Department of Environment & Conservation

Air Quality 101

TCCI Industrial Air Regulations Workshop

July 14 & August 24, 2016

Jimmy Johnston, Deputy Director

Topics Covered

- Mission Statement
- Personnel Changes
- NAAQS Updates
- Permitting Initiatives & Updates
- Title V Fees

DAPC Mission Statement

The Division of Air Pollution Control is directed to maintain the purity of the air resources of the State of Tennessee consistent with the protection of normal health, general welfare, and physical property of the people while preserving maximum employment and enhancing industrial development of the State.

TN Division of Air Pollution Control - 2015

Barry Stephens
Director

Robert Brawner
Environmental
Fellow

Jimmy Johnston
Deputy Director
Permitting &
Regulatory
Development

Carol Williams
Deputy Director
Field Office
Operations

Quincy Styke
Deputy Director
Central Office
Operations

TN Division of Air Pollution Control - 2015

Robert Brawner
Environmental Fellow

Jimmy Johnston
Deputy Director
Permitting & Regulatory Development

Carol Williams
Operations

Quincy Styke
Deputy Director
Central Office Operations

TN Division of Air Pollution Control - 2016

Michell Owenby
Director

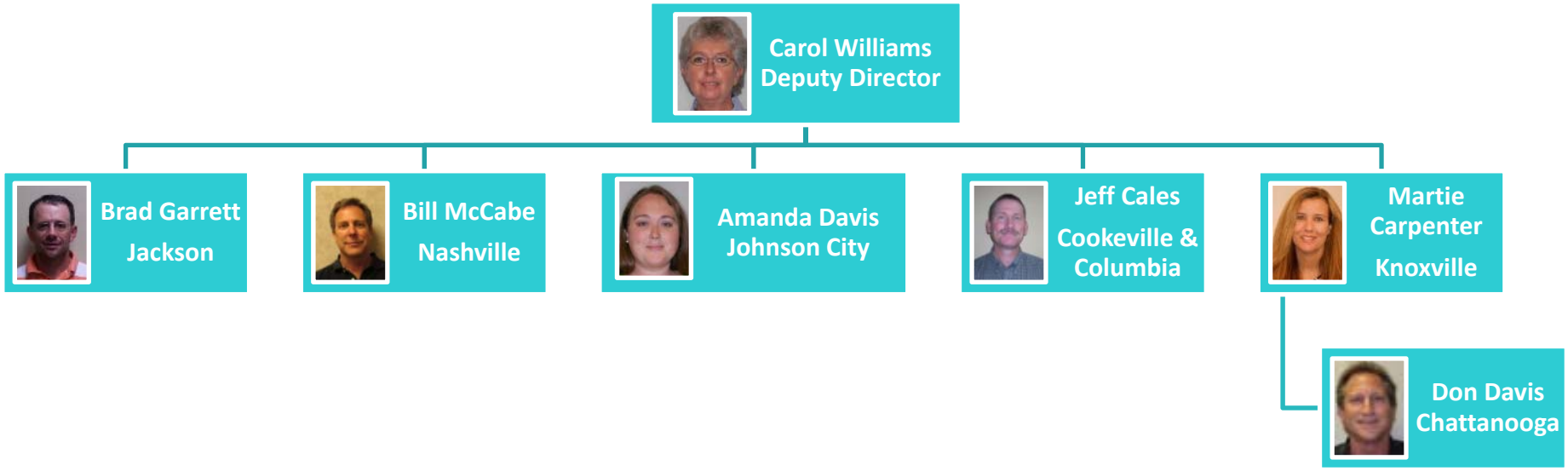
Robert Brawner
Environmental
Fellow

Jimmy Johnston
Deputy Director
Permitting &
Regulatory
Development

Martie Carpenter
Deputy Director
Field Office
Operations

Quincy Styke
Deputy Director
Central Office
Operations

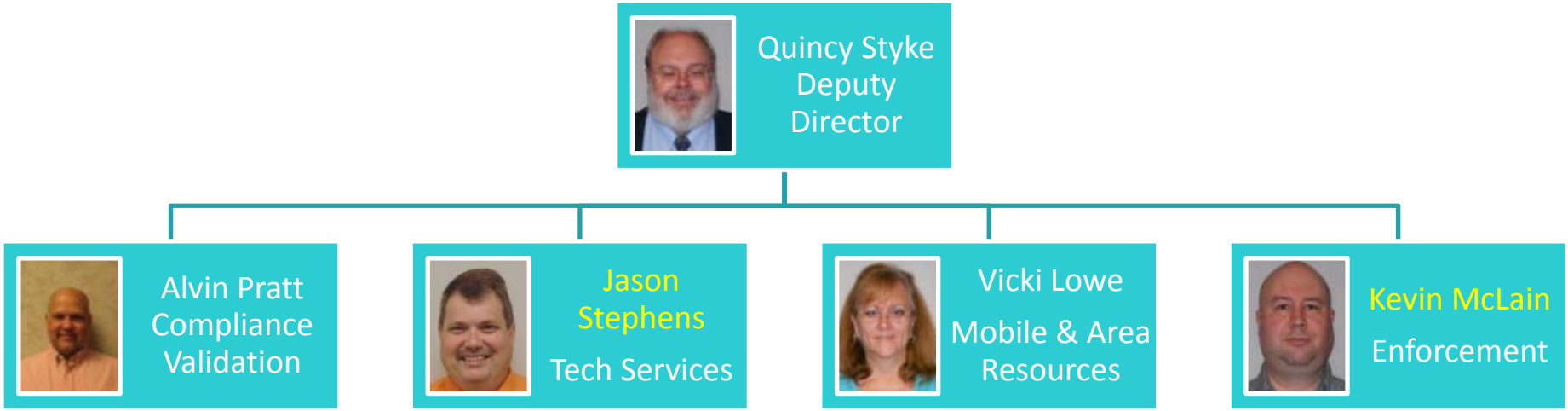
Field Office Operations - 2015



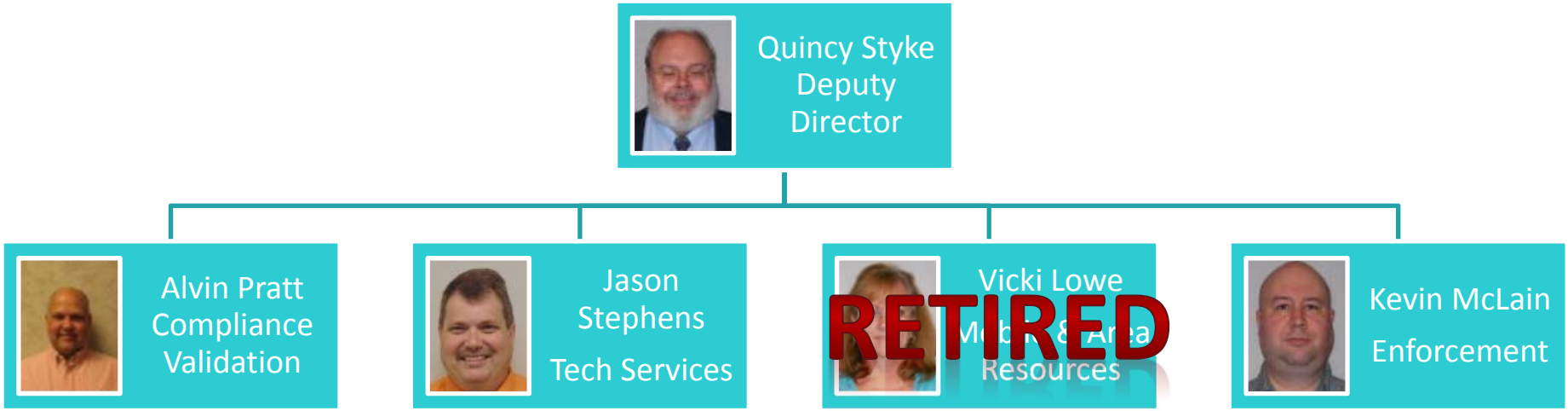
Field Office Operations - 2015

Field Office Operations - 2016

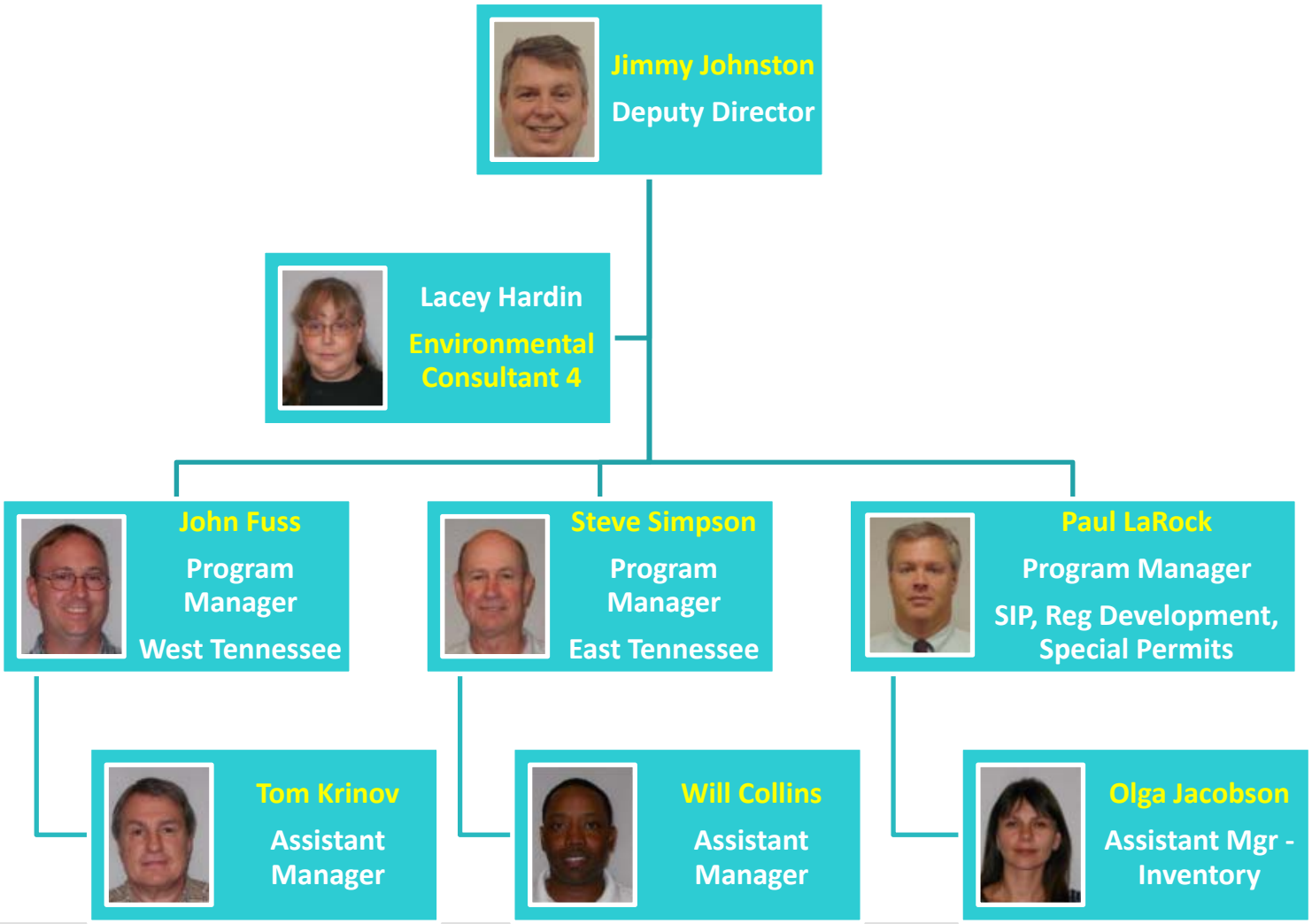
Central Office Operations - 2015



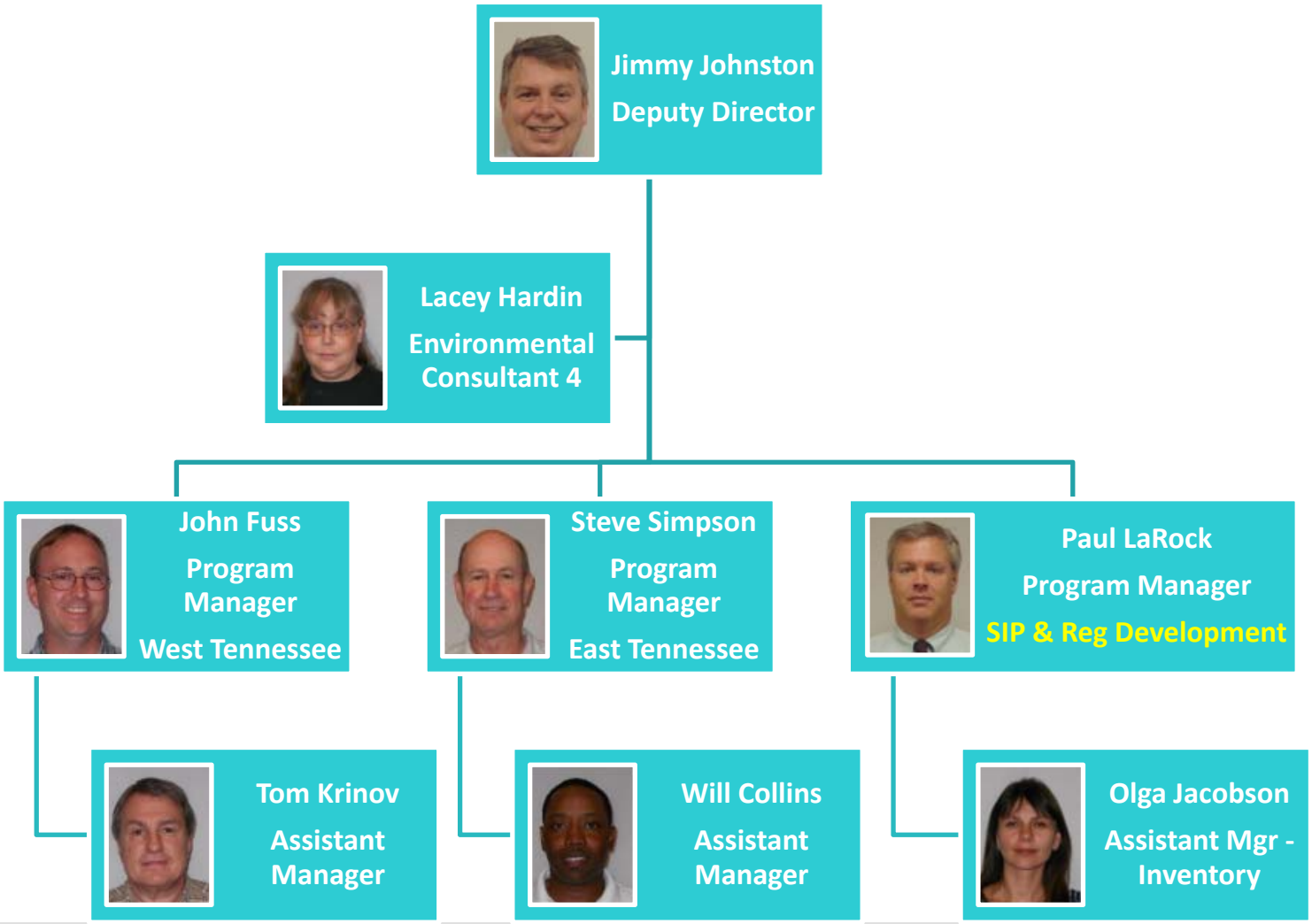
Central Office Operations - 2016



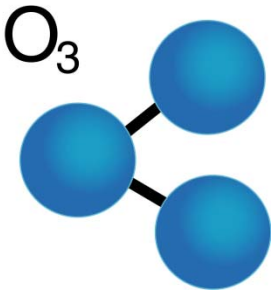
Permitting & Regulatory Development - 2015



Permitting & Regulatory Development - 2016



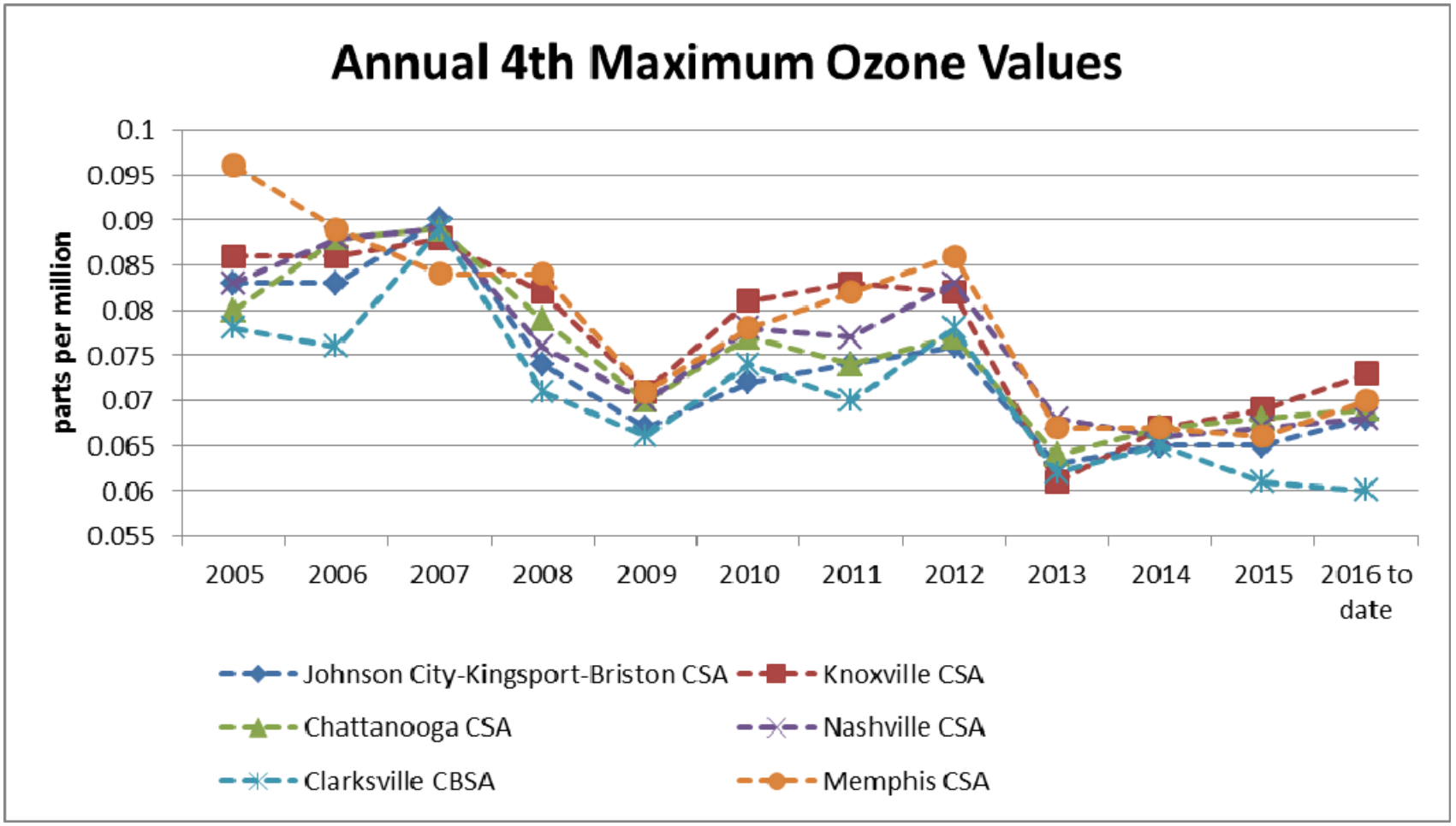
Ozone



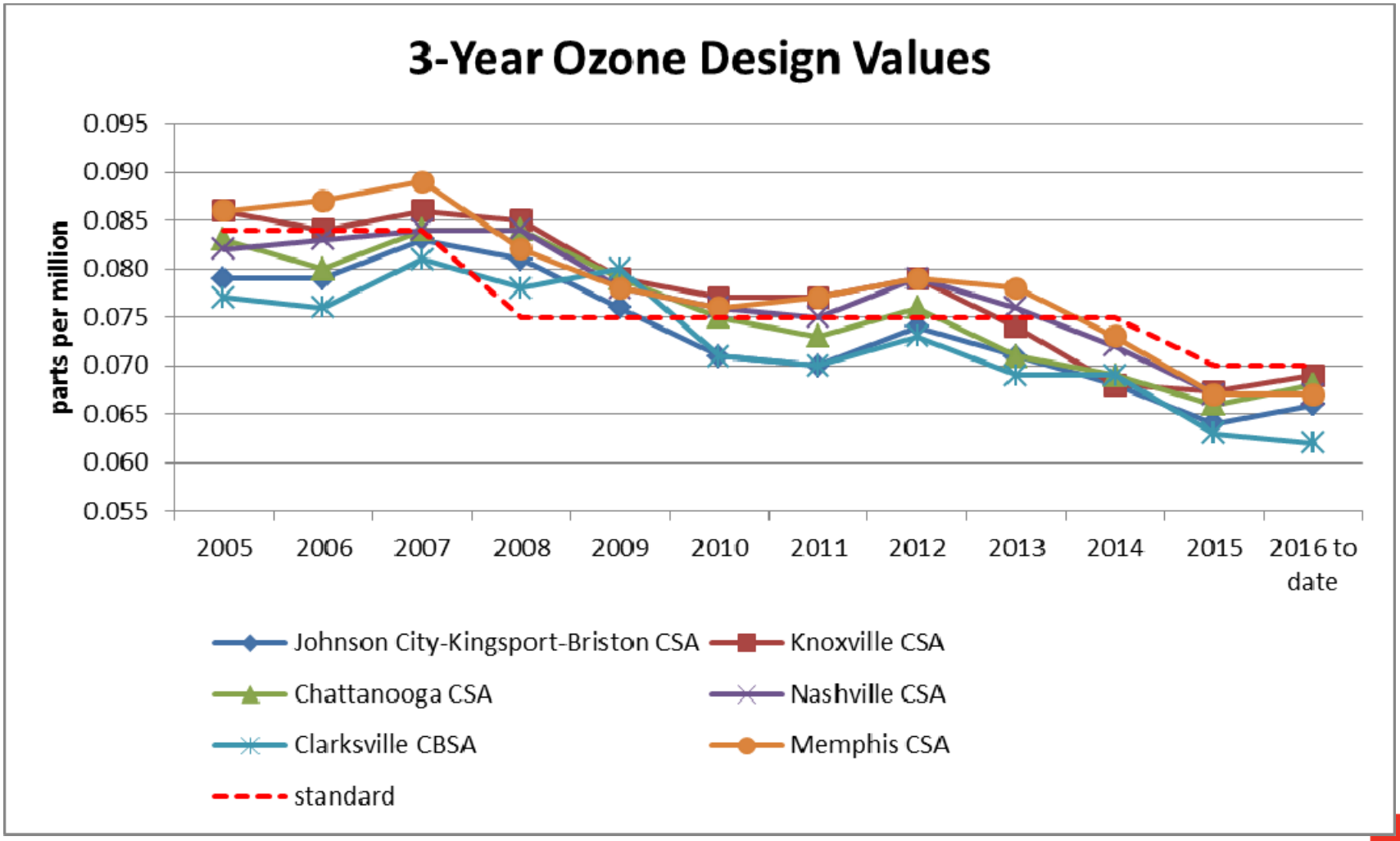
Colorless, odorless gas that is formed in the atmosphere as the result of man-made pollution and can trigger a variety of health problems including chest pain, coughing, throat irritation, and airway inflammation. It can reduce lung function and harm lung tissues and can worsen lung diseases such as bronchitis, emphysema, and asthma.

Current standard is based on an 8-hour average and was set in 1997 at 84 ppb, lowered to 75 ppb in 2008 and again to 70 ppb in 2015.

Ozone


Annual 4th Maximum Ozone Values
parts per million
0.1
0.095
0.09
0.085
0.08
0.075
0.07
0.065
0.06
0.055
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016 to date
Johnson City-Kingsport-Briston CSA
Knoxville CSA
Chattanooga CSA
Nashville CSA
Clarksville CBSA
Memphis CSA

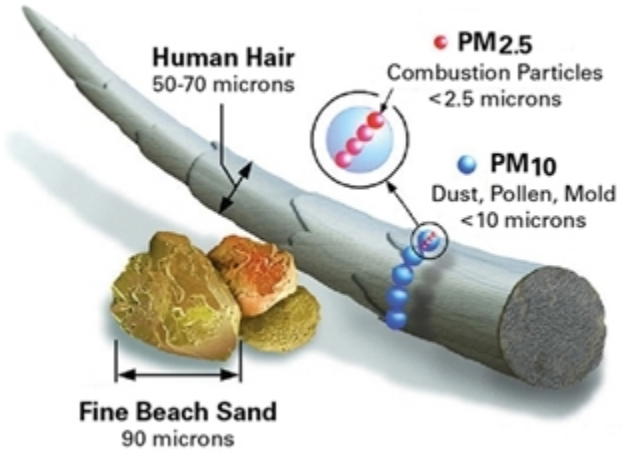
Ozone


3-Year Ozone Design Values
parts per million
0.095
0.090
0.085
0.080
0.075
0.070
0.065
0.060
0.055
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016 to date
Johnson City-Kingsport-Briston CSA
Knoxville CSA
Chattanooga CSA
Nashville CSA
Clarksville CBSA
Memphis CSA
standard

2008 Ozone Nonattainment Area Status - Memphis

- Attained standard in 2014
- Shelby County Health Department prepared maintenance plan & redesignation request
  - TDEC Submitted to EPA on 1/14/2016
  - EPA Re-Designated TN Portion of Memphis to "Attainment"on 6/23/2016
- Arkansas DEQ And Mississippi DEQ, submitted similar requests in late 2015
  - EPA Re-Designated AR & MS portions to "Attainment" in April, 2015

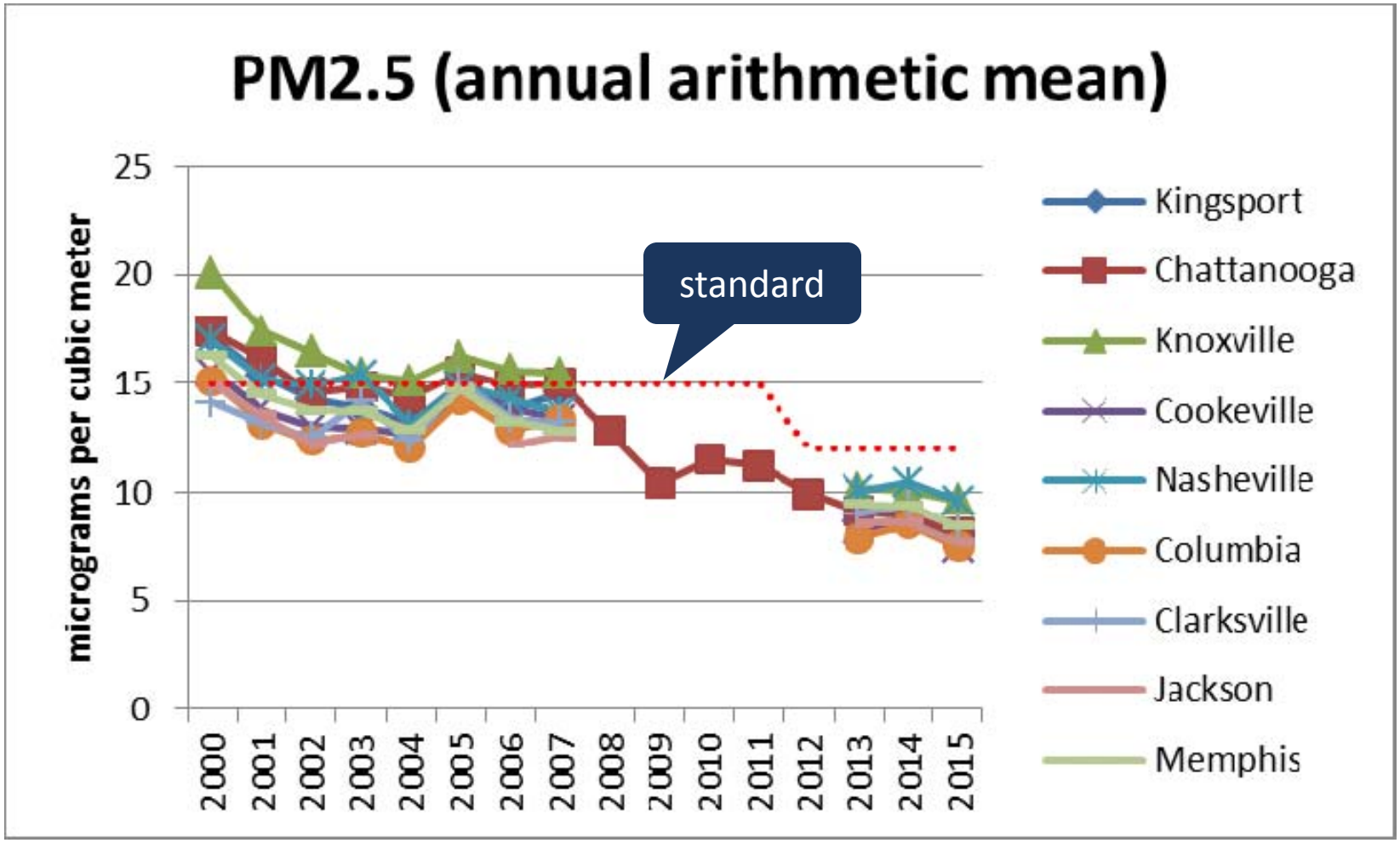
$PM_{2.5}$



Particle pollution - especially fine particles - contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including:

- premature death in people with heart or lung disease,
- nonfatal heart attacks,
- irregular heartbeat,
- aggravated asthma,
- decreased lung function, and
- increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing.

Fine Particulate Matter ($PM_{2.5}$)



1997 & 2006 Nonattainment Area Status - Knoxville

- Attained Standard in 2013
- Draft Maintenance Plans & Redesignation Requests sent to Interagency Consultation September 7, 2016
- Tentative Schedule
  - Proposal October
  - Public Hearing November
  - Board Adoption & Submittal December

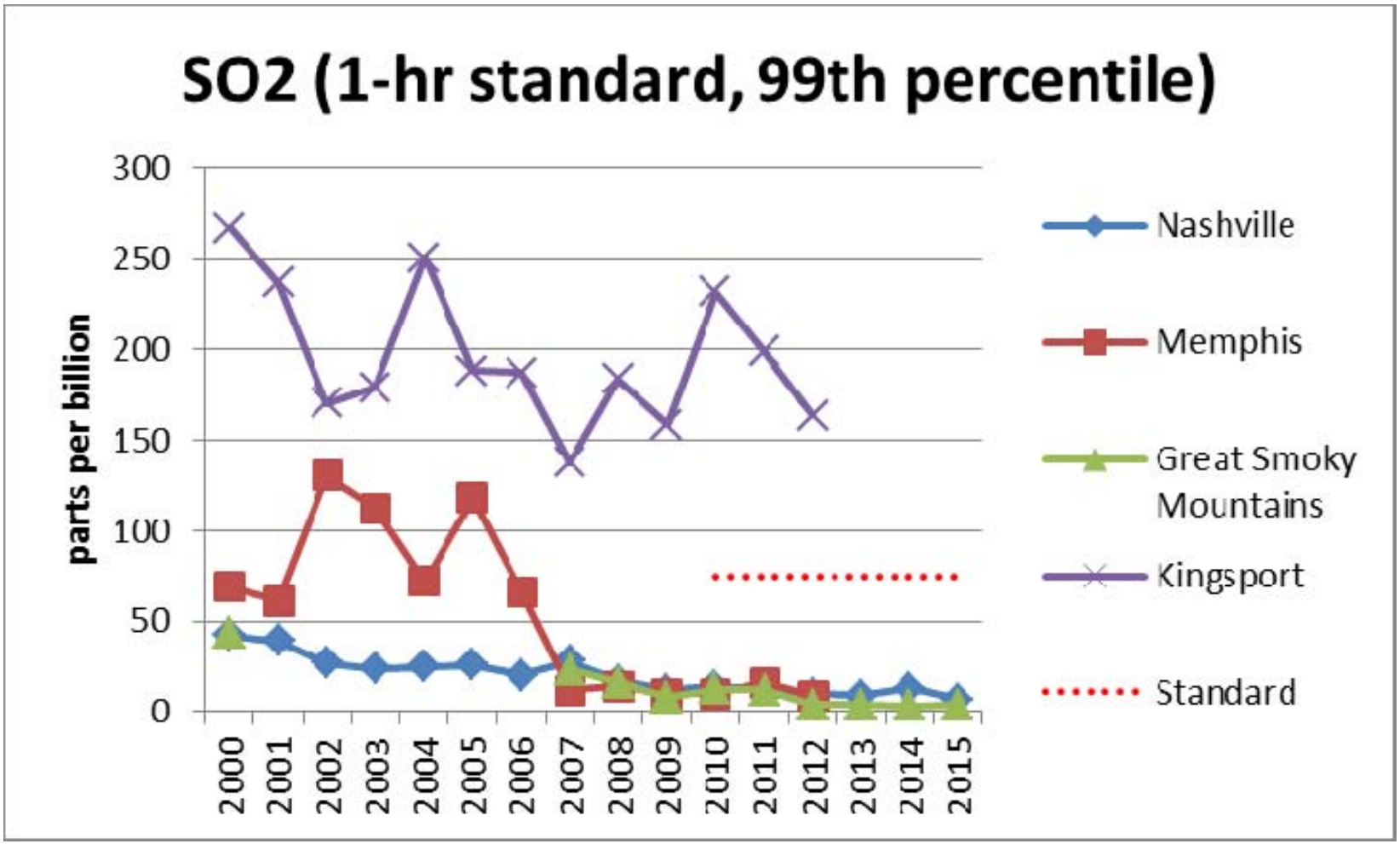
Sulfur Dioxide (SO_2)

Sulfur Dioxide forms when sulfur bearing fossil fuels are combusted.

Sulfur Dioxide reacts with water to form sulfurous and sulfuric acid. Those acids can irritate sensitive mucous membranes and airways. Once in the body, they can react with body salts to form sulfates and sulfites.

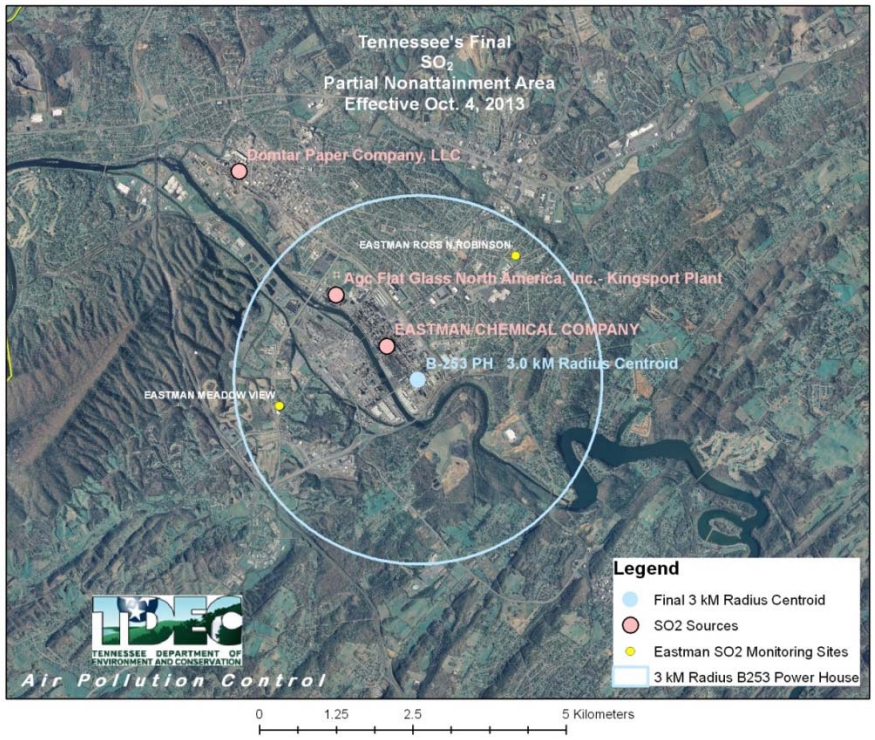
Sulfur Dioxide in the atmosphere can form acidic precipitation and sulfate fine particulate matter.

Sulfur Dioxide (SO_2)



Round 1 - Kingsport Area

- August 5, 2013
- 3 km radius around Eastman Chemical
- Based on Violating Monitor
- Working with EPA on Attainment Plan



Round 2 - TVA Gallatin Plant

- FGD installed all four units at TVA Gallatin. Completed April, 2016.

  - Designated "unclassifiable"
  - Moves to Round 3
  - Modeling with new limits completed & approved by EPA

Round 3 (modeling)

TVA Cumberland

TVA Johnsonville

TVA Allen

Nitrogen Dioxide NO_2

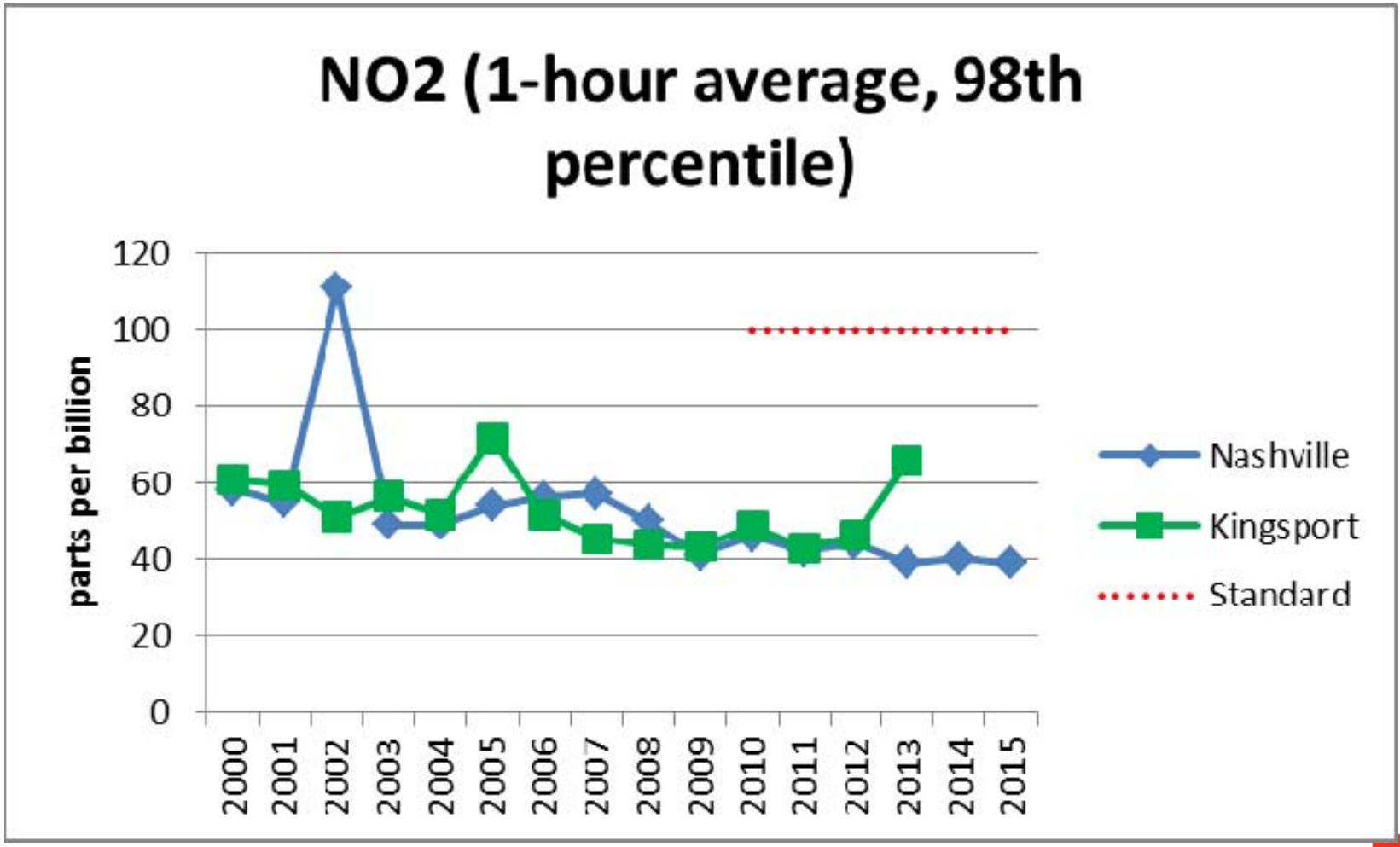
Forms when heat and pressure from combustion cause oxygen & nitrogen in the air to chemically combine.

Nitrogen dioxide inflames the lining of the lungs, and it can reduce immunity to lung infections. This can cause problems such as wheezing, coughing, colds, flu and bronchitis.

Once in the atmosphere, can combine with ammonia or other substances to form nitrate fine particles or with water vapor and increase acid rain.

Ambient exposures are greatest in urban areas near roadways. Nationally, about 16% of the population lives within 300 feet of roadways – primarily a mobile source issue

Nitrogen Dioxide (NO_2)



Lead NAAQS

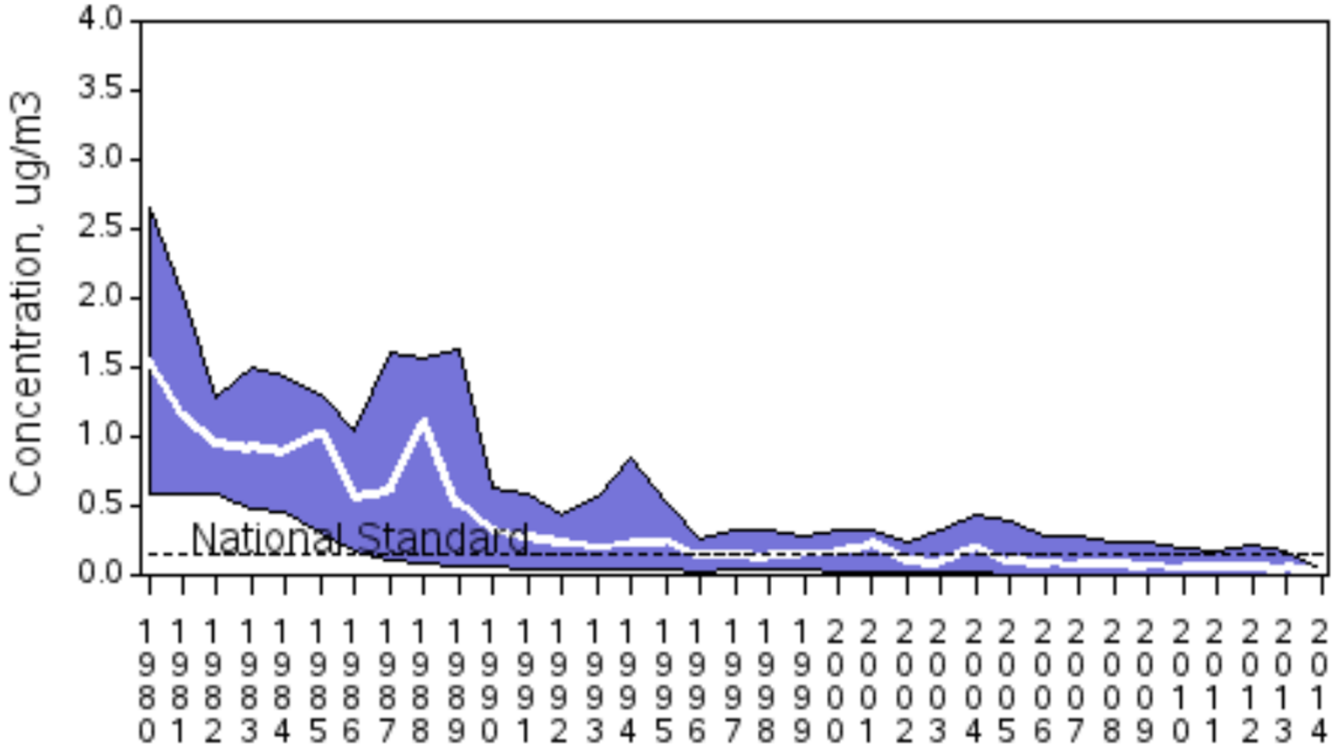
Lead is a toxic metal that can cause neurological impairment in humans, particularly children.

While once used as a performance additive in gasoline, it is now used mainly in lead acid storage batteries and in ionizing radiation shielding.

Lead

Lead Air Quality, 1980 - 2014

(Annual Maximum 3-Month Average)
National Trend based on 11 Sites



1980 to 2014 : 98% decrease in National Average

Ambient lead concentrations dropped significantly when leaded gasoline was phased out starting in the 1970's. However, in 2008, EPA lowered the ambient lead standard from 1.5 µg/m^3 to 0.15 µg/m^3.

TN

Lead

Lead Design Value Data 2013 - 2015

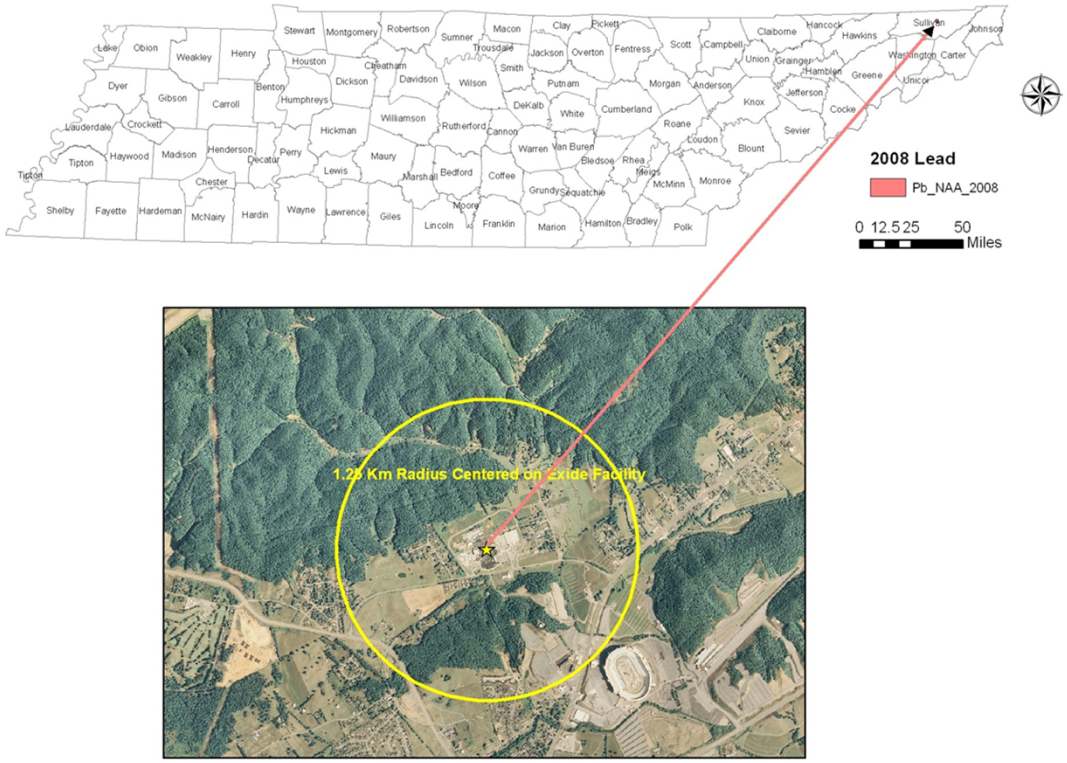
AQS ID	County	Site Location	3 Year DV Lead 2013 - 2015	Comments
470930023	Knox	1584 Ely Avenue, Knoxville	0.11	Incomplete
470930027	Knox	2522 BURNSIDE ST, Knoxville	0.03	Incomplete
470931017	Knox	1613 VERMONT AVENUE, Knoxville	0.02	Incomplete
471570075	Shelby	6388 Haley Rd. (Shelby Farms NCORE site)	0.00	Incomplete
471633004	Sullivan	364 Exide Dr	0.07	Incomplete

3-Month Rolling Average 3 year Max >=0.15 ug/m3

Data evaluated 2/7/2016.

Lead

Air Quality Attainment and Nonattainment Areas, Lead 2008 Standard



2008 Lead NAAQS Nonattainment Area – Sullivan Co (partial)

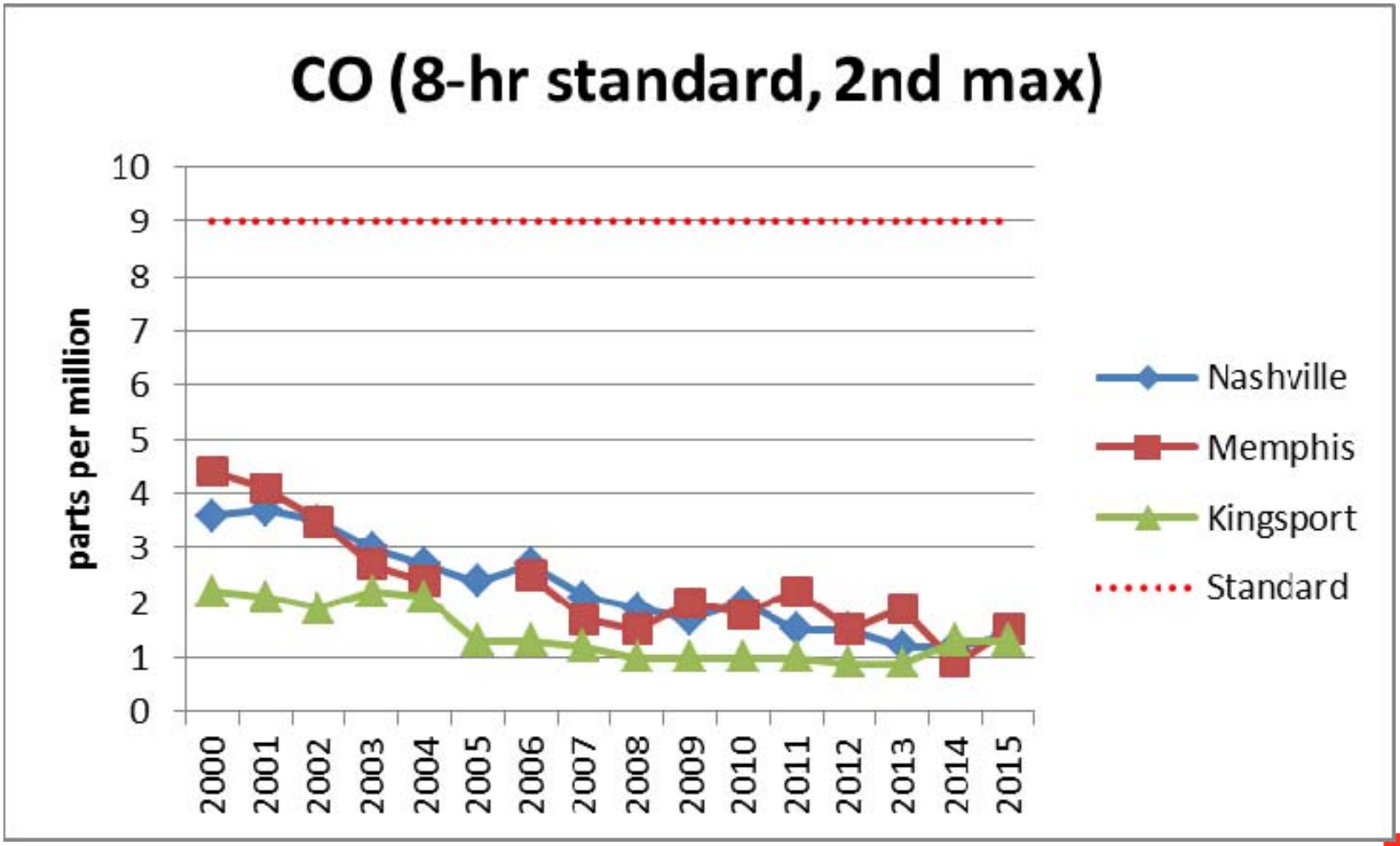
- **Attained Standard in 2013**
- **Maintenance Plan & Redsignation Request submitted to EPA on 7/10/2015**
- **EPA Re-designated area to "Attainment" on 7/7/2016**

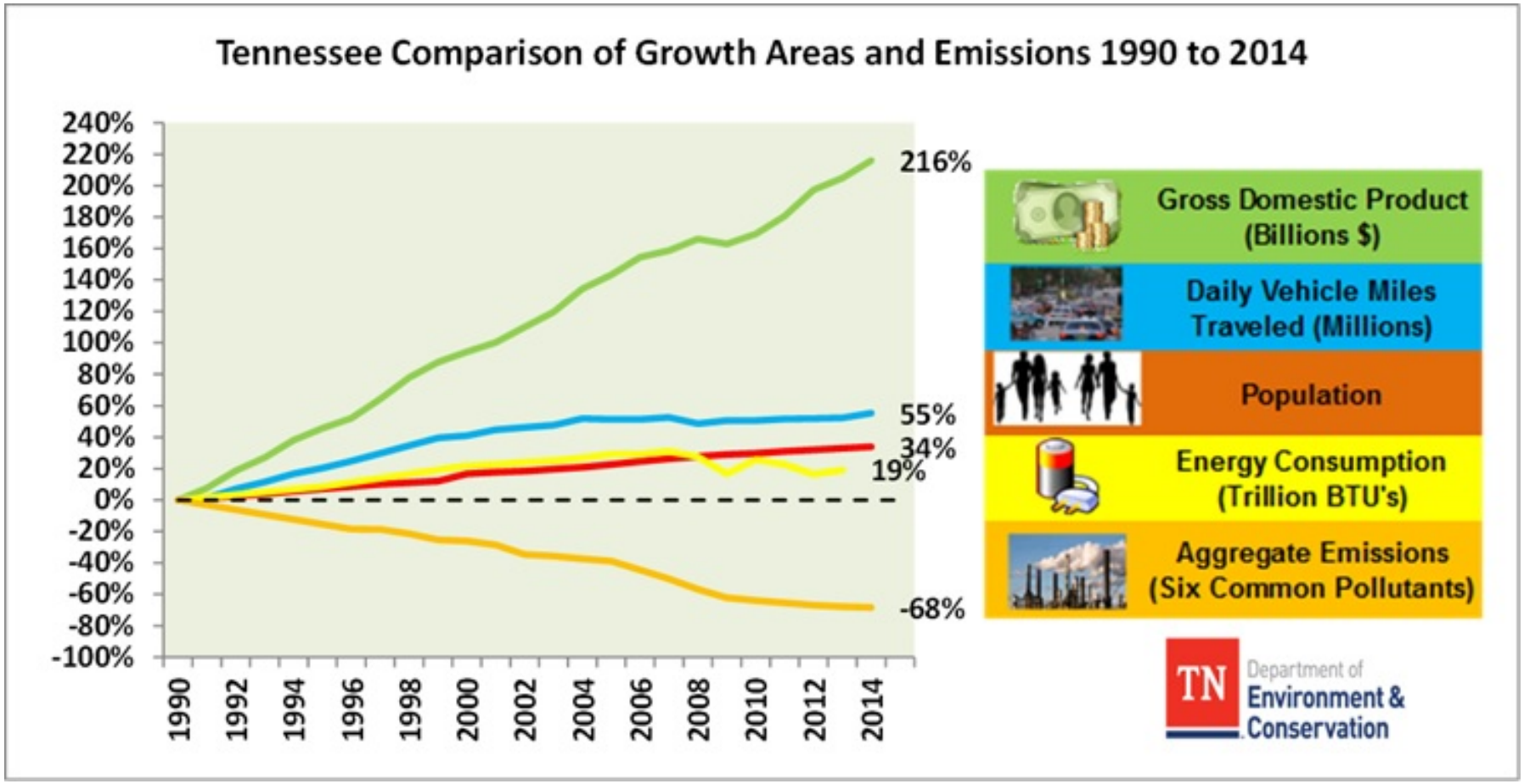
Carbon Monoxide NAAQS

Arises from incomplete combustion of fossil fuels

Chemically binds to hemoglobin, temporarily reducing oxygen carrying capacity of blood

Carbon Monoxide (CO)



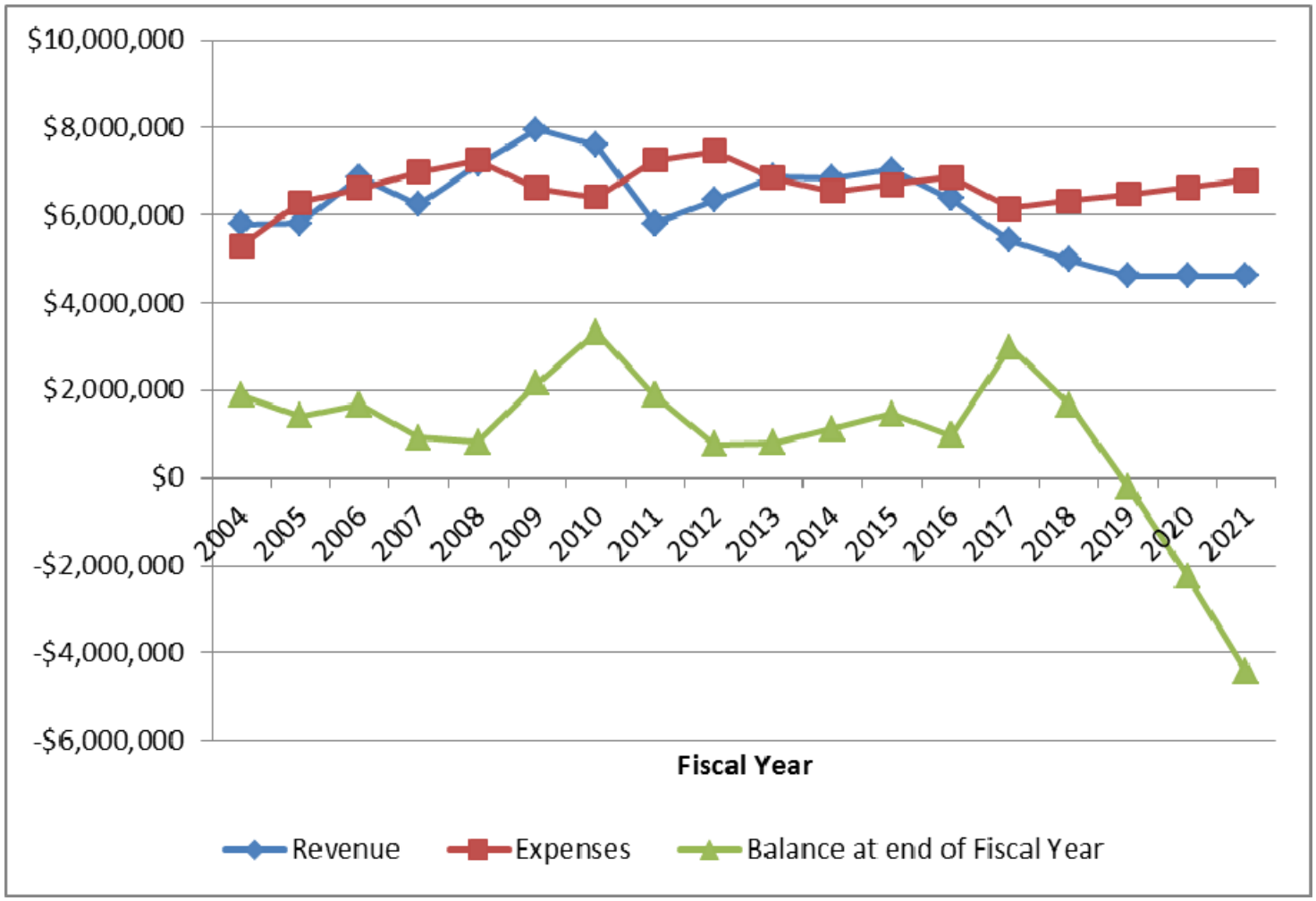


Courtesy of Robert Brawner

Permit Streamlining Efforts

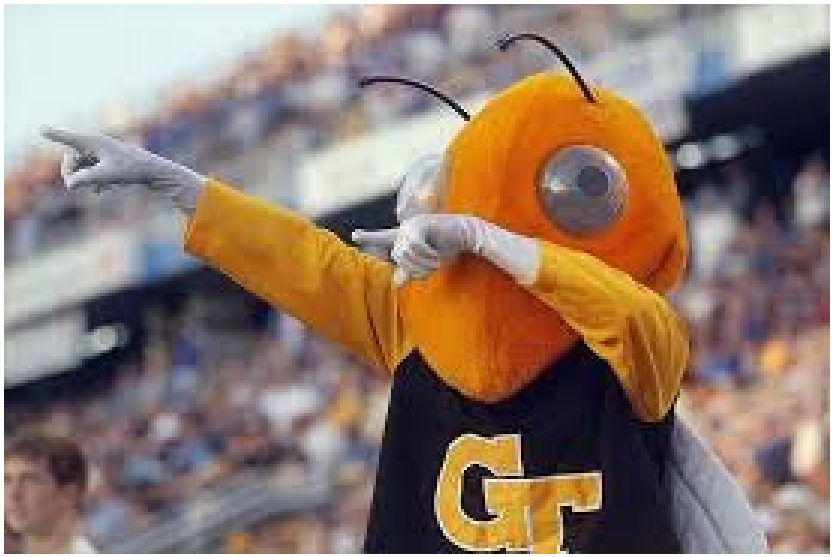
- Rulemaking completed & procedures being developed for:
  - General Permits
- Rulemaking underway to provide TDEC with authority to issue:
  - Permits-by-Rule
  - Combined Construction and Operating Permits
  - True Minor and Conditional Major Ownership Changes through Permit Amendment
  - Changes to Exemptions to allow sources subject to Federal NSPS & NESHAP to qualify as “insignificant activities”
- Construction Permit LEAN Process

Title V Fees



FY2016 and beyond expenses estimated

Jimmy Johnston
Deputy Director
TDEC Division of Air Pollution Control
james.johnston@tn.gov
615-253-7319



Questions?