
- Subchapter A: General Provisions
- Subchapter B: Organization of the Texas Natural Resource Conservation Commission
- Subchapter C: Texas Natural Resource Conservation Commission
- Subchapter D: General Powers and Duties of the Commission
- Subchapter E: Administrative Provisions for Commission
- Subchapter F: Executive Director (except §§5.225, 5.226, 5.227, 5.2275,5.231, 5.232, and 5.236)
- Subchapter H: Delegation of Hearings
- Subchapter I: Judicial Review
- Subchapter J: Consolidated Permit Processing
- Subchapter L: Emergency and Temporary Orders (§§5.514, 5.5145, and 5.515 only)
- Subchapter M: Environmental Permitting Procedures (§5.558 only)

Chapter 7: Enforcement
- Subchapter A: General Provisions (§§7.001, 7.002, 7.0025, 7.004, and 7.005 only)
- Subchapter B: Corrective Action and Injunctive Relief (§7.032 only)
- Subchapter C: Administrative Penalties
- Subchapter D: Civil Penalties (except §7.109)
- Subchapter E: Criminal Offenses and Penalties: §§7.177, 7.179-7.183

Rules

All of the following rules are found in 30 Texas Administrative Code, as of the following latest effective dates:

Chapter 7: Memoranda of Understanding, §§7.110 and 7.119	December 13, 1996 and May 2, 2002
Chapter 19: Electronic Reporting	March 15, 2007
Chapter 35: Subchapters A-C, K: Emergency and Temporary Orders and Permits; Temporary Suspension or Amendment of Permit Conditions	July 20, 2006

Chapter 39: Public Notice, §§39.201; 39.401; 39.403(a) and (b)(8)-(10); 39.405(f)(1) and (g); 39.409; 39.411 (a), (b)(1)-(6), and (8)-(10) and (c)(1)-(6) and (d); 39.413(9), (11), (12), and (14); 39.418(a) and (b)(3) and (4); 39.419(a), (b), (d), and (e); 39.420(a), (b) and (c)(3) and (4); 39.423 (a) and (b); 39.601-39.605	June 24, 2010
Chapter 55: Requests for Reconsideration and Contested Case Hearings; Public Comment, §§55.1; 55.21(a) - (d), (e)(2), (3), and (12), (f) and (g); 55.101(a), (b), and (c)(6) - (8); 55.103; 55.150; 55.152(a)(1), (2), and (6) and (b); 55.154; 55.156; 55.200; 55.201(a) - (h); 55.203; 55.205; 55.209, and 55.211	June 24, 2010
Chapter 101: General Air Quality Rules	October 27, 2011
Chapter 106: Permits by Rule, Subchapter A	May 15, 2011
Chapter 111: Control of Air Pollution from Visible Emissions and Particulate Matter	February 16, 2012
Chapter 112: Control of Air Pollution from Sulfur Compounds	July 16, 1997
Chapter 113: Standards of Performance for Hazardous Air Pollutants and for Designated Facilities and Pollutants	May 14, 2009
Chapter 114: Control of Air Pollution from Motor Vehicles	August 11, 2011
Chapter 115: Control of Air Pollution from Volatile Organic Compounds	December 29, 2011
Chapter 116: Permits for New Construction or Modification	March 1, 2012
Chapter 117: Control of Air Pollution from Nitrogen Compounds	May 15, 2011
Chapter 118: Control of Air Pollution Episodes	March 5, 2000
Chapter 122: §122.122: Potential to Emit	December 11, 2002
Chapter 122: §122.215: Minor Permit Revisions	June 3, 2001
Chapter 122: §122.216: Applications for Minor Permit Revisions	June 3, 2001
Chapter 122: §122.217: Procedures for Minor Permit Revisions	December 11, 2002
Chapter 122: §122.218: Minor Permit Revision Procedures for Permit Revisions Involving the Use of Economic Incentives, Marketable Permits, and Emissions Trading	June 3, 2001

SECTION VI: CONTROL STRATEGY

A. Introduction (No change)
B. Ozone (No Change)
C. Particulate Matter (No change)
D. Carbon Monoxide (No change)
E. Lead (Revised)
    1. 1980 State Implementation Plan for the Control of Lead Air Pollution (No change)
    2. 1993 Lead SIP Revisions for Collin County (No change)
    3. 1999 Lead SIP Revisions for Collin County (No change)
    4. 2009 Collin County Maintenance Plan for Lead (No change)
    5. 2011 Collin County Attainment Demonstration SIP Revision for the 2008 Lead NAAQS (New)
F. Oxides of Nitrogen (No change)
G. Sulfur Dioxide (No change)
H. Conformity with the National Ambient Air Quality Standards (No change)
I. Site Specific (No change)
J. Mobile Sources Strategies (No change)
K. Clean Air Interstate Rule (No change)
L. Transport (No change)
M. Regional Haze (No change)

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LIST OF ACRONYMS

ADEC	Alaska Department of Environmental Conservation
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
AIRS	Aerometric Information Retrieval System
ANR	air monitoring network review
AQS	Air Quality System
AQS ID	Air Quality System Identification
ASOS	Automated Surface Observing System
BPIPPRM	Building Profile Input Program for Plume Rise Model Enhancements
CAMS	Continuous Air Monitoring Station
CFR	Code of Federal Regulations
cm	centimeters
DEM	digital elevation model
EAF	electric arc furnace
EI	emissions inventories
EIQ	emissions inventory questionnaires
EPA	United States Environmental Protection Agency
EPN	Emission Point Number
ERG	Eastern Research Group, Inc.
FCAA	Federal Clean Air Act
FIN	Facility Identification Number
FR	*Federal Register*
GEP	good engineering practice
GNB	GNB Technologies, Inc.
GPS	global positioning system
HAP	hazardous air pollutants
HEPA	high efficiency particulate air
ISHD	Integrated Surface Hourly Data
km	kilometer
lb/hr	pounds per hour
lb/hr•m^2	pounds per hour per square meter
m/sec	meters per second
mph	miles per hour

NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NLCD	National Land Cover Database
PRIME	Plume Rise Model Enhancements
psia	pounds per square inch absolute
PTFE	polytetrafluoroethylene
R^2	correlation coefficient
RACM	reasonably available control measure
RACT	reasonably available control technology
RFP	reasonable further progress
scfm	standard cubic feet per minute
scm/sec	standard cubic meter per second
SIP	state implementation plan
SSE	south-southeast
TAC	Texas Administrative Code
TACB	Texas Air Control Board
TCAA	Texas Clean Air Act
TCEQ	Texas Commission on Environmental Quality (commission)
TNRCC	Texas Natural Resource Conservation Commission
tons/hr	tons per hour
tpd	tons per day
tpy	tons per year
USGS	United States Geological Survey
$\mu g/m^3$	micrograms per cubic meter
WESP	wet electrostatic precipitator

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CHAPTER 1: GENERAL

1.1 BACKGROUND

The *History of the Texas State Implementation Plan (SIP)*, a comprehensive overview of the SIP revisions submitted to the United States Environmental Protection Agency (EPA) by the State of Texas, is available on the Texas Commission on Environmental Quality's (TCEQ) Introduction to the Texas SIP Web page (http://www.tceq.texas.gov/airquality/sip/sipintro.html).

1.2 INTRODUCTION

The EPA designated a portion of Collin County as a lead nonattainment area for the 1978 lead National Ambient Air Quality Standard (NAAQS) on November 6, 1991 (56 FR 56694). The EPA approved the Collin County lead attainment demonstration SIP revision for the 1978 lead NAAQS on November 29, 1994 (59 FR 60930). The EPA redesignated the area to attainment and approved the first 10-year maintenance plan in October 15, 1999 (64 FR 55421). In 2009, the TCEQ submitted to the EPA the second and final 10-year maintenance plan for the 1978 lead NAAQS. The maintenance plan included contingency measures to promptly correct any violation of the 1978 lead NAAQS. Because there was only one significant lead source in the nonattainment area, all measures were directed at this source. The contingency measures included in the 2009 maintenance plan required Exide Technologies' (Exide) battery recycling plant to do one of the following if the area monitored lead concentrations above the 1978 lead NAAQS:

- automate the scale and feed for the reverberatory furnace;
- expand the existing water misting dust suppression system; or
- implement an alternative measure that will provide, at a minimum, emissions reductions equivalent to those listed previously.

On November 12, 2008, the EPA substantially strengthened the NAAQS for lead. The new standard, set at 0.15 micrograms per cubic meter ($\mu g/m^3$) measured as a rolling three-month average, is significantly more stringent than the previous standard of 1.5 $\mu g/m^3$ measured as a quarterly average (73 FR 66964). On November 22, 2010, the EPA designated a portion of Collin County surrounding Exide as nonattainment for the 2008 lead NAAQS, effective December 31, 2010 (75 FR 71033). The 2008 lead NAAQS final rule contained a revised method for calculating averaging time for the purposes of comparing monitored data to the NAAQS. Compliance with the 2008 lead NAAQS is based on 36 three-month rolling averages. For an ambient air monitoring site to meet this standard, no three-month rolling average for the previous 36 months prior to the attainment date may exceed 0.15 $\mu g/m^3$. The EPA's deadline for Collin County to attain the 2008 lead NAAQS is as expeditiously as practicable, but no later than December 31, 2015. Appendix B: *Monitoring Data from Collin County Lead Monitors* describes available monitoring data in Collin County since November 2002.

1.3 CURRENT SIP REVISION

Effective December 15, 2010, the EPA designated a 1.28 square mile area surrounding Exide in Frisco, Texas, as nonattainment for the 2008 lead NAAQS (75 FR 71033). The nonattainment area is a portion of Collin County located in the City of Frisco that is bounded to the north by latitude 33.153, to the east by longitude -96.822, to the south by latitude 33.131, and to the west by longitude -96.837. Figure 1-1*: Map of Collin County Lead Nonattainment Area* provides a visual representation of the nonattainment area. Lead nonattainment areas designated in 2010 are required to attain the 2008 lead NAAQS as expeditiously as practicable but no later than December 31, 2015. The state must submit a SIP revision addressing the lead nonattainment area requirements of the Federal Clean Air Act (FCAA) by June 30, 2012. To ensure that the Collin County nonattainment area attains the 2008 lead NAAQS as expeditiously as practicable, this SIP revision includes control measures implemented during SIP development, but prior to adoption, as agreed upon by Exide.

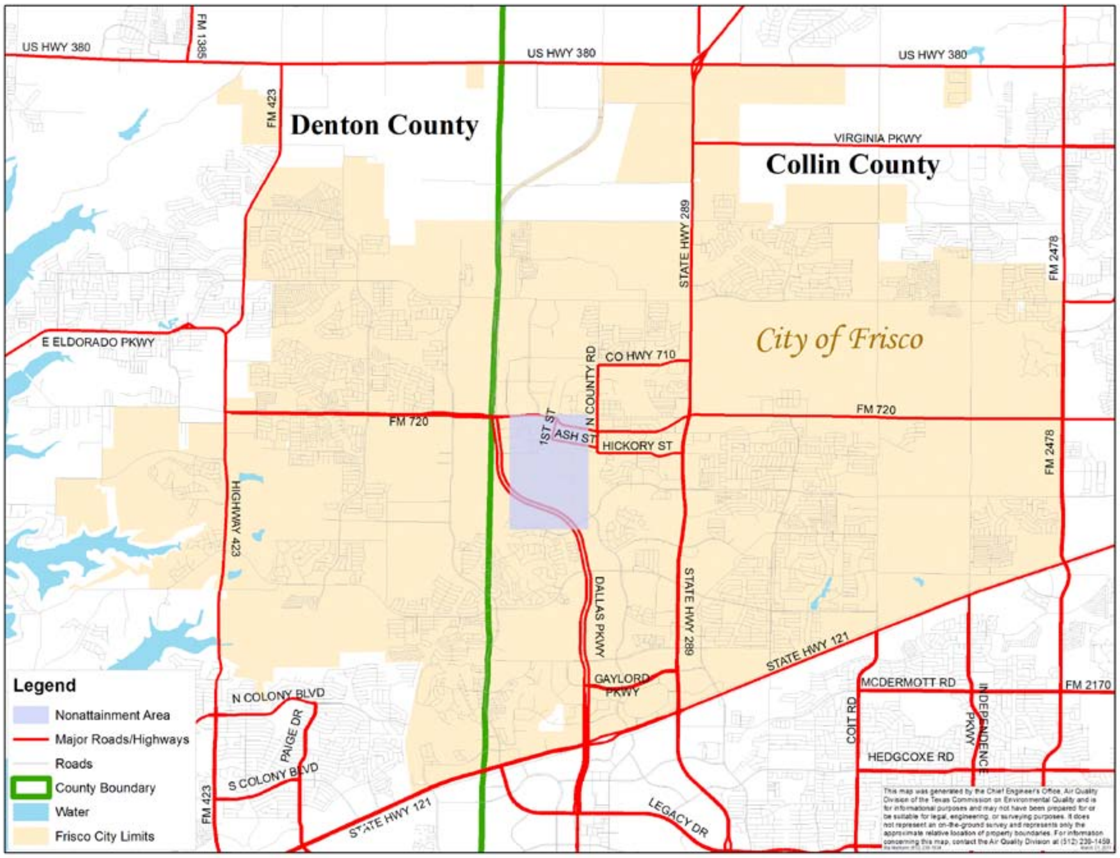

Figure 1-1: Map of Collin County Lead Nonattainment Area

This SIP revision demonstrates attainment of the 2008 lead NAAQS using an air dispersion modeling analysis and contains control measures necessary to bring Collin County into attainment as expeditiously as practicable but no later than December 31, 2015. In addition to control measures, this SIP revision contains contingency measures to be implemented if the area fails to meet the federal deadline or fails to meet reasonable further progress (RFP) requirements. As required by the FCAA and the EPA's implementation guidance for the 2008 lead NAAQS, this SIP revision also contains a reasonably available control measure and a reasonably available control technology analysis, and an RFP demonstration.

The control measures and contingency measures identified for this SIP revision are enforceable through Agreed Order 2011-0521-MIS between the TCEQ and Exide. To ensure compliance with the 2008 lead NAAQS, the Agreed Order is being adopted concurrently with this SIP revision. The Agreed Order provides enforceable measures to reduce emissions necessary for the Collin County lead nonattainment area to attain the 2008 lead NAAQS as expeditiously as practicable, but no later than December 31, 2015, and contains contingency measures designed to ensure continued compliance with the standard.

1.4 SUMMARY OF MEASURED LEAD CONCENTRATIONS IN FRISCO

The 2008 lead NAAQS final rule contained a revised method for calculating averaging time for the purposes of comparing monitored data to the NAAQS. Compliance with the 2008 lead NAAQS is based on 36 three-month rolling averages. Collin County must monitor attainment of the NAAQS by the EPA's compliance deadline of December 31, 2015.

As of February 27, 2012, the lead design value for Collin County is 0.71 µg/m^3. Table 1-1: *Monitoring Data from Collin County Lead Monitors* describes the most recent 36-month period of lead monitoring data in Collin County.

Table 1-1: Monitoring Data from Collin County Lead Monitors

Monitor/ Aerometric Information Retrieval System Number	Highest 3-month ambient air concentration average in the most recent 36-month period (µg/m^3)	Most recent three-month rolling average as of 2/27/12 (µg/m^3)
Eubanks 480850009	(October 2010) 0.71	0.13
Ash Street 480850007	0.20	0.05
Parkwood 480850003	0.37	0.05
Stonebrook 480850029	0.18	0.03

1.5 HEALTH EFFECTS

On October 15, 2008, the EPA substantially strengthened the NAAQS for lead. According to the EPA's final rule for the 2008 lead NAAQS (73 FR 66964), scientific evidence about lead and health has expanded dramatically since the EPA issued the initial standard of 1.5 µg/m^3 in 1978. More than 6,000 new studies on lead health effects, environmental effects, and lead in the air have been published since 1990. Evidence from health studies shows that adverse effects occur at much lower concentrations of lead in blood than previously thought.

Lead that is emitted into the air can be inhaled directly or ingested after it settles onto surfaces or soils. However, for the general population, exposure to lead occurs primarily via ingestion through contact with contaminated soils or other surfaces. Once taken into the body, lead distributes throughout the body in the blood and accumulates in the bones. Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and the cardiovascular system. Lead exposure also affects the oxygen-carrying capacity of the blood.

The most commonly encountered effects of lead exposure in current populations are neurological effects in children and cardiovascular effects (e.g., high blood pressure and heart disease) in adults. Children are at a higher risk of exposure to lead when compared to adults. The risk of exposure is higher because children tend to put their hands and other objects, which may contain lead, into their mouths (e.g., lead-based paint chips from older homes). Children also have a higher risk of adverse effects because their brains are still developing. Infants and young children are especially sensitive to low levels of lead, which may contribute to behavioral problems, learning deficits, and lowered Intelligence Quotient.

1.6 PUBLIC COMMENT AND STAKEHOLDER PARTICIPATION

1.6.1 Stakeholder Meetings

The TCEQ held a lead stakeholder meeting to discuss concepts for potential control strategies for the Collin County lead nonattainment area and to present an overview of the SIP revision development process. The meeting was held at the City of Frisco Council Chambers on January 19, 2011. TCEQ staff from the Toxicology, Air Permits, and Air Quality Divisions presented information and answered questions. Staff presented stakeholders with an overview of the health effects of lead, an update on the 2008 lead NAAQS, the associated SIP revision, an overview of the role of modeling in demonstrating attainment, and a draft list of potential control strategies. The presentation and additional information about the lead stakeholder meeting can be found at the SIP for Lead Stakeholder Group Web page (http://www.tceq.texas.gov/airquality/sip/stakeholders/pb_stakeholder).

1.6.2 Public Hearing and Comment Information

The public comment period opened on June 24, 2011, and closed on August 8, 2011. Notice of public hearings for this SIP revision and Agreed Order were published in the *Texas Register* and various newspapers. Written comments were accepted via mail, fax, and through the TCEQ's eComments system.

The commission held a public hearing for the proposed Collin County Attainment Demonstration SIP Revision for the 2008 Lead NAAQS, which included Agreed Order 2011-0521-MIS, on July 28, 2011, at 6:00 p.m. at the Frisco City Council Chambers. During the comment period the commission received comments from Downwinders at Risk, the EPA, Exide, Texas Campaign for the Environment, and 23 individuals.

Electronic copies of the SIP revision, Agreed Order, and all appendices can be obtained from the TCEQ's Texas SIP Revisions Web page (http://www.tceq.texas.gov/airquality/sip/sipplans.html).

1.7 SOCIAL AND ECONOMIC CONSIDERATIONS

No significant fiscal implications are anticipated for the TCEQ or other units of state or local governments as a result of administration or enforcement of Agreed Order 2011-0521-MIS. Because Exide is the primary contributing source to the nonattainment area, all controls to reach attainment will be borne by this source. As such, any economic impacts will be limited to the single lead source associated with this SIP revision. The Agreed Order is expected to have significant fiscal impact to Exide. The citizens living and working within the nonattainment area will benefit from reduced lead emissions.

1.8 FISCAL AND MANPOWER

The TCEQ has determined that its fiscal and manpower resources are adequate and will not be adversely affected through implementation of this plan.

CHAPTER 2: EMISSIONS INVENTORY

2.1 INTRODUCTION

Federal Clean Air Act, §172(c)(3) requires the development of emissions inventories (EI) for nonattainment areas. The Texas Commission on Environmental Quality (TCEQ) maintains a point source EI with information on major lead sources. The EI identifies the types of emissions sources present in an area, the amount of each pollutant emitted, and the types of processes and control devices employed at each plant or source category.

On November 22, 2010, the United States Environmental Protection Agency (EPA) designated a portion of Collin County, located in Frisco, Texas, as a lead nonattainment area, effective December 31, 2010 (75 FR 71033). This nonattainment area surrounds Exide Technologies' (Exide) lead battery recycling plant, a point source that submits annual emissions inventory data to the TCEQ. This chapter discusses general EI development for the point source category. Contributions from non-point sources were found to be insignificant. See Section 2.3: *Other Source Categories* for more information about emissions from non-point source categories.

2.2 POINT SOURCES

2.2.1 Emissions Inventory Development

Stationary point source emissions data are collected annually from sites that meet the reporting requirements of 30 Texas Administrative Code §101.10. The TCEQ receives emissions inventory data from sites identified as meeting the reporting requirements. Companies are required to report emissions data and to provide samples of calculations used to determine the emissions. Information characterizing the process equipment, the abatement units, and the emission points is also required. All data submitted in the emissions inventory questionnaires (EIQ) are reviewed for quality assurance purposes and then stored in the State of Texas Air Reporting System database.

2.2.2 Updated 2010 Emissions Inventory

The TCEQ requested that Exide submit an expedited 2010 lead emissions inventory for all lead-emitting sources located at the company's battery recycling plant in Frisco, Texas. Exide submitted the 2010 lead emissions inventory data to the TCEQ on February 24, 2011. Total reported lead emissions for 2010 are 1.09 tons per year. There are no other point sources in the Collin County nonattainment area that have reported lead emissions to the emissions inventory.

The 2010 lead emissions inventory that Exide submitted on February 24, 2011, is reproduced in Appendix C: *Annual Emissions Inventory Update for Exide Technologies' Frisco Lead Battery Recycling Plant.*

2.3 OTHER SOURCE CATEGORIES

According to the Air Emissions Reporting Requirements (73 FR 76539), only annual point source emissions are required to be reported to the EPA for the 2010 inventory year. Since the next triennial reporting year is 2011, the mobile and area source periodic emissions inventories were not developed for 2010. However, a review of 2008 data indicated an insignificant contribution of lead emissions (less than 0.1%) from these non-point sources. Therefore, the point source category is the only inventory category developed for the inventory year.

CHAPTER 3: AIR DISPERSION MODELING

3.1 INTRODUCTION

The Texas Commission on Environmental Quality (TCEQ) performed a dispersion modeling analysis for the Collin County Attainment Demonstration State Implementation Plan (SIP) Revision for the 2008 Lead National Ambient Air Quality Standard (NAAQS). The dispersion modeling analysis examined the potential effectiveness of proposed emission controls at the Exide Technologies (Exide) site in Frisco, Texas.

The analysis evaluated the air quality impact of the control strategies listed in Section 4.4: *New Control Measures* of this SIP revision and described in Appendix A: *Agreed Order 2011-0521-MIS* between the TCEQ and Exide. Dispersion modeling was used to validate that the control strategies will bring the Collin County lead nonattainment area into compliance with the 2008 lead NAAQS.

3.2 CONCEPTUAL MODEL

3.2.1 Monitoring Data Analysis

In order to determine if all sources of lead at the Exide site were accounted for and if there were other sources of lead near the Exide site, the TCEQ reviewed and analyzed monitoring data from the Eubanks (Aerometric Information Retrieval System (AIRS) number 480850009), Parkwood Street (AIRS number 480850003), and the Ash Street (AIRS number 480850007) monitors for the period 2006 through 2010. Figure 3-1: *Map of Current Lead Monitors in Frisco* shows the location of the current lead monitors in Frisco in relation to the Exide facility. All three monitors are located near Exide's production facility and active landfill. The active landfill is located approximately 75 meters due east of the Eubanks monitor and 330 meters south of the Ash Street monitor. Particular attention was given to data from 2008 as the highest rolling three-month average concentration (May through July 2008) of 1.26 micrograms per cubic meter ($\mu g/m^3$), highest monthly average concentration (May 2008) of 1.56 $\mu g/m^3$, and highest 24-hour average concentration (June 5, 2008) of 3.42 $\mu g/m^3$ for the period of 2006 through 2010.

TCEQ staff compared trends in monitored concentrations to wind direction and wind speed. Since the sampling period for the monitors is 24 hours, days when the wind direction did not vary more than 90 degrees were given more consideration. TCEQ staff also compared concentrations between monitors during identical sampling times. None of the three monitors near the Exide site gathered meteorological data during this time period, e.g., wind speed and wind direction, so the nearest monitor with meteorological data, Frisco Continuous Air Monitoring Station (CAMS) (AIRS number 480850005), was used.

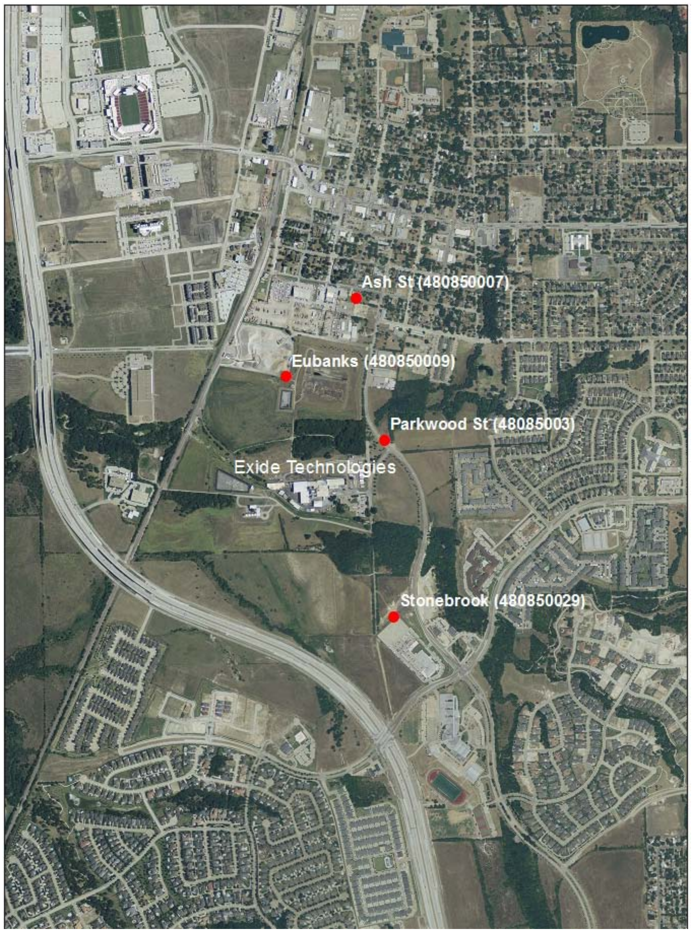

Figure 3-1: Map of Current Lead Monitors in Frisco

The data show that the hourly wind direction when the lead monitors were sampling was either from the south or southeast approximately 49% of time. The wind directions next most frequent during sampling periods were northwest and east, each approximately 12% of the time. Northerly winds occurred approximately 11% of the time. Winds from the northeast, west, and southwest each occurred approximately 5% of time.

The analyses showed that higher lead concentrations were slightly more likely to occur when the wind speeds were high. Though there was a correlation between lead concentrations and wind speed, it was a very weak correlation. When looking at data from each monitor, only the Eubanks monitor data showed a correlation between lead concentrations and wind speed. Data from the Parkwood Street and Ash Street monitors showed no correlation between lead concentrations and wind speed.

When partitioning data by concentration, for concentrations greater than 1.0 $\mu g/m^3$, the mean daily wind speed was 10.6 miles per hour (mph). For concentrations less than 1.0 $\mu g/m^3$, the mean daily wind speed was 7.5 mph. However, 56 of the 60 24-hour samples greater than 1.0 $\mu g/m^3$ occurred at the Eubanks monitor.

When comparing measured concentrations between monitors during identical sampling times, the data show a moderate correlation in concentrations between the Eubanks monitor data and the Ash Street monitor data. The data show a weak correlation between the Eubanks monitor data and the Parkwood Street monitor data. The data also show a moderate to weak correlation between Ash Street monitor data and the Parkwood Street monitor data. The best fit correlations were exponential relationships.

The following conclusions can be drawn for the monitoring analysis from 2006 through 2010 data.

- Eubanks monitor samples are dominated by emissions from the Exide site processes. The Exide site process area is south to southeast of the Eubanks monitor. Southerly and southeasterly winds will transport emissions from the process area towards the Eubanks monitor.
- The Ash Street and Parkwood Street monitor samples are routinely more indicative of background sources of lead emissions. The Exide site process area is south southwest of the Ash Street monitor and west southwest of the Parkwood Street monitor. With southwesterly and westerly winds being the least frequent, approximately 90% of the winds during this time period are not blowing from the Exide process area to the monitor.
- Based on the 2006 to 2010 data, the Exide site active landfill does not appear to be an appreciable lead emission source. However, the TCEQ will continue to review the data as it is available to determine any potential contribution from the landfill.

Based on the monitoring data, additional fugitive emissions were included with the base case modeling. As a result, model performance was significantly improved. The details of the data analysis are in Appendix D: *Conceptual Model*.

3.2.2 Model Performance Analysis

The TCEQ compared modeled predicted rolling three-month, monthly, and 24-hour average concentrations to monitored concentrations during the period 2006 through 2010. This modeling analysis was a reasonable attempt to replicate actual conditions. The purpose of modeling actual conditions was to determine if all sources were accounted for and appropriately characterized in the modeling. When all sources are accounted for and characterized, the modeling results should reasonably agree qualitatively with the monitoring data. Qualitative agreement would not be exact agreement between modeled and monitored concentrations in time and space but would reflect similarity in concentration trends over time and dispersion patterns in a general area. Once the current actual conditions have been sufficiently replicated, the appropriate target of the control strategies can be inferred.

TCEQ staff initially modeled the maximum hourly allowable emission rates authorized by Exide's permits 1147A and 3048A based on representations approved in October 2010. Given the variability of emissions due to the nature of the processes and not all processes operating at the same time, modeling maximum hourly allowable emission rates occurring from all sources at the same time should produce an over-prediction of ambient concentrations that would exceed any actual monitored value. The maximum modeled concentration was approximate 50% less than the maximum monitored concentration.

Stack testing of point sources associated with permit 1147A demonstrated that these point sources were emitting below maximum hourly allowable emission rates. Analysis of the modeling results showed that fugitive sources dominated the maximum predicted concentrations and the point source impact was minimal.

From the model performance analysis, the following conclusions were made.

- Fugitive emissions from the Exide site process area appear to be under-estimated.
- Control of stack emissions alone is not sufficient to demonstrate compliance with the lead NAAQS.
- Control of fugitive emission sources would significantly reduce monitored concentrations, particularly at the Eubanks monitor.

The details of the model performance analysis for the conceptual model are contained in Appendix D.

3.3 MODEL AND MODELING INPUTS

3.3.1 Model and Model Programs

The dispersion modeling analysis to demonstrate compliance with the lead NAAQS was performed using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD). There are two input data processors that are regulatory components of the AERMOD modeling system: AERMET, a meteorological data preprocessor that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, and AERMAP, a terrain data preprocessor that incorporates complex terrain using United States Geological Survey (USGS) Digital Elevation Data. The Building Profile Input Program for Plume Rise Model Enhancements (BPIPPRM), a multi-building dimensions program incorporating the good engineering practice (GEP) technical procedures for Plume Rise Model Enhancements (PRIME) applications was also used.

The selections made for model programs, model settings, meteorological data, and downwash data for this analysis are summarized below.

- AERMOD (Version 11353) was used with default regulatory settings. Since the current version of AERMOD is not capable of calculating rolling three-month average concentrations, the United States Environmental Protection Agency (EPA) post-processor LeadPost (Version 11237) was used. The input values to LeadPost are monthly average values at each receptor in the POSTFILE output format from AERMOD.
- AERMET (Version 11059) was used to process meteorological data for the period 2006 through 2010.
- Downwash parameters were generated using BPIPPRM (Version 04274). Building and point source locations were derived from global positioning system (GPS) measurements by TCEQ regional staff and validated by TCEQ Air Permits Division staff using aerial photography.
- Terrain elevations within the modeling domain were determined using AERMAP (Version 11103). The input data used for this analysis were USGS seamless data covering the following digital elevation models (DEMs): Little Elm, Frisco, Lewisville East, and Hebron data sets.

3.3.2 Meteorology

3.3.2.1 Surface Characteristics

In order to generate meteorological input data for use with AERMOD, surface characteristics (noontime albedo, Bowen ratio, and surface roughness length) of the modeling domain must be obtained for input for AERMET. Values for Bowen ratio and surface roughness length for the modeling domain were calculated using the methodology proposed by the Alaska Department of Environmental Conservation (ADEC) described in *ADEC Guidance re AERMET Geometric Means, How to Calculate the Geometric Mean Bowen Ratio and the Inverse-Distance Weighted Geometric Mean Surface Roughness Length in Alaska,*[1] with input of land cover data from the USGS National Land Cover Database (NLCD) 2006. The ADEC guidance provided an equivalent calculation method to the surface characteristic pre-processor program

AERSURFACE (Version 08009), which requires the input of land cover data from the USGS NLCD 1992. The ADEC guidance is for use with land cover data other than the 1992 NLCD.

The 2006 NLCD was used rather than the 1992 NLCD due to the rapid growth of the Frisco area. From United States Census Bureau data, the 1990 population of Frisco was less than 10,000, the 2000 population was over 30,000, and the 2010 population was over 116, 000. For this reason, the 1992 NLCD was deemed not representative of current land cover characteristics. The 2006 NLCD is the most recent available dataset, so it was used for this modeling analysis.

Using the 1992 NLCD classifications obtained from the AERSURFACE User's Guide,[2] land cover data from 2006 were reclassified to reasonably equivalent 1992 NLCD classifications using documentation from the NLCD 1992/2001 Retrofit Land Cover Change Product.[3] The NLCD 1992/2001 Retrofit Land Cover Change Product is also appropriate for use with the 2006 NLCD.

Representative noontime albedo, Bowen ratio, and surface roughness length values were calculated using the reclassified 2006 NLCD with the ADEC guidance. The noontime albedo and average Bowen ratio values were calculated using the reclassified 2006 NLCD for all land classifications within a 10 kilometer (km) square, as specified by the AERSURFACE User's Guide, surrounding the Exide site. The surface roughness length value was calculated using the reclassified 2006 NLCD for all land classifications within a 1 km radius of the Exide site centroid, as specified by the AERSURFACE User's Guide. The noontime albedo calculated was 0.1747, Bowen ratio was 0.9334, and surface roughness length was 0.2625 meters. Detailed explanations of the methodology and calculations are contained in Appendix E: *Surface Analysis Calculations*.

3.3.2.2 Raw Data Input

Meteorological raw input data were used with generalized surface characteristics of the application site and processed with AERMET (Version 11059). This version of AERMET integrates one-minute Automated Surface Observing System (ASOS) wind data with Integrated Surface Hourly Data (ISHD) using the EPA's AERMINUTE (Version 11325) program. ISHD and one-minute ASOS wind data were obtained from the National Climactic Data Center. The upper air data was obtained from the National Oceanic Atmospheric Administration Earth System Research Laboratory.

Meteorological data from 2006 through 2010 from the Dallas-Fort Worth surface station (Station # 03927) and the Fort Worth upper air station (Station # 03990) were used in these analyses. Missing data from the Dallas-Fort Worth surface station were replaced with available 2006 through 2010 data from the McKinney Airport surface station (Station # 53914). The McKinney Airport was selected because it is the nearest National Weather Service station to the lead nonattainment area. The McKinney Airport ISHD and one-minute ASOS wind data were processed in conjunction with Fort Worth upper air data using AERMET. Any hours that contained missing data in the Dallas-Fort Worth input file were replaced with the corresponding hourly data in the McKinney Airport input file when available. Table 3-1: *Missing and Calm Hours in Meteorological Data* lists the number of hours with missing and filled data. A "calm" is defined as "a reported wind speed less than three knots."

Table 3-1: Missing and Calm Hours in Meteorological Data

Year	Total Hours	Missing Hours Before Fill	Missing Hours After Fill	Calm Hours Before Fill	Calm Hours After Fill
2006	8,760	202	166	28	29
2007	8,760	314	294	37	39
2008	8,784	211	183	117	119
2009	8,760	95	83	19	20
2010	8,760	62	42	63	63

3.3.2.3 Meteorology Sensitivity Analysis

A sensitivity analysis was performed using the base case emissions with unfilled and filled meteorological input data. The rolling three-month average lead concentrations were compared receptor by receptor. At the location of the highest predicted concentration, the difference in concentration was 0.07%. For all receptors within 1 km of the Exide site, the difference was less than 2%, except for five receptors. At those five receptors, the difference was less than 2.5%. Due to the small number of missing hours of data, small number of hours with calms compared to the total number of hours, the highest predicted concentration being at or near the site property line, and the rolling three-month averaging time for predicted concentrations, additional filling of meteorological data would not significantly impact the modeling results.

3.3.3 Receptor Grid

The receptor grid used in the modeling analyses consisted of receptors with 100-meter spacing and extended approximately 3 km from the Exide site property line in all directions. Discrete receptors were used for the locations of the existing ambient air monitoring stations. Additional receptors with 25-meter spacing were located in the vicinity of the Eubanks monitor. The receptor representing the location of the Eubanks monitor has historically been the location of the maximum predicted concentration of lead. Graphical representations of the receptor grids are depicted in Figure 3-2: *Graphical Representation of Receptor Grid Showing Full Grid* and Figure 3-3: *Graphical Representation of Receptor Grid Showing Refined Grid*.

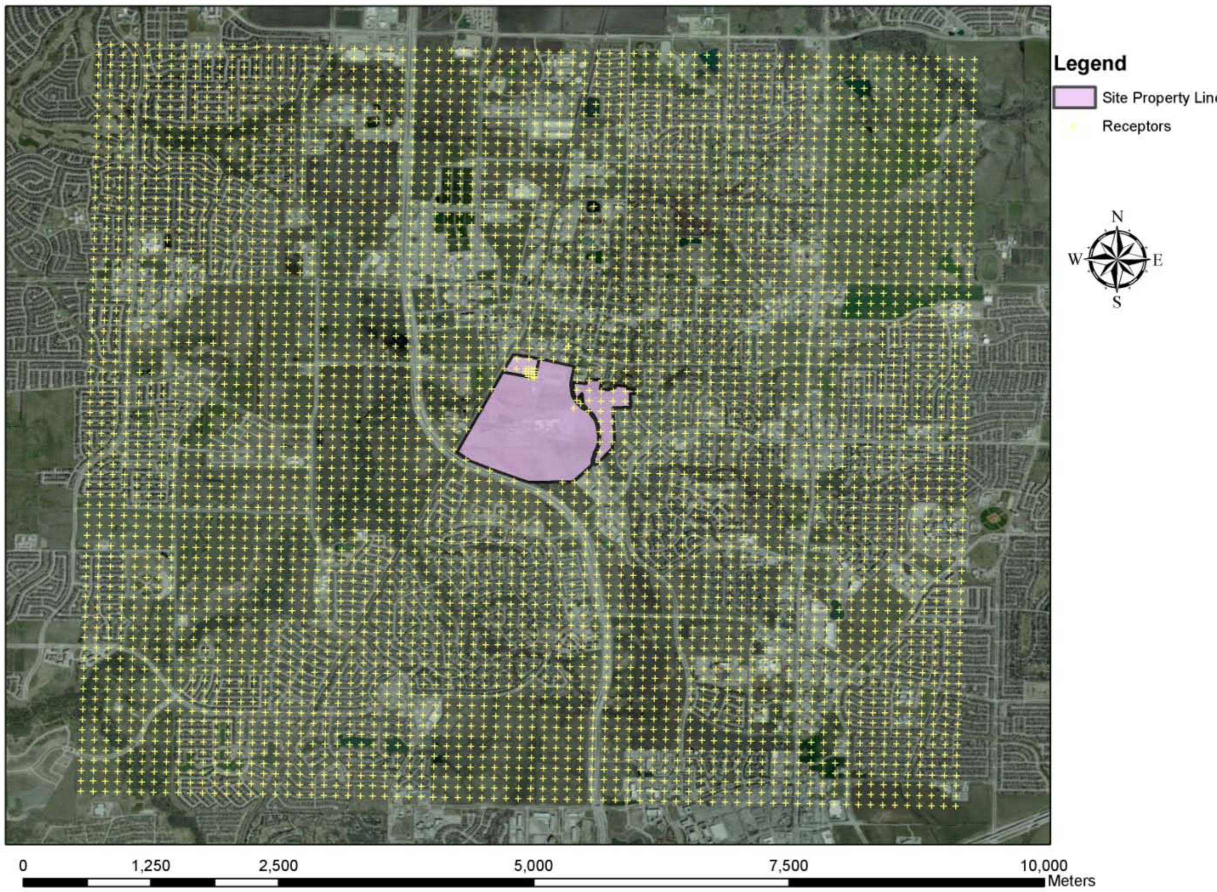

Figure 3-2: Graphical Representation of Receptor Grid Showing Full Grid

Figure 3-3: Graphical Representation of Receptor Grid Showing Refined Grid

3.4 SOURCE INPUT DATA

3.4.1 Source and Building Configuration

The sources modeled are listed in Table 3-2: *List of Sources Modeled*. This list represents all emission sources from Emission Point Numbers (EPN) of lead and lead compounds at the Exide site.

Table 3-2: List of Sources Modeled

EPN	Source Name	Permit Authorization
10A	Blast Furnace Fugitive Baghouse Stack	1147A
18	Hard lead Ventilation Baghouse Stack	1147A
21	Soft Lead Refining and Feeder Dryer	1147A
22	Specialty Alloy Baghouse Stack	1147A
23	Refining Building Vacuum Stack	1147A
35A	RF Refining Casting Fugitive Baghouse Stack	1147A
37	Reverberatory/Blast Furnaces Fugitive Baghouse Stack	1147A
38	Reverberatory/Blast Furnaces Metallurgical Scrubber Stack	1147A

EPN	Source Name	Permit Authorization
39A	Slag Treatment Baghouse	1147A
45	Raw Material Storage Shredder Baghouse Stack	1147A
48	Battery Breaker Scrubber Stack	1147A
48A	Battery Breaker Enclosure Baghouse Stack	1147A
ROAD	Vehicle Traffic	1147A
BUILDFUG	Total Enclosure Fugitives	1147A
OCS	Consolidated Stack For Oxide Sources	3048A
27	West Truck Loading Fugitive	3048A
28	East Truck Loading Fugitive	3048A

The stack parameters for point sources and area sources are listed in Table 3-3: *Point Sources and Associated Parameters* and Table 3-4: *Area Sources and Associated Parameters*. The locations, elevations, and other parameters are those represented by Exide during their permit review.

Table 3-3: Point Sources and Associated Parameters

EPN	Easting (meters)	Northing (meters)	Elevation (meters)	Height (meters)	Temperature (Kelvins)	Velocity (meters/sec)	Diameter (meters)
18	702628.1	3668768	193.7	30.63	312.73	4.98	1.62
21	702626.9	3668739	193.6	31.24	310.74	18.08	1.52
22	702685.7	3668804	194.6	22.86	304.17	15.05	0.81
23	702637.4	3668765	193.8	7.7	351.3	14.19	0.18
37	702682.6	3668810	194.6	22.86	309.45	19.15	1.68
38	702620.2	3668772	193.7	50.29	315.25	15.94	1.37
39A	702672	3668836	194.6	30.48	0	23.64	1.37
45	702623.1	3668714	193.5	32.16	303.1	12.92	1.8
48	702585	3668771	193.4	15.77	0	12.28	1.01
48A	702593	3668828	193.5	30.48	0	22.96	1.98
10A	702686	3668817	194.7	30.48	0	22.96	1.98
35A	702715	3668841	195.2	30.48	0	22.96	1.98
OCS	702728	3668827	195.4	30.48	360.93	19.72	0.99

Table 3-4: Area Sources and Associated Parameters

EPN	Easting (meters)	Northing (meters)	Elevation (meters)	Height (meters)	E-W Length (meters)	N-S Length (meters)	Rotation (degrees)
BUILDFUG	702550.1	3668758.5	193.19	2.0	214	57	-2
27	702733.8	3668768	194.8	4.57	0.91	0.91	0
28	702756.3	3668782	195.4	4.57	0.91	0.91	0

EPN	Easting (meters)	Northing (meters)	Elevation (meters)	Height (meters)	E-W Length (meters)	N-S Length (meters)	Rotation (degrees)
ROAD	702532	3668809	193	1	NA	NA	NA

The dimensions of the modeled area sources are representative of the actual areas where the emissions are generated. The height of release for sources 27 and 28 is based on the height where the emissions escape a structure. The source ROAD is represented as an AREAPOLY source with 18 vertices. The source location encompasses the area where truck and vehicle traffic would occur. The release height for source ROAD was set to 1 meter, which is a reasonable release height for road generated emissions.

The source BUILDFUG is represented as a rectangular area source having the approximate size and extent of the process area at the Exide site. The height of this source is represented as 2 meters, as this measurement is approximately half the eve height of the shortest building structure in the process area. This source representation is conservative since the emissions are treated as occurring continuously and transported by the wind unobstructed by physical barriers. In reality, the fugitive emissions will be occurring sporadically and be transported around building structures by the wind. This area source characterization is consistent with fugitive emission representation in the protectiveness analysis of the secondary lead smelter maximum achievable control technology.

For the graphical representation depicting source locations and building configuration, refer to Figure 3-4: *Graphical Representation of Modeled Emission Source Locations and Building Configuration*.

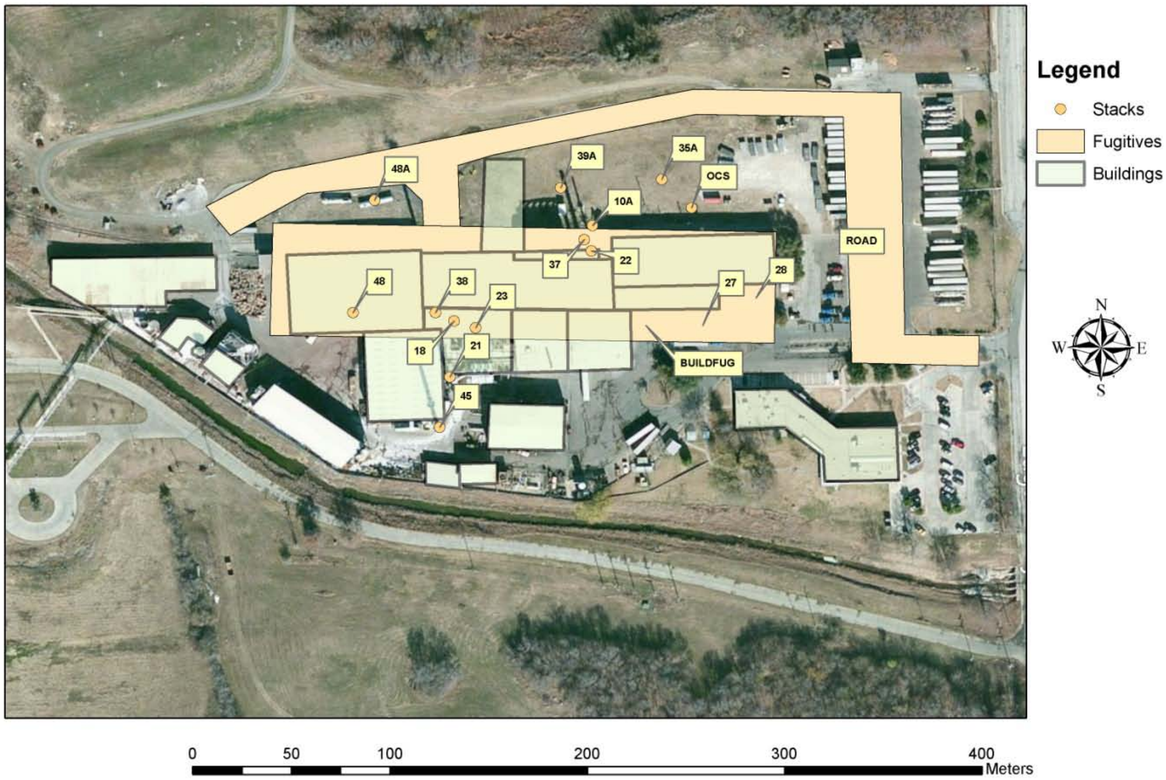

Figure 3-4: Graphical Representation of Modeled Emission Source Locations and Building Configuration

3.4.2 Emissions Inventory

The emission rates modeled are the allowable emission rates represented in permits 1147A and 3048A. For this demonstration of compliance with the lead NAAQS, the maximum hourly emission rates were modeled. The model treats all sources as emitting the maximum rate simultaneously every hour. Given that the form of the lead NAAQS is a rolling three-month average concentration, modeling maximum hourly emission rates is extremely conservative, predicting a higher concentration than would be actually monitored, due to the variability of actual emission rates and the fact that not all sources operate at the same time. The aggregate maximum hourly lead emission rate for all the stack sources is limited to 0.4517 pound per hour. Individual emission rates by source can be found in TCEQ permit numbers 1147A and 3048A.

3.4.3 Background Sources

A background concentration was developed consistent with 40 Code of Federal Regulations (CFR) 51 Appendix W Chapter 8.2.2. The mean background concentration was determined at each monitor by excluding values when the source in question is impacting the monitor.

Exide is a significant contributor of lead emissions. Four lead ambient air monitors currently collect 24-hour lead concentration samples around the Exide site. Three of the four current lead monitors (Ash Street, Parkwood Street, and Stonebrook) were used to calculate the lead background concentrations due to their upwind location from Exide when the wind is blowing away from the Exide site. Because there was only one year of valid data available at the Stonebrook monitor, the deactivated Gould National Battery monitor (operational from 1993 through 1996) was also used in the background analysis. Use of the Gould National Battery monitor gives a total of four years of data and data from that monitor is comparable because trends investigated from previous years determined no increases or decreases in overall lead concentration trends at that monitor. The Ash Street and the Parkwood Street monitors were used to determine background lead concentrations from the north and east directions from 2006 through 2010. The Stonebrook and Gould National Battery monitors determined background lead concentrations when air was incoming from the southern direction. All four monitors fit the recommendations from EPA 40 CFR 51 Chapter 8.2.2. The location of each monitor as well as the location of Exide are displayed in Figure 3-5: *Lead Background Monitors around Exide Technologies*.

Figure 3-5: Lead Background Monitors around Exide Technologies

Lead sampling data were used to determine the 24-hour lead concentrations. Because no meteorological data was available at the Ash Street, the Parkwood Street, the Gould National Battery, or the Stonebrook monitors, hourly wind data was taken from the Frisco CAMS 31 monitor. For the Stonebrook monitor, wind data from Frisco Eubanks CAMS 1010 was used for dates after June 08, 2011. Wind direction windows, shown in Table 3-5: *Wind Direction Windows in Frisco Monitors*, of either 0 through 90 degrees, 0 through 120 degrees, 45 through 270 degrees, or 270 through 359 degrees were assigned, depending on the monitoring location, to define the monitor to be upwind from the isolated source. Only wind speeds 2 miles per hour (mph) and above were considered due to higher wind speeds yielding better wind direction estimates.

Table 3-5: Wind Direction Windows in Frisco Monitors

Monitor	AIRS Number	Wind Direction (degrees)	Years
Gould National Battery	480850006	45-270	1993-1996
Stonebrook	480850029	45-270	2011
Ash Street	480850007	270-360, 0-90	2006-2010
Parkwood Street	480850003	0-120	2006-2010

The 24-hour lead concentrations that met the above requirements for a 24-hour period were considered background lead concentrations. Those lead concentrations were then averaged to give a lead background level that represents the air coming from the restricted direction, as shown in Table 3-6: *Background Lead Concentrations by Monitor*.

Table 3-6: Background Lead Concentrations by Monitor

Monitor	AIRS Number	Number of Restricted Days	Mean Lead Background (µg/m3)
Gould National Battery	480850006	76	0.026
Stonebrook	480850029	20	0.032
Ash Street	480850007	32	0.021
Parkwood Street	480850003	7	0.066

A weighted average of the four lead background concentrations was calculated. Consistent with guidance from Appendix W of 40 CFR 51, calculation of the weighted average uses air quality data collected in the vicinity of the source, excludes values when the source is impacting the monitor, and then determines the background by taking the average of the annual lead concentrations at each monitor. The weighted average gives more weight to monitors with more data. This weighting is important because several local monitors have only been in operation for a short period of time. The weighted average also includes potential unknown lead sources in the lead background concentration. The weighted average uses monitoring data from the Gould National Battery (deactivated at the end of 1996), Stonebrook, Ash Street, and Parkwood Street monitors.

The weighted average was calculated by multiplying the number of restricted days by the background mean at each monitor, then dividing the total number of days. The calculated weighted average, rounded to three decimal points, is 0.028µg/m^3 (refer to Table 3-7: *Frisco Lead Background Concentration by Weighted Average*).

Table 3-7: Frisco Lead Background Concentration by Weighted Average

Monitor	Number of Restricted Days	(Restricted x Mean) / Total
Gould National Battery	76	0.014666667
Stonebrook	20	0.004716593
Ash Street	32	0.005040000
Parkwood Street	7	0.003427407
	Calculated Weighted Average (µg/m^3)	**0.027850667**
	Calculated Weighted Average (µg/m^3), Rounded	**0.028**

The methodology used in the analysis follows recommendations made by the EPA for isolated sources. The weighted average of 0.028 µg/m^3 best represents the 24-hour lead background concentration entering into the Exide battery recycling plant area.

3.5 MODELING RESULTS

The maximum predicted three-month rolling concentration was 0.1198 $\mu g/m^3$. The maximum predicted concentration occurred at the receptor representing the location of the Eubanks monitor, which is at the fence line on the northern Exide property line. With a background concentration of 0.028 $\mu g/m^3$, the overall maximum predicted three-month rolling concentration is 0.1478 $\mu g/m^3$. Since the maximum predicted three-month rolling concentration is less than 0.15 $\mu g/m^3$, attainment of the 2008 lead NAAQS is expected based upon implementation of emission controls included in Appendix A: *Agreed Order 2011-0521-MIS.* Figure 3-6: *Graphical Representation of Location of Maximum Predicted Concentration, Wide View* and Figure 3-7: *Graphical Representation of Location of Maximum Predicted Concentration, Zoomed in Near Eubanks Monitor* depict the magnitude and location of maximum predicted lead concentrations.

Additionally, a few emission control measures were not taken into consideration for the modeling analysis. These include the following:

- Replacement of bag media, with polytetrafluoroethylene (PTFE) membrane media, in sources 18, 22, 23, and 37. This change would reduce emissions from these sources due to improved collection of particulate matter;

- Replacement of tube sheeting in sources 18, 21, 22, 23, 37, and 39. This change would reduce emissions from these sources due improved collection of particulate matter; and

- Installation of secondary high efficiency particulate air (HEPA) filtration on all baghouses that receive lead emissions (sources 11 through 18, 21 through 26, 37, and 39) except for the reverbatory and blast furnace baghouse (source 38).

Because these measures were not accounted for in the attainment demonstration modeling, the overall maximum predicted three-month rolling concentration of 0.1478 $\mu g/m^3$ is expected to be conservative.

Figure 3-6: Graphical Representation of Location of Maximum Predicted Concentration, Wide View

Figure 3-7: Graphical Representation of Location of Maximum Predicted Concentration, Zoomed in Near Eubanks Monitor

3.6 REFERENCES

1. "ADEC Guidance re AERMET Geometric Means, How to Calculate the Geometric Mean Bowen Ratio and the Inverse-Distance Weighted Geometric Mean Surface Roughness Length in Alaska," Alaska Department of Environmental Conservation, Revised June 17, 2009.
2. "AERSURFACE User's Guide", EPA-454/B-08-001, United States Environmental Protection Agency, Office of Air Quality Planning and Standards, Air Quality Assessment Division, Air Quality Modeling Group, Research Triangle Park, North Carolina, January 2008.
3. "NLCD 1992/2001 Retrofit Land Cover Change Product", website http://www.mrlc.gov/multizone.php, U.S. Department of the Interior, U.S. Geological Survey, February 25, 2008.

CHAPTER 4: CONTROL STRATEGY AND REQUIRED ELEMENTS

4.1 INTRODUCTION

The Collin County nonattainment area for the 2008 lead National Ambient Air Quality Standard (NAAQS) consists of a 1.28 square mile area surrounding the Exide Technologies (Exide) lead-acid battery recycling operations in Frisco, Texas. Exide is a significant contributor to ambient air lead emissions in the area. In addition to permit numbers 1147A and 3048A held by Exide for the secondary lead smelting and lead oxide operations at the lead-acid battery recycling facility, the Texas Commission on Environmental Quality (TCEQ) has made control measures and contingency measures enforceable through agreed orders adopted as part of the 1993 lead state implementation plan (SIP) for Collin County, the 1999 Collin County Redesignation and Maintenance Plan for Lead, and the 2009 Collin County Maintenance Plan for Lead. This chapter describes existing lead emission control measures in place at Exide, control measures implemented as part of the Agreed Order associated with this SIP revision (Agreed Order 2011-0521-MIS), as well as how Texas meets the lead nonattainment area SIP requirements of reasonably available control technology (RACT), reasonably available control measures (RACM), and contingency measures.

4.2 EXISTING CONTROL MEASURES

Title 30 Texas Administrative Code (TAC) Chapter 113 previously incorporated the existing federal regulations for control of hazardous air pollutants (HAP) from lead smelting facilities that include the National Emission Standards for Hazardous Air Pollutants (NESHAP) from Secondary Lead Smelting (40 Code of Federal Regulations (CFR) Part 63, Subpart X). The United States Environmental Protection Agency (EPA) published a final revision to NESHAP for secondary lead smelting in the January 5, 2012, issue of the *Federal Register* (77 FR 556). In addition, Texas has maintained enforceable control measures for Exide through a series of agreed orders for the facility. Prior to being operated by Exide, the secondary lead smelter and battery recycling facility in Frisco, Texas, was operated by Gould National Battery, Inc., and by GNB Technologies, Inc. (GNB). In 1992, GNB entered into Agreed Board Order 92-09(k) with the Texas Air Control Board (TACB), a predecessor agency to the TCEQ, and special provisions were included in amendments to Air Quality Permits R-1147A and R-5466D to ensure maintenance of the 1978 lead NAAQS and to resolve notices of violations regarding exceedances of the 1978 lead NAAQS.

GNB subsequently amended Air Quality Permits 1147A and was issued a new permit number 3048A to incorporate provisions in Agreed Board Order 92-09(k) (Order 92-09k) as permanent and enforceable control measures. The maximum allowable lead emission rate in these permits limited lead emissions to 4.27 tons per year (tpy). In 1993, GNB entered into Agreed Board Order 93-12 (Order 93-12) with the TACB to establish contingency measures related to the 1993 Lead SIP for Collin County.

As part of the 1999 Collin County Redesignation and Maintenance Plan for Lead, GNB entered into Agreed Order 99-0351-SIP, which terminated Orders 93-12 and 92-09(k); however, GNB agreed to continue implementation of these measures or to implement additional measures or control technologies proposed by GNB that were judged by the TCEQ executive director to be similarly effective in controlling lead emissions from the plant. Exide acquired the GNB plant in Collin County in 2000.

The state maintained permanence of the earlier reductions through Agreed Order 2009-0071-MIS, in which Exide agreed to abide by representations made by GNB to continue implementation of the requirements of paragraph eight in Order 92-09(k) as incorporated in permits 1147A and 3048A or to implement additional proposed measures or control technologies judged by the executive director to be similarly effective in controlling lead emissions from the plant.

In 2009, Exide entered into Agreed Order 2009-0071-MIS as part of the second ten-year maintenance plan for the 1978 lead NAAQS. As part of that agreed order, Exide agreed to continue implementation of measures previously implemented. Exide also agreed to maintain records for the period of the second ten-year maintenance plan (2009 through 2019) and make those records available upon request by the TCEQ or any other air pollution control agency with jurisdiction.

Below is a list of the existing control measures and restrictions applicable to the Collin County lead nonattainment area under Agreed Order 2009-0071-MIS:

- addition of a supplemental ventilation baghouse to the reverberatory and blast furnace metallurgical operations area;
- installation of covers over blast furnace bins and water spray system over the bin area;
- installation of a baghouse and supporting ventilation and ducting at the raw materials storage building;
- installation of a feed dryer and baghouse at the reverberatory furnace charging area to reduce the possibility of reverberatory furnace explosions due to wet feed;
- development and implementation of a detailed site operation and maintenance plan for all site baghouse operations;
- installation of a Tri-bo Flow® System in all baghouse ducts to detect upset emissions;
- maintenance of compliance with all emission limits and standard operating procedures for process sources, process fugitive sources, and fugitive dust sources from the National Emissions Standards for Hazardous Air Pollutants from Secondary Lead Smelters under 40 CFR Part 63 Subpart X;
- maintenance of records from the second (2009) maintenance plan sufficient to demonstrate compliance with control measures and requirements under the agreed orders;
- restrictions on any increase in actual emissions above 4.27 tpy and approved amendments to permits 1147A and 3048A or through the issuance of a new permit pursuant to 30 TAC Chapter 116, along with executive director approved dispersion modeling demonstrating that such an increase will not cause a violation of the 1978 lead NAAQS; and
- continue to maintain all air pollution control and monitoring equipment in good working order and operate properly during normal operation.

In addition to the above control measures, Agreed Order 2009-0071-MIS includes contingency measures to be implemented in the event that an exceedance of the 1978 lead NAAQS is measured at any TCEQ ambient air quality monitoring site in Collin County or Exide reports an exceedance of 4.27 tpy in the annual emissions inventory and that exceedance of 4.27 tpy was not the result of a permitted increase in lead emissions. If at any time during the second 10-year maintenance period one of the above exceedances occurs, Exide will implement one of the following contingency measures within 180 days of notification by the executive director:

- automation of the scale and feed for the reverberatory furnace;
- installation of water misting dust suppression system beyond the system already required under permit 1147A; or
- an alternative measure proposed by Exide that results in emission reductions which, at a minimum, must be equivalent to the emissions reductions achievable by the above contingency measures and approved by the executive director.

4.3 RACT AND RACM ANALYSIS

4.3.1 General Discussion

As discussed in the lead NAAQS final rule published in the November 12, 2008, issue of the *Federal Register* (73 FR 67035), states containing areas designated as nonattainment are required to submit a SIP revision demonstrating that the associated enforceable control measures fulfill the RACT and RACM requirements for sources of ambient lead concentrations.

In the September 17, 1979, issue of the *Federal Register* (44 FR 53762) RACT is defined as "the lowest emissions limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility." Section 172(c)(1) of the Federal Clean Air Act (FCAA) requires states to provide for implementation of all RACM, including RACT, as expeditiously as practicable. In the General Preamble for implementation of the FCAA Amendments, published in the April 16, 1992, issue of the *Federal Register* (57 FR 13498), the EPA explains that it interprets §172(c)(1) of the FCAA as a requirement that states incorporate into their SIP all RACM that would advance a region's attainment date. However, regions are obligated to adopt only those measures that are reasonably available for implementation considering local circumstances. In the preamble for the lead NAAQS final rule (73 FR 67035, November 12, 2008), the EPA provided guidelines to help states determine which measures should be considered reasonably available.

> If it can be shown that measures, considered both individually as well as in a group, are unreasonable because emissions from the affected sources are insignificant (i.e., de minimis), than the measures may be excluded from further consideration...the resulting control measures should then be evaluated for reasonableness, considering their technological feasibility and the cost of control in the area to which the SIP applies...In the case of public sector sources and control measures, this evaluation should consider the impact of the reasonableness of the measures on the municipal, or other governmental entity that must assume the responsibility for their implementation.

In addition to these criteria, the TCEQ also considered whether the control measure was similar or identical to control measures already in place at Exide. If the suggested control measure would not provide substantive and quantifiable benefit over the existing control measure, then the suggested control measure was not considered RACM because comparable controls were already in place.

The TCEQ developed a comprehensive list of potential control strategies to evaluate during the RACM and RACT analysis. First, the TCEQ developed a draft list of potential control strategy concepts based on an evaluation of the existing point and fugitive sources of lead at Exide. The draft list of potential control strategy concepts was presented to stakeholders for comment at a stakeholder meetings held in Frisco, Texas, on January 19, 2011. The TCEQ requested comment on the potential control strategies and invited stakeholders to suggest any additional strategies that might help advance attainment of the Collin County nonattainment area. The final list of potential control strategy concepts for the RACM and RACT analysis includes the strategies presented to stakeholders and the strategies suggested by stakeholders during the informal stakeholder comment process. The final list of potential control strategy concepts for the RACM and RACT analysis also includes control measures proposed or implemented at similar secondary lead smelting facilities in other states. The TCEQ evaluated existing and proposed control measures at similar facilities including the Exide Technologies facility in Vernon, California; the RSR Quemetco facility in City of Industry, California; Gopher Resources in

Eagan, Minnesota; Exide Technologies in Muncie, Indiana; and the Envirofocus facility in Tampa, Florida. The TCEQ also evaluated the control measures required in the South Coast Air Quality Management District Rule 1420.1, *Emissions Standard for Lead from Large Lead-Acid Battery Recycling Facilities*. In support of the Agreed Order and SIP revision, the TCEQ commissioned third-party contractor Eastern Research Group, Inc. (ERG) to evaluate available control measures and work practices to reduce lead emissions from point sources and fugitive lead-dust emissions at lead-acid battery recycling operations with secondary lead smelters and lead oxide facilities. On April 25, 2011, ERG submitted their report, *Comprehensive Evaluation of Air Quality Control Technologies used for Lead-Acid Battery Recycling* (http://www.tceq.texas.gov/airquality/sip/stakeholders/pb_stakeholder). The final list of potential control strategy concepts for the RACM and RACT analysis includes control technologies and measures recommended in the ERG report. Please see Appendix F: *Reasonably Available Control Measure (RACM) and Reasonably Available Control Technology (RACT) Analysis* for a complete list of control measures evaluated during the RACM and RACT analysis.

4.3.2 Results of RACT and RACM Analysis

Each potential control measure identified through the control strategy development process was evaluated to determine if the measure would meet established criteria to be considered reasonably available. Please see Appendix F for a complete list of control measures and RACM and RACT determinations.

The TCEQ determined that full enclosures with negative pressure ventilation sufficient to ensure that area fugitive emissions are routed to a high efficiency control device is RACM and RACT for Exide's secondary lead smelting operations, including battery breaking operations, blast and reverberatory furnaces, refining and casting operations, slag treatment and fixation, and raw materials storage and handling areas. In most cases, the high efficiency control device is a polytetrafluoroethylene (PTFE) membrane baghouse; however, for some operations, high efficiency cartridge filters are used instead of high efficiency PTFE membrane baghouses. Due to equivalent control efficiencies, cartridge filters used in place of PTFE membrane baghouses are considered RACM and RACT.

The TCEQ determined the following operational work practices and housekeeping requirements that minimize fugitive lead-dust emissions to the ambient air are RACM and RACT: traffic plans for materials loading and unloading; traffic plans that avoid areas with the potential to create fugitive lead-dust; inspection and removal of leaking lead-acid batteries upon delivery; and the cleaning of equipment that is contaminated with lead inside of a permanent total enclosure prior to moving such equipment to a maintenance building.

The TCEQ determined that wet scrubbers for battery breaker operations stacks and metallurgical scrubbers for furnace operations stacks with high efficiency PTFE membrane baghouses are RACM and RACT.

The TCEQ determined that partial enclosure with negative pressure hooding and ducting to high efficiency PTFE membrane baghouses of lead oxide operations areas is RACM and RACT.

The TCEQ determined that the installation of wet electrostatic precipitator (WESP) control technology is not RACM or RACT for the Exide facility in Collin County, because it is not economically feasible given the estimated emission reductions. In the recently promulgated revisions to the NESHAP from Secondary Lead Smelting in 40 CFR Part 63, Subpart X, the EPA stated that adding WESP technology as supplementary control for hazardous air pollutants

(HAP) metal is excessively costly and not cost effective (76 FR 29058). According to the supporting documentation, the cost effectiveness of installing WESP technology at all secondary lead smelting facilities is an estimated $2.37 million per ton of HAP (Docket No. EPA-HQ-OAR-2011-0344-0155). In comparison, the cost effectiveness of complying with all of the newly promulgated NESHAP requirements is an estimated $0.33 million per ton of HAP (Docket No. EPA-HQ-OAR-2011-0344-0155). Agreed Order 2011-0521-MIS requires Exide to install high efficiency particulate air (HEPA) filters as secondary lead control devices. HEPA filters have a minimum 99.97% control efficiency for the removal of particles with a diameter of at least 0.3 micrometre. According to the EPA's Air Pollution Control Technology Fact Sheets (EPA-452/F-03-023), the capital cost for a HEPA filter is $6,400 to $8,500 per standard cubic meter per second (scm/sec) or $3 to $4 per standard cubic feet per minute (scfm). According to the EPA's Air Pollution Control Technology Fact Sheets (EPA-452/F-03-030 and EPA-452/F-03-023), the control efficiency of a typical new WESP design is between 99% and 99.9%, and the capital cost is $42,000 to $85,000 per scm/sec or $20 to $40 per scfm, which is roughly ten times the capital cost of a HEPA filter. The HEPA filter provides equivalent control efficiency at a much lower cost than a WESP.

WESP has been installed at one secondary lead smelting operation in California to comply with the AB2588 Toxics Hot Spots program, a unique regulatory requirement that specifically addresses cancer risk from arsenic and other heavy metal emissions. The facility in California selected WESP technology as a secondary pollution control device installed after the baghouse to further reduce arsenic emissions from the secondary lead smelting operation. In this case, WESP technology may be reasonable for facilities that operate electric arc furnaces (EAF) as part of the secondary lead smelting process. EAF operate at much higher temperatures (2500 - 3000 degrees Fahrenheit) than the blast furnaces used at Exide in Frisco. This higher heat volatilizes compounds such as arsenic and other heavy metals, which makes the particles more difficult to remove using a dry filtration device, such as a baghouse or secondary HEPA filter. Arsenic and other heavy metals such as lead are not volatilized in secondary lead smelting operations using blast and reverberatory furnaces, such as those used at Exide in Frisco. There is not sufficient information to substantiate that WESP is reasonable for secondary lead smelting facilities using blast and reverberatory furnaces at the additional cost of $16 to $40 million at each secondary lead smelter when the HEPA filter provides equivalent control efficiency at a much lower cost.

In addition, installing a WESP at Exide for process emission control will have limited benefit because the vast majority of Exide's lead emissions are from fugitive sources. Air dispersion modeling conducted for this SIP revision demonstrates that with the controls in Agreed Order 2011-0521-MIS, the ambient lead concentration in the Collin County lead nonattainment area will be below the 2008 lead NAAQS by the December 31, 2015, attainment date. Because the lead emissions that will remain after Exide has installed and is operating all the required controls included in the Agreed Order are sufficient for Collin County to demonstrate attainment of the 2008 lead NAAQS, it is unnecessary for a lower lead emission limit to be imposed on Exide.

The TCEQ determined that full enclosure of lead oxide operations in conjunction with negative ventilation sufficient to ensure that area fugitives are routed to a high efficiency control device is not RACM or RACT, because it is not economically feasible. Full enclosure of lead oxide operations is included as a contingency measure in Agreed Order 2011-0521-MIS to be triggered in the event that quality assured data shows an exceedance of the 0.15 microgram per cubic meter ($\mu g/m^3$) lead NAAQS measured as a rolling three-month average at any TCEQ ambient air quality lead monitoring site in Collin County.

The TCEQ determined that the installation of HEPA filters as secondary controls in addition to high efficiency PTFE membrane baghouses is not RACT or RACM. The estimated cost per ton of lead emission reductions associated with the secondary HEPA filters is not reasonable when compared to the lead emission reductions achieved from the high efficiency PTFE baghouses used alone. Agreed Order 2011-0521-MIS requires the installation of secondary HEPA filters where possible in addition to the high efficiency PTFE baghouses. This control measure is included in Agreed Order 2011-0521-MIS, but is beyond RACM and RACT.

The TCEQ determined that the replacement of the hydraulic ram with a rotary screw feeder for the reverberatory furnace charging process is not RACM or RACT because it is not economically feasible given the estimated emission reductions. In addition, any emissions associated with this source will be controlled through the furnace area enclosure. This control measure is included in Agreed Order 2011-0521-MIS, but is beyond RACM and RACT.

4.4 NEW CONTROL MEASURES

The new control measures needed to demonstrate attainment for the 2008 lead NAAQS in the Collin County nonattainment area are made enforceable by Agreed Order 2011-0521-MIS. Agreed Order 2011-0521-MIS includes the control measures for attainment and the associated implementation schedule. Agreed Order 2011-0521-MIS also includes contingency measures to be triggered in the event of an exceedance “condition” (as defined in Agreed Order Paragraph 10) of the 2008 lead NAAQS.

The following control measures have already been implemented as part of Agreed Order 2011-0521-MIS.

- Exide retrofitted baghouses (Permit 1147A Emission Point Numbers (EPNs) 18, 21, 22, 23, 37, and 38) by replacing all bags with PTFE membrane media and replacing all of the baghouse tube sheets with improved seating design.
- Exide replaced the existing seals on the blast furnace “doghouse” emissions capture and ventilation hooding system (Facility Identification Number (FIN) 10).
- Exide replaced the reverberatory furnace (FIN 35) hydraulic ram feeder with a screw conveyor.
- Exide installed a non-fouling area misting system in the blast and reverberatory furnace areas (FIN 10 and 35). Exide will continue operating this system until the blast and reverberatory furnace area, including the refining/casting/charging area is fully enclosed and placed under negative pressure and secondary HEPA filtration has been installed, as required in Agreed Order 2011-0521-MIS.
- Exide will continue to maintain all air pollution abatement equipment in good working order and operate it properly during normal operations.

The following control measures will be implemented as part of Agreed Order 2011-0521-MIS.

- Exide will inspect any batteries that are not stored in a total enclosure once each week and move any broken batteries to the battery breaking area for processing or move them to a total enclosure, within 72 hours of identification. Exide must clean residue from broken batteries within 72 hours of identification. This measure will be implemented on May 30, 2012. Exide will replace existing roll-up doors with fabric roll-up doors in the raw material storage building. Existing roll-up doors at openings without truck docks in the raw material storage building must be replaced with high-speed fabric roll-up doors. This measure will be implemented as expeditiously as possible, but no later than November 1, 2012.

- If Exide does not complete any of the control measures specified in Agreed Order Paragraphs 21, 22, 26, or 27 before November 1, 2012, the following interim measures will be implemented by November 15, 2012: install dock seals at existing truck docks to help minimize fugitive emissions; and change baghouse cleaning cycle controls from time-based to pressure-drop demand based cycles to allow for increased filter cake on bags.
- By July 31, 2012, to the extent that no building permits are needed to conduct repairs, the raw material storage building must be free of significant cracks, gaps, corrosion, or other deterioration that could cause lead bearing material to be released from the building. After July 31, 2012, the raw material storage building will follow the inspection requirements of 40 CFR § 63.544(d), as promulgated on January 5, 2012.
- Exide will construct a new slag treatment building adjacent to the furnace and refining operations to reduce fugitive emissions associated with truck traffic. The new slag treatment building will be fully enclosed and placed under negative pressure ventilation. Once the new slag treatment building is constructed and operational, the old slag treatment building (FIN 39) will no longer be used for activities involving processing or handling lead bearing materials unless the building is fully enclosed and placed under negative pressure ventilation sufficient to ensure that fugitive emissions are routed to a baghouse. This measure will be implemented as expeditiously as possible, but no later than January 6, 2014.
- Exide will fully enclose and place under negative pressure ventilation the following buildings/areas: the blast and reverberatory furnace area, including the refining/casting/charging area (FINs 10, 35, 36, and 37), the new slag treatment building (FIN 39A), the battery breaker area (FIN 48A), and the raw material storage area (FIN 45). This will include the full enclosure of the buildings/areas, the installation of negative pressure ventilation sufficient to ensure that the buildings/areas fugitives emissions are routed to new baghouses or existing baghouses, the installation of new point sources, and installation of new baghouses with PTFE filter media and improved seating design bags, or equivalent or superior design if approved by the TCEQ. Total enclosures must be ventilated continuously whenever equipment and processes with the potential to generate fugitive lead emissions are occurring within the enclosure. The ventilation must ensure negative pressure values of at least 0.013 millimeter of mercury (0.007 inches of water) consistent with the requirements of 40 CFR §63.544(c)(1), as promulgated on January 5, 2012. This measure will be implemented as expeditiously as possible, but no later than January 6, 2014.
- Exide will operate under a traffic plan for trucks unloading batteries at the facility and for traffic to, from, and across the on-site landfill. Exide will relocate the spent battery loading docks to the north side of the battery breaker operation and reconfigure the traffic route such that the spent battery delivery trucks enter and leave along the north route and never enter the center of the facility. Traffic excluded from this plan includes chemical delivery trucks, plant service vehicles, and other scrap delivery vehicles. This measure will be implemented as expeditiously as possible, but no later than January 6, 2014.
- Exide will fence the property boundaries of the plant property to deter trespassers. On the south and west property boundaries, Exide will install a wire fence at least 48 inches high with mesh spacing approximately 2 inches by 4 inches topped by a strand of barbed wire for a total fence height of approximately 54 inches. The railroad tracks on the west side will be gated at the fence boundary. On the east boundary, Exide will install monitors to detect unlawful ingress onto Exide's property across the existing board fence. Exide will also install a camera to monitor the plant entrance for trespassers. This measure will be implemented as expeditiously as possible, but no later than January 6, 2014.
- Exide will install secondary HEPA filtration on all baghouses that receive lead emissions (EPNs OCS, 10A, 18, 21, 22, 23, 35A, 37, 39A, 45, and 48A) except for the reverberatory furnace baghouse and the blast furnace baghouse (EPN 38). All HEPA filters must be rated by the manufacturer to achieve a minimum of 99.97% capture efficiency for particles 0.3

micrometre or larger. Exide will evaluate the technical feasibility of installing secondary HEPA filtration on the reverberatory furnace baghouse and the blast furnace baghouse, and, if technically feasible, will also install secondary HEPA filtration on these two baghouses. If HEPA filtration is not technically feasible for these two baghouses, Exide will install high efficiency PTFE secondary filtration devices. This measure will be implemented as expeditiously as possible, but no later than January 6, 2014.

- Process or mobile equipment that is contaminated with lead will be initially cleaned inside of a permanent total enclosure prior to being moved to the maintenance building. This measure will be implemented as expeditiously as possible, but no later than January 6, 2014.
- After implementation of the controls required by Paragraphs 15 to 27 of this Agreed Order, Exide will emit no more than a maximum of 0.4517 pound per hour (lb/hr) of lead from stack sources. Air dispersion modeling completed for this SIP revision indicates that 0.4517 lb/hr of lead is the maximum that Exide can emit without causing or contributing to an exceedance of the 2008 lead NAAQS.

The following contingency measures are included under Agreed Order Paragraph 10. The contingency measures would be triggered in the event that quality assured data shows an exceedance of the 0.15 $\mu g/m^3$ lead NAAQS measured as a rolling three-month average at any TCEQ ambient air quality lead monitoring site in Collin County. If the TCEQ provides notice of such an exceedance condition, Exide has the opportunity to submit to the TCEQ an affirmative demonstration that an identifiable problem involving existing operations is the root cause of the condition and a proposal for remedy and prevention of recurrence of the problem. If Exide does not submit this demonstration and proposal for correction within the allotted 30 days or the TCEQ disapproves of such submission within the allotted 45 days, the following contingency measures will be implemented as expeditiously as possible, but no later than 12 months after the TCEQ's notification of the condition.

- Exide will fully enclose the lead oxide operational area and install negative pressure ventilation, a new point source, and filtration media (either a baghouse or cartridge filter) (FIN 46). This will include the full enclosure of the lead oxide operational area, the installation of negative pressure ventilation sufficient to ensure that lead oxide operational area fugitives are routed to the new baghouse, the installation of a new point source, installation of a new baghouse with PTFE filter media and improved seating design bags, or equivalent or superior design if approved by the TCEQ, and secondary HEPA filtration. All HEPA filters must be rated by the manufacturer to achieve a minimum of 99.97% capture efficiency for particles 0.3 micrometre or larger. The enclosure performance must be consistent with the requirements of 40 CFR §63.544(c) and §63.548(k), as promulgated on January 5, 2012.
- Exide will install and operate according to good engineering practices vacuum hooding over lead oxide loading operations (EPNs 27 and 28). The exhaust air from the vacuum hooding must be routed to an existing or new baghouse with PTFE filter media and improved seating design bags, or equivalent or superior design if approved by the TCEQ, and secondary HEPA filtration. All HEPA filters must be rated by the manufacturer to achieve a minimum of 99.97% capture efficiency for particles 0.3 micrometre or larger.
- Exide will designate that wheeled and powered plant equipment, such as forklifts, used inside a fully enclosed area will not be used outside of such an area without cleaning inside a permanent total enclosure. Cleaning must include washing of tires, undercarriage, and exterior surface of the vehicle followed by vehicle inspection.

4.5 MONITORING NETWORK

States are required by 40 CFR, Part 58, Subpart B, to submit an annual network review (ANR) to the EPA by July 1 of each year. This review of the TCEQ's air monitoring networks is required in order to provide the framework for establishment and maintenance of an air quality surveillance system. The ANR must be made available for public inspection and comment for at least 30 days prior to submission to the EPA. The review and any comments received during the 30-day inspection period are then forwarded to the EPA for final review and approval. The TCEQ posted the 2010 plan for public comment from June 1, 2010, through June 30, 2010. The TCEQ then submitted the plan to the EPA on July 1, 2010, for review and approval. The ANR document presented the current Texas network of ambient air quality monitors in Texas for which the TCEQ uploads data to the EPA's Air Quality System (AQS), a national database of air quality data. The 2011 plan will follow the same schedule.

4.5.1 Lead Monitoring Sites in Frisco

From 1981 until mid-1999, the TCEQ monitored lead levels at a residential location on Hickory Street in Collin County, Texas (EPA AQS site identification number 480850001), approximately one-half mile northeast of the Exide plant. The Ash Street monitoring site (AQS 480850007) located at 6931 Ash Street, replaced the Hickory Street site in mid-1999. Another site (Eubanks, AQS 480850009) was located on Exide property inside Exide's security fence near the northern property line, and a third site (Parkwood, AQS 480850003) was located on Exide property outside Exide's security fence west of 5th Street. In July 2010, after meeting with the EPA to determine a location that EPA-Region 6 found acceptable for the maximum-concentration, source-oriented monitor required by the rule establishing the 2008 lead NAAQS, the Eubanks monitor was moved off Exide property and outside the company's security fence so that it could be used to monitor ambient air. As defined in 40 CFR Part 50.1, ambient air means that portion of the atmosphere, external to buildings, to which the general public has access. To meet EPA criteria for regulatory ambient air monitoring data, the following EPA criteria must be met:

- use federal reference method, federal equivalent method, or approved regional methods (40 CFR Part 58, Appendix C);
- meet siting criteria (40 CFR Part 58, Appendix E);
- meet quality assurance requirements (40 CFR Part 58, Appendix A); and
- meet data certification criteria (40 CFR Part 58, Subpart B).

4.5.2 Current Ambient Air Monitoring

The Ash Street monitor is a population-oriented site located in a neighborhood north of the Exide property. The Eubanks monitor is currently located approximately 15 feet north of its previous location on the exterior side of the Exide property fence line. This monitor is a maximum concentration source-oriented site. In August 2010, the Parkwood monitor was moved to the east side of 5th Street in Frisco and is now located outside the Frisco Recycling Center's fence line on an area of the property that is subject to an easement to the City of Frisco.

The EPA currently requires one primary and one co-located lead monitor for Collin County. The TCEQ has voluntarily operated up to three monitors near Exide and has recently installed a fourth lead monitor (Stonebrook, AQS 480850029) located south of the Exide plant at the Frisco Police Station on Stonebrook Parkway. This monitor commenced operations in January 2011. The TCEQ has also recently added an additional co-located lead monitor to its network.

Figure 4-1: *Collin County Lead (Pb) Nonattainment Area* shows ambient lead monitoring locations in the Collin County lead nonattainment area, Frisco, Texas.

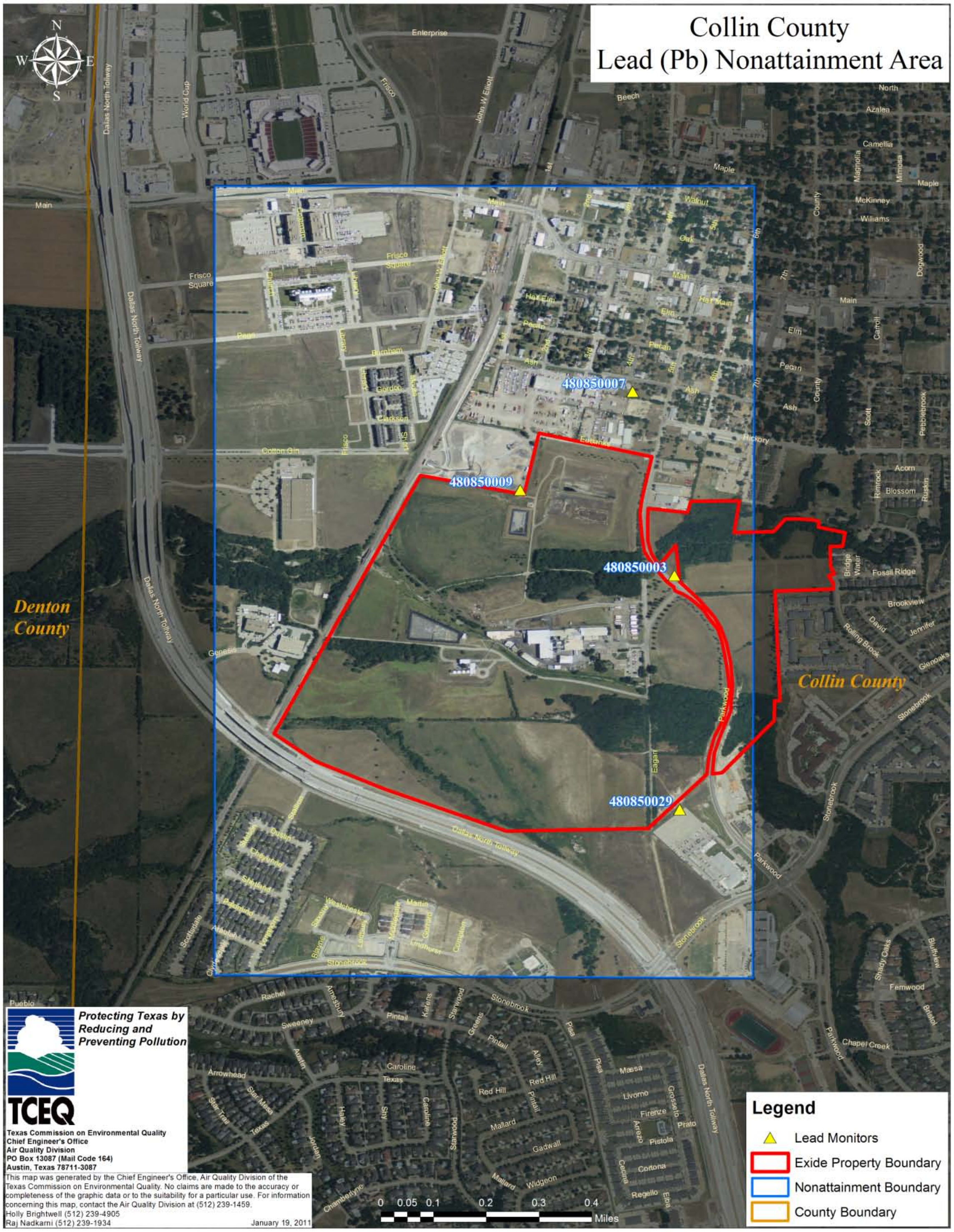

Figure 4-1: Collin County Lead (Pb) Nonattainment Area

4.6 CONTINGENCY PLAN

SIP revisions for nonattainment areas are required by §172(c)(9) of the FCAA to provide for specific measures to be implemented should a nonattainment area fail to meet reasonable further progress (RFP) requirements or attain the NAAQS by the attainment date set by the EPA. The contingency plan must be enforceable and should identify measures to be adopted, a schedule and procedure for adoption and implementation, and a specific time constraint on action to be taken by the state. Additionally, the plan should identify specific indicators or triggers that will be used to determine when the contingency measures are to be implemented. The intent of the indicators and triggers is to allow the state and Exide to take early action to remedy an actual or potential violation of the 2008 lead NAAQS prior to the attainment date.

The contingency measures are made enforceable in Agreed Order 2011-0521-MIS.

4.6.1 Contingency Measures

4.6.1.1 Contingency Measure Requirements

- Exide will fully enclose the lead oxide operational area and install negative pressure ventilation, a new point source, and filtration media (either a baghouse or cartridge filter) (FIN 46). This will include the full enclosure of the lead oxide operational area, the installation of negative pressure ventilation sufficient to ensure that lead oxide operational area fugitives are routed to the new baghouse, the installation of a new point source, installation of a new baghouse with PTFE filter media and improved seating design bags, or equivalent or superior design if approved by the TCEQ, and secondary HEPA filtration. All HEPA filters must be rated by the manufacturer to achieve a minimum of 99.97% capture efficiency for particles 0.3 micrometre or larger. The enclosure performance must be consistent with the requirements of 40 CFR §63.544(c) and §63.548(k), as promulgated on January 5, 2012.
- Exide will install and operate according to good engineering practices vacuum hooding over lead oxide loading operations (EPNs 27 and 28). The exhaust air from the vacuum hooding must be routed to an existing or new baghouse with PTFE filter media and improved seating design bags, or equivalent or superior design if approved by the TCEQ, and secondary HEPA filtration. All HEPA filters must be rated by the manufacturer to achieve a minimum of 99.97% capture efficiency for particles 0.3 micrometre or larger.
- Exide will designate that wheeled and powered plant equipment, such as forklifts, used inside a fully enclosed area will not be used outside of such an area without cleaning inside a permanent total enclosure. Cleaning must include washing of tires, undercarriage, and exterior surface of the vehicle followed by vehicle inspection.

4.6.1.2 Contingency Trigger Levels

A contingency measure would be triggered upon failure to meet RFP requirements or failure to attain the 2008 lead NAAQS. Details regarding the implementation of contingency measures can be found in the Agreed Order (see Appendix A: *Agreed Order 2011-0521-MIS*, Paragraph 38).

CHAPTER 5: REASONABLE FURTHER PROGRESS

5.1 GENERAL

Section 172(c)(2) the Federal Clean Air Act (FCAA) requires areas that have been designated nonattainment for criteria pollutants to include a demonstration of reasonable further progress (RFP) in attainment demonstrations. RFP is defined in FCAA, §172(c)(2) as such annual incremental reductions in emissions of the relevant air pollution as are required by part D or may reasonably be required by the United States Environmental Protection Agency for the purpose of ensuring attainment of the applicable National Ambient Air Quality Standard (NAAQS) by the applicable attainment date.

The Collin County Attainment Demonstration State Implementation Plan (SIP) Revision for the 2008 Lead NAAQS fulfills RFP for the Collin County lead nonattainment area through a compliance schedule that yields consistent and periodic significant emission reductions. This demonstration includes a detailed schedule for compliance of reasonably available control measure (RACM) including reasonably available control technologies (RACT) in the nonattainment area.

5.2 RFP DEMONSTRATION

As stated in the final lead rule (73 FR 67039), RFP is satisfied by the adherence to a compliance schedule that is expected to periodically yield significant emission reductions. Air dispersion modeling conducted for this SIP revision demonstrates that with the controls in Agreed Order 2011-0521-MIS, the ambient lead concentration in the Collin County lead nonattainment area will be below the 2008 lead NAAQS by the December 31, 2015, attainment date. The Agreed Order requires these control measures and resulting emissions reductions to be achieved as expeditiously as possible but no later than January 6, 2014. As pointed out in Section 4.4 *New Control Measures*, several control measures have already been implemented as part of Agreed Order 2011-0521-MIS.

5.3 RACM AND RACT

The Texas Commission on Environmental Quality has developed a detailed implementation schedule of the RACM (including RACT) required in Agreed Order 2011-0521-MIS. This schedule involves the expeditious implementation of all control measures to assure attainment of the 2008 lead NAAQS by the December 31, 2015, attainment date.