

# Proposed 2010 Ozone Standards

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Air Quality Division

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# Proposed 2010 Ozone Standards

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# 2010 Ozone Standard Key Dates

| Milestones   | Date   |
|--|--|
| EPA proposed revisions to the standards                                | January 6, 2010                                |
| TCEQ hosts public meetings   | June and July 2010                             |
| <b>EPA August 20, 2010, update:</b> revised ozone standards final rule | <b>On or around the end of October</b>         |
| Executive director develops recommendation                             | Fall 2010                                      |
| Commission work session for designation recommendation tentative dates | <b>TBD</b>                                     |
| Governor's recommendation due to EPA                                   | To be announced on or about the end of October |
| EPA letter to governor on state recommendation                         | To be announced on or about the end of October |
| EPA public comment period on designations                              | To be announced on or about the end of October |
| EPA designates ozone nonattainment areas                               | To be announced on or about the end of October |



# 2010 Secondary Ozone Standard Alternative Schedule

| Milestone   | Date   |
|---|--|
| <b>EPA signs revised ozone standard final rule with alternative schedule for secondary standard</b> | <b>To be announced on or around the end of October</b> |
| <b>Designation recommendation due to EPA</b>  | <b>To be announced on or around the end of October</b> |
| <b>EPA signs secondary standard designations</b>  | <b>To be announced on or around the end of October</b> |
| <b>SIP revisions due for secondary standard</b>   | <b>To be announced on or around the end of October</b> |



# Primary vs. Secondary Ozone Standards

- The primary ozone standard protects people.
- The secondary ozone standard protects welfare such as sensitive ecosystems and forests.
  - The Clean Air Act requires a secondary standard that, in the administrator’s judgment, “is requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air.”
    - Welfare includes effects on soils, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.
- Cost is not considered when setting ozone standards.



# Primary Ozone Standard

1997 eight-hour ozone standard

**0.08 ppm**

2008 revisions to the eight-hour ozone standard

**0.075 ppm**

2010 proposed revisions to the eight-hour ozone standard

**from 0.060 ppm to 0.070 ppm**



# Calculating the Primary Ozone Design Value

- Find the fourth highest eight-hour daily peak at each monitor.
- Average those fourth highest values from the most recent three years, remember to do this for each monitor. This is the design value for each monitor.
- To find a design value for a county or combined statistical area (CSA), take the maximum design value from all of the regulatory monitors located within that county or CSA.
- Remember that each year in the design value calculation must have at least 75% valid data, or a design value above the standard, to be considered a valid design value.



# Calculating the 2008 Primary Ozone Design Value: An Example

1. Monitor A has three years of complete data:

|   | 2007 | 2008 | 2009 |
|---|------|------|------|
| Maximum Peak Eight-Hour Ozone                 | 87   | 85   | 86   |
| 2 <sup>nd</sup> Highest Peak Eight-Hour Ozone | 85   | 83   | 80   |
| 3 <sup>rd</sup> Highest Peak Eight-Hour Ozone | 70   | 78   | 75   |
| 4 <sup>th</sup> Highest Peak Eight-Hour Ozone | 69   | 73   | 72   |

2. Take the 4<sup>th</sup> highest peak hour-ozone from each year, and find the average:

$$\frac{69 + 73 + 72}{3} = 71.334$$

3. Now truncate your average so there are no decimal places and you have your design value:

$$71.\cancel{334} = 71$$

\*Note that all units in this example are in parts per billion (ppb)





# Calculating the 2010 Primary Ozone Design Value: An Example

1. Monitor A has three years of complete data:

|   | 2007 | 2008 | 2009 |
|---|------|------|------|
| Maximum Peak Eight-Hour Ozone                 | 87   | 85   | 86   |
| 2 <sup>nd</sup> Highest Peak Eight-Hour Ozone | 85   | 83   | 80   |
| 3 <sup>rd</sup> Highest Peak Eight-Hour Ozone | 70   | 78   | 75   |
| 4 <sup>th</sup> Highest Peak Eight-Hour Ozone | 69   | 73   | 72   |

2. Take the 4<sup>th</sup> highest peak hour-ozone from each year, and find the average:

$$\frac{69 + 73 + 72}{3} = 71.334$$

3. Now **ROUND** your average so there are no decimal places and you have your design value:

$$71.334 = 71$$

\*Note that all units in this example are in parts per billion (ppb)



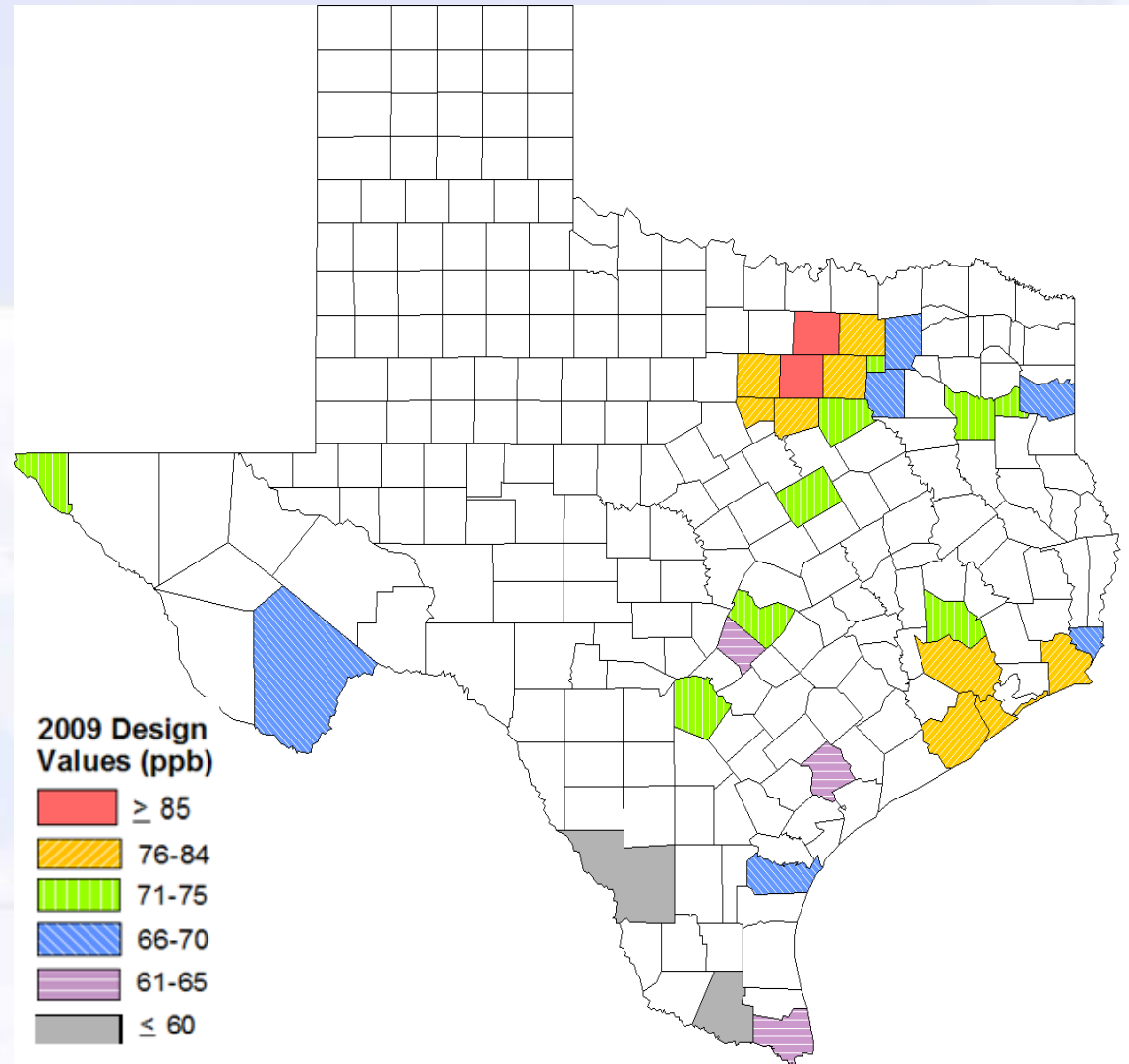
# Calculating the Primary Ozone Design Value: Rounding Conventions

- Note that the 1997 8-hour ozone standard was reported to two decimal places.
  - 0.084 ppm → 0.08 ppm → **ATTAINMENT**
  - 0.085 ppm → 0.09 ppm → **NONATTAINMENT**
- The 2008 standard is reported to three decimal places so rounding is no longer necessary. (Anything past three decimal places is still truncated)
- Example - For the 2008 standard of 0.075 ppm:
  - 0.075 ppm → **ATTAINMENT**
  - 0.076 ppm → **NONATTAINMENT**
- The 2010 standard is expected to follow the 2008 conventions.



# 2009 Primary Ozone Design Values by County

| Region   | County     | 8hr Ozone DV (ppb) |
|----------|------------|--------------------|
| DFW      | Tarrant    | 86                 |
| DFW      | Denton     | 85                 |
| HGB      | Brazoria   | 84                 |
| HGB      | Harris     | 84                 |
| DFW      | Johnson    | 83                 |
| DFW      | Dallas     | 81                 |
| DFW      | Parker     | 81                 |
| DFW      | Collin     | 79                 |
| BPA      | Jefferson  | 77                 |
| DFW      | Hood       | 77                 |
| HGB      | Galveston  | 77                 |
| ARR      | Travis     | 75                 |
| DFW      | Rockwall   | 75                 |
| ELP      | El Paso    | 75                 |
| NETX     | Gregg      | 75                 |
| NETX     | Smith      | 74                 |
| SAN      | Bexar      | 74                 |
| DFW      | Ellis      | 73                 |
| WACO     | McLennan   | 72                 |
| HGB      | Montgomery | 71                 |
| BPA      | Orange     | 70                 |
| DFW      | Kaufman    | 70                 |
| CC       | Nueces     | 69                 |
| NETX     | Harrison   | 68                 |
| DFW      | Hunt       | 66                 |
| BIG BEND | Brewster   | 66*                |
| ARR      | Hays       | 65                 |
| VIC      | Victoria   | 65                 |
| LRGV     | Cameron    | 62                 |
| LRGV     | Hidalgo    | 57                 |
| LAR      | Webb       | 51                 |



\*Brewster County monitor is maintained by the National Park Service and reported in EPA AQS.



# EPA Default Boundary is the CSA

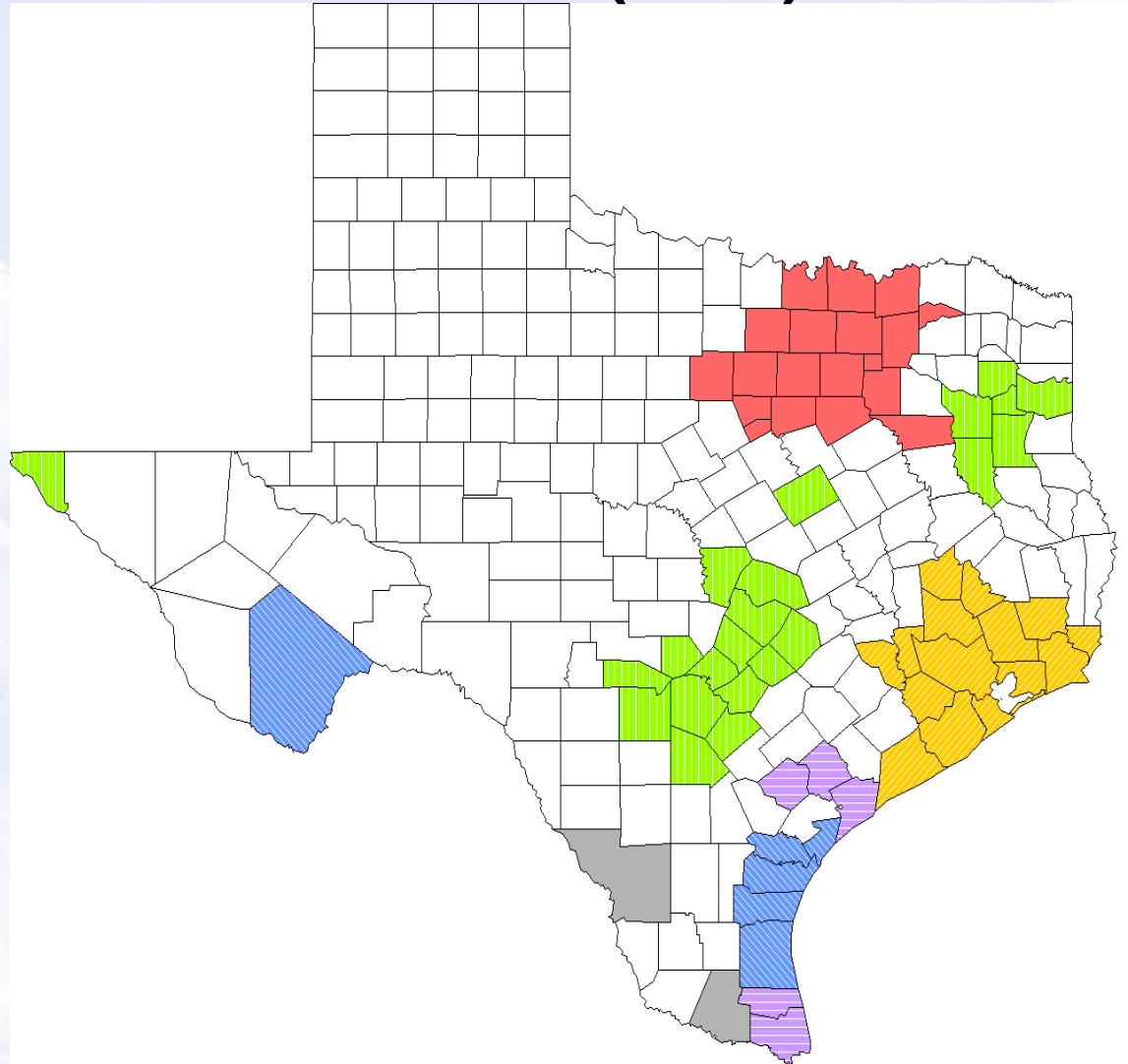
Historically EPA Recommended Nine Factors be Considered  
in Recommending Boundaries

1. Air quality data
2. Emissions data (location of sources and contribution to ozone concentrations)
3. Population density and degree of urbanization
4. Traffic and commuting patterns
5. Growth rates and patterns
6. Meteorology (weather/transport patterns)
7. Geography/topography
8. Jurisdictional boundaries
9. Level of control of emission sources



# 2009 Primary Ozone Design Values by Combined Statistical Area (CSA)

| CSA       | 2009 8-Hr Ozone DV (ppb) |
|-----------|--------------------------|
| DFW       | 86                       |
| HGB       | 84                       |
| BPA       | 77                       |
| NETX      | 75                       |
| ELP       | 75                       |
| ARR       | 75                       |
| SAN       | 74                       |
| WACO      | 72                       |
| CC        | 69                       |
| Big Bend* | 66                       |
| VIC       | 65                       |
| LRGV      | 62                       |
| LAR       | 55                       |



\*Brewster County monitor is maintained by the National Park Service and reported in EPA AQS.



# Secondary Ozone Standard

The 1997 Ozone Standard

**Secondary standard same as the primary standard: 0.08 ppm**

The 2008 Ozone Standard

**Secondary standard same as the primary standard: 0.075 ppm**

The 2010 Proposed Revisions to 2008 Standard

**A cumulative secondary standard called W126 in the range of 7 to 15 ppm-hours**

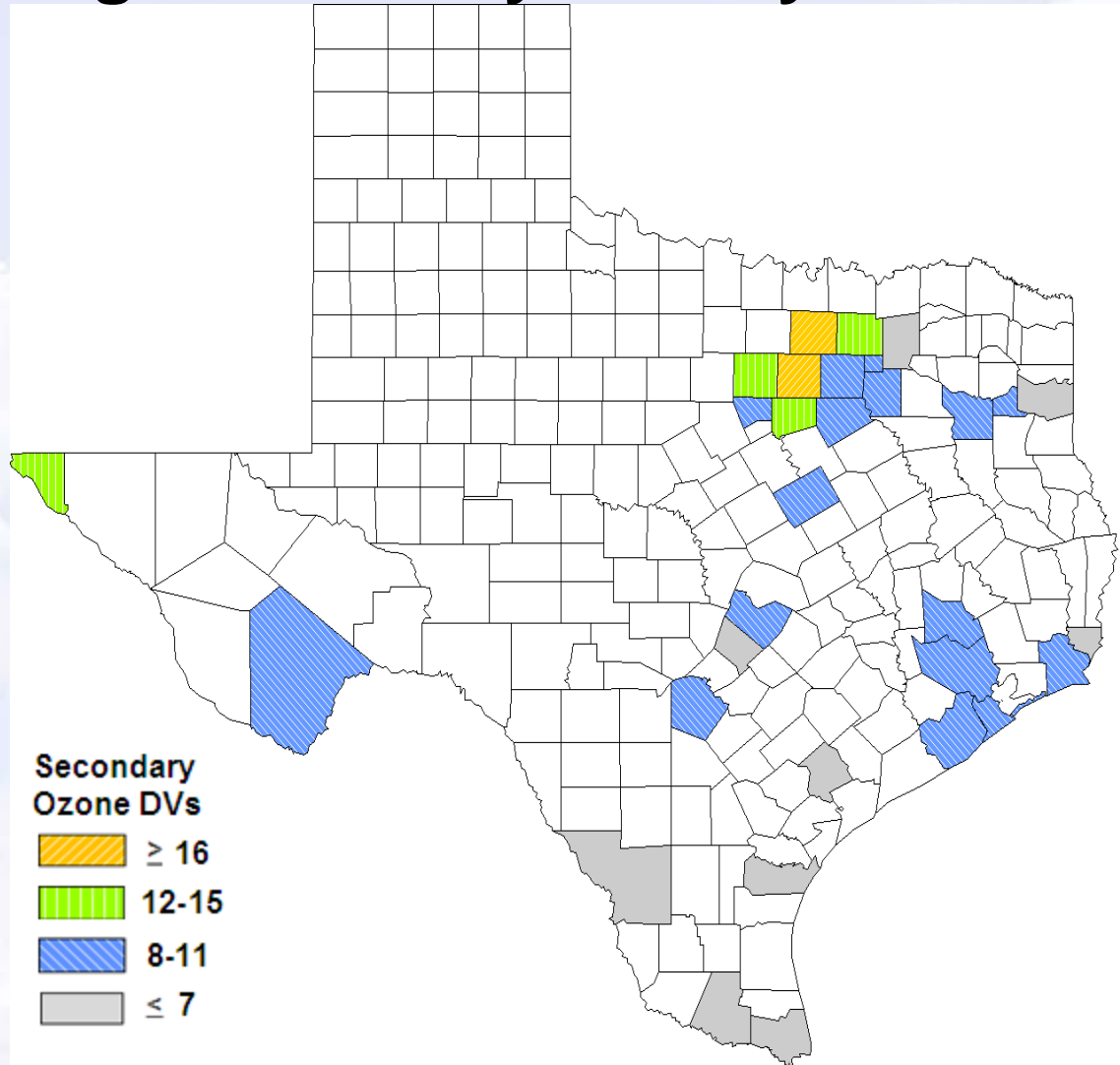
For more information go to:

<http://www.epa.gov/air/ozonepollution/actions.html#jan10s>



# 2009 Secondary Ozone W126 Design Values by County

| Region   | County     | W126 DV<br>(ppm-hrs) |
|----------|------------|----------------------|
| DFW      | Tarrant    | 18                   |
| DFW      | Denton     | 16                   |
| DFW      | Collin     | 15                   |
| DFW      | Parker     | 12                   |
| DFW      | Johnson    | 12                   |
| ELP      | El Paso    | 12                   |
| DFW      | Dallas     | 11                   |
| HGB      | Harris     | 10                   |
| DFW      | Rockwall   | 10                   |
| BPA      | Jefferson  | 10                   |
| BIG BEND | Brewster   | 10*                  |
| SAN      | Bexar      | 10                   |
| ARR      | Travis     | 9                    |
| NETX     | Smith      | 9                    |
| DFW      | Kaufman    | 9                    |
| DFW      | Hood       | 9                    |
| NETX     | Gregg      | 9                    |
| HGB      | Montgomery | 8                    |
| HGB      | Galveston  | 8                    |
| DFW      | Ellis      | 8                    |
| HGB      | Brazoria   | 8                    |
| WACO     | McLennan   | 8                    |
| BPA      | Orange     | 7                    |
| CC       | Nueces     | 6                    |
| DFW      | Hunt       | 6                    |
| NETX     | Harrison   | 6                    |
| VIC      | Victoria   | 5                    |
| ARR      | Hays       | 5                    |
| LRGV     | Cameron    | 4                    |
| LRGV     | Hidalgo    | 3                    |
| LAR      | Webb       | 2                    |

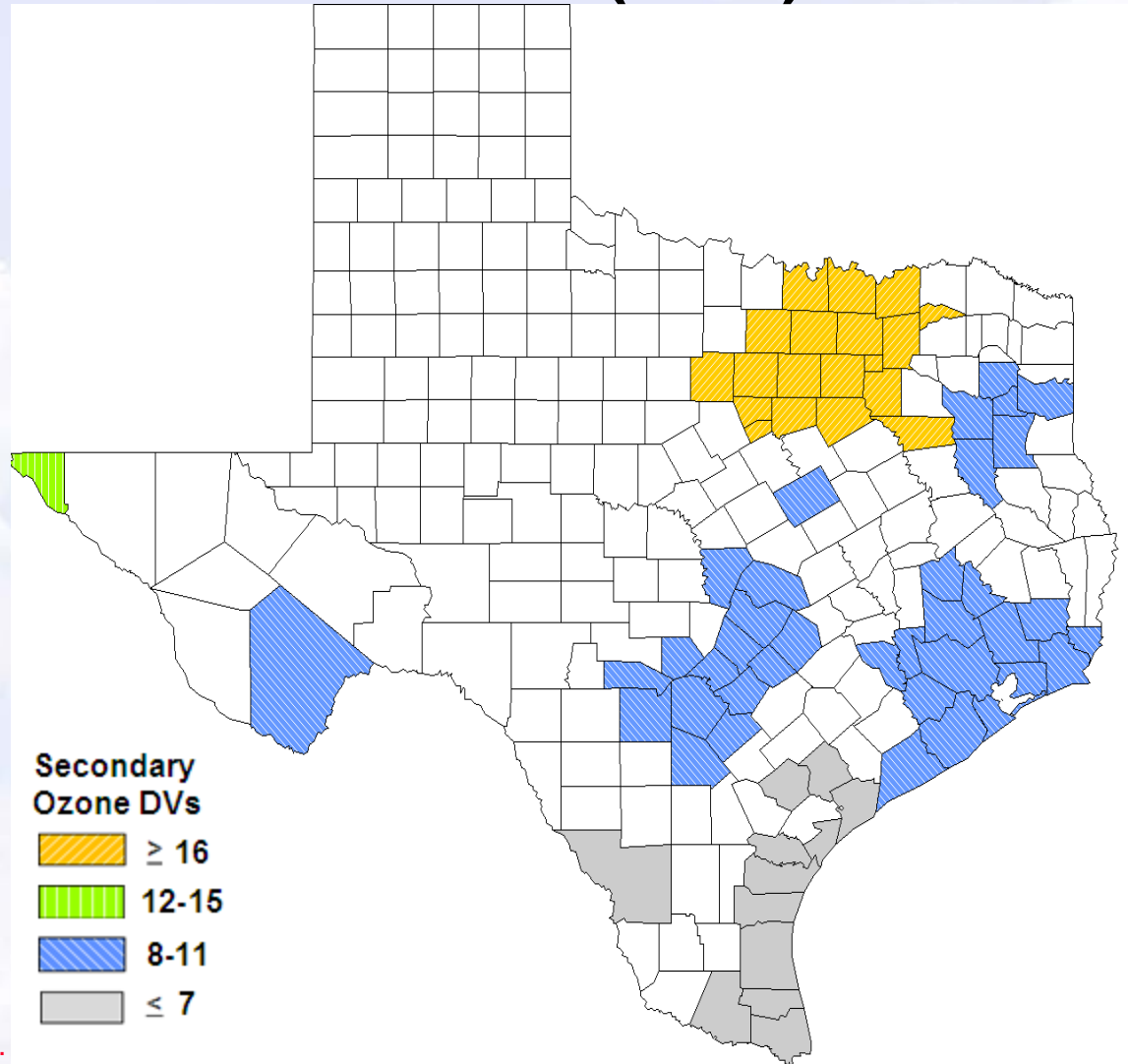


\*Brewster County monitor is maintained by the National Park Service and reported in EPA AQS.



# 2009 Secondary Ozone Design Values by Combined Statistical Area (CSA)

| CSA        | W126 DV (ppm-hrs) |
|------------|-------------------|
| DFW        | 18                |
| ELP        | 13                |
| HGB        | 11                |
| BPA        | 10                |
| Big Bend** | 10                |
| SAN        | 10                |
| ARR        | 9                 |
| NETX       | 9                 |
| WACO       | 8                 |
| CC         | 6                 |
| VIC        | 5                 |
| LRGV       | 4                 |
| LAR        | 2                 |



There is currently no guidance indicating that the EPA will consider the CSA as the presumptive nonattainment boundary for the secondary standard.

\*Brewster County monitor is maintained by the National Park Service and reported in EPA AQS.





# How is the Secondary Standard Calculated? What is W126?

- Biologically based
- W126 uses a sigmoidal weighting function to assign a weight to each hourly ozone concentration.
  - Focuses on higher ozone concentrations by giving them more weight, but still retains the lower and mid level concentrations.
- W126 is a cumulative exposure index.
  - Designed to account for cumulative effects of repeated ozone exposures on sensitive vegetation during months with the highest ozone concentrations.



# Calculating the W126 Index

- Take hourly ozone concentrations from 8am to 8pm (12 hours)
- Weight each hour based on concentration, with higher concentrations receiving more weight:

$$O_3 * \left( \frac{1}{1 + 4403e^{-126 * O_3}} \right)$$

- Sum the weight from each hour to get a daily W126 value
- For each month in the ozone season, sum the daily W126 values to get a monthly value adjusted for data completeness
- The three year average of the consecutive three-month period with the highest W126 value is the secondary design value for the site.

# Calculating the W126 Index-Example

| Start of Hour                    | Concentration (ppm) | Weighted Concentration (ppm) |
|----------------------------------|---------------------|------------------------------|
| 8:00 a.m.                        | 0.045               | 0.002781                     |
| 9:00 a.m.                        | 0.060               | 0.018218                     |
| 10:00 a.m.                       | 0.075               | 0.055701                     |
| 11:00 a.m.                       | 0.080               | 0.067537                     |
| 12:00 p.m.                       | 0.079               | 0.065327                     |
| 1:00 p.m.                        | 0.082               | 0.071715                     |
| 2:00 p.m.                        | 0.085               | 0.077394                     |
| 3:00 p.m.                        | 0.088               | 0.082448                     |
| 4:00 p.m.                        | 0.083               | 0.073683                     |
| 5:00 p.m.                        | 0.081               | 0.069667                     |
| 6:00 p.m.                        | 0.065               | 0.02926                      |
| 7:00 p.m.                        | 0.056               | 0.011676                     |
| Sum=Daily W126 index value(D.I.) |                     | 0.625406 ppm-hours           |

$$M.I. = \sum D.I.*$$

\*The monthly index is the sum of the all the daily indices for that month adjust for data completeness.

|                             | April | May   | June   | July   | August | Septemeber | October | Overall             |
|-----------------------------|-------|-------|--------|--------|--------|------------|---------|---------------------|
| 2006                        |       |       |        |        |        |            |         |                     |
| Adjusted monthly W126 index | 4.442 | 9.124 | 12.983 | 16.153 | 13.555 | 4.364      | 1.302   |                     |
| 3-Month sum                 | na    | na    | 26.549 | 38.26  | 42.691 | 34.072     | 19.221  |                     |
| 2006 Maximum                |       |       |        |        | 42.691 |            |         | 42.691              |
| 2007 Maximum                |       |       |        |        |        |            |         | 23.78               |
| 2008 Maximum                |       |       |        |        |        |            |         | 20.978              |
| 3-Year Average W126 Index   |       |       |        |        |        |            |         | 29.14966667         |
|                             |       |       |        |        |        |            |         | <b>29 ppm-hours</b> |

**2008 Secondary  
Ozone Design  
Value**

\*Round to a whole number with decimal values equal to or greater than 0.500 rounding up.

In calculations all digits supported by the calculator/ software should be retained.



# EPA Proposed Ozone Monitoring Requirements

## Urban MSA Ozone Monitoring

- Monitoring would be required in MSAs at a location of expected maximum ozone concentrations and populations between 50,000 and 350,000.
- New ozone monitors would be required in 10 new urban areas
  - Texarkana
  - Bryan-College Station
  - Abilene
  - Amarillo
  - Lubbock
  - Midland
  - Odessa
  - San Angelo
  - Sherman-Denison
  - Wichita Falls



# EPA Implementation Rule

- Establishes the process for classifying nonattainment areas
- Need to know:
  - Required attainment date
  - Minimum level of required controls and state implementation plan submittals
  - Process to transition between standards
- Expected to be proposed by EPA this summer and finalized by March 2011



## Primary Ozone Standard Revision Summary – 2009 Ozone Design Values

At 70 ppb

**20 counties with ozone monitors are exceeding**

At 65 ppb

**26 counties with ozone monitors are exceeding**

At 60 ppb

**29 counties with ozone monitors are exceeding**

2 out of 31 Texas counties with an ozone monitor will be in compliance with the lowest suggested primary ozone standard.



## Secondary Ozone Standard Revision Summary – 2009 Ozone Design Values

At 15 ppm-hours

**2 counties with ozone monitors are exceeding**

At 11 ppm-hours

**7 counties with ozone monitors are exceeding**

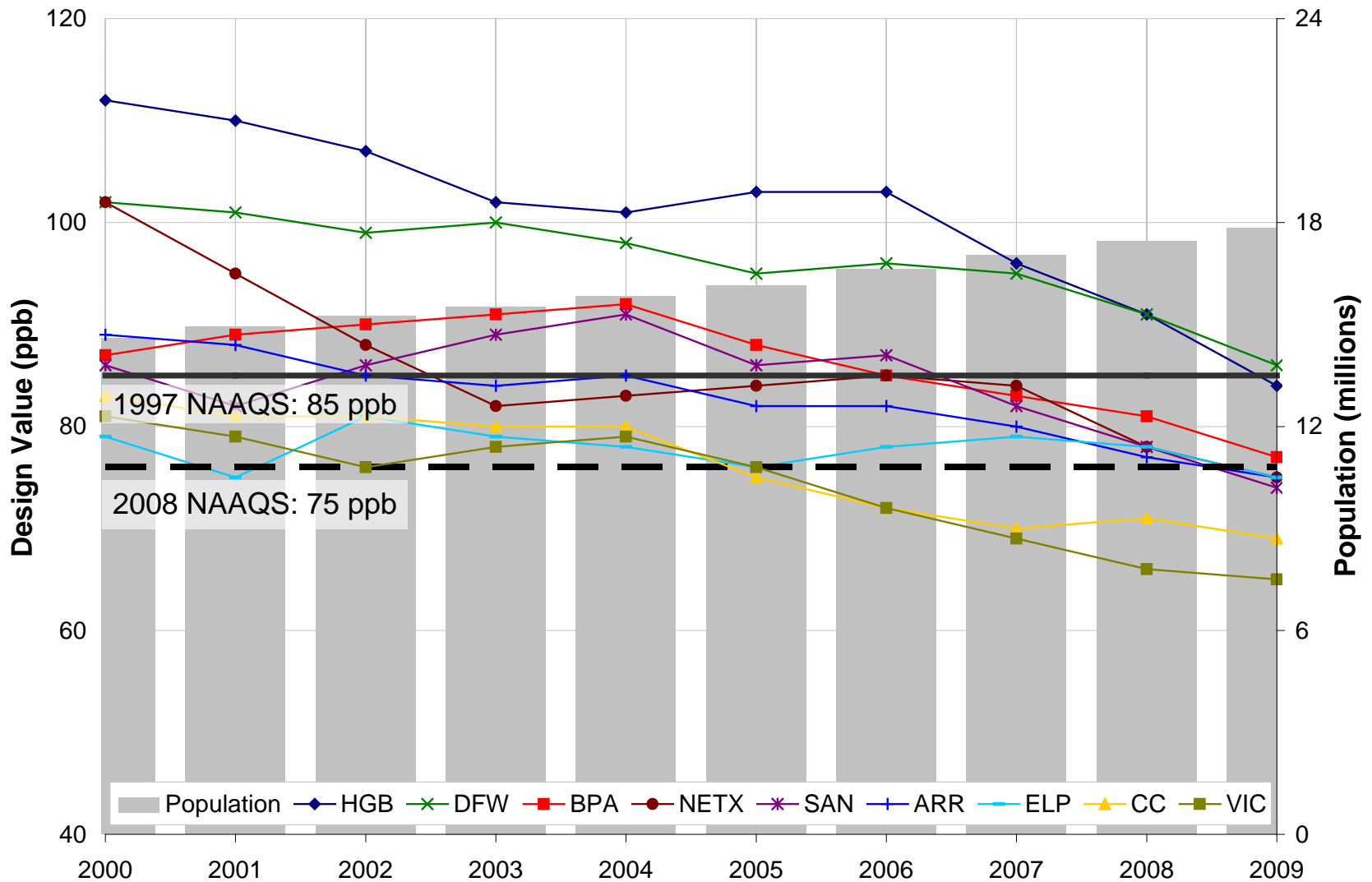
At 7 ppm-hours

**22 counties with ozone monitors are exceeding**

9 out of 31 Texas counties with an ozone monitor will be in compliance with the lowest suggested secondary ozone standard.



# Texas Primary Ozone Design Value and Population Trends







# Submit Comments

The Federal Clean Air Act requires each state to submit to the United States Environmental Protection Agency a list of areas to be designated attainment, nonattainment, or unclassifiable for new or revised air quality standards.

The state recommendation on the 2010 ozone standards is due by **January 7, 2011**. You are invited to submit comments by **November 8, 2010**.

Please submit your comments to:

Ms. Margie McAllister

Air Quality Division, Chief Engineer's Office

**By e-mail**

[mmcallis@tceq.state.tx.us](mailto:mmcallis@tceq.state.tx.us)

**By mail**

Post Office Box 13087, Mail Code 164

Texas Commission on Environmental Quality

Austin, Texas 78711-3087

**By delivery**

12100 Park Circle Drive, Building E, 3rd floor

Texas Commission on Environmental Quality

Austin, Texas 78753

**By fax**

512-239-1500

For More Information:

<http://www.tceq.state.tx.us/implementation/air/aqps/eighthour.html>