

Ten Years Later: STAR & Louisville Air Toxics

Air Pollution Control District
November 18, 2015



Air Toxics

Responding to growing concerns about toxic emissions in Western Louisville, in 2005 the APCD developed and implemented the Strategic Toxic Air Reduction (STAR) program.

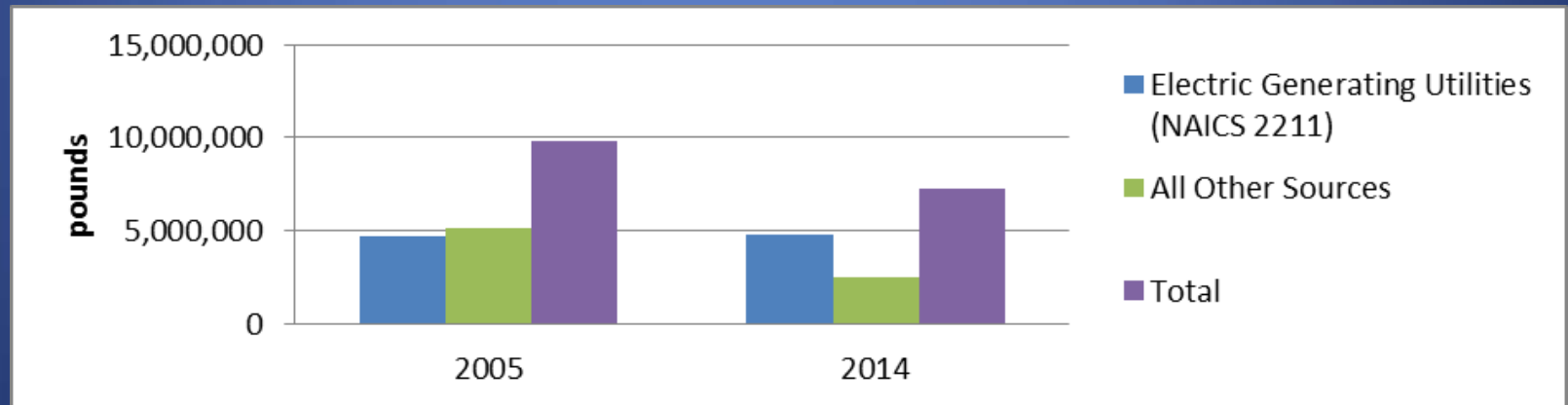


An air toxics program designed to regulate the reduction of toxic emissions by large industries, STAR was created after a monitoring study in 2000-2001 found unsafe levels of 18 toxic chemicals present in and around the Rubbertown industrial complex.

Since STAR was enacted, levels of toxic pollutants have dropped considerably, resulting in a significant reduction in the risk of negative health impacts on residents.

Total Air Toxics

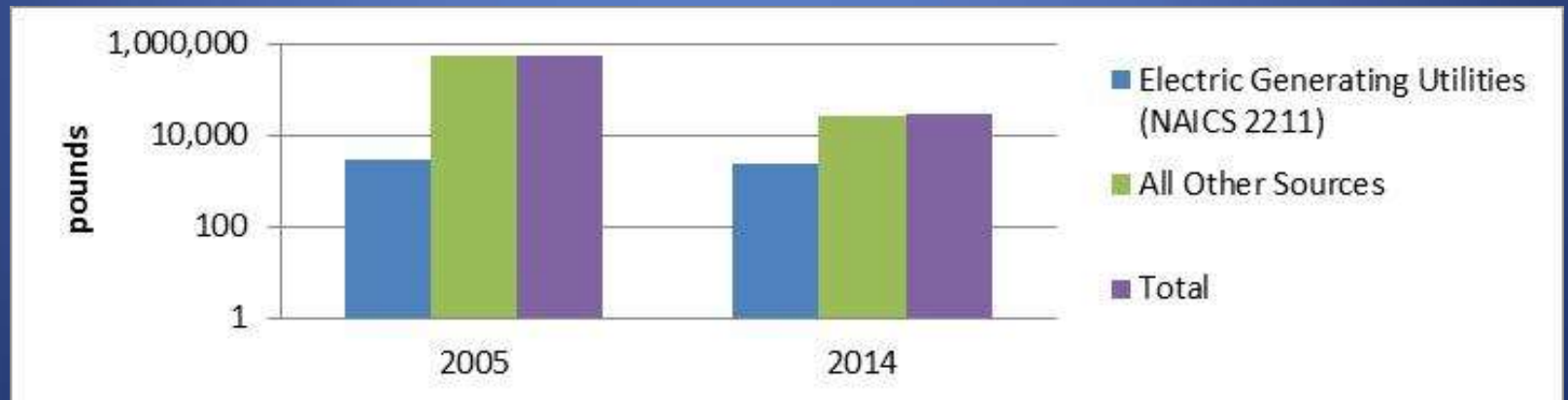
Jefferson County, Ky. Sources	2005 Air Releases in Pounds	2014 Air Releases in Pounds	% Change
Electric Generating Utilities (NAICS 2211)	4,710,016	4,753,327	1% Increase
All Other Sources	5,141,564	2,497,341	-51% Decrease
Total	9,851,580	7,250,668	-26% Decrease



Source: EPA Toxics Release Inventory

Category 1 Air Toxics

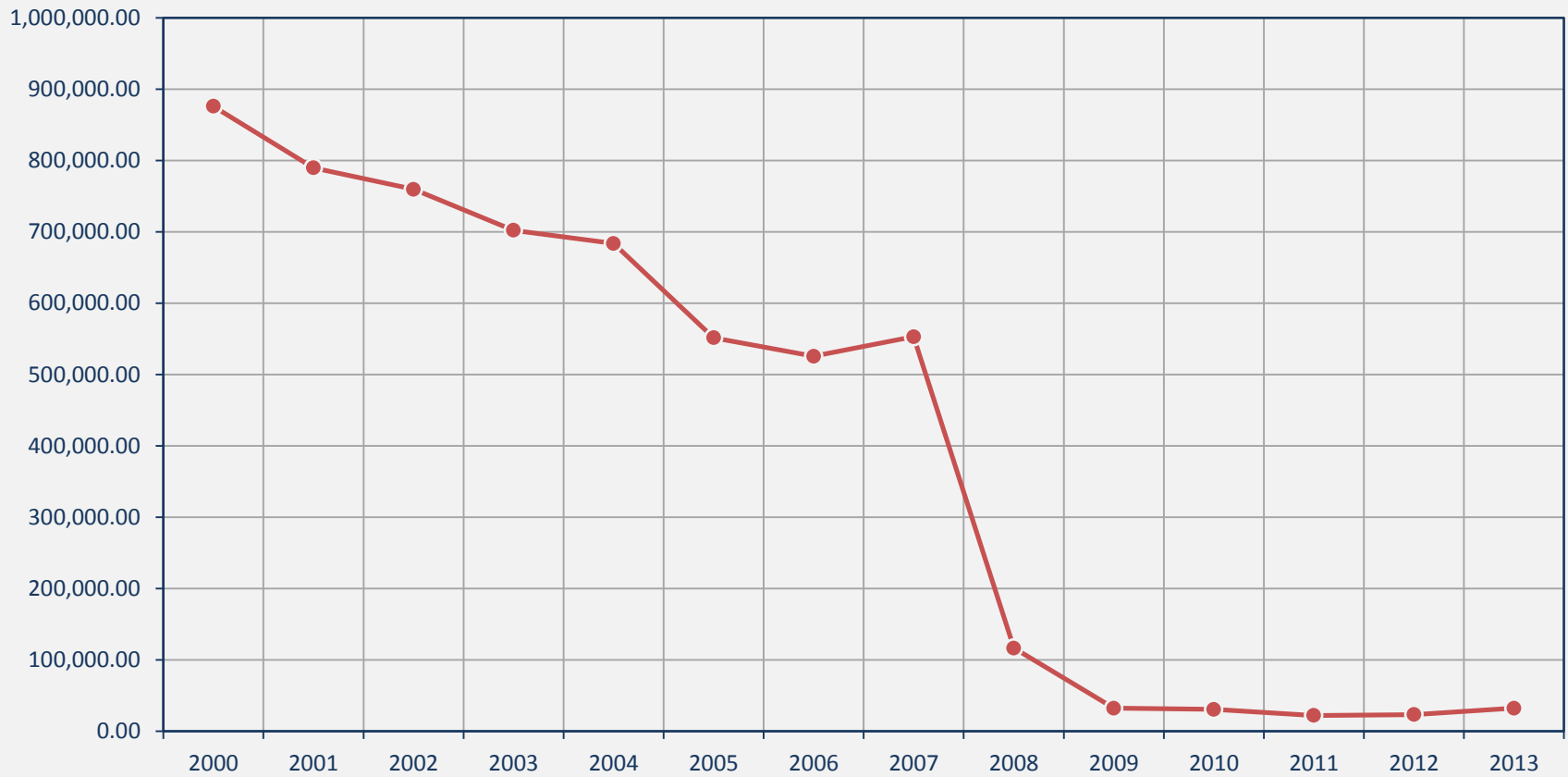
Jefferson County, Ky. Sources	2005 Air Releases in Pounds	2014 Air Releases in Pounds	% Change
Electric Generating Utilities (NAICS 2211)	3,112	2,471	-21% Decrease
All Other Sources	548,389	26,836	-95% Decrease
Total	551,501	29,307	-95% Decrease



Source: EPA Toxics Release Inventory

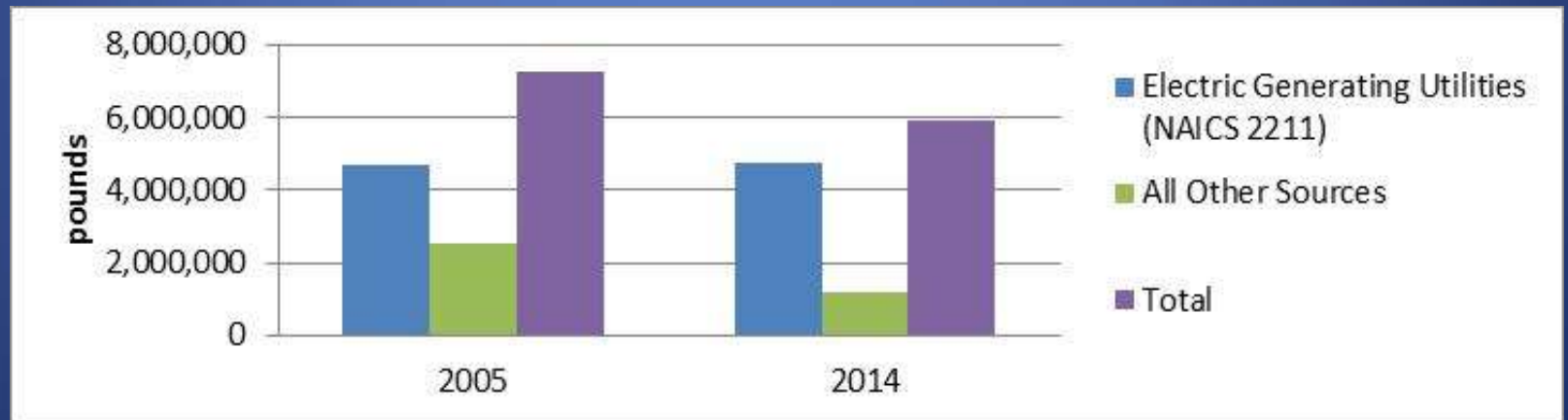
Category 1 Air Toxics

TRI-Reported Category 1 TAC Emissions



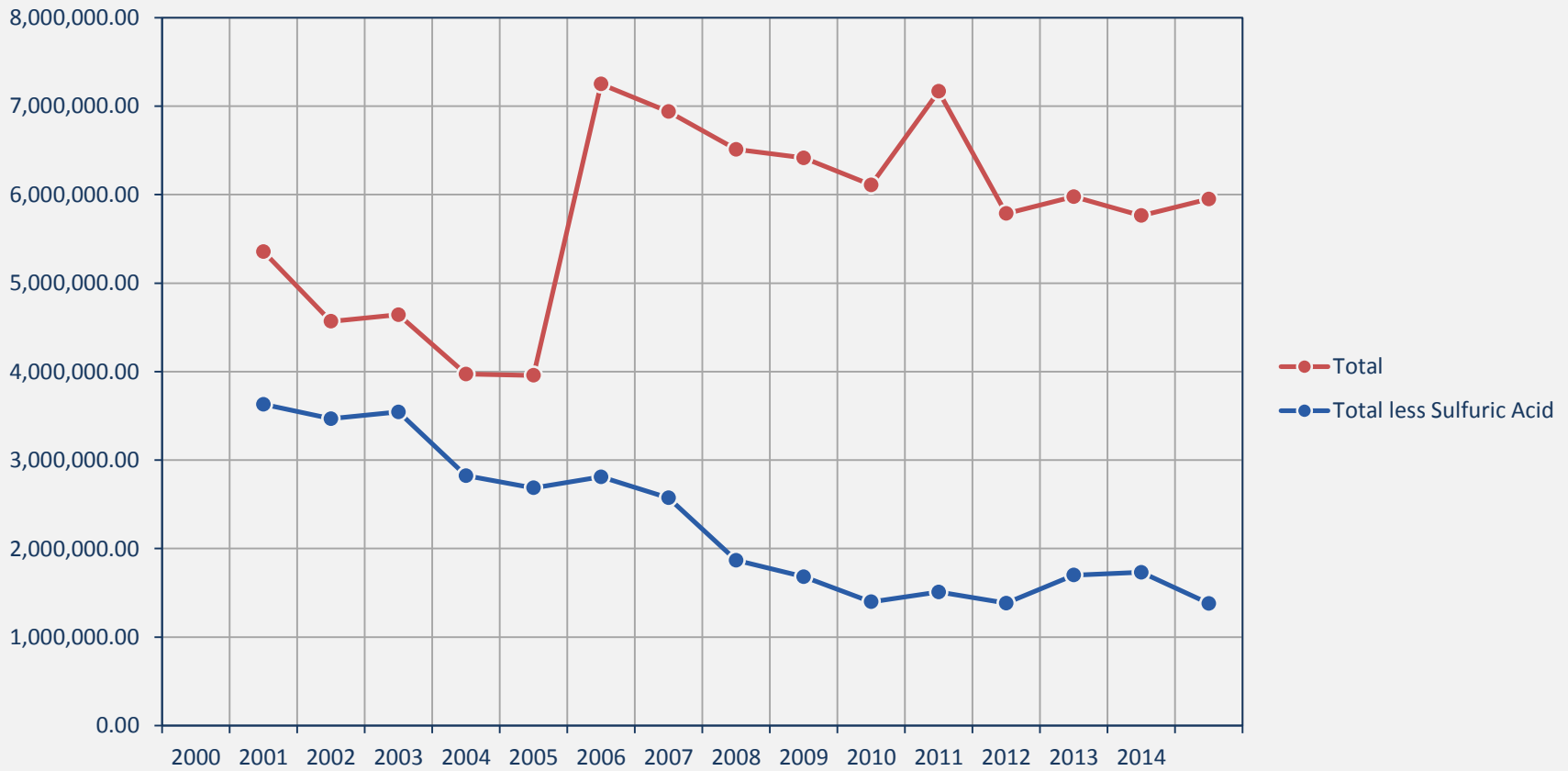
Category 2 Air Toxics

Jefferson County, Ky. Sources	2005 Air Releases in Pounds	2014 Air Releases in Pounds	% Change
Electric Generating Utilities (NAICS 2211)	4,699,509	4,741,600	1% Increase
All Other Sources	2,549,340	1,209,276	-53% Decrease
Total	7,248,849	5,950,876	-18% Decrease



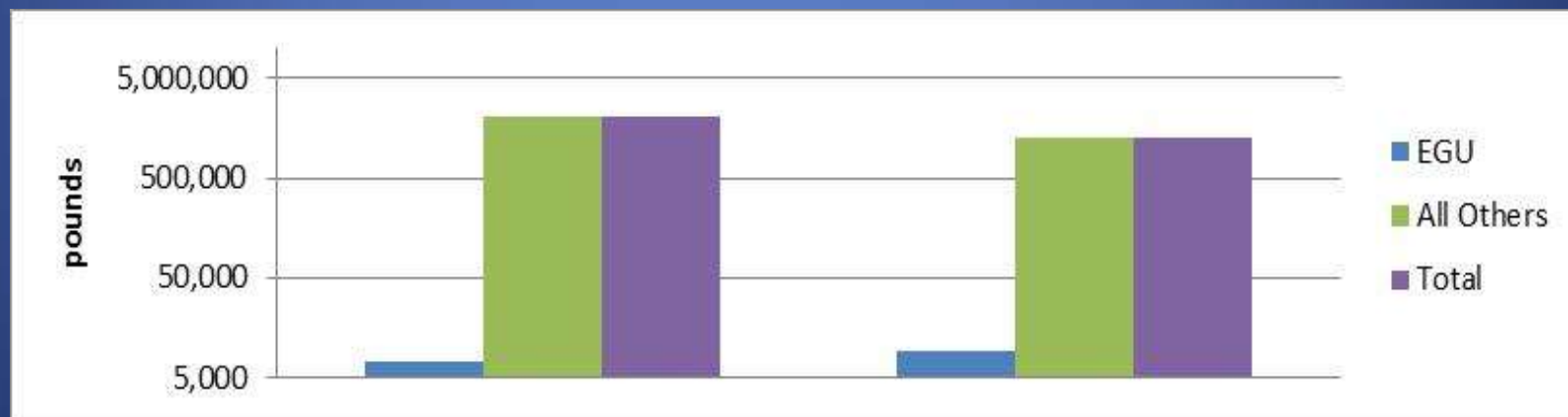
Category 2 Air Toxics

TRI-Reported Category 2 TAC Emissions & Sulfuric Acid



Category 3 & 4 TACs

Jefferson County, Ky. Sources	2005 Air Releases in Pounds	2014 Air Releases in Pounds	% Change
Electric Generating Utilities (NAICS 2211)	7,395	9,256	25% Increase
All Other Sources	2,043,835	1,261,229	-38% Decrease
Total	2,051,230	1,270,485	-38% Decrease



Source: EPA Toxics Release Inventory

1,3-Butadiene Emissions

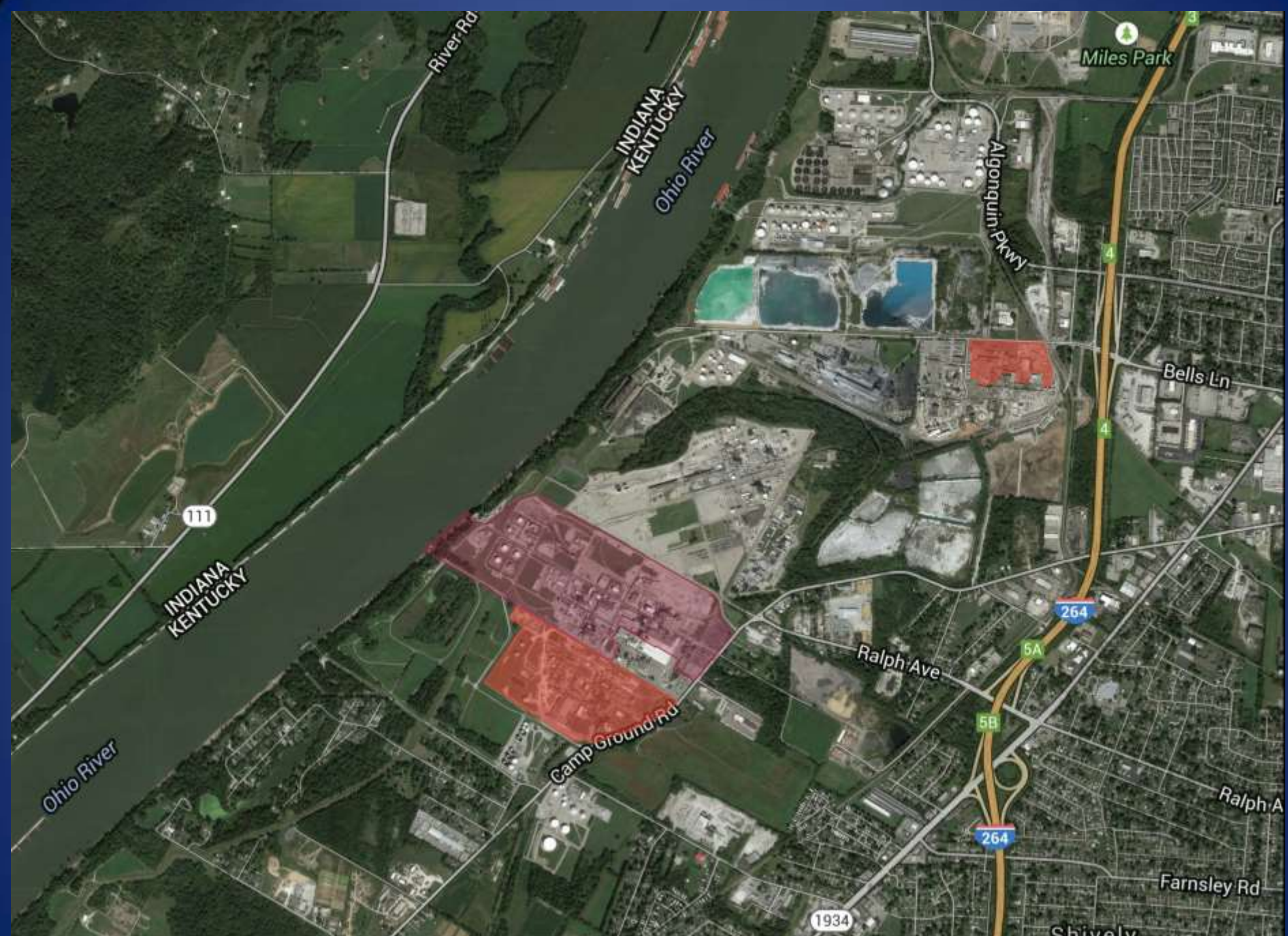
- **West Louisville Air Toxics Study –**

5.9.7 Conclusions of the trend analysis

1,3-Butadiene demonstrated the largest year-to-year variation and consistently contributes the greatest cancer risk at all sites with the exception of the control site, Site E. 1,3-Butadiene is produced through petroleum processing and is primarily used in the production of synthetic rubber. It is also found in smaller amounts in plastics and fuel. Sites A, C, F, I, and M are located in areas where industrial emissions (i.e., Rubbertown) are expected to have a large influence on the ambient levels of air toxic contaminants. Site E is located farther east, and was chosen as an urban anthropogenic control site. 1,3-Butadiene was measured in much lower concentrations at Site E compared to the other sites due to its distance from the Rubbertown industrial plants. Therefore, the measure data are consistent with onsite observations.

Pre-STAR 1,3-Butadiene Emissions

- **Rohm & Haas**
 - Pre-STAR Average annual emissions (2000-2005)
 - 2,860 lbs
- **Zeon Chemicals**
 - Pre-STAR average - 21,869 lbs
- **American Synthetic Rubber Company**
 - Pre-STAR average - 104,824.67 lbs



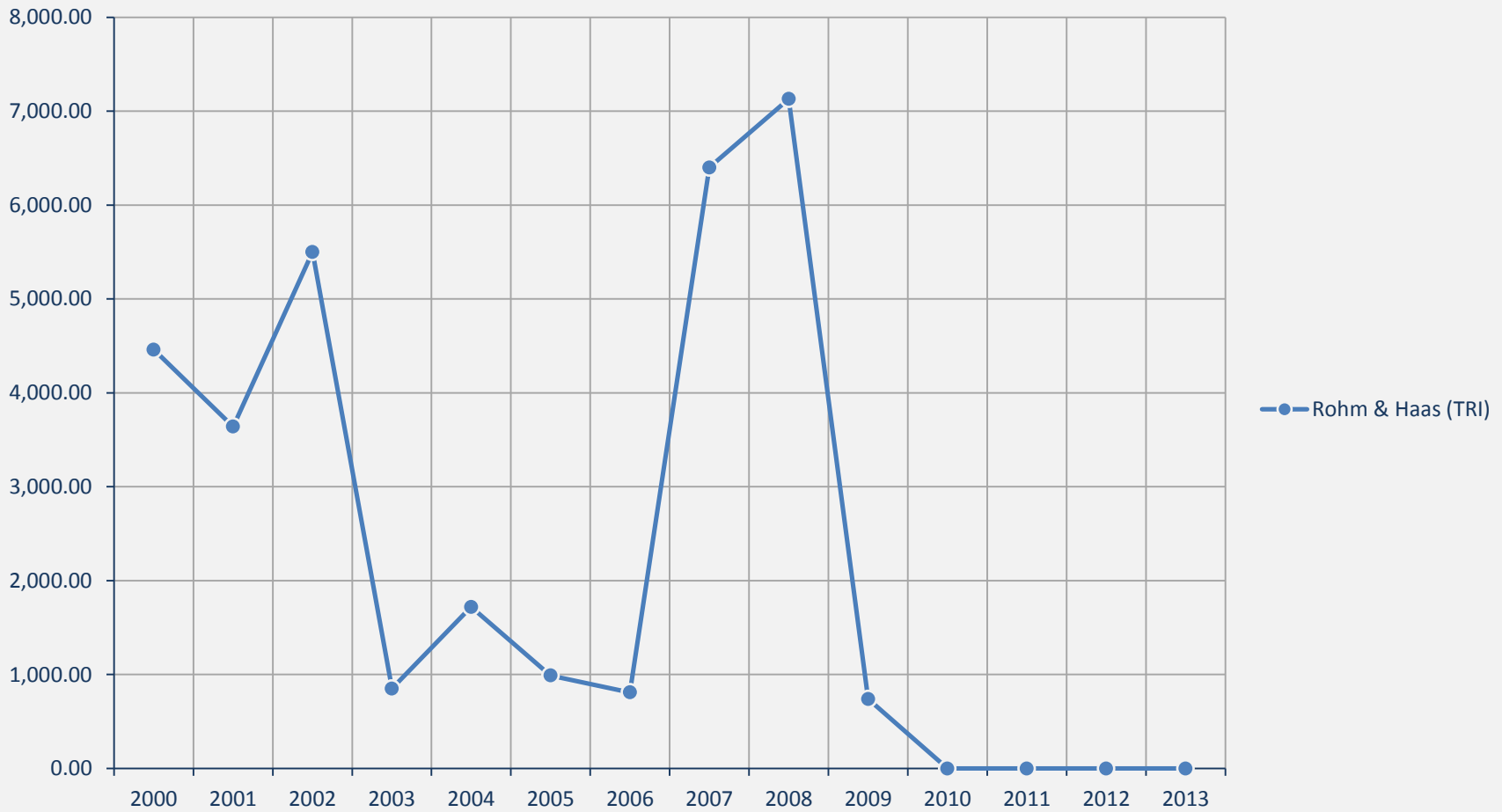
Rohm & Haas

1,3-Butadiene Emissions

- Pre-STAR average - 2,860 lbs
- Pre-STAR high in TRIs - 5500 lbs in 2002
- Post-STAR average (2007-2013) - 1,885 lbs
- 34.09% Reduction in average
- As of 2010, 100% eliminated

Rohm & Haas

1,3-Butadiene Emissions



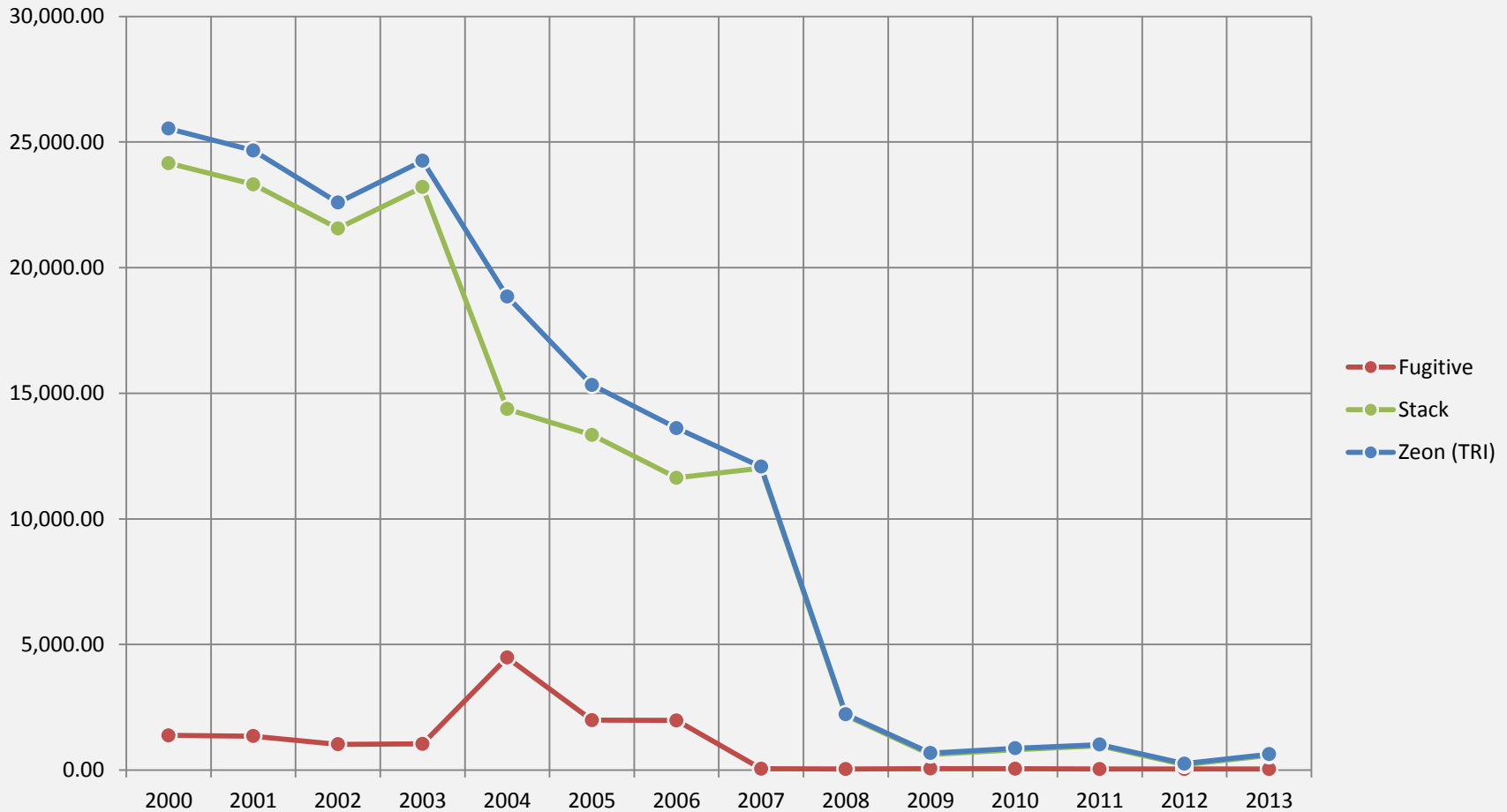
Zeon Chemicals

1,3-Butadiene Emissions

- Pre- STAR average 21,869.50 lbs
- Pre-STAR high in TRIs - 32,903 lbs in 1998
- Post-STAR average - 3,919.25 lbs
- 82.08% Reduction

Zeon Chemicals

1,3-Butadiene Emissions



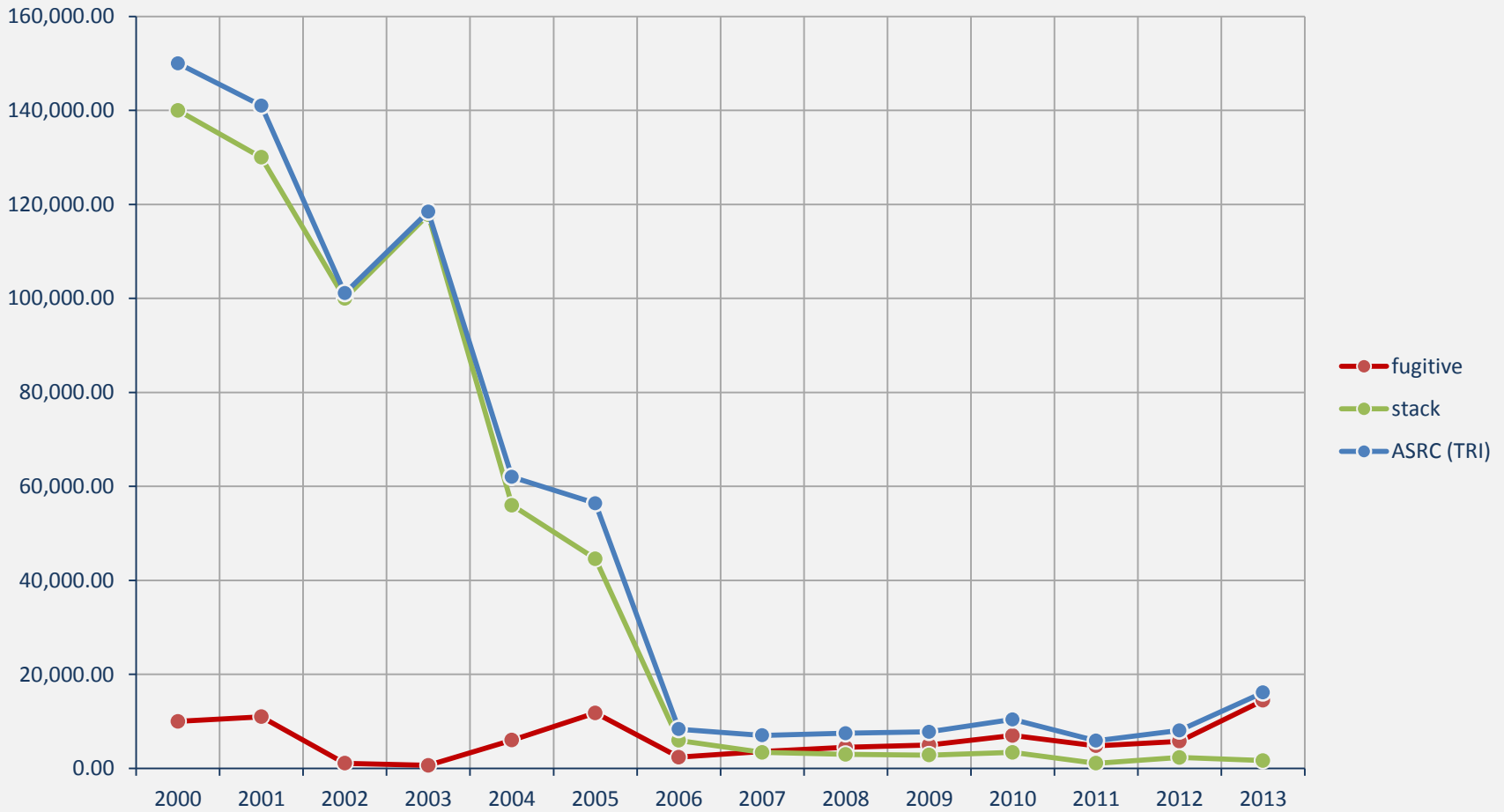
ASRC

1,3-Butadiene Emissions

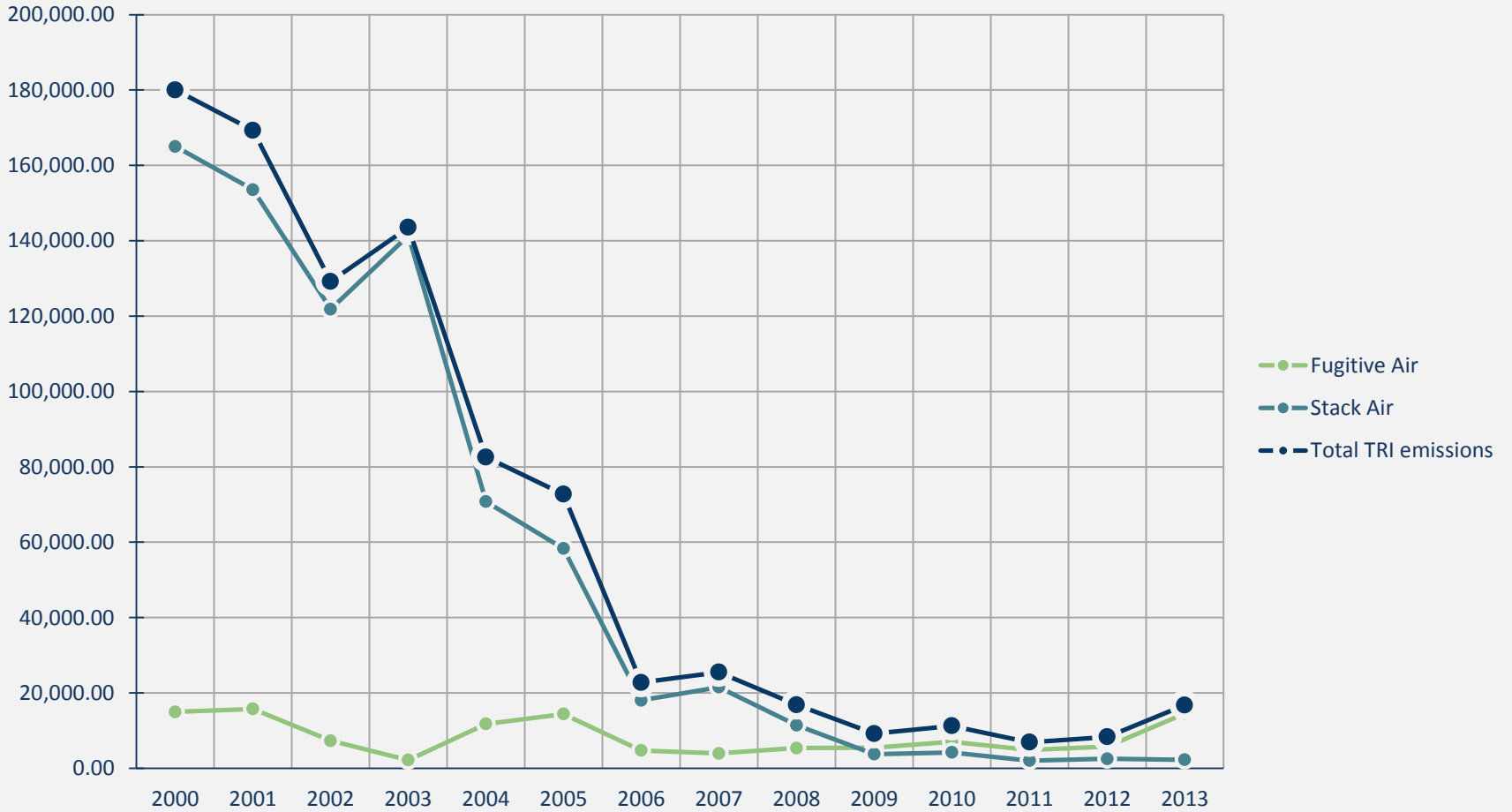
- Pre-STAR average 104,824.67 lbs
- Pre-STAR high in TRIs - 231,000 lbs in 1999
- Post-STAR average - 8,895.88 lbs
- 91.51% Reduction

ASRC

1,3-Butadiene Emissions



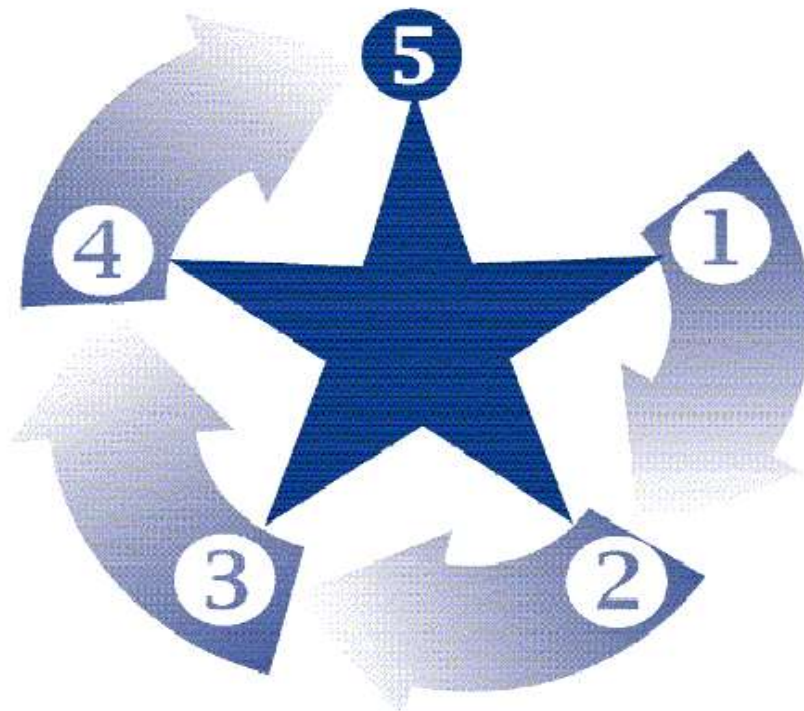
Total 1,3-Butadiene Emissions





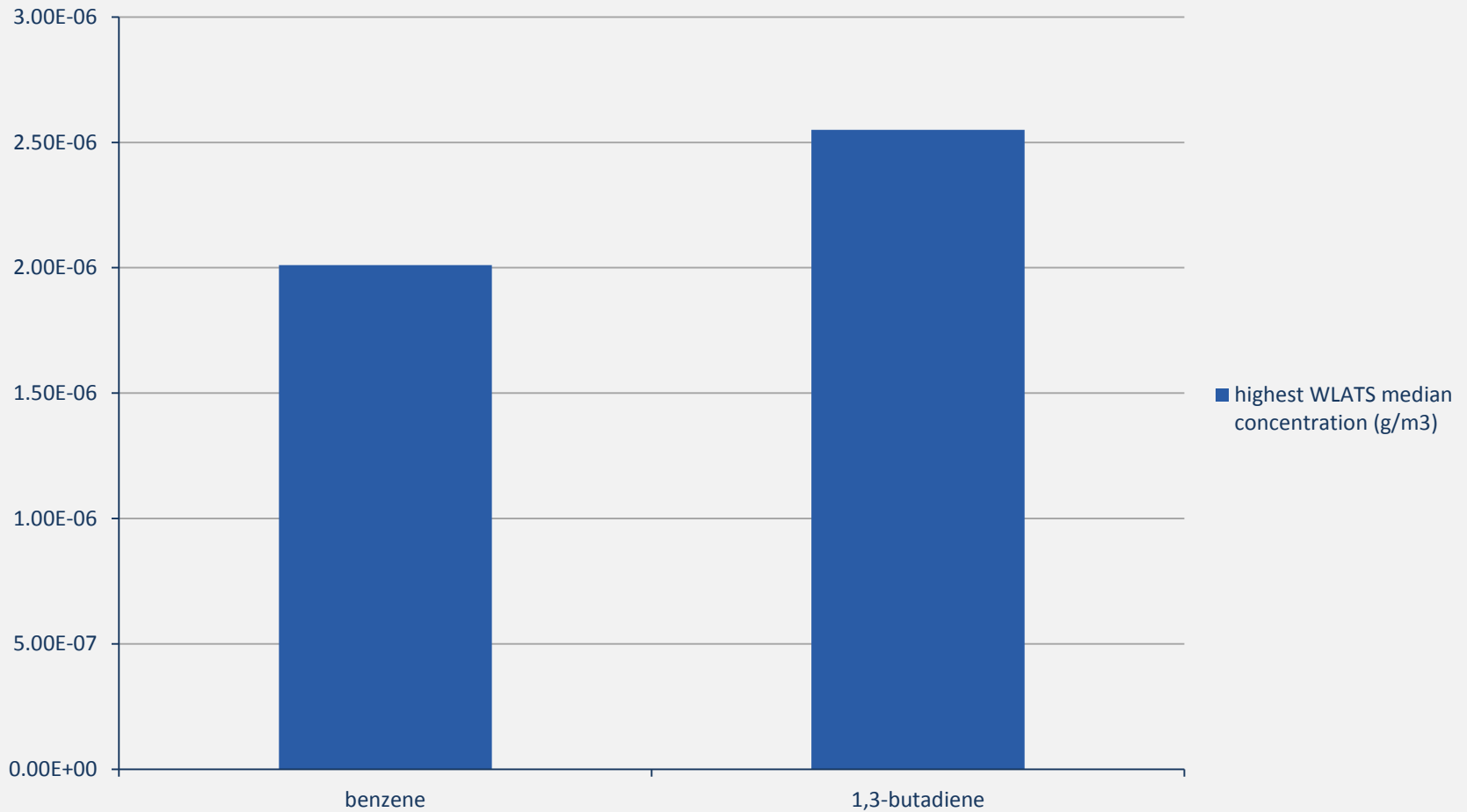
STAR Program

Strategic Toxic Air Reduction



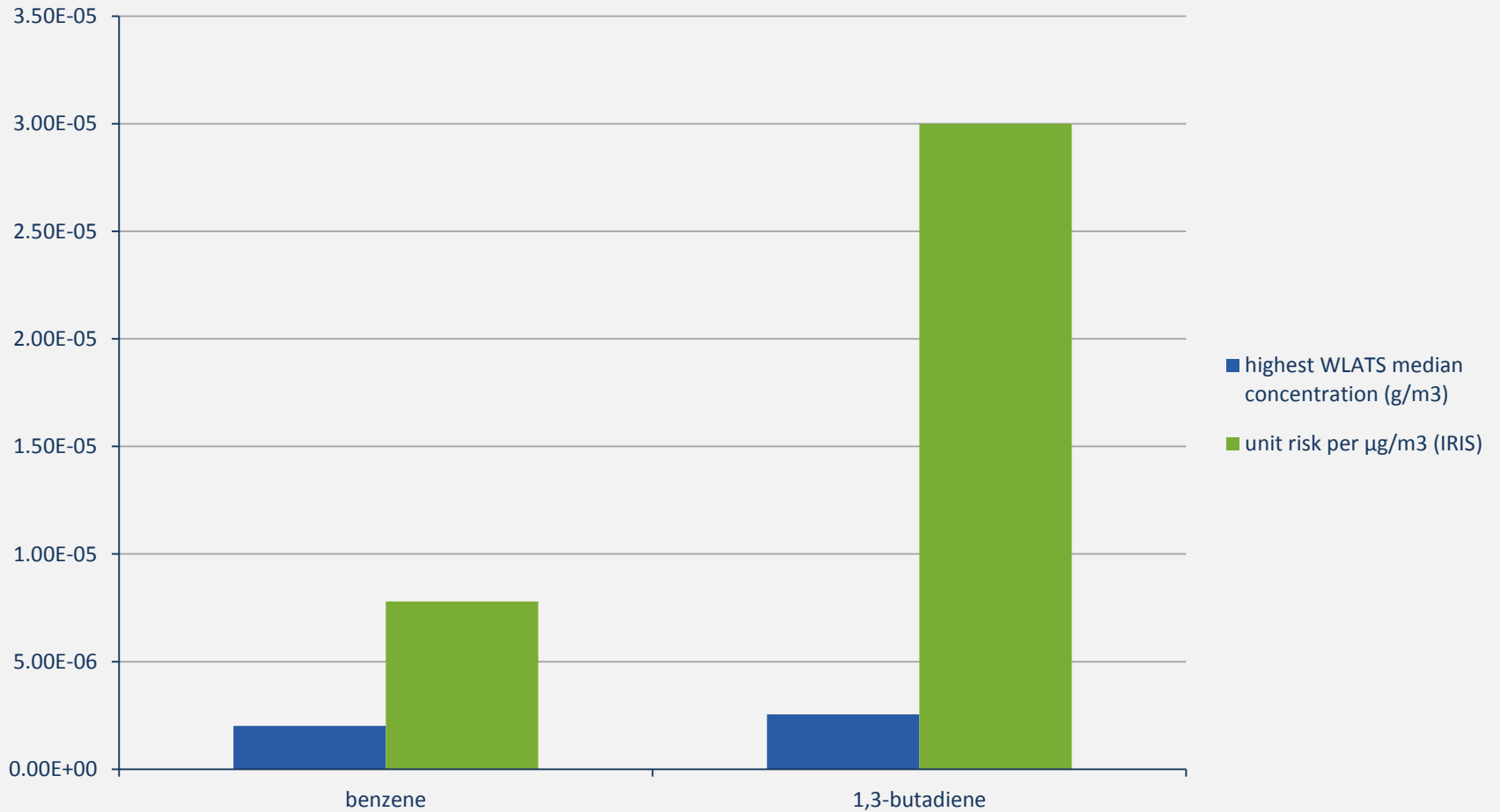
- ① Emissions levels
- ② Release points
- ③ Modeling
- ④ Reduction plan
- ⑤ Compliance

Emissions Mass



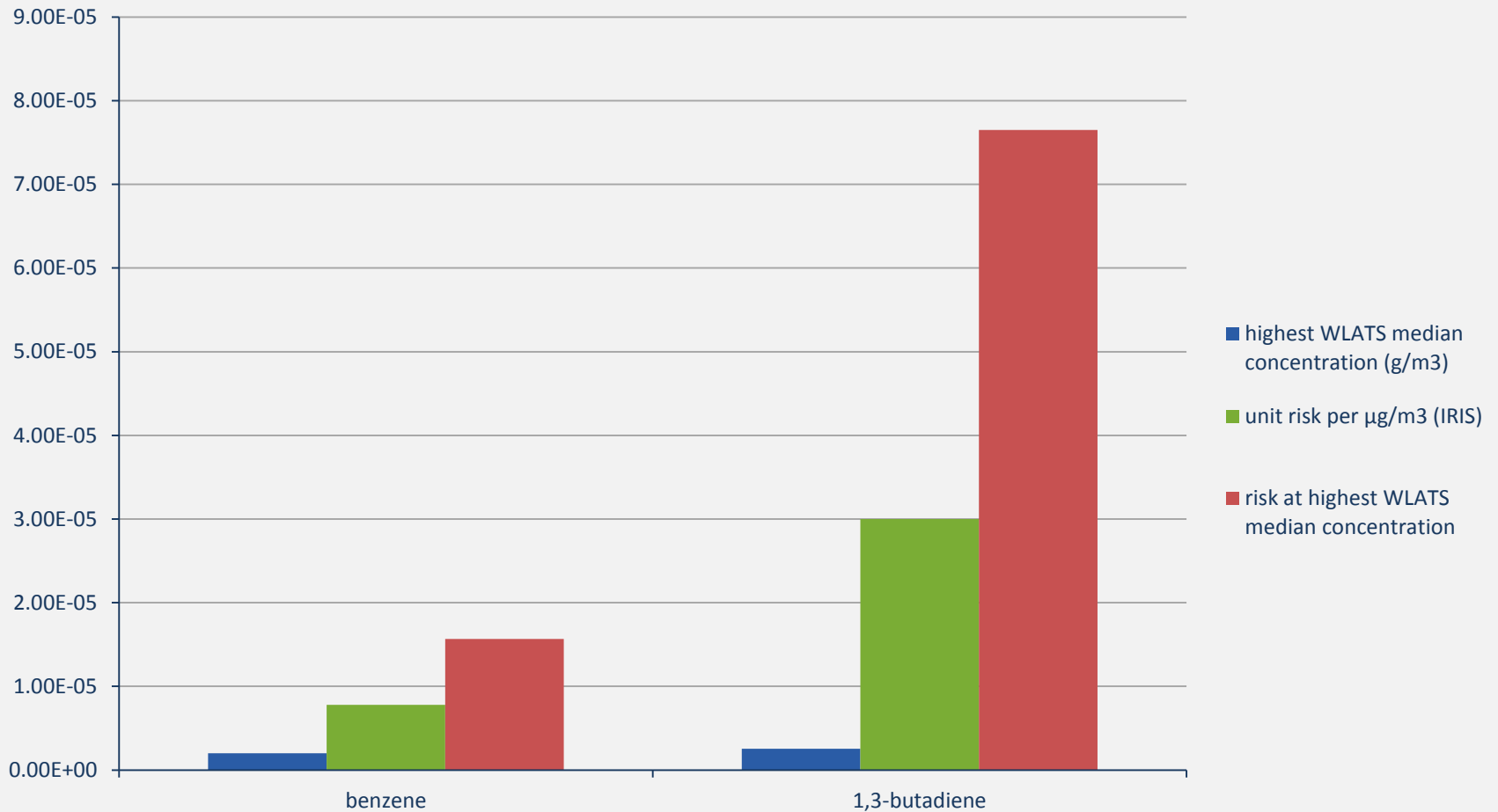
Source: West Louisville Air Toxics Study Risk Assessment (2003)

Emissions Risk



Source: West Louisville Air Toxics Study Risk Assessment (2003)

Emissions v. Risk – Actual Risk





Relevant Non-Cancer Hazard Range

**Ample Margin
of Safety Met**

**Ample Margin of
Safety with
consideration of
costs, technical
feasibility and other
factors**

**Risk Unsafe
Action Needed to
Reduce Risks**

1.0

case-by-case

HI_{max}



Relevant Cancer Risk Range

