Lead Stakeholder Meeting

Air Quality Division

Presented to the Lead Stakeholder Group
January 19, 2011

Meeting Topics

- Health Effects Information on Lead
- Lead Standard
- State Implementation Plan (SIP) Update
- Modeling in SIP Development
- Potential Control Strategies

Health Effects Information on Lead

Sources of Lead

- Lead occurs naturally in the environment.
- Industrial processes can emit lead to the air.
- Primary sources of lead emissions are:
  - leaded gasoline for piston-engine aircraft (not used in commercial passenger aircraft);
  - lead-acid battery manufacturers and recyclers;
  - lead smelters;
  - waste incinerators; and
  - industrial/commercial/utility boilers.

Other Sources

- Historical man-made sources of lead
  - leaded gasoline
  - lead-based paint
  - lead plumbing
- Others:
  - Lead in the diet (from food or utensils)
  - Drinking water
  - Toys, etc.

Routes of Lead Exposure

- Ingestion-Major
  - The most common means of ingesting lead is through lead paint, contaminated soil, food, and drinking water. Exposure of children to lead paint (chips of paint, soils with paint chips) is the major reason children have elevated lead blood levels.

- Inhalation – Less than 1% contribution
  - Lead that is emitted into the air can also be inhaled directly.

Absorption & Exposure Biomarkers

- Absorption
  - Once ingested or inhaled, lead is rapidly absorbed into the bloodstream and stored in the bone.

- Exposure Biomarkers
  - Blood Lead
    - Blood lead levels reflect recent (~three months) from all routes of exposure.
  - Bone Lead
    - Lead found in bones reflects long-term exposure.

Lead Health Effects

- Lead can cause health effects at higher exposure concentrations.

- Effects in children:
  - Central nervous system (>10 µg/dL *in blood*)
  - Red blood cell formation (~20 µg/dL *in blood*)
  - Colic (~55 µg/dL *in blood*)
  - Kidney Problems (~85 µg/dL *in blood*)

- Effects in adults occur at higher blood lead concentration than children.

Children: Sensitive Subpopulation

- Children are at a relatively higher risk to lead when compared to adults.
  - Their bodies are developing rapidly including the sensitive target of the nervous system.
  - Children tend to put their hands and other objects (lead paint chips) that may come into contact with lead into their mouths.

Children: Sensitive Subpopulation

- Effects in children:
  - Potentially increase risk of behavioral problems, IQ loss, and learning deficits
- Effects in adults:
  - Potentially increased the risk of high blood pressure and heart disease

Lead NAAQS: Health Protective

- The 2008 Lead NAAQS was established to protect public health with an adequate margin of safety including consideration for sensitive subpopulations (children).

Lead NAAQS: Health Protective

- Based on EPA's study on breathing air that contains lead (inhalation exposure), we would not expect lead blood concentrations to reach a level in children where adverse health effects would occur.

- Inhalation – Less than 1% of total lead exposure

Contact Information

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Lead
National Ambient Air Quality Standard (NAAQS)

1978 Lead NAAQS

- 1978 NAAQS nonattainment area
  - Portion of Collin County
  - Designated nonattainment in 1991
  - Redesignated to attainment in 1999
  - The Federal Clean Air Act (FCAA) requires that areas prove NAAQS maintenance for 20 years after being redesignated attainment.
    - 1993 Attainment Demonstration for the 1978 NAAQS
    - 1999 Redesignation Request and Maintenance Plan for the 1978 NAAQS
    - 2009 Maintenance Plan for the 1978 NAAQS

2008 Lead NAAQS

- 2008 NAAQS - 0.15 micrograms per cubic meter ($\mu g/m^3$)
  - On October 15 2008, the Environmental Protection Agency (EPA) lowered the lead NAAQS from 1.5 $\mu g/m^3$ to 0.15 $\mu g/m^3$.

2008 Lead NAAQS

- NAAQS compliance is based on 36 three-month averages.

- An area attains the 2008 NAAQS when data from all monitors in that area show 36 consecutive months below the standard.

Nonattainment Area

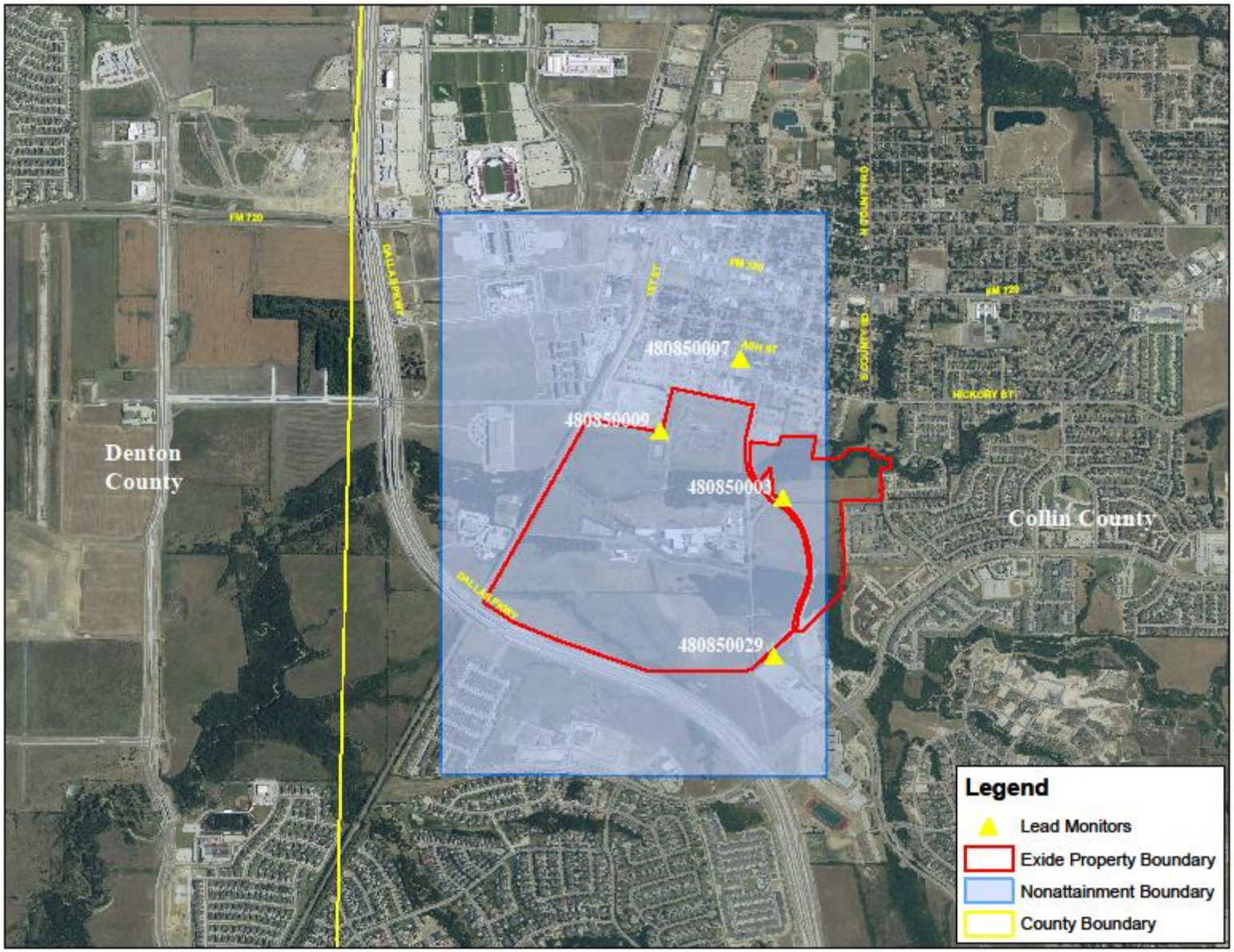
- Effective December 31, 2010, the EPA designated a portion of Collin County as nonattainment for the 2008 lead standard.
- Nonattainment areas must submit Attainment Demonstration SIP revisions to the EPA.
- Monitoring data*
  - The 2008 - 2010 design value is 0.71 µg/m^3

*Monitoring Data Note

At the January 19, 2011, Lead Stakeholder Meeting, TCEQ staff cited the 2008 through 2010 design value for lead as being 1.2 micrograms per cubic meter (µg/m^3). However, the number cited is calculated from monitor #480850009, which was located on Exide property, and was not accessible by the general public. The monitor was located on Exide property because the monitor was originally used to determine whether the implementation of contingency measures at the Exide facility was necessary to ensure continued maintenance of the 1978 Lead National Ambient Air Quality Standard (NAAQS). Along with other requirements, a monitor must be in an area accessible to the public to be considered as monitoring ambient air. A regulatory monitor must collect data from ambient air to be compared to the NAAQS to determine attainment. To be considered regulatory, a monitor must meet federal siting criteria and quality assurance requirements detailed in 40 Code of Federal Regulations, Part 58, Appendix A.

In June of 2010, after meeting with the United States Environmental Protection Agency (EPA) to determine a location for the monitor that meets the EPA's siting criteria, the monitor was moved to its current location.

The lead design value for Collin County from all regulatory monitors that are representative of ambient air is 0.71 µg/m^3.


Denton County
Collin County
480850007
480850009
480850003
480850029
FM 720
HICKORY ST
Legend
Lead Monitors
Exide Property Boundary
Nonattainment Boundary
County Boundary

State Implementation Plan (SIP) Update

SIP Timeline

- February – April 2011
  - Control Strategy Development
- June 2011
  - Proposal Agenda
- July 2011
  - Public Hearing and 30-day Comment Period
- December 2011
  - Adoption Agenda
- June 2012
  - Due to EPA

Attainment Demonstration

The SIP must demonstrate attainment of the NAAQS by the December 31, 2015, attainment date.

To attain by December 31, 2015, monitoring data must show no exceedances of the NAAQS in any of the previous 36 months.

Elements of the Attainment Demonstration

- Modeling Analysis
- Base-Year Inventory
- Reasonable Further Progress (RFP)
- Reasonably Available Control Technologies (RACT) and Reasonably Available Control Measures (RACM)
- Contingency Measures

Contact Information

- Lead SIP Project Manager

  Holly Brightwell

  512-239-4905

  Holly.brightwell@tceq.texas.gov

- To receive e-mail notification of the SIP revision updates and SIP-related news:
  1) Go to TCEQ's Web site http://www.tceq.state.tx.us
  2) Choose "sign up for e-mail updates"
  3) Under Air Quality, select "SIP Hot Topics"

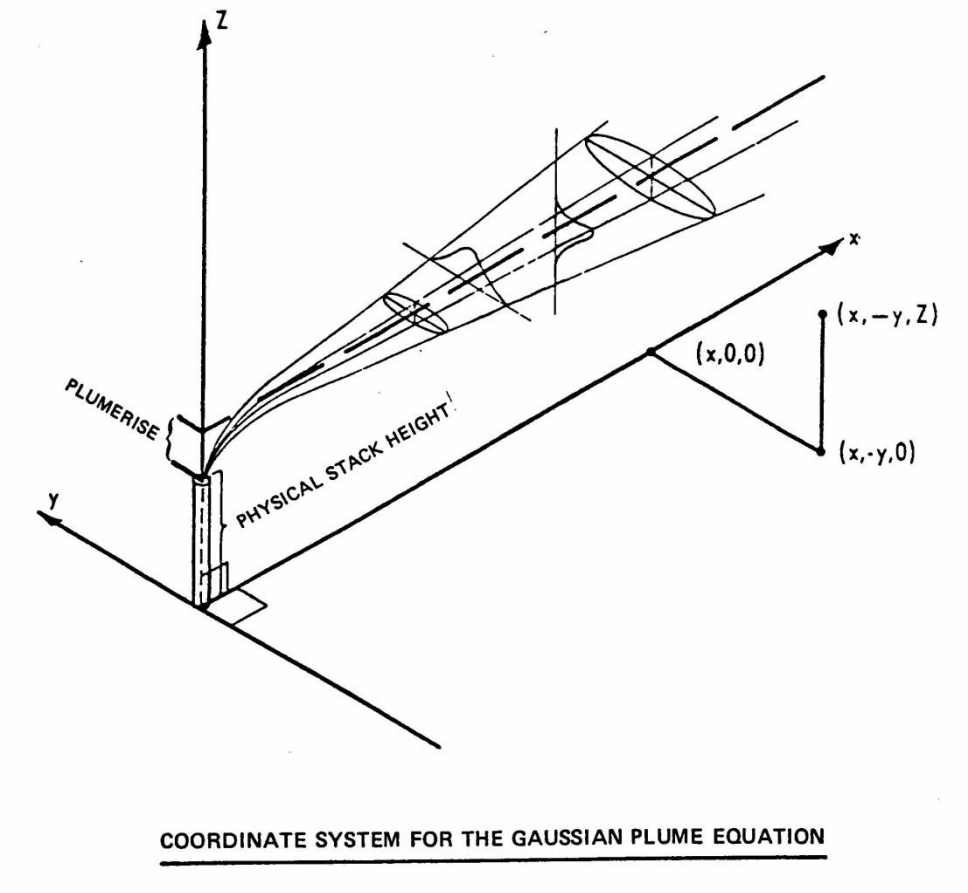
Modeling
in SIP Development

What is Dispersion Modeling?

- A Tool
  - Provides explanation of what might have happened
  - Provides explanation of what might happen
  - Provides information to make decisions
- An Approximation of Atmospheric Processes
  - Actual processes very complicated
  - Simulates most dominant processes
  - Not an exact replication of all processes

Actual Atmospheric Process

Modeled Atmospheric Process



COORDINATE SYSTEM FOR THE GAUSSIAN PLUME EQUATION

Purpose of Modeling for the SIP

- Base Case
  - Current authorized emissions
  - Which sources contributed most to maximum predicted ground level concentration (GLCmax)
- Validation of Control Strategy
  - Proposed future-case emissions
    - Predicts what ambient air concentration will be once control strategies are implemented
  - Must demonstrate compliance with the NAAQS

Modeling Procedures

- Protocol
  - Description of model inputs
    - Emission source characterizations
    - Emission rates
    - Meteorological data
  - Description of model run selections
    - Regulatory default selections
    - Non-regulatory selections

Modeling Procedures

- Modeling Demonstration
  - Base Case
    - Results used for control strategy
  - Proposed future case
    - Must demonstrate compliance with the NAAQS
    - If not, refine control strategy until compliance with NAAQS is demonstrated

Contact Information

- Lead Dispersion Modeler
  - Robert Opiela, P.E.
  - Air Permits Division
  - Robert.opiela@tceq.texas.gov
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Potential Control Strategies

Potential Control Strategies

- Reasonably Available Control Measure (RACM)
  - FCAA §172(c)(1) requires states to implement all RACM as expeditiously as practicable and to include RACM analyses in SIPs.
- To be considered RACM, a potential control measure must meet the following criteria:
  - technologically feasible;
  - economically feasible;
  - does not have adverse impacts;
  - is enforceable and practical;
  - reduces emissions before November 1, 2012.

Potential Control Strategies

- The TCEQ is requesting informal comments on control strategy concepts.
- When submitting comments:
  - provide detail and technical information
  - use citations when possible;
  - identify confidential information; and
  - provide specific information on economic feasibility in dollars per ton basis.

- Submit comments by February 9, 2011.

Contact Information

- Jay Tonne, P.E.
  - Chief Engineer's Office
  - Jay.tonne@tceq.texas.gov
  - 512-239-1453

Potential Control Strategies

- Please send comments by post or e-mail to:

  Holly Brightwell, State Implementation Plan

  Holly.brightwell@tceq.texas.gov

  Texas Commission on Environmental Quality

  12100 Park 35 Circle, MC-206

  Austin, TX 78753

- Written comments will be posted on the stakeholder group's Web page at:
  - www.tceq.state.tx.us/goto/pbstakeholder

Open Discussion

Potential Control Strategies

- Procedural and operational changes to lower particulate matter (PM) generating activities
- Improvement, replacement, and upgrade of existing equipment and systems, including baghouse seals, vacuum sweepers, enclosures, decontamination, and process equipment
- Installation of water mist dust suppression system
- Installation of additional negative-pressure enclosures on current non-enclosed activities, including battery breaking, furnace, and lead oxide operations
- Re-ducting of certain sources to a baghouse for PM control
- Replace existing baghouse filter media with high-efficiency PTFE media
- Installation of secondary HEPA filtration after baghouses
- Installation of wet electrostatic precipitator (WESP)
- Enforceable permitted production and operation curtailments, including permanent shutdown