Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Commissioners **Date:** October 20, 2009

Thru: LaDonna Castañuela, Chief Clerk

From: Susana M. Hildebrand, P.E.
Chief Engineer's Office

Subject: Update of Air Quality in Texas

At the October 29, 2009, Commissioners' Work Session, an air quality update will be presented on the following topics:

Air Toxics – Effects Screening Levels, Benzene, Butadiene, and the Air Pollutant Watch List

National Ambient Air Quality Standards (NAAQS) – Ozone Design Values and Population Trends, the Particulate Matter of 2.5 microns and less ($PM_{2.5}$) Design Values in Harris County and Clinton Drive, and $PM_{2.5}$ Efforts to Reduce Local $PM_{2.5}$ Emission in the Clinton Drive Area

Permitting Actions to Improve Air Quality in Texas – A general overview of permitting programs in Texas that assist in improving air quality.

Ongoing Activities – Texas Emission Reduction Plan and Drive a Clean Machine

Air Quality Challenges – Relating to the Toxicology Division and the Air Quality Division

Ongoing Efforts – Relating to the Toxicology Division and the Air Quality Division

Overview – An overview of ozone design values in Texas

This presentation will incorporate the attached slides.

Update of Air Quality in Texas

Susana M. Hildebrand, P.E.
Chief Engineer

Update of Air Quality in Texas

- Air Toxics
- National Ambient Air Quality Standards (NAAQS)
- Permitting Actions to Improve Air Quality in Texas
- Ongoing Activities
- Air Quality Challenges
- Ongoing Efforts

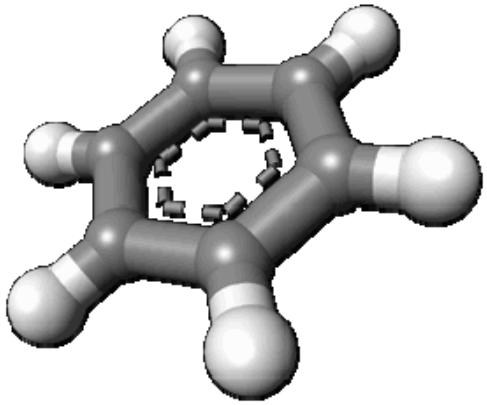
Air Toxics

- Effects Screening Levels
- Benzene
- Butadiene
- Air Pollutant Watch List

Effects Screening Levels

- New guidelines November 2006
  - External scientific peer review by panel of international experts
  - Two rounds of public comments
- Used in air permitting and for evaluating air monitoring data.
- Currently, 28 ESLs have been derived using the new process.

Benzene



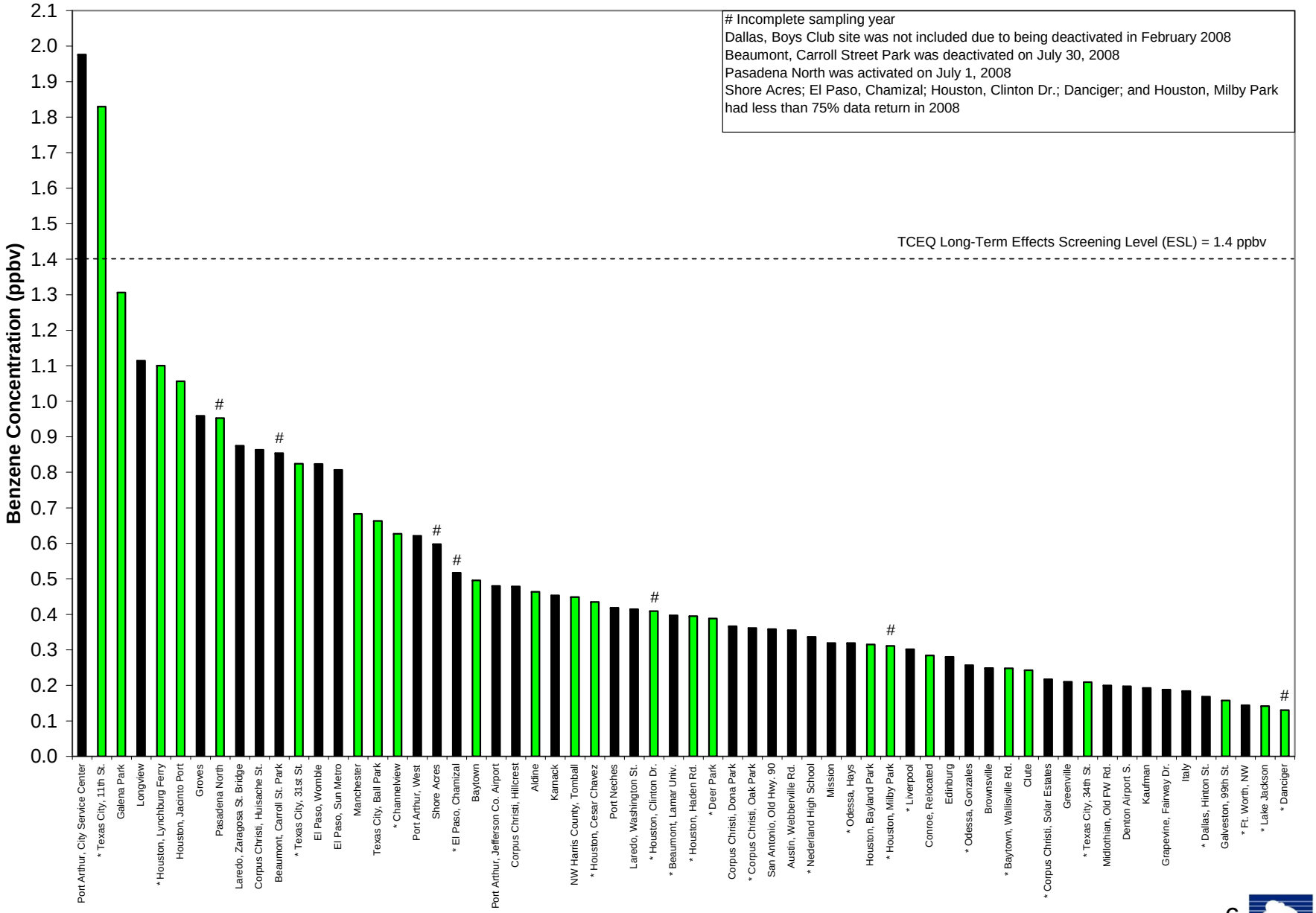
- Risk-driver for Texas and U.S.
- Wide variety of emission sources
- Representative of other chemicals

- In 2008, **no** monitors in Harris County were above the long-term ESL for benzene

- **All monitors** in the Houston Region showed a **decrease** in average benzene concentration from 2005-2008

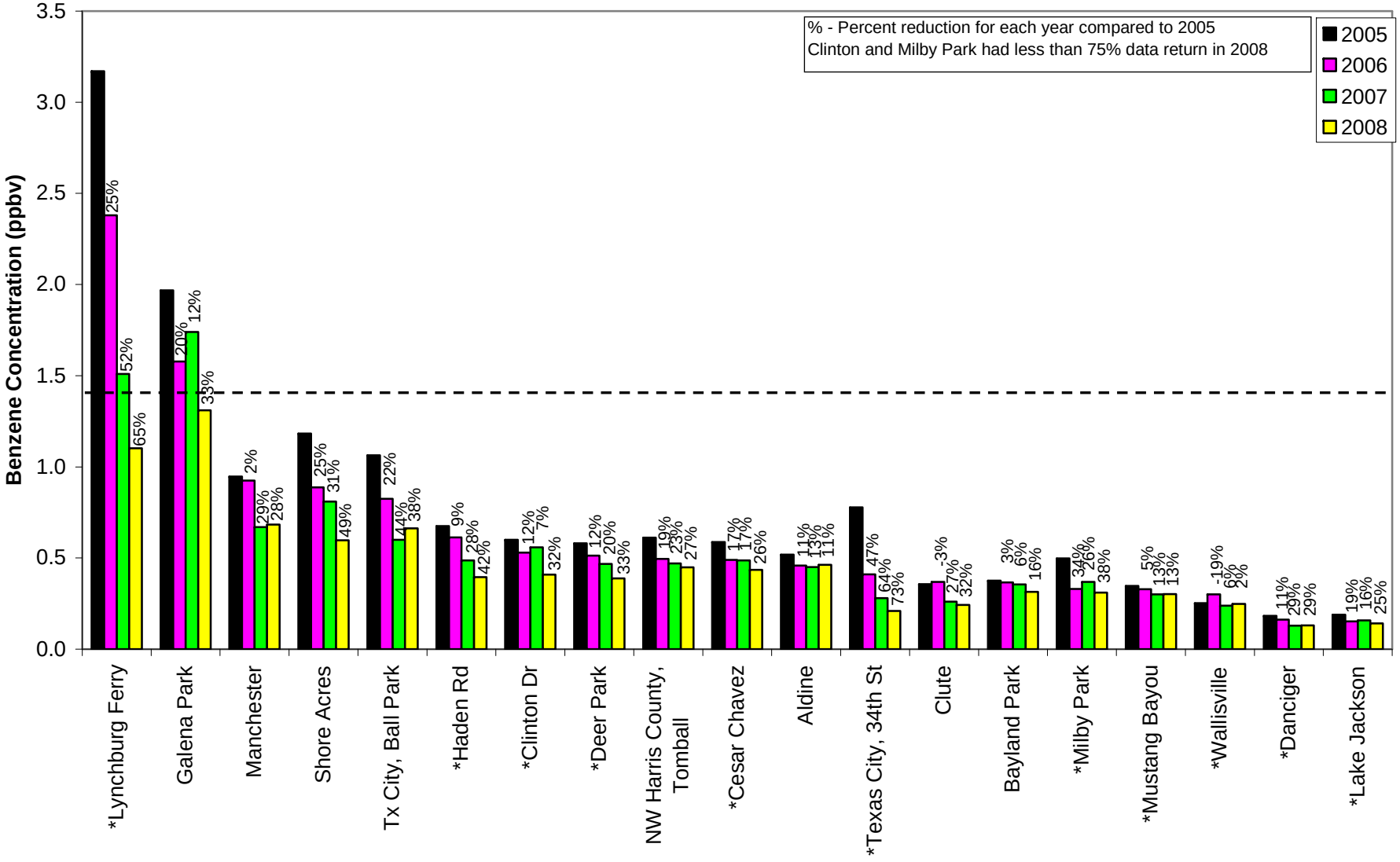
2008 Average Benzene Concentrations at Air Monitoring Sites in Texas

(Values shown are arithmetic means of 5329 to 7594 hourly autoGC measurements where available*; otherwise arithmetic means of 45 to 61 canister samples.)

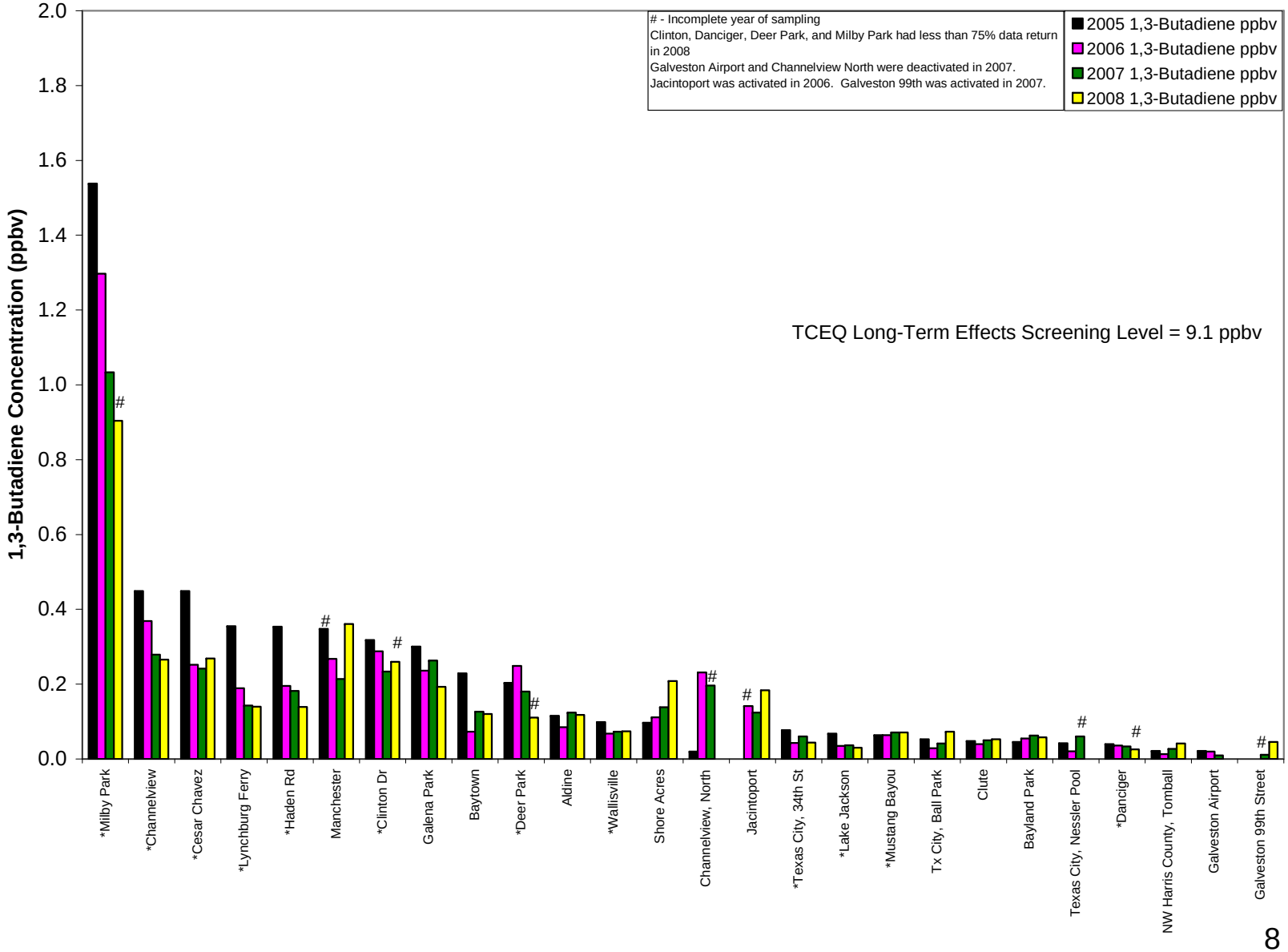


Annual Average Benzene Levels at Selected Harris and Galveston County Sites, 2005-2008

(based on hourly autoGC data if available*; otherwise every-sixth-day 24-hour canister data)

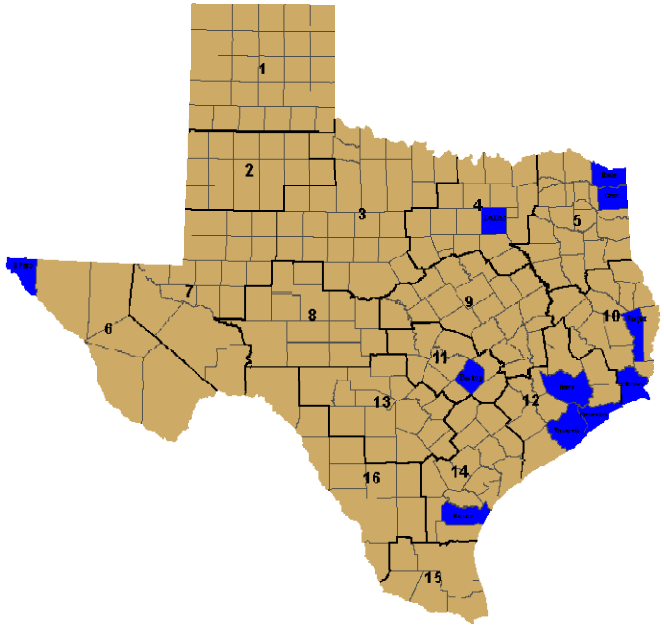


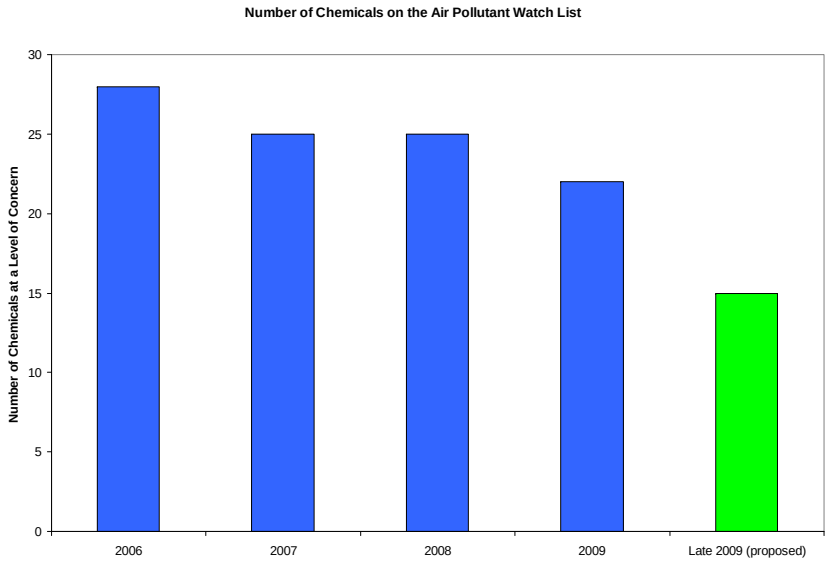
Annual Average 1,3-Butadiene Levels at Harris and Galveston County Sites, 2005-2008
(based on hourly autoGC data if available*; otherwise every-sixth-day 24-hour canister data)



Air Pollutant Watch List

- Currently, there are 12 APWL areas in 11 counties
- Over the last 2 years, 6 pollutants have been removed
- 7 more pollutants in 5 APWL areas are proposed to be removed later this year

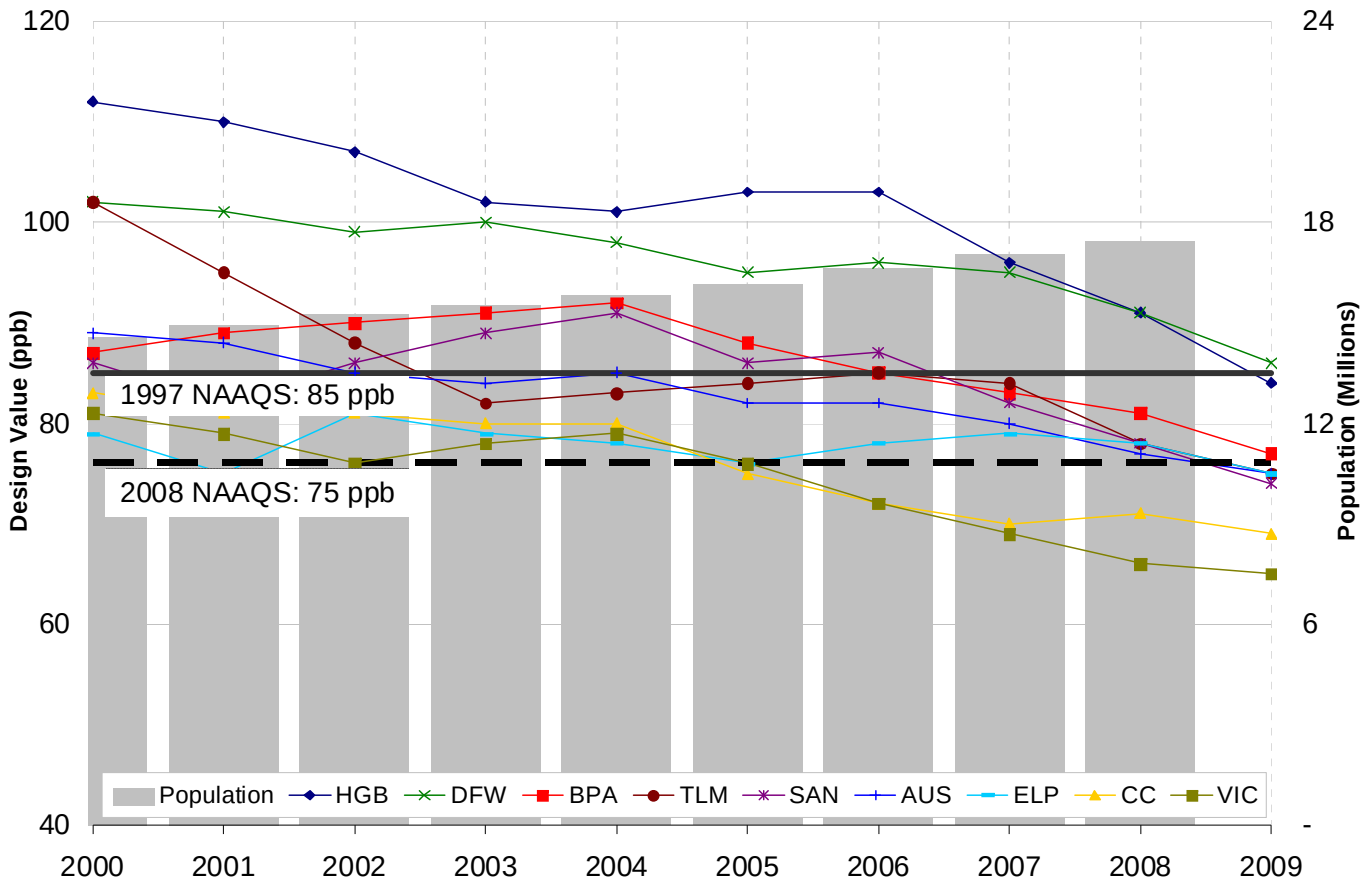




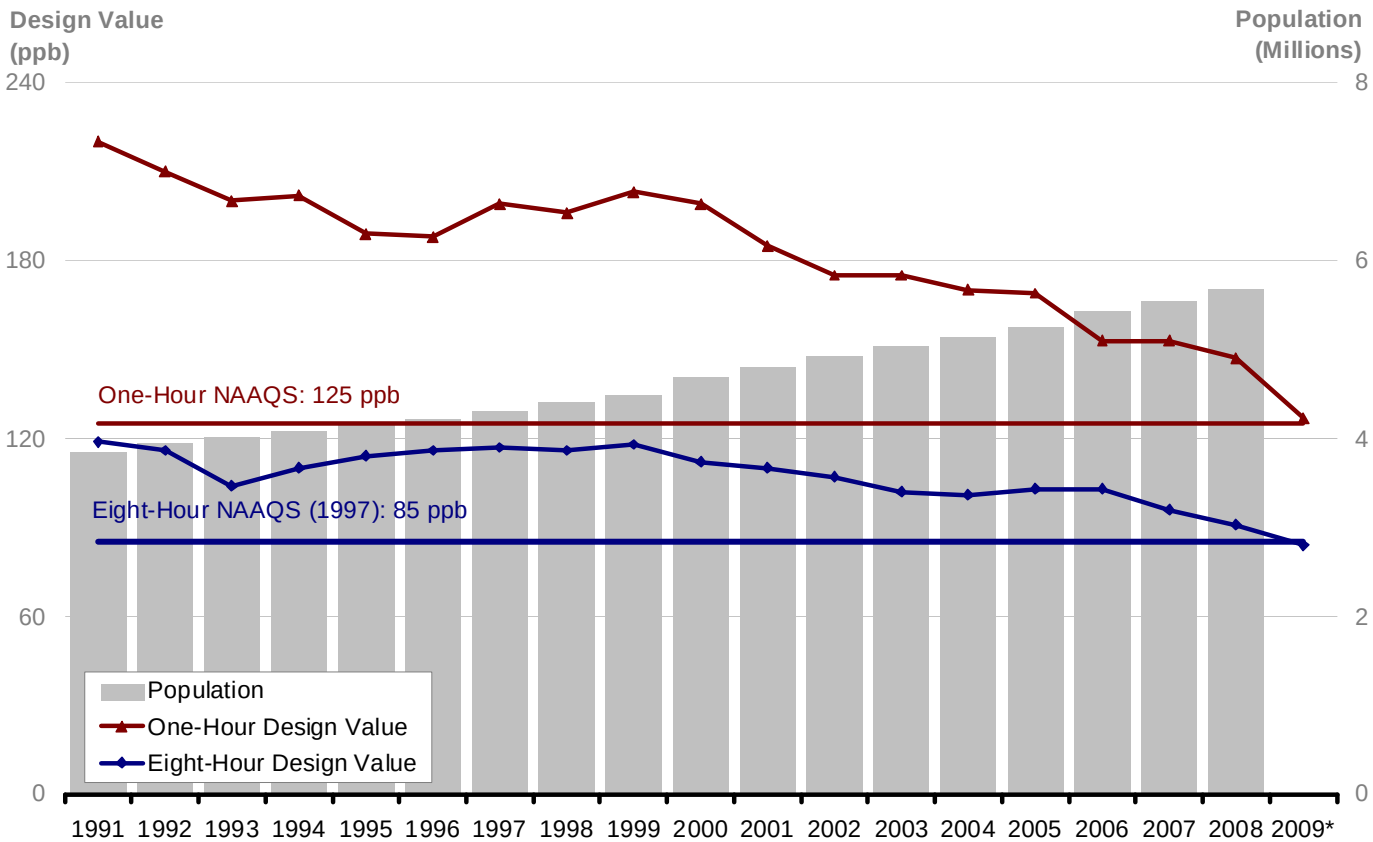
National Ambient Air Quality Standards (NAAQS)

- Ozone (1997 Standard - 0.08 parts per million)
  - Houston-Galveston-Brazoria
  - Dallas-Fort Worth
  - Beaumont-Port Arthur (redesignation request pending approval)
- Particulate Matter
  - El Paso County for PM_{10}
- Lead
  - A portion of Collin County in the Dallas-Fort Worth Area
- Nitrogen Dioxide
  - All areas attainment
- Sulfur Dioxide
  - All areas attainment
- Carbon Monoxide
  - All areas attainment

Texas Eight-Hour Ozone Design Value and Population Trends 2000-2009

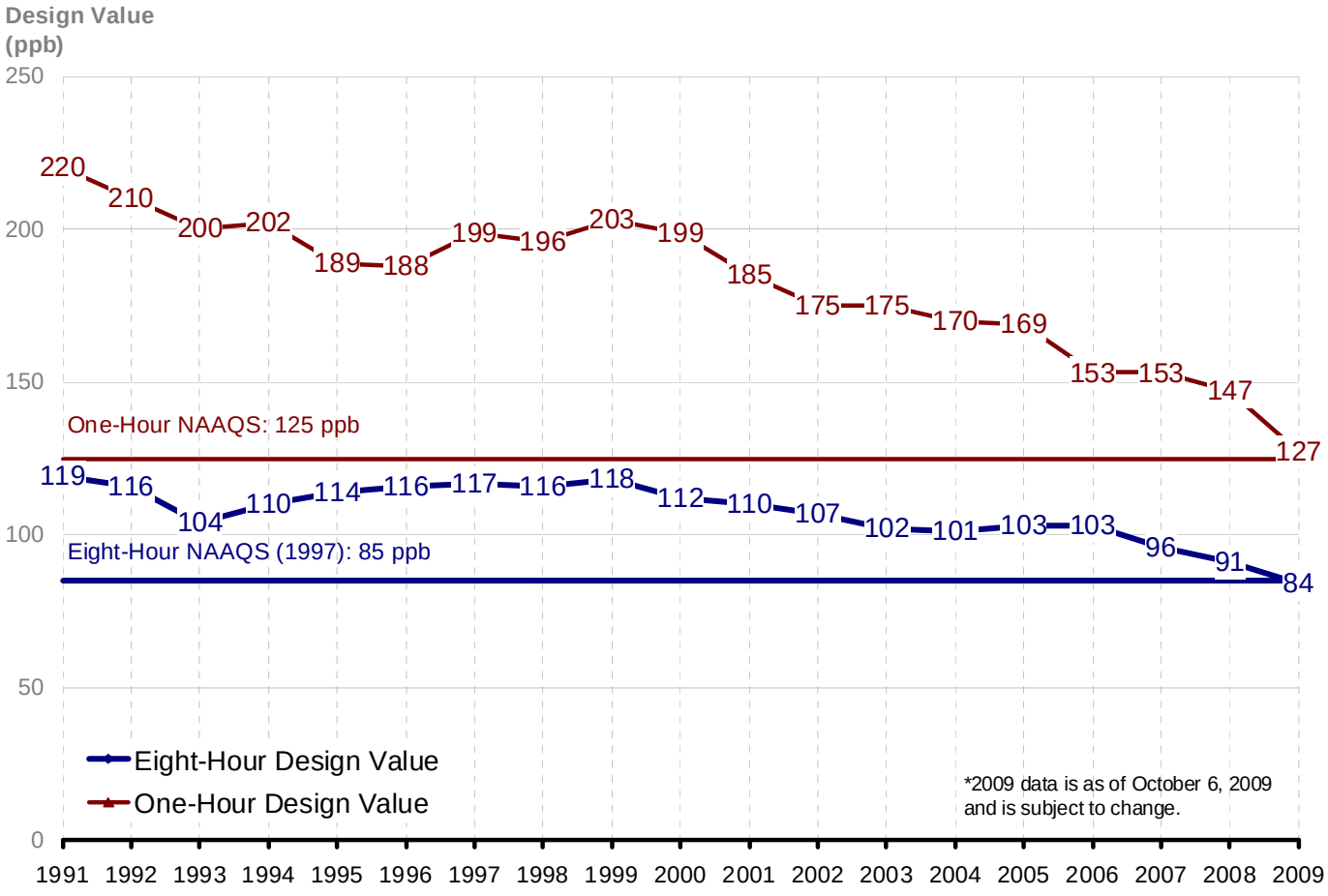


HGB Ozone Design Value and Population Trends 2000-2009

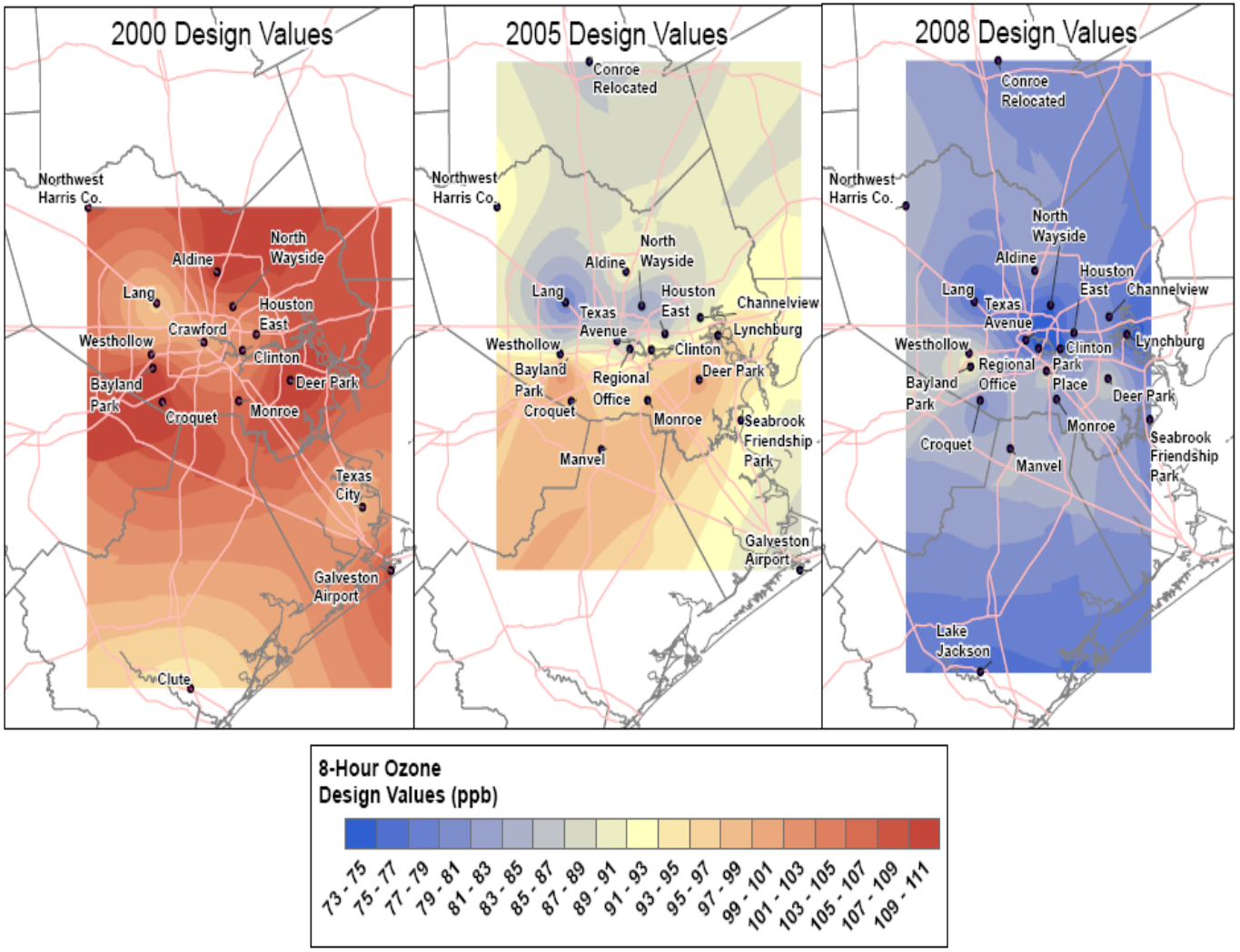


*Source: Ozone -- EPA's AQS database.
1991-2008 Population --http://www.census.gov/popest/archives/1990s/MA-99-03b.txt and http://www.census.gov/popest/counties/CO-EST2008-popchg2000_2008.html
2009 Data is current as of October 6, 2009 and is subject to change. 2009 population data will not be available until June 2010.

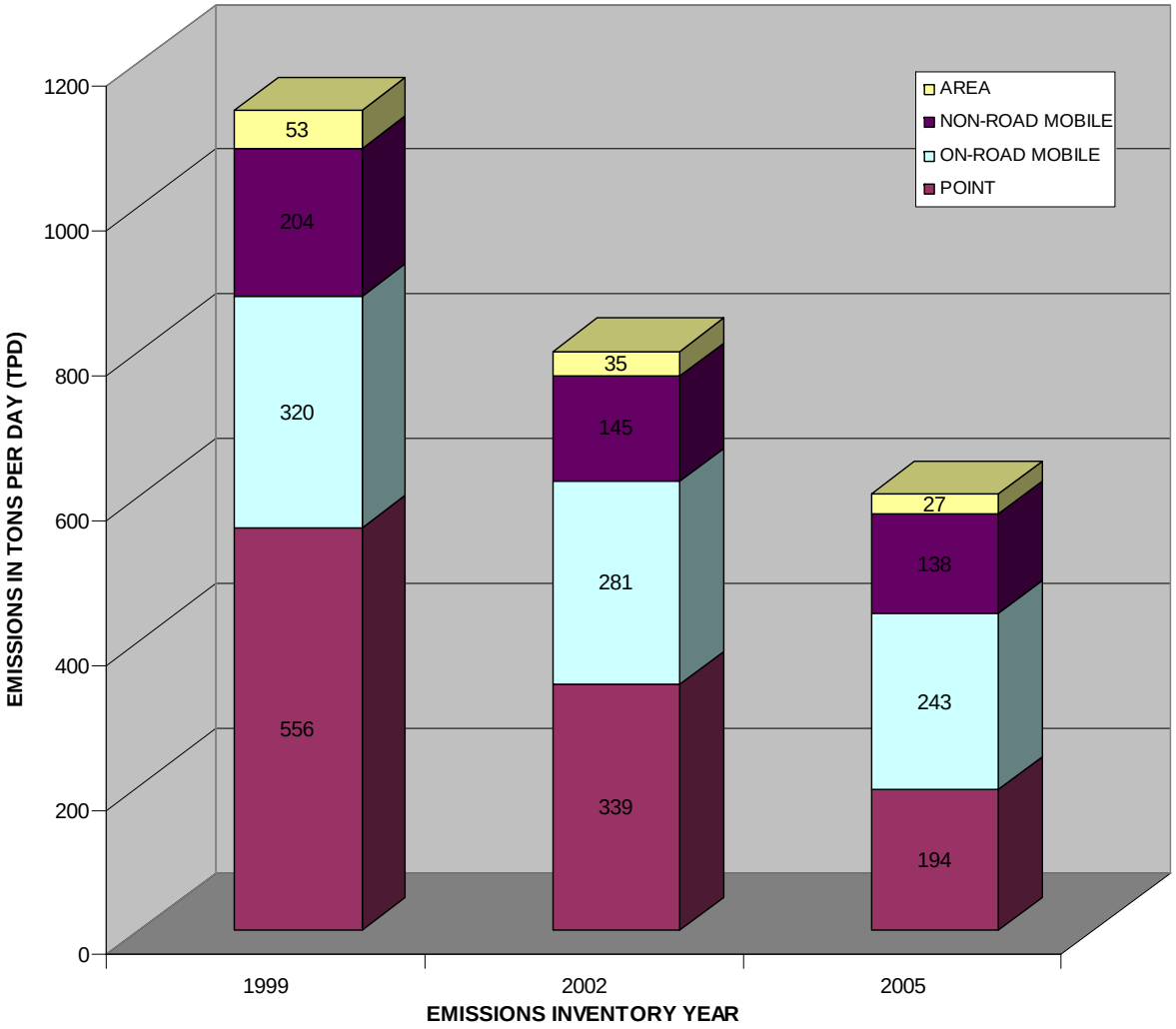
Ozone Design Values for the HGB Area



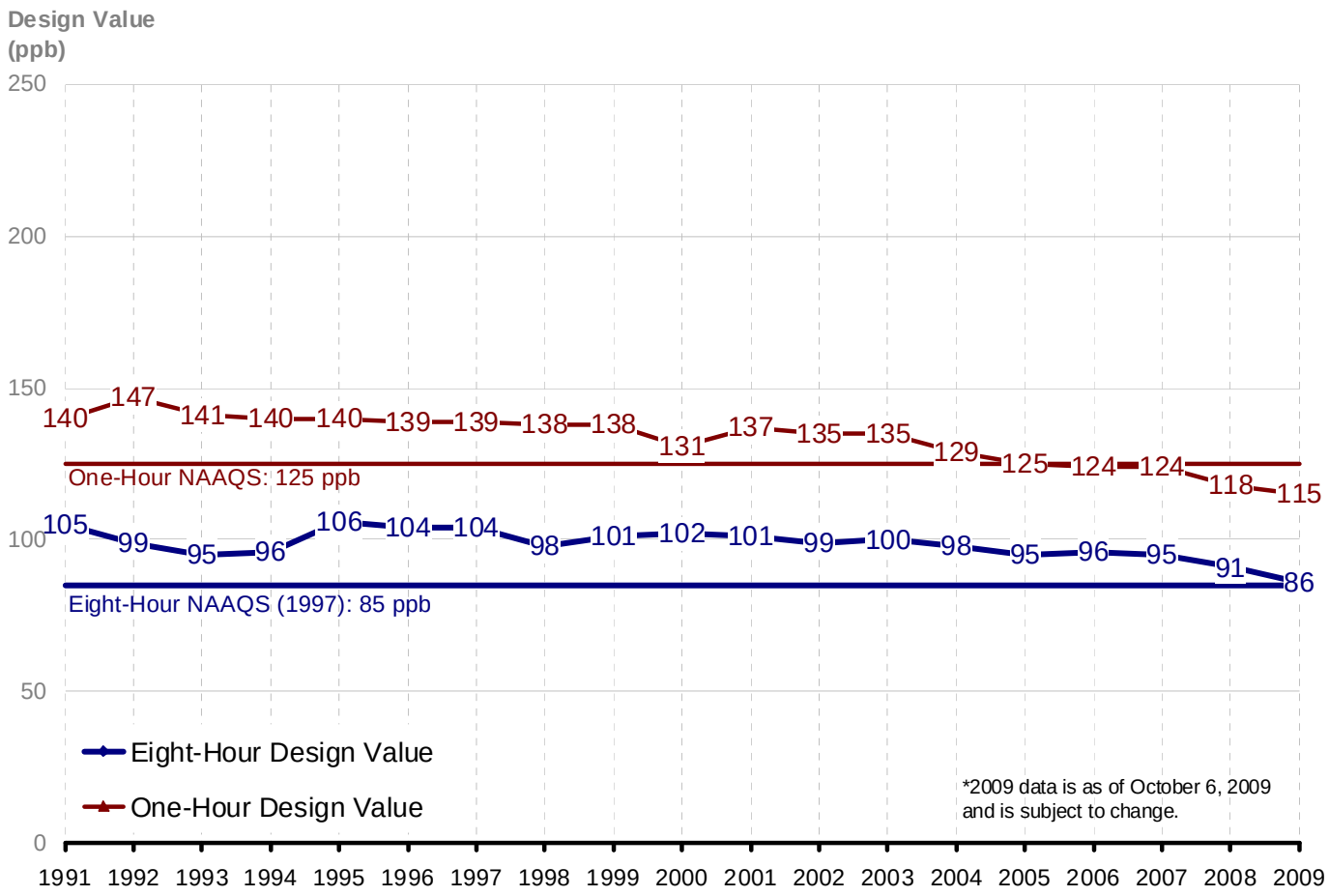
HGB 1997 Eight-Hour Design Values for 2000, 2005, and 2008



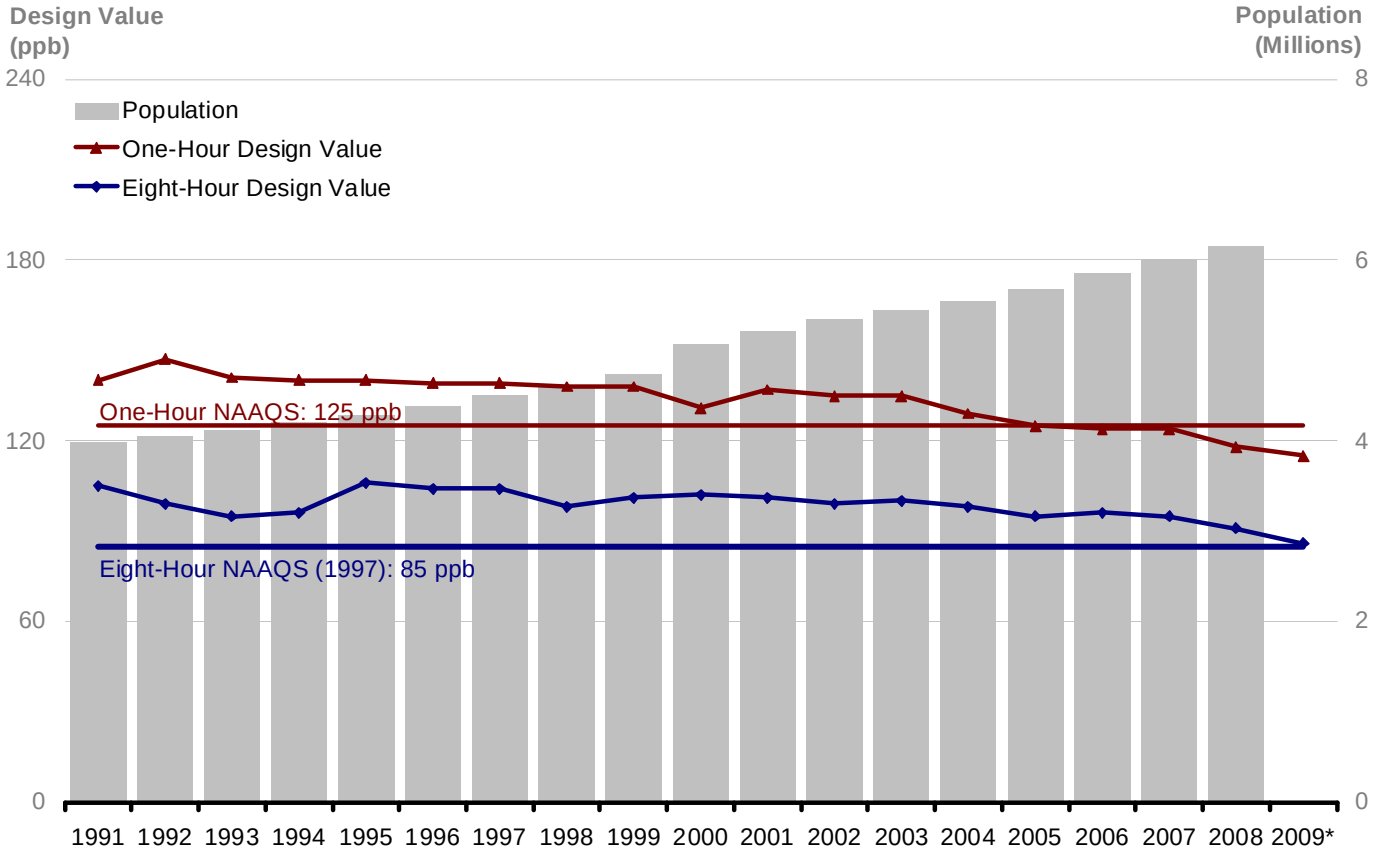
HGB Eight-County NO_X Emissions



Ozone Design Value for the DFW Area



Ozone Design Values and Estimated Population in the DFW Area



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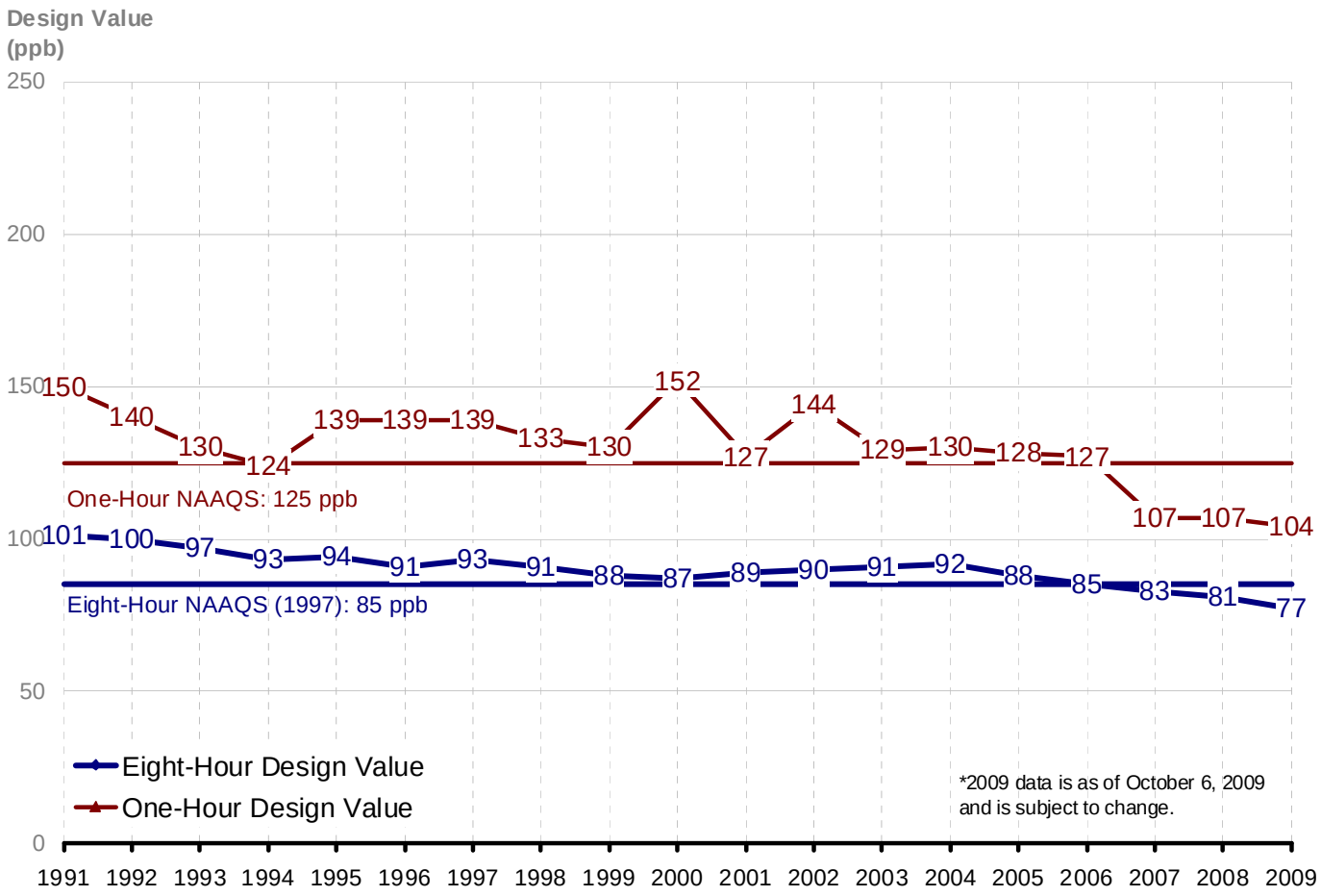
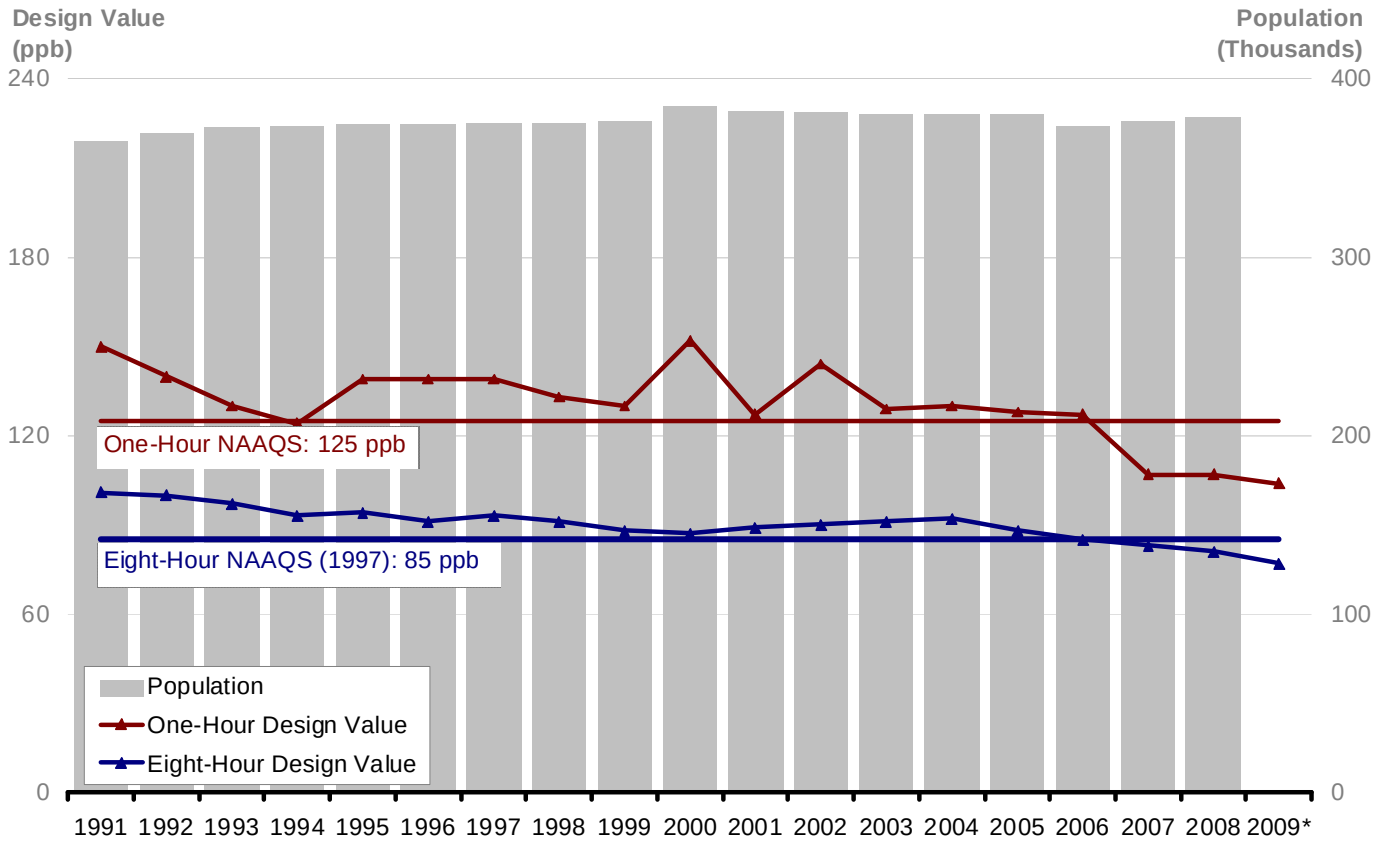
Ozone Design Values for the BPA Area



Ozone Design Values and Estimated Population in the BPA Area



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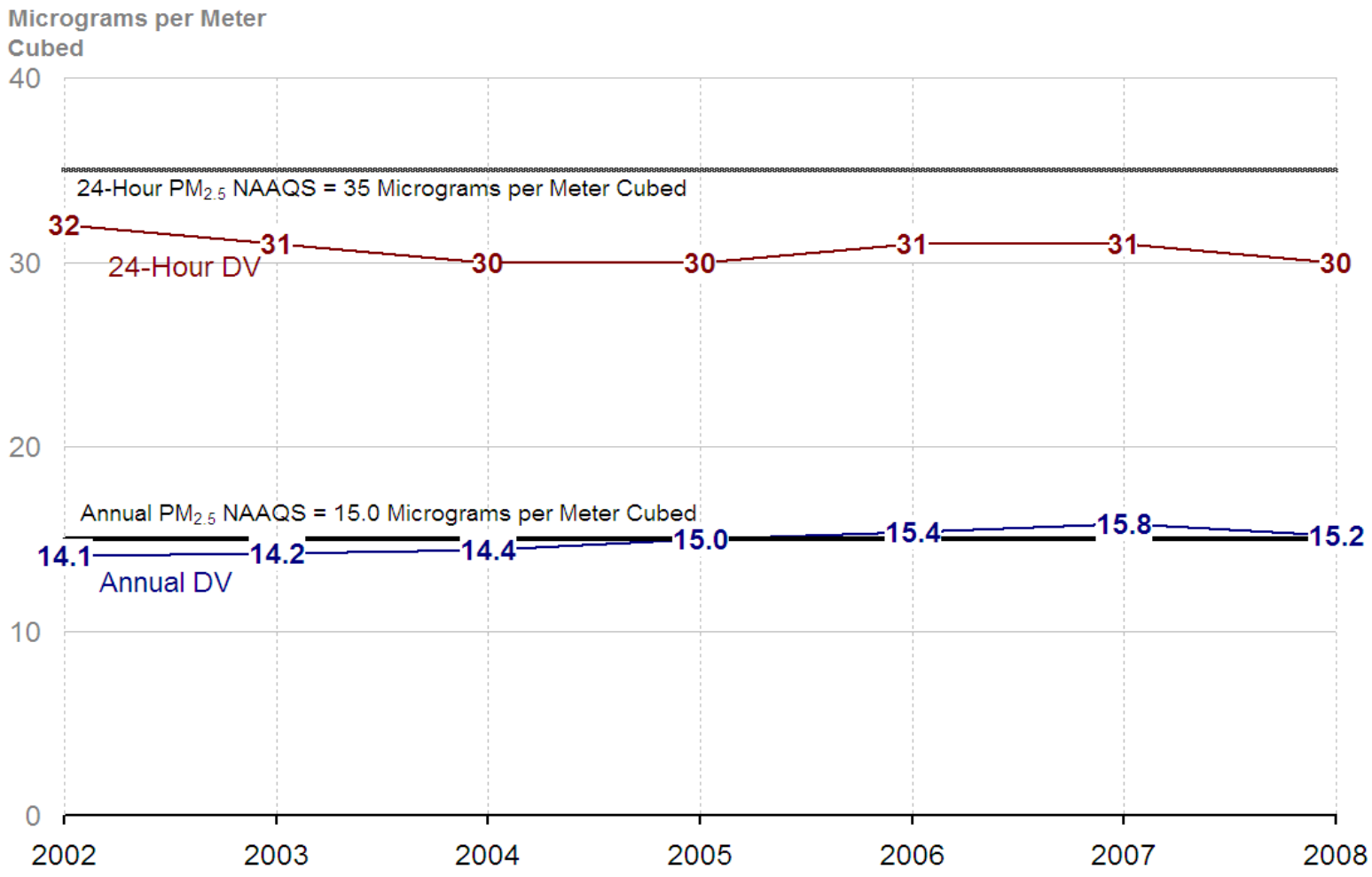
$PM_{2.5}$ Design Values For Clinton Drive
(Includes Exceptional Events)



$PM_{2.5}$ Design Values For Clinton Drive
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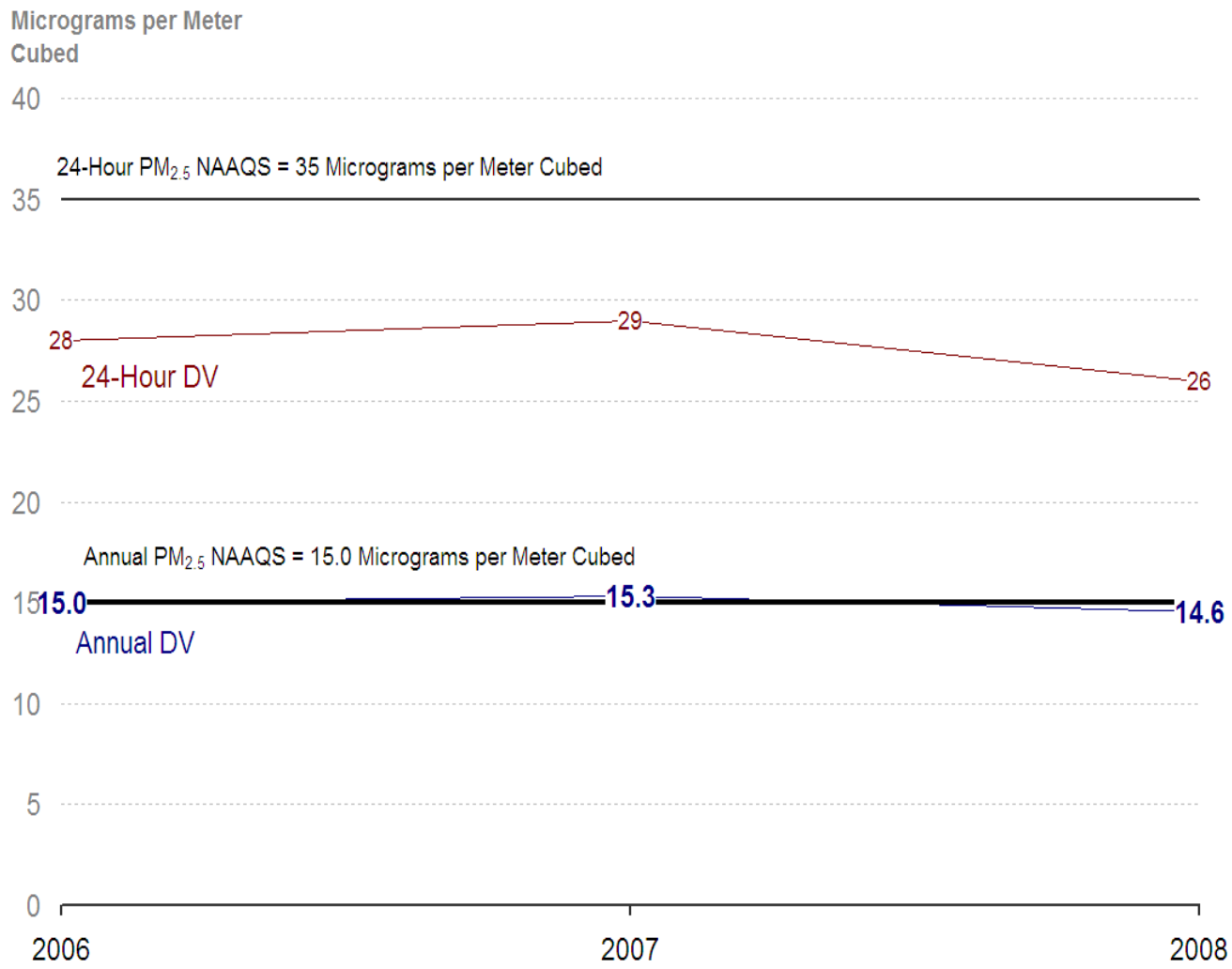
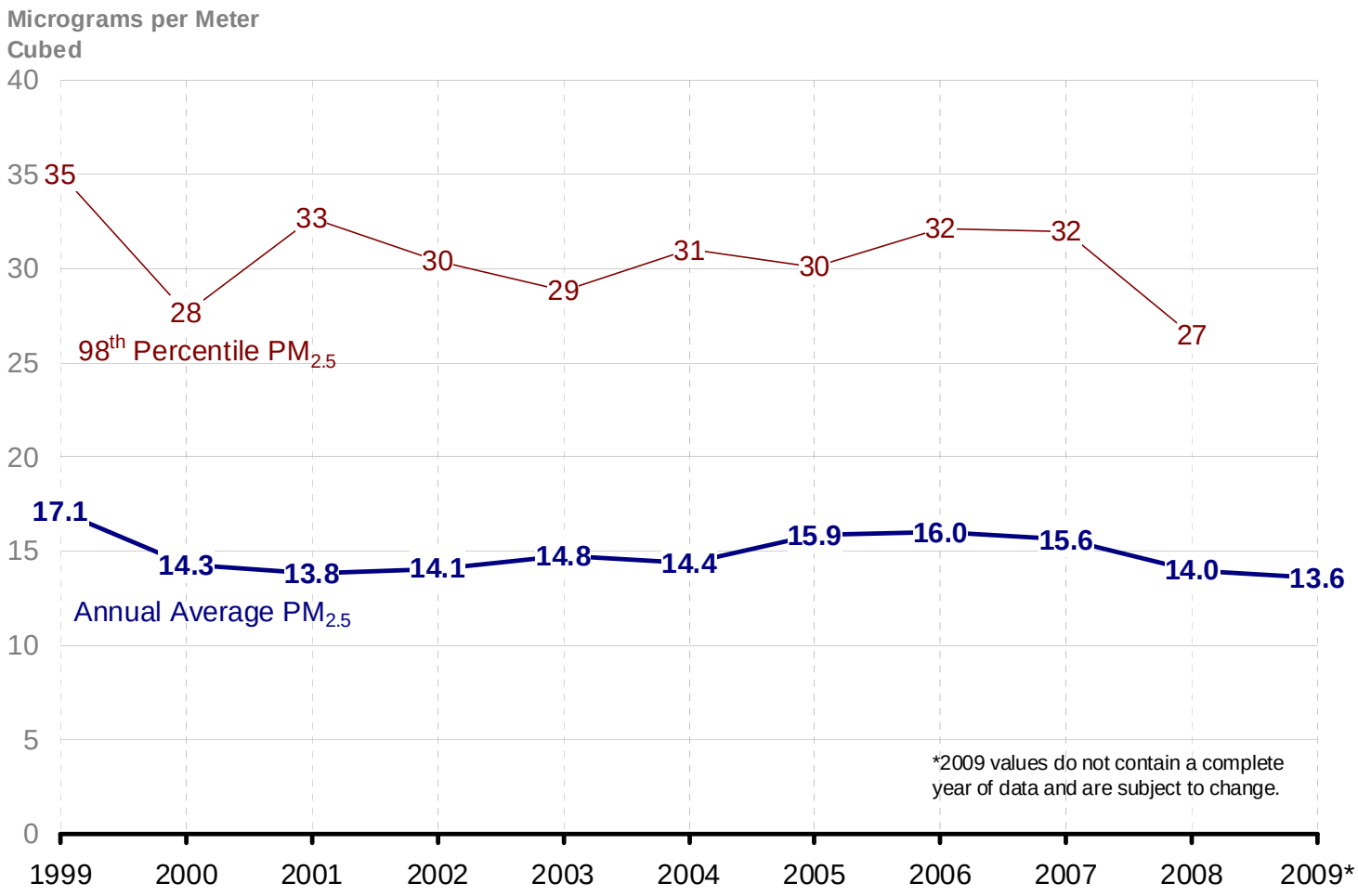


Annual Average and 98th Percentile $PM_{2.5}$ at the Clinton Drive Monitor

(Projects 2009 and Includes Exceptional Events)



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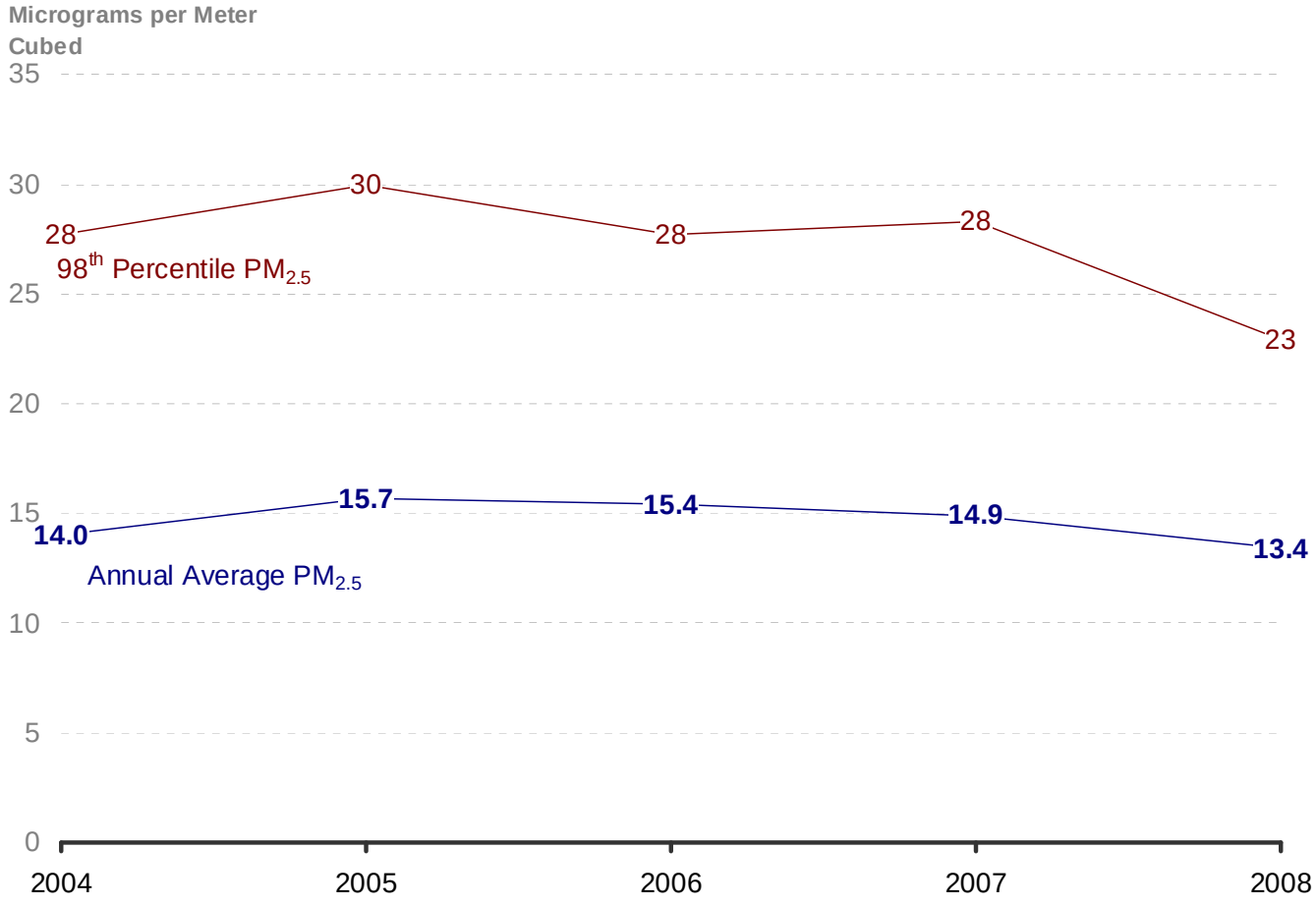

Efforts to Reduce Local $PM_{2.5}$ Emissions in the Clinton Drive Area

(as of September 2009)

- Road Projects
- Railroad Projects
- Regulated Industry Projects

Road Projects

- The City of Houston installed barriers to keep trucks from driving off Clinton Drive onto the dirt shoulders of the road.
- The City of Houston installed a traffic light at Clinton Drive and the Industrial Park East gate to control traffic at the intersection and completed a landscaping project along Clinton Drive.
- The TCEQ commissioners approved an SEP to pave the parking lot directly adjacent to the monitoring station.
- The Port of Houston Authority (PHA) reports widespread use of emulsified asphalt began October 1, 2007.
- Valero Asphalt paved its large work yard located across Clinton Drive to the southeast of the monitor.

Railroad Projects

- Port Terminal Rail Association (PTRA) and Union Pacific (UP) are operating newly refurbished switcher engines on the Clinton line.
  - UP currently has 43 new gensets in the Houston area.
  - UP will be adding 9 new gensets into the Houston area.
  - UP has 13 locomotives being funded by TERP.
- 60% of UP switcher engines operating in the area have anti-idling control.
- PTRA has stopped the steel loading activities on a dirt area to the south of the monitor.

The following revised page was provided
to the Commission on 10/29/2009.

Railroad Projects

- Port Terminal Rail Association (PTRA) and Union Pacific (UP) are operating newly refurbished switcher engines on the Clinton line.
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- 60% of UP switcher engines operating in the area have anti-idling control.
- PTRA has stopped the steel loading activities on a dirt area to the south of the monitor.

Regulated Industry Projects

- DuPont, a PHA tenant, has implemented new dust control best management practices at its fluorspar unloading and storage facility.

- Federal consent decrees are anticipated to result in an estimated 33,900 tpy of SO_2 reductions in the upper Texas Gulf Coast.
  - Valero Refining has already implemented control measures to reduce SO2 emissions by 3,500 tpy.
  - The Rhodia sulfuric acid plant will decrease its SO_2 emissions by 8,984 tpy from 2005 actual emissions by 2012.

Permitting Actions to Improve Air Quality in Texas

- Flexible Permits

Coal and petroleum coke fired power plants	Petroleum refineries
25,803 tpy SO_2	4,877 tpy SO_2
10,330 tpy NO_X	3,392 tpy NO_X
795 tpy PM/PM10	880 tpy PM
	530 tpy VOC
	4,877 tpy CO

- Senate Bill 7 - Grandfathered Electric Generating Units
  - Resulted in emissions reductions of **102,436** tpy of NO_X and SO_2 from previously grandfathered electric generating units.

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Permitting Actions to Improve Air Quality in Texas

- Flexible Permits

Coal and petroleum coke fired power plant	Petroleum refinery
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- Senate Bill 7 - Grandfathered Electric Generating Units
  - Resulted in emissions reductions of **102,436** tpy of NO_X and SO_2 from previously grandfathered electric generating units.

Permitting Actions to Improve Air Quality in Texas
-continued-

- The voluntary and mandatory permitting requirements for previously grandfathered facilities resulted in over **260,000** tons of reductions in actual emissions from these facilities either through the addition of controls or the shutdown of the facilities.
  - Senate Bill 766 - Voluntary Emission Reduction Permit or VERP
  - House Bill 2912 - Mandatory permitting of all grandfathered facilities.
- Planned Maintenance, Startup, and Shutdown (MSS)
- Infrared (IR) Camera

Ongoing Activities

- Texas Emission Reduction Plan (TERP)
- Drive a Clean Machine

Texas Emission Reduction Plan (TERP) Projects Awarded or Pending Award

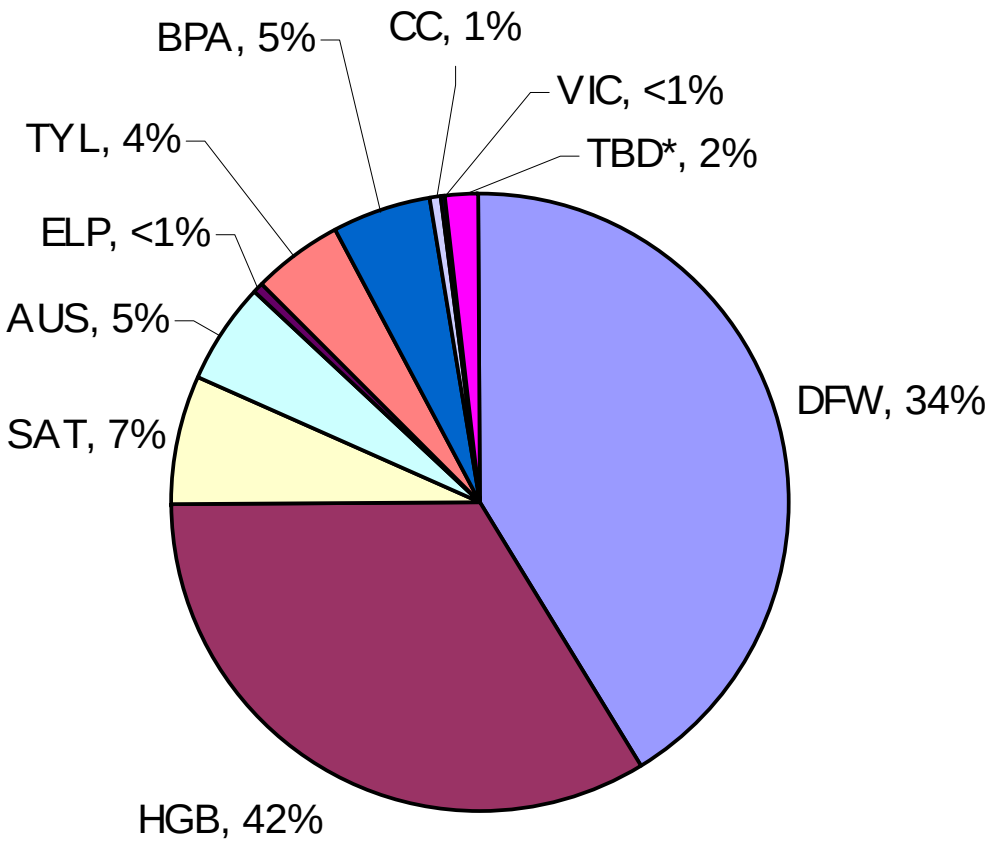
AREA	NUMBER OF PROJECTS	NUMBER OF ACTIVITES	TOTAL NO_x (TONS)	GRANT AMOUNT	COST PER TON	TONS PER DAY IN 2009	TONS PER DAY IN 2010	TONS PER DAY IN 2011	TONS PER DAY IN 2012	TONS PER DAY IN 2013
Houston/ Galveston/ Brazoria	2,213	4,840	69,822.8429	$319,444,382.79	$4,575	29.7931	30.7708	29.1571	27.3117	24.8410
Dallas/ Fort Worth	2,183	4,268	56,581.5491	$259,083,412.91	$4,579	21.9942	23.0500	23.0350	22.1917	21.6412
San Antonio	516	853	9,971.3820	$55,661,139.82	$5,582	4.1469	4.5457	4.4670	4.4036	4.1044
Austin	418	776	5,829.6737	$40,479,888.78	$6,944	2.9992	3.2717	3.0814	2.8333	2.6272
El Paso	137	172	696.6289	$3,183,977.08	$4,571	0.3273	0.3258	0.2946	0.2782	0.2194
Tyler/ Longview	113	256	6,685.3548	$37,876,742.90	$5,666	3.0795	3.4620	3.5765	3.5655	3.5023
Beaumont/ Port Arthur	106	328	8,275.3975	$40,013,009.67	$4,835	3.1543	3.4937	3.1247	2.9798	2.2243
Corpus Christi	22	84	1,086.7595	$5,304,328.28	$4,881	0.6799	0.6662	0.5746	0.3573	0.2612
Victoria	9	13	91.6944	$620,288.66	$6,765	0.0548	0.0548	0.0536	0.0519	0.0032
Unknown (TBD)*	3	3	1,820.9220	$13,656,915.00	$7,500	1.0405	1.0405	1.0405	1.0405	1.0405
	5,720	**11,593**	**160,862.2048**	**$775,324,085.89**	**$4,820**	**67.2696**	**70.6813**	**68.4050**	**65.0137**	**60.4649**

* Includes Third-Party Grants to the Railroad Commission of Texas and the Texas General Land Office for funding not yet reported as assigned to specific areas.

TERP Projects Awarded or Pending Award Summary

- Number of Projects – 5,720
- Number of Activities – 11,593
- Total NO_X Tons – 160,862.2048
- Grant Amount - $775,324,085.89
- Cost Per Ton - $4,820

TERP Grant Amount by Area



AUS	Austin Area
BPA	Beaumont-Port Arthur
CC	Corpus Christi
DFW	Dallas-Fort Worth
ELP	El Paso
HGB	Houston-Galveston-Brazoria
SAT	San Antonio Area
TBD*	To Be Determined
TYL	Tyler-Longview
VIC	Victoria

* Includes Third-Party Grants to the Railroad Commission of Texas and the Texas General Land Office for funding not yet reported as assigned to specific areas.

Drive a Clean Machine

Area	Number of Repairs	Number of Replacements	Amount Distributed for Repair/ Replacement
Central Texas	440	1,273	$4,865,105
Dallas-Fort Worth	3,427	11,645	$38,119,599
Houston-Galveston-Brazoria	3,314	9,299	$34,407,340
Total	7,181	22,217	$77,392,044

From December 2007, implementation of Senate Bill 12, to May 2009 (end of Fiscal Year 2009 third quarter)

Drive a Clean Machine

Air Quality Challenges

- Revisions to the 2008 Ozone NAAQS
- NAAQS Review Schedule
- Effective communication of risk
- Continual improvement of APWL process focusing on consistency, transparency, and progress.

2010 Ozone Standard Key Dates

The EPA administrator announced there would be a review of the 2008 ozone National Ambient Air Quality Standard.	September 16, 2009
Proposal of the reconsideration to be published in the *Federal Register.*	December 2009
Final reconsideration published in the *Federal Register*.	August 2010
Final ozone nonattainment designations by the EPA.	August 2011
State Implementation Plan (SIP) Revisions due to the EPA.	December 2013
Attainment deadlines	2013 – 2030 (?)

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2010 Ozone Standard Key Dates

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Proposal of the reconsideration to be published in the *Federal Register.*	December 21, 2009
Final reconsideration published in the *Federal Register*.	August 31, 2010
Final ozone nonattainment designations by the EPA.	August 2011
State Implementation Plan (SIP) Revisions due to the EPA.	December 2013
Attainment deadlines	August 2014 – August 2031

NAAQS Review Schedule

2009

- **Nitrogen Dioxide (NO_2)** Proposed Rule – June 26, 2009
- **Sulfur Dioxide (SO_2)** Proposed Rule – November 16, 2009
- **Ozone (O_3)** Proposed Rule – December 2009

2010

- **Nitrogen Dioxide (NO_2)** Final Rule – January 22, 2010
- **Nitrogen Oxides (NO_X)/ Sulfur Oxides (SO_X) Secondary Level** Proposed Rule – February 12, 2010
- **Sulfur Dioxide (SO_2)** Final Rule – June 2, 2010
- **Ozone (O_3)** Final Rule – August 2010
- **Nitrogen Oxides (NO_X)/ Sulfur Oxides (SO_X) Secondary Level** Final Rule – October 19, 2010
- **Carbon Monoxide (CO)** Proposed Rule – October 28, 2010

2011

- **Particulate Matter (PM)** Proposed Rule – January 2011
- **Carbon Monoxide (CO)** Final Rule – May 13, 2011
- **Particulate Matter (PM)** Final Rule – October 2011

2012

- **Ozone (O_3)** Proposed Rule – June 2012

2013

- **Ozone (O_3)** Final Rule – March 2013

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2011

- **Particulate Matter (PM)** Final Rule – April 2011
- **Carbon Monoxide (CO)** Final Rule – May 13, 2011

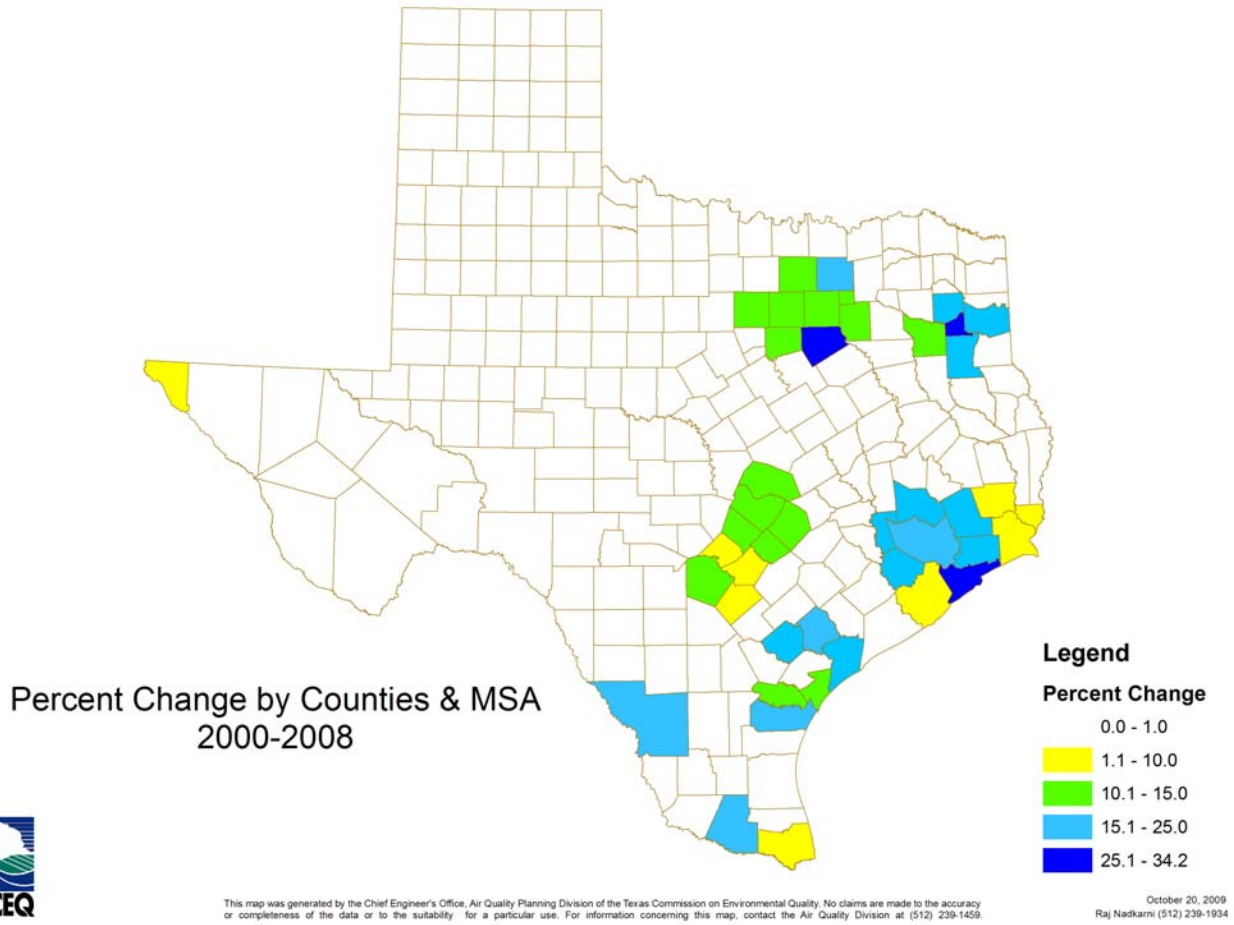
2013

- **Ozone (O_3)** Proposed Rule – May 2013

2014

- **Ozone (O_3)** Final Rule – February 2014

Ongoing Efforts

- Corpus Christi Benzene Biomonitoring Project
- Barnett Shale Investigations
- Houston Exposure to Air Toxics Study (HEATS)
- Linear Dose Response Workshops
- Flare Task Force
- Flare Research Project
- Clinton Drive $PM_{2.5}$ Initiatives

Reduction of Ozone in Texas