



# ***Area Designations for the 2012 Annual Fine Particulate Matter ( $PM_{2.5}$ ) Standard***

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Texas Commission on Environmental Quality  
Air Quality Division

El Paso Public Informational Meeting  
September 17, 2013



# Overview

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- Revised PM<sub>2.5</sub> National Ambient Air Quality Standard (NAAQS)
- 2010 through 2012 PM<sub>2.5</sub> Design Values
- Exceptional Events
- Local PM Reduction Efforts
- Designations Process and Timeline
- TCEQ Commissioners' Agenda



# Revised PM<sub>2.5</sub> NAAQS

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- Final rule promulgated on December 14, 2012
- Previous NAAQS
  - Primary and Secondary Annual: 15.0 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ )
  - Primary and Secondary 24-Hour: 35  $\mu\text{g}/\text{m}^3$
- Revised NAAQS
  - **Primary Annual: 12.0  $\mu\text{g}/\text{m}^3$**
  - **Secondary Annual: 15.0  $\mu\text{g}/\text{m}^3$  (retain previous NAAQS)**
  - **Primary and Secondary 24-Hour: 35  $\mu\text{g}/\text{m}^3$  (retain previous NAAQS)**



# Calculating PM<sub>2.5</sub> Design Values

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- Design values are calculated for each monitor in an area.
- The monitor with the highest design value sets the area design value.
- Annual PM<sub>2.5</sub> NAAQS Design Value Calculation:
  1. Average the 24-hour PM<sub>2.5</sub> values from each quarter within a year.
  2. Average the quarterly averages to obtain a yearly average.
  3. Average the yearly average from three consecutive years to obtain the design value.



# Calculating PM<sub>2.5</sub> Design Values

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- 24-Hour PM<sub>2.5</sub> NAAQS Design Value Calculation:
  1. Find the 98<sup>th</sup> percentile of 24-hour PM<sub>2.5</sub> values from each year.
  2. Average the 98<sup>th</sup> percentile values from three consecutive years to obtain the design value.
- Data must meet the Environmental Protection Agency's (EPA) data completeness and certification requirements to represent a design value that is comparable to the NAAQS.  
<http://www.gpo.gov/fdsys/pkg/FR-2013-01-15/pdf/2012-30946.pdf>



# Calculating Annual PM<sub>2.5</sub> Design Values: An Example

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- All numbers in µg/m<sup>3</sup>:
  - A monitor has 30, 24-hour average, PM<sub>2.5</sub> samples for each quarter of 2012. The average of quarter one would be:

$$\frac{(30 + 24 + 10 + 15 + 12 + 14 + 21 + \dots)}{30} = 12.96$$

- Take the average from each quarter and average those together to get the 2012 average:

$$\frac{(12.96 + 11.08 + 12.07 + 10.96)}{4} = 11.7675$$

- Take the yearly average from 2012, 2011, and 2010 to get the 2012 design value:

$$\frac{(12.0496 + 10.8945 + 11.7675)}{3} = 11.5706$$

- Round to one decimal place (0.05 rounds up and 0.049 rounds down)

2012 Annual PM<sub>2.5</sub> Design Value = 11.6



# Calculating 24-Hour PM<sub>2.5</sub> Design Values: An Example

- All numbers in  $\mu\text{g}/\text{m}^3$ :
  - Rank all 24-hour PM<sub>2.5</sub> averages for each year from highest to lowest:

2010 (100 Values)	2010 Rank	2011 (110 Values)	2011 Rank	2012 (104 Values)	2012 Rank
24	1	10	1	15	1
28	2	20	2	18	2
⋮	⋮	⋮	⋮	⋮	⋮
44	98	35	108	26	102
48	99	38	109	28	103
50	100	40	110	30	104

- Find the 98<sup>th</sup> percentile by multiplying the number of values from each year by 0.98 and adding 1 to the integer of the result.

$$\text{For 2012: } 104 \times 0.98 = 101.92$$

$$101 + 1 = 102$$



# Calculating 24-Hour PM<sub>2.5</sub> Design Values: An Example

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- Find the value from each year that corresponds to each rank:

2010 Rank 99 = 48

2011 Rank 108 = 35

2012 Rank 102 = 26

- Average the three years together to get the design value:

$$\frac{(48 + 35 + 26)}{3} = 36.333$$

- Round to the nearest 1 (0.5 rounds up and 0.49 rounds down)

2012 24-Hour PM<sub>2.5</sub> Design Value = 36



# 2012 PM<sub>2.5</sub> Design Values (DV)

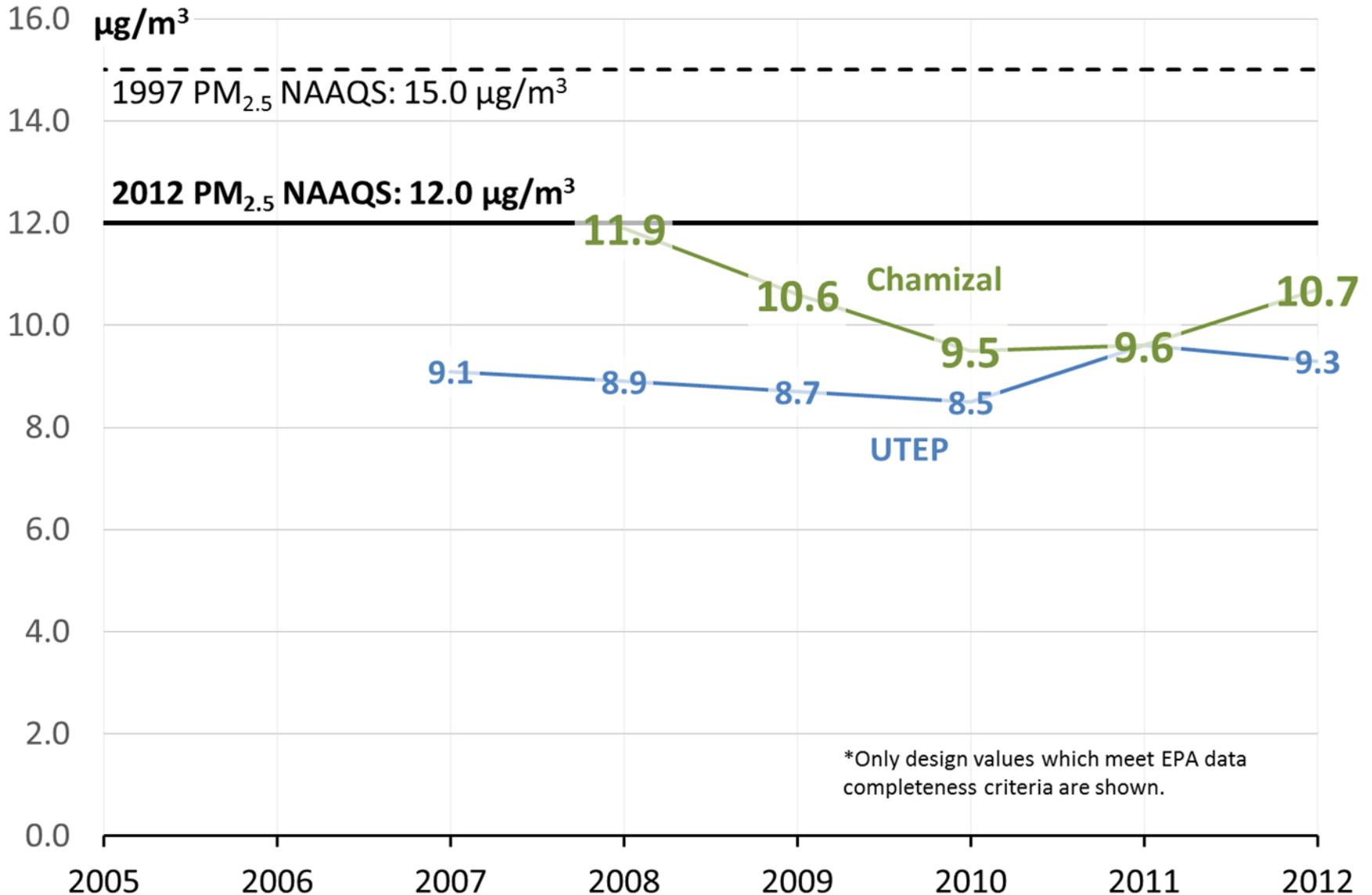
CBSA	Number of 2012 FRM* Monitors	Annual Design Value µg/m <sup>3</sup>	24-Hour Design Value µg/m <sup>3</sup>	Monitors with Annual Design Value Above 12.0 µg/m <sup>3</sup>
		(Standard: 12.0 µg/m <sup>3</sup> )	(Standard: 35 µg/m <sup>3</sup> )	
Austin-Round Rock	2	10.2	21	0
Corpus Christi	2	10.4	30	0
Dallas-Fort Worth-Arlington	2	10.8	22	0
El Paso	2	10.8	30	0
Houston-The Woodlands- Sugar Land	3	12.1**	24	1**
McAllen-Edinburg-Mission	1	10.3	23	0
San Antonio-New Braunfels	2	9.0	23	0
Texarkana	1	11.1	21	0
Marshall	1	10.9	22	0

\* FRM: Federal Reference Method

\*\* Includes exceptional events such as Saharan dust events and smoke from Central American agricultural burning

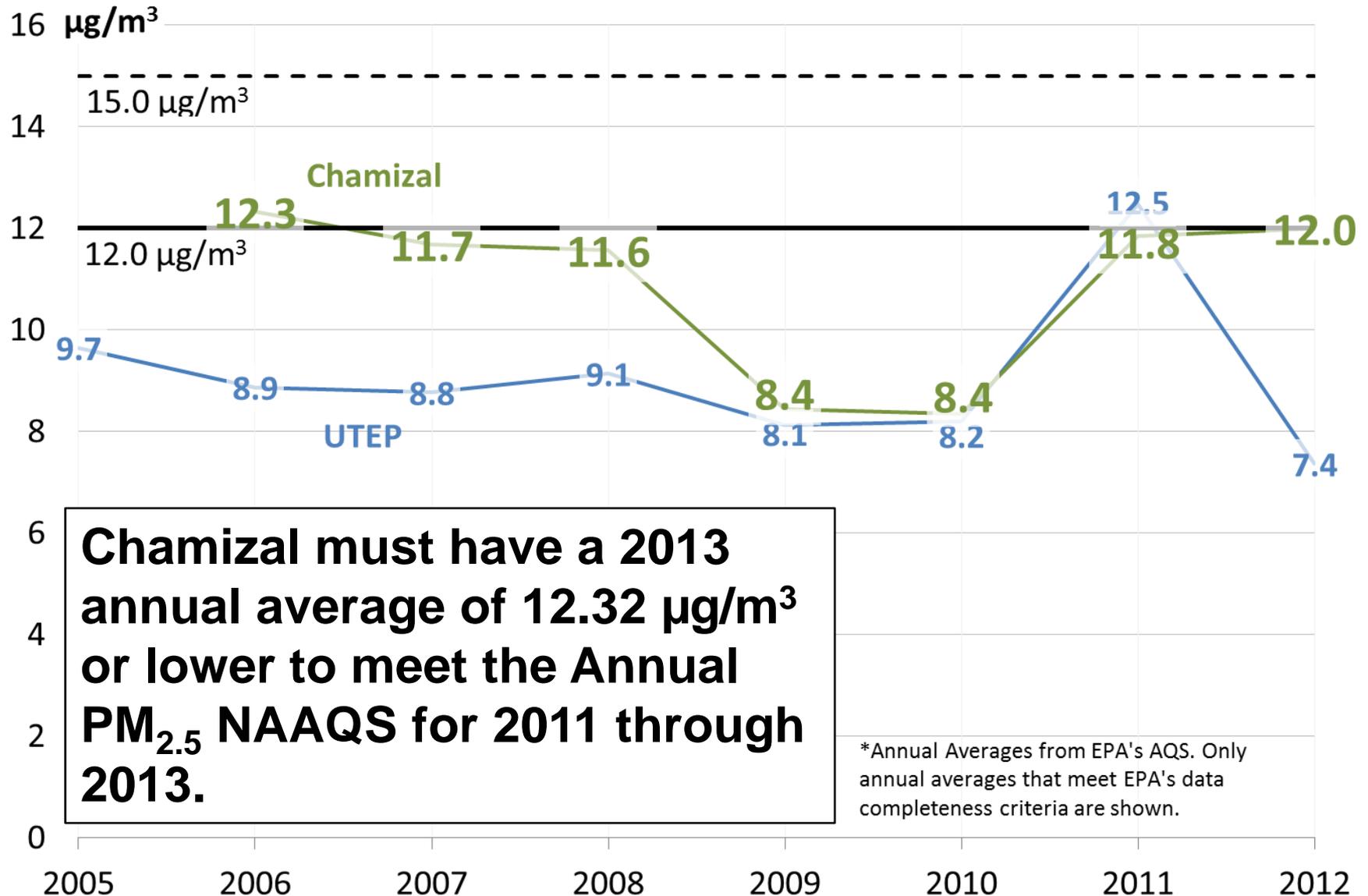


# Annual PM<sub>2.5</sub> Design Values in the ELP Area





# Annual Average PM<sub>2.5</sub> in the ELP Area



**Chamizal must have a 2013 annual average of 12.32 µg/m<sup>3</sup> or lower to meet the Annual PM<sub>2.5</sub> NAAQS for 2011 through 2013.**

\*Annual Averages from EPA's AQS. Only annual averages that meet EPA's data completeness criteria are shown.



# Preliminary 2013 Annual PM<sub>2.5</sub> Averages at Chamizal

	2010	2011	2012	2013*
Quarter 1 Average (µg/m <sup>3</sup> )	8.2	12.0	12.5	11.9
Quarter 2 Average (µg/m <sup>3</sup> )	7.2	14.3	12.1	16.4
Quarter 3 Average (µg/m <sup>3</sup> )	6.4	10.6	9.8	
Quarter 4 Average (µg/m <sup>3</sup> )	11.8	10.4	13.6	
<b>Annual Average</b> (µg/m <sup>3</sup> )	<b>8.4</b>	<b>11.8</b>	<b>12.0</b>	<b>14.1</b>

\*2013 data is not validated and is subject to change.



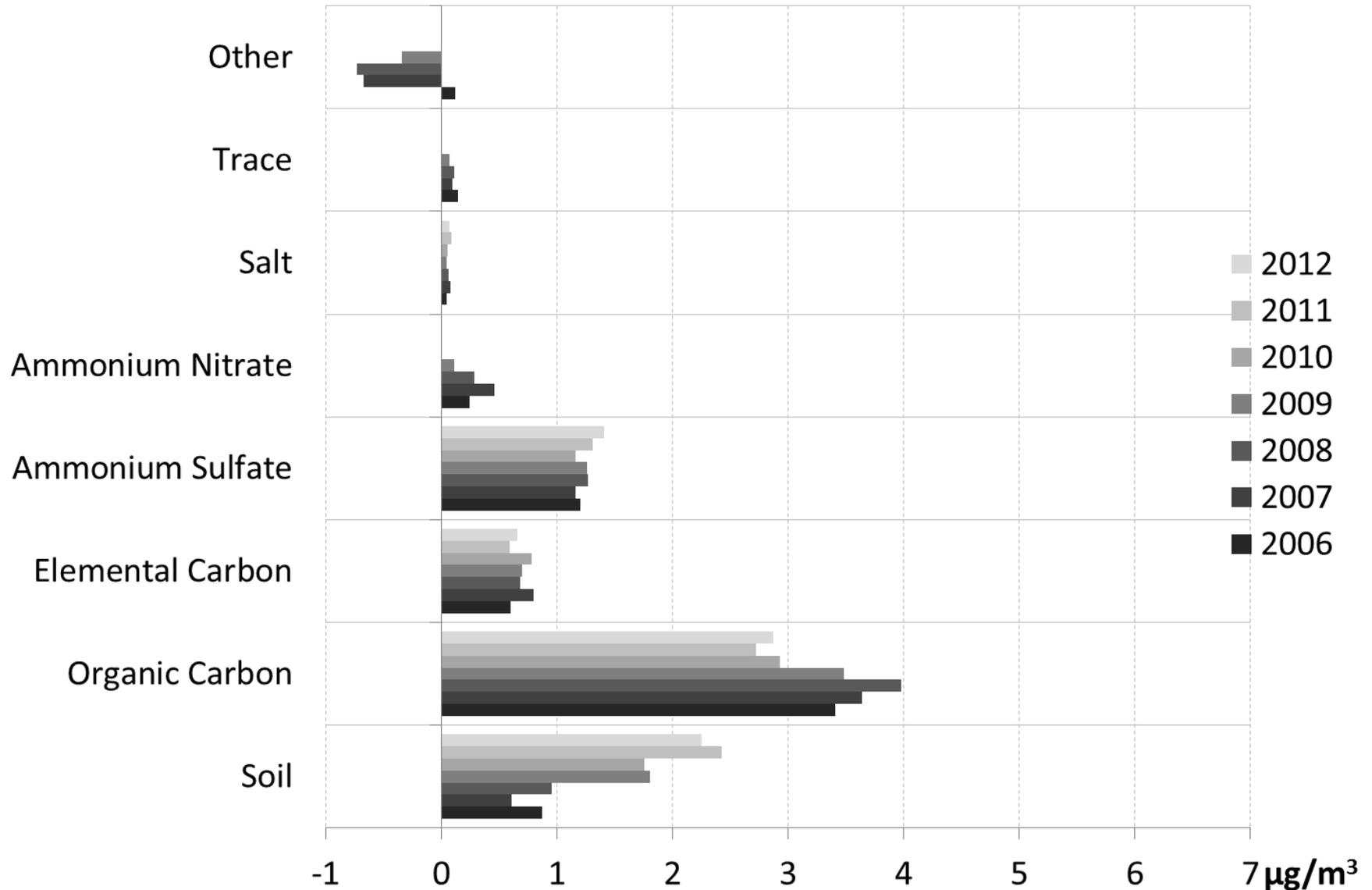
# Increased Monitoring at Chamizal

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- Missing data from a federal reference method (FRM) monitor must be filled in using data from a federal equivalent method (FEM) monitor when available.
- Prior to 2011, El Paso Chamizal only had data from the FRM monitor, which samples every sixth day.
- In 2011, an FEM monitor was also installed at Chamizal, resulting in an increase in sampling days.
- The increased monitoring captured more high PM days, causing an increase in the annual average  $PM_{2.5}$ .
- Some of those high days are exceptional events (typically dust events).



# Speciated Annual Average PM<sub>2.5</sub> at Chamizal





# Exceptional Events Rule

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- Allows for data to be flagged and excluded from calculations in determining whether or not an area has attained the standard
- 40 Code of Federal Regulations §50.14 defines an Exceptional Event as an event that:
  - affects air quality;
  - is not reasonably controllable or preventable;
  - is caused by human activity that is unlikely to recur at a particular location or by a natural event; and
  - results in an exceedance of the standard that would not have otherwise occurred.
- Requires concurrence from the EPA



# Annual PM<sub>2.5</sub> Design Values at Chamizal with and without Exceptional Events

	PM <sub>2.5</sub> Annual Average (µg/m <sup>3</sup> )			2013* Annual PM <sub>2.5</sub> DV (µg/m <sup>3</sup> )
	2011	2012	2013*	
All Data	11.8	12.0	14.1	<b>12.7</b>
Data with Exceptional Events Removed	11.4	11.3	12.5	<b>11.7</b>
Number of Exceptional Event Days	5	3	7	

\*2013 data is incomplete and not validated and is subject to change.



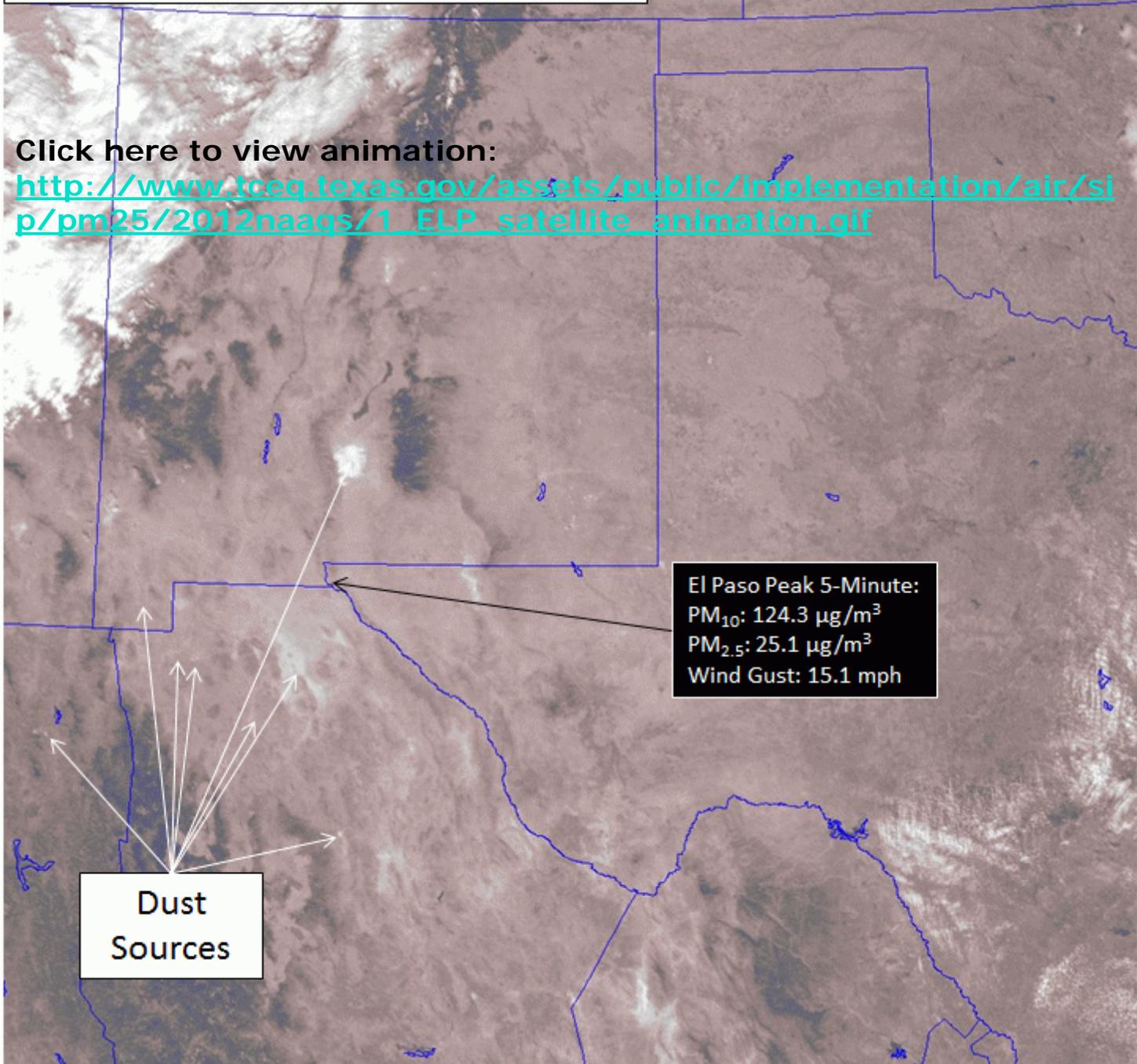
# Example of an Exceptional Event Day in El Paso

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Click here to view animation:

[http://www.tceq.texas.gov/assets/public/implementation/air/sip/pm25/2012naags/1\\_ELP\\_satellite\\_animation.gif](http://www.tceq.texas.gov/assets/public/implementation/air/sip/pm25/2012naags/1_ELP_satellite_animation.gif)



El Paso Peak 5-Minute:  
 $PM_{10}$ :  $124.3 \mu\text{g}/\text{m}^3$   
 $PM_{2.5}$ :  $25.1 \mu\text{g}/\text{m}^3$   
Wind Gust: 15.1 mph

Dust Sources



# **TCEQ Webcam Animations Overlooking El Paso**

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11/28/2010

(Shakiness is Due to High Winds)

Click here to view animation:

[http://www.tceq.texas.gov/assets/public/implementation/air/sip/pm25/2012naags/2\\_chelsea\\_animation.gif](http://www.tceq.texas.gov/assets/public/implementation/air/sip/pm25/2012naags/2_chelsea_animation.gif)



Click here to view animation:

[http://www.tceq.texas.gov/assets/public/implementation/air/sip/pm25/2012naaqs/3\\_rangerpeak\\_animation.gif](http://www.tceq.texas.gov/assets/public/implementation/air/sip/pm25/2012naaqs/3_rangerpeak_animation.gif)





# PM Nonattainment Status in El Paso

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- The City of El Paso has been designated as a moderate nonattainment area for  $PM_{10}$  since 1990.
- Texas was required to submit a state implementation plan (SIP) to demonstrate that the City of El Paso would attain the  $PM_{10}$  standard by December 31, 1994.
- Modeling of emissions indicated that El Paso would have attained the  $PM_{10}$  NAAQS by the December 31, 1994 attainment deadline, if not for emissions transported from Mexico.
- If an area cannot demonstrate in its SIP that it will attain or maintain the standard because of emissions from outside the United States (U.S.), then EPA is required to approve the area's SIP under Federal Clean Air Act (FCAA), §179B.
- The EPA approved the El Paso  $PM_{10}$  attainment demonstration on January 18, 1994.



# Cross-Border Air Quality Planning

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- Paso del Norte Air Basin
  - Comprised of El Paso, parts of Doña Ana County in New Mexico, and Ciudad Juárez in the Mexican state of Chihuahua
  - Located between the Franklin Mountains and Sierras de Juárez
  - Unique topography, meteorology, population, and economy
  - Jurisdictional obstacles in controlling cross-border emissions
- Regional Air Quality Planning
  - Formal cross-border cooperation through the *Joint Advisory Committee for the Improvement of Air Quality in the Paso del Norte*



# Local Actions Taken to Reduce PM

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- 1991 Memorandum of Understanding (MOU)
  - Defined actions required by the City of El Paso and the Texas Air Control Board (TACB) to reduce PM
  - Replaced by a Memorandum of Agreement (MOA) between the City of El Paso and Texas Natural Resource Conservation Commission (TNRCC) in 2001
- Control measures included:
  - Wood Burning Regulations
  - Alley Paving
  - Street Sweeping



# Local Actions Taken to Reduce PM

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- From 1991 through 2010, the percentage of unpaved alleys decreased from 66% to 16% of the total alleys in the El Paso area.
- The City of El Paso discontinued garbage collection in alleys in 1997 dramatically reducing traffic in alleys.
- Reclaimed asphalt pavement (RAP) has been used to cover some unpaved alleys and has proven to be as effective as paving.



# Local Actions Taken to Reduce PM

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# Local Actions Taken to Reduce PM

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- The MOA was revised between the City of El Paso and the TCEQ in 2012 to update PM control measures.
- The MOA established that:
  - all new alleys must be paved;
  - unpaved alleys may not be used for residential garbage and recycling collection; and
  - RAP may be used as an alternate means of PM control for alleys.



# Local Actions Taken to Reduce PM

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# Local Actions Taken to Reduce PM





# Local Actions Taken to Reduce PM

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- El Paso Natural Events Action Plan (NEAP)
  - Plan for managing exceedances of the PM standards caused by uncontrollable natural events such as unusually high winds that result in dust storms
  - Adopted by the TCEQ in 2007
  
- Paving of levee roads near Chamizal Monitor
  - The Texas Department of Transportation (TxDOT) is currently in discussions with the International Boundary and Water Commission regarding dust suppression and/or paving options to reduce PM emissions from unpaved roads used by U.S. Border Patrol.



# Designation Recommendations

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- Federal Clean Air Act requires state designation recommendations to the EPA within one year of NAAQS promulgation.
- States recommend designations of attainment, nonattainment, or unclassifiable based on ambient air quality monitoring data.
- State recommendations are expected to be primarily based on 2010 through 2012 monitored data.
- State recommendations may be updated when 2013 data are certified.



# Final Designations

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- The EPA will consider state recommendations in making final area designations.
- 120-Day Letter
  - The EPA will notify states concerning intended modifications to their recommendation.
  - States will have 60 days to respond and provide additional information.
- The EPA will consider all available data and is expected to make final designations based on 2011 through 2013 monitored data.



# PM<sub>2.5</sub> Designations Timeline

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- **December 13, 2013:** State designation recommendations are due.
- **August 14, 2014:** EPA sends 120-day letters.
- **August 29, 2014:** EPA publishes public notice of state recommendations for 30-day comment period.
- **October 29, 2014:** States respond to 120-day letters.
- **December 12, 2014:** EPA promulgates final area designations.



# Exceptional Event Flagging and Document Submissions Timeline

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- **July 1, 2013:** Event flagging deadline for data from 2010, 2011, and 2012
- **December 12, 2013:** Demonstration submission deadline for flags from 2010, 2011, and 2012
- **July 1, 2014:** Event flagging deadline for data from 2013
- **August 1, 2014:** Demonstration submission deadline for flags from 2013



# TCEQ Commissioners' Agenda

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- October 23, 2013
- Commissioners will consider designation recommendation for submittal to the governor.
- Documents available on the [Commissioners' Agenda Web page](#) and the [SIP Hot Topics Web page](#) October 4, 2013.



# Additional Information

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**Contact the SIP Team or join our e-mail list**

<http://www.tceq.texas.gov/airquality/sip/sipcontact.html>



# Questions?

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