

Kentucky Department for Environmental Protection

Kentucky Toxic Release Inventory Analysis

2013 Reporting Year



March 8, 2015



Executive Summary

Under the national Toxic Release Inventory (TRI) program, facilities within specific industry sectors that manufacture, process or use chemical amounts over the TRI thresholds must report releases, transfers, disposal, reuse and recycling activities to the U.S. Environmental Protection Agency (U.S. EPA) and the corresponding state agency. Those reports are due on July 1 of each year for the previous calendar year.

The TRI program was established in response to the 1986 chemical release incident in Bhopal, India. The United States Congress passed the Emergency Planning and Community Right-to-Know Act in 1986. The purpose is to provide information to federal and state agencies and make the data available to the public. The U.S. EPA compiles the data and publishes the information for public information and analysis.

The Kentucky Department for Environmental Protection completed an analysis of the data submitted to the TRI program. This report contains the analysis of data reported by Kentucky industries for the 2013 reporting year. Within Kentucky, there were a total of 427 facilities and 168 chemicals reported for the 2013 calendar year. This is a decrease from the 431 Kentucky facilities and 174 chemicals reported for the 2012 calendar year.

Total on-site releases in Kentucky for 2013 were 63,811,627 pounds, off-site releases were 8,282,154 pounds and a total of 72,093,781 pounds were released or disposed in Kentucky for 2013. This represents a decrease of 3,522,948 pounds from 2012 reported releases on-site, 2,369,589-pound decrease off-site, and a total decrease of 5,892,538 pounds from 2012. That equates to a 7.6 % decrease for total releases, a 5.2% decrease on-site, and a 22.2% decrease in off-site releases. When compared to 2011, reporting year 2013 releases represent a decrease of 13% on-site, 22.5% off-site, and 14.2% for total releases. Chemicals releases reported through the TRI Program do not directly reflect exposure to these chemicals. In addition to releases, total production-related waste that was handled during 2013 was 806,261,259 pounds, a decrease from 2012 of 16,872,822 pounds reported. 91% of the chemical amounts reported during the 2013 TRI reports are not released to environmental media (air, water, or landfill) but rather are recycled, treated, or used for energy recovery.

Results of the 2013 Toxic Release Inventory analysis were:

- On-site releases in Kentucky for 2013 were 63,811,627 pounds, off-site releases were 8,282,154 pounds, and total on-site and off-site releases and disposal were reported as 72,093,781 pounds in 2013.
- On-site releases decreased 3,522,948 pounds (5.2%) from 2012 reports, off-site releases decreased 2,369,589 pounds (22.2%), and total reductions of 5,892,538 pounds were reported compared to the 2011 reporting year, which is a 7.6% decrease for total releases.
- Over 91% of the amount reported for TRI chemicals was to recycling, treatment, energy recovery, rather than released or disposed of in environmental media.

- Trends in reported releases for the last 5 years and the core chemicals and industries since 1988 have shown a downward trend. Since air releases make up the largest portion of total releases this specifically reflects the success of the Clean Air Act and air quality standards.
- In 2013, total releases decreased in seven out of the ten Kentucky counties that had the highest amounts in 2012. On-site releases in five of the top ten 2012 Kentucky counties decreased from 2012 to 2013.
- Additionally, total releases for seven out of the top ten facilities in 2013 in Kentucky decreased from 2012 to 2013.
- Air emissions from Kentucky electrical utilities in 2013 decreased from 2012 and 2011 values.
- With reduction in reported releases, the potential impact on communities that may be disproportionately impacted has also decreased.

Introduction

The Kentucky Department for Environmental Protection (KYDEP) conducted an analysis of the 2013 Reporting Year data from the Toxic Release Inventory (TRI). The deadline for data submittal to the United States Environmental Protection Agency (U.S. EPA) was July 1, 2014 for calendar year 2013. Facilities are also required to submit a copy of reporting forms to the state where the facility is located which in Kentucky is the Department for Environmental Protection. Kentucky is a member of the State Data Exchange and receives electronic copies of all forms submitted via the Central Data Exchange (CDX). This report presents the results of the analysis of TRI data and considers trends in releases, transfers, disposal, and pollution prevention in Kentucky.

The Kentucky Department for Environmental Protection conducted this analysis to identify key metrics and trends in reporting. The TRI reporting data were analyzed using key metrics selected to give a better understanding of the data for Kentucky, answer relevant questions related to the state of our environment, and assist with identifying areas of success in reducing pollutants and focus future efforts to improve Kentucky's environment.

Metrics selected for this report were:

- total pounds released in Kentucky and the United States for 2013 compared to 2012 and 2010 and changes in pounds and percentage,
- releases and disposal by media (air, land, water),
- number of facilities and chemicals reporting in Kentucky,
- comparison of Kentucky releases to surrounding states, U.S. EPA Region 4 states, and other states in the US,
- trends in reporting for the last five years,
- 10 highest releases by chemical,
- 10 highest counties with releases,

- 10 facilities with the greatest reported releases or disposal,
- pollution prevention activities reported by Kentucky facilities,
- 5 industry sectors with the greatest reported releases or disposal, and
- top 10 reducers of releases from 2012 to 2013 in Kentucky.

Description and Background of the Toxic Release Inventory (TRI) Program

The Emergency Planning and Community Right-to-Know Act (also known as EPCRA) was enacted in 1986 because of concerns related to the deadly cloud of methyl isocyanate that killed thousands of people in Bhopal, India. Shortly thereafter, there was a serious chemical release at a sister plant in West Virginia. These incidents underscored demands by industrial workers and communities in several states for information on hazardous materials in their vicinity.

In 1990, Congress passed the Pollution Prevention Act, which requires facilities to report additional data on waste management and source reduction activities to U.S. EPA under TRI. The goal of the Toxics Release Inventory Program is to provide communities with information about toxic chemical releases and waste management activities and to support informed decision making at all levels by industry, government, non-governmental organizations, and the public.

One of EPCRA's primary purposes is to inform citizens of toxic chemical releases in their areas. EPCRA Section 313 requires U.S. EPA and the states to collect data annually on releases and transfers of certain toxic chemicals from industrial facilities and make the data available to the public through TRI. The covered industries can be found at <http://www2.epa.gov/toxics-release-inventory-tri-program/my-facilitys-six-digit-naics-code-tri-covered-industry> and the covered chemicals are listed at <http://www2.epa.gov/toxics-release-inventory-tri-program/tri-listed-chemicals>

Section 313 of EPCRA, requires certain facilities that manufacture, process, or otherwise use listed toxic chemicals in amounts above reporting threshold levels to report their environmental releases and other waste management quantities of such chemicals annually. These facilities must also report pollution prevention and recycling data for such chemicals, pursuant to section 6607 of the PPA, 42 U.S.C. 13106. Facilities submit their reports on Form R or the shorter Form A.

The Toxics Release Inventory Program compiles the TRI data submitted by regulated facilities each year and makes the data available online. For more information on the Toxic Release Inventory, visit www.epa.gov/tri

2013 Reporting Year Data

Toxic Release Inventory reporting includes on-site releases, off-site releases, energy recovery, recycling activities, and transfers to treatment or disposal facilities. On-site releases include fugitive and stack emissions, releases to surface waters, and groundwater through underground injection and onsite landfills. Off-site releases include placement in off-site landfills, impoundments, land treatment, and wastewater treatment.

The U.S. EPA did not add any new chemicals to TRI reporting for Reporting Year 2013. Hydrogen sulfide was added to the list of TRI chemicals for reporting year 2012 and there were 8 facilities that reported releases of 255,101 pounds during the most recent reporting year of 2013. EPA announced that ortho-nitrotoluene will be added for Reporting Year 2014 due on July 1, 2015.

National Data

Total U.S. on-site releases during 2013 were 3,731,023,991 pounds and 406,304,330 pounds off-site for a total of 4,137,328,321 pounds. This is a 538 million pound (16.9%) increase from 2012 reported on-site releases and 33 million pounds (7.5%) decrease in off-site releases. Lead and arsenic had the highest reported increases in pounds from 2012 to 2013 with an increase of over 220 million pounds for lead due mainly to two facilities and 128 million pounds for arsenic attributable to four mining facilities. The U.S. EPA released its national analysis of TRI data on January 14, 2015 that considers trends in release reporting pollution prevention activities. The national analysis also considers economic trends, risk information and interpretation of results. Table 1 summarizes the 10 chemicals with the greatest change for on-site, off-site, and total releases from 2012 to 2013 reporting years.

Table 1. U.S. Increases From 2012 to 2013 (pounds)					
	On-site		Off-site		Total
Lead Compounds	220,702,864	Nickel Compounds	3,112,171	Lead Compounds	220,843,304
Arsenic Compounds	128,442,939	Ethylene Glycol	2,991,260	Arsenic Compounds	128,195,826
Barium Compounds	109,165,376	Benzene	2,358,872	Barium Compounds	110,717,390
Zinc Compounds	33,839,424	Manganese Compounds	1,669,967	Zinc Compounds	31,538,015
Manganese Compounds	22,010,106	Barium Compounds	1,552,013	Manganese Compounds	23,680,072
Copper Compounds	15,464,299	Vanadium Compounds	1,275,273	Copper Compounds	15,314,821
Hydrochloric Acid	6,311,888	Nitric Acid	1,231,509	Hydrochloric Acid	6,388,754
Thallium Compounds	4,312,200	Methanol	988,989	Thallium Compounds	4,496,379
Ammonia	4,003,622	Methyl Methacrylate	843,517	Benzene	4,479,909
Sulfuric Acid	3,941,033	Certain Glycol Ethers	832,850	Sulfuric Acid	4,008,950

Kentucky Data

The Kentucky Department for Environmental Protection received reports from 427 facilities and 168 chemicals in 2013. This is a decrease from a total of 431 Kentucky facilities and 173 chemicals reported in 2012.

Total on-site releases in Kentucky for 2012 were 63,811,627 pounds, off-site releases were 8,282,154 pounds with a total of 72,093,781 pounds released or disposed in Kentucky for 2013. This represents a decrease of 3,522,948 pounds from 2012 reported releases on-site, 2,369,589-pound decrease off-site, and a total decrease of 5,892,538 pounds from 2012. That equates to a 7.6% decrease for total releases, a 5.2% decrease on-site and a 22.2% decrease in off-site releases. The itemized list of all chemicals reported for 2013 are shown in Appendix A summarized by On-site, Off-site, and Total Releases.

The majority of the reported releases or disposals in 2013 were to air with 40,282,534 pounds. 8,090,417 pounds of chemicals were placed in on-site surface impoundments, 8,699,890 to onsite landfills, and 5,662,967 pounds were discharged to surface water. The remainder of notable releases were to off-site landfills, land treatment or off-site solidification or stabilization. In addition to disposal and releases, an additional 109,193,555 pounds were transferred off-site for recycling, energy recovery, Publicly Owned Treatment Works (POTWs), or disposal or further waste management by another entity. In addition, 279,961,561 pounds of chemicals were recycled on-site, 31,434,966 went to on-site energy recovery, and 321,892,276 pounds were treated on-site.

Comparison to Other State Reports

Kentucky's 2012 and 2013 ranking in comparison to all states, surrounding states, and states within U.S. EPA Region 4 are shown below in regard to releases and disposal. Kentucky's ranking increased in total US releases and remained the same for on-site U.S. releases when compared to other states. When compared to other Region 4 states and states adjacent to Kentucky, Kentucky's rank dropped or remained the same for on-site and total releases. Kentucky ranked 11th for percent reduction for onsite releases or disposal, 7th for reduction of off-site releases or disposal, and 11th for percent reduction in total releases.

<u>Kentucky Rank</u>	<u>2012</u>	<u>2013</u>
U.S. (Total Releases)	13 th	12 th
U.S. (on-site)	12 th	12 th
Region 4 (Total)	3 rd	3 rd
Region 4 (On-site)	3 rd	3 rd
Adjacent States (Total)	5 th	5 th
Adjacent States (On-site)	5 th	5 th

5-Year Trends

Tables 2 and 3 and the following charts summarize the 5-year trend for total on-site, total off-site, and combined total pounds released or disposed in reporting year 2013 and the major individual contributors to those numbers. Releases and disposal have generally decreased from 2009 to 2013 with air releases decreasing and discharges to surface waters and landfills initially increasing and more recently decreasing. Releases to surface impoundments have been decreasing during the last 3 years. The majority of on-site releases represent air emissions, which can be further broken down into stack and fugitive emissions. Off-site disposal has fluctuated over the years with disposal in Resource Conservation and Recovery Act (RCRA) landfills fluctuating over the last 5 years with disposal in other landfills decreasing. Total on-site and total combined releases and disposal decreased over the last 5 reporting years.

Table 2. On-site Releases and Disposal in Kentucky					
Year	Total Air Emissions	Surface Water Discharges	Total Landfills	Total Surface Impoundments	Total On-site Disposal or Other Releases
2009	51,594,659	5,066,868	7,189,423	7,757,428	73,250,300
2010	58,563,370	6,605,678	7,613,872	10,385,887	84,620,519
2011	47,646,163	6,273,169	8,295,739	9,870,818	73,020,591
2012	41,171,493	7,417,795	8,910,676	8,639,405	67,334,575
2013	40,282,534	5,662,967	8,699,890	8,090,417	63,811,627

Table 3. Off-site and Total On- and Off-Site Releases and Disposal in Kentucky					
Year	Off-Site Disposal-RCRA Subtitle C Landfills	Off-Site Disposal-Other Landfills	Off-Site Disposal-Land Treatment	Total Off-site Disposal or Other Releases	Total On- and Off-site Disposal or Other Releases
2009	979,305	5,999,441	3,214	9,624,567	82,874,867
2010	5,850,597	4,943,173	3,716	12,328,502	96,949,021
2011	4,317,735	5,197,314	1,646	10,566,530	83,587,122
2012	5,823,573	3,859,300	550	10,651,743	77,986,319
2013	4,493,328	2,692,985	6,901	8,282,154	72,093,781

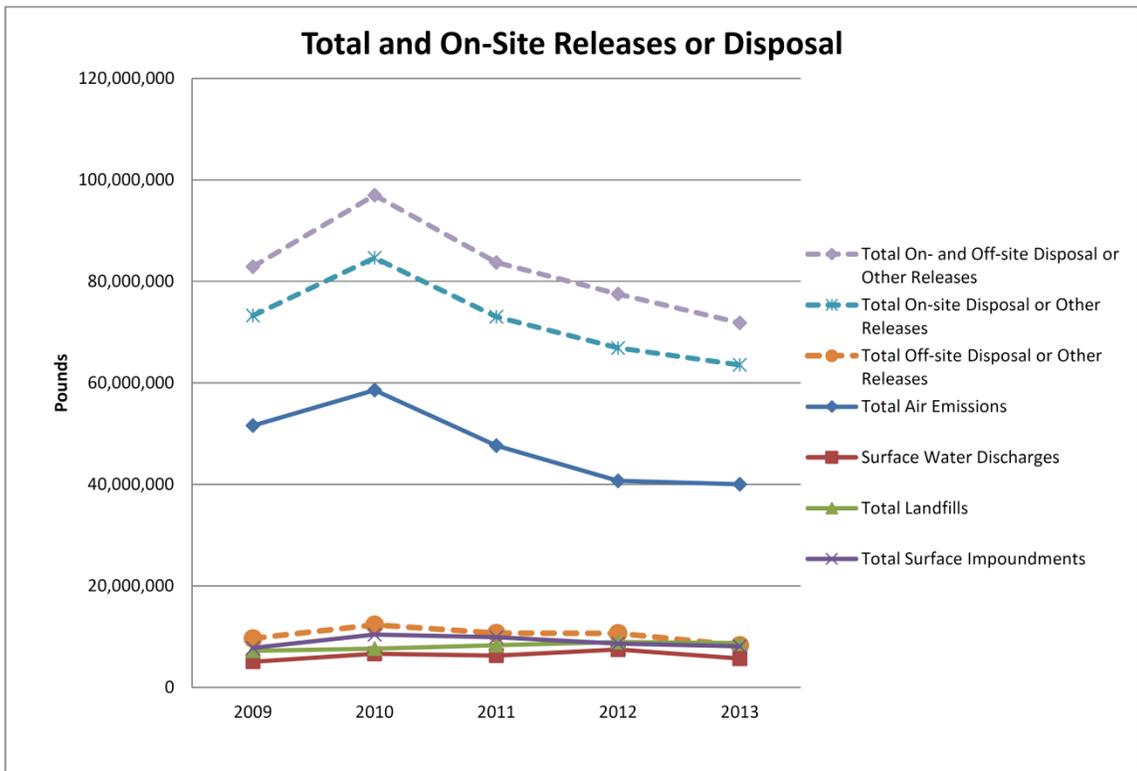


Figure 1.

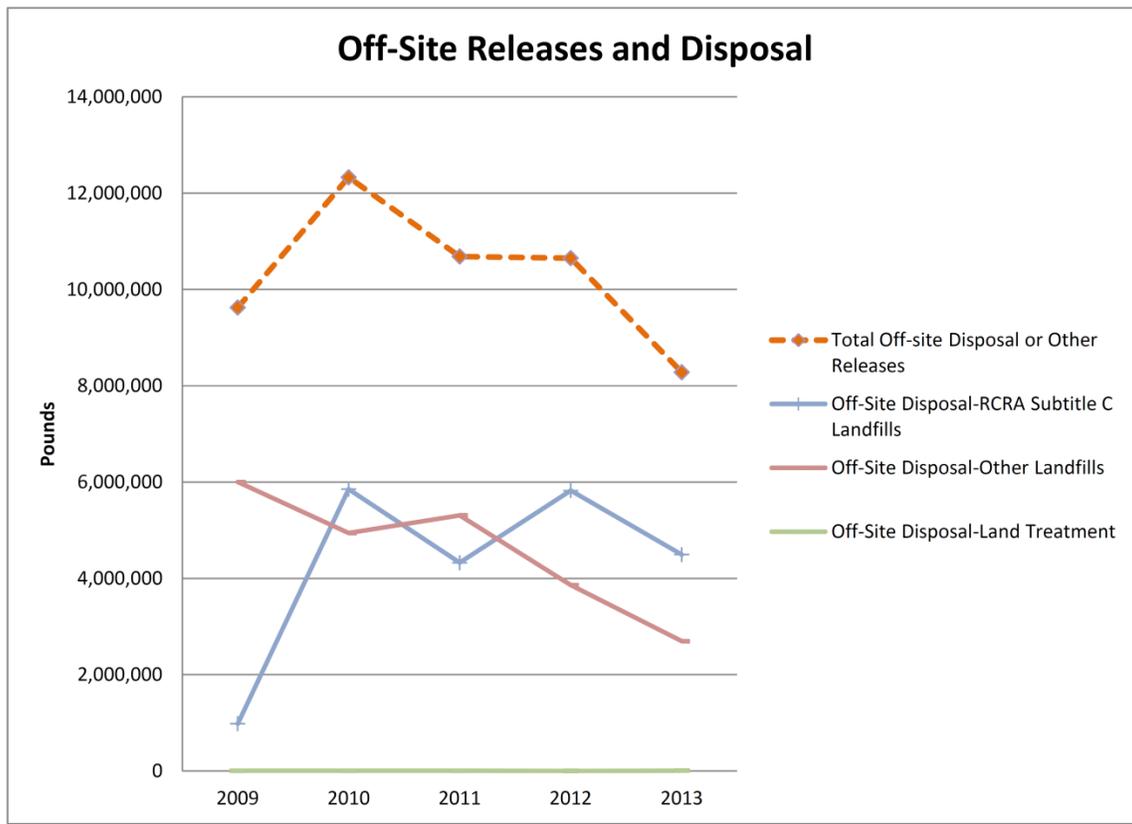


Figure 2.

Top Chemicals

The Toxic Release Inventory data were further analyzed to identify the top ten chemicals released on-site and off-site for Reporting Year 2013. The results are shown in Tables 4, 5, and 6. On-site releases of sulfuric acid mists and hydrochloric acid comprise 34% of all on-site and off-site reported releases or disposal for 2013. Sulfuric acid mists and hydrochloric acid are primarily associated with coal-fired power plant emissions. On-site and off-site releases and disposal of nitrates and metals are also influenced by steel and metal processing facilities in Kentucky.

Chemical	Pounds
Sulfuric Acid (1994 And After "Acid Aerosols" Only)	18,873,425
Hydrochloric Acid (1995 And After "Acid Aerosols" Only)	5,985,067
Nitrate Compounds	5,305,617
Barium Compounds	4,920,766
Methanol	3,777,868
Zinc Compounds	2,677,671
Manganese Compounds	2,232,354
Vanadium Compounds	2,013,000
Toluene	1,604,095
Hydrogen Fluoride	1,346,796

Chemical	Pounds
Chromium Compounds	2,508,916
Zinc Compounds	1,944,697
Manganese Compounds	1,072,888
Copper Compounds	466,318
Nickel Compounds	463,047
Copper	266,120
Aluminum (Fume Or Dust)	212,908
Barium Compounds	201,393
Lead Compounds	176,175
Styrene	148,481

Chemical	Pounds
Sulfuric Acid (1994 And After "Acid Aerosols" Only)	18,873,425
Hydrochloric Acid (1995 And After "Acid Aerosols" Only)	5,985,067
Nitrate Compounds	5,346,721
Barium Compounds	5,122,159
Zinc Compounds	4,622,367
Methanol	3,780,250
Chromium Compounds (Except Chromite Ore Mined In The Transvaal Region)	3,586,332
Manganese Compounds	3,305,241
Vanadium Compounds	2,022,082
Toluene	1,628,381

The top 10 chemicals for total releases in 2013 were evaluated for trends over the last 5 years for releases to air, land disposal and surface water. Many of Kentucky's industries are implementing pollution control upgrades to eliminate or reduce emissions and disposal of TRI chemicals. Appendix B contains the tables that show these trends for the top 10 chemicals. Air releases and surface water releases in Figure 3 are presented on a logarithmic scale due to the range of values from the highest chemical to the lowest. Data tables for the 5-year trends are shown in the appendix.

Air releases for the top ten chemicals in 2013 for total releases have remained relatively steady with sulfuric acid mists increasing slightly from 2009 to 2010 and then dropping in 2011, 2012 and 2013. The logarithmic scale makes it difficult to notice that hydrochloric acid releases decreased from 2009 to 2013 to less than one-half of 2009 releases. Manganese dropped to one-third of its 2009 levels.

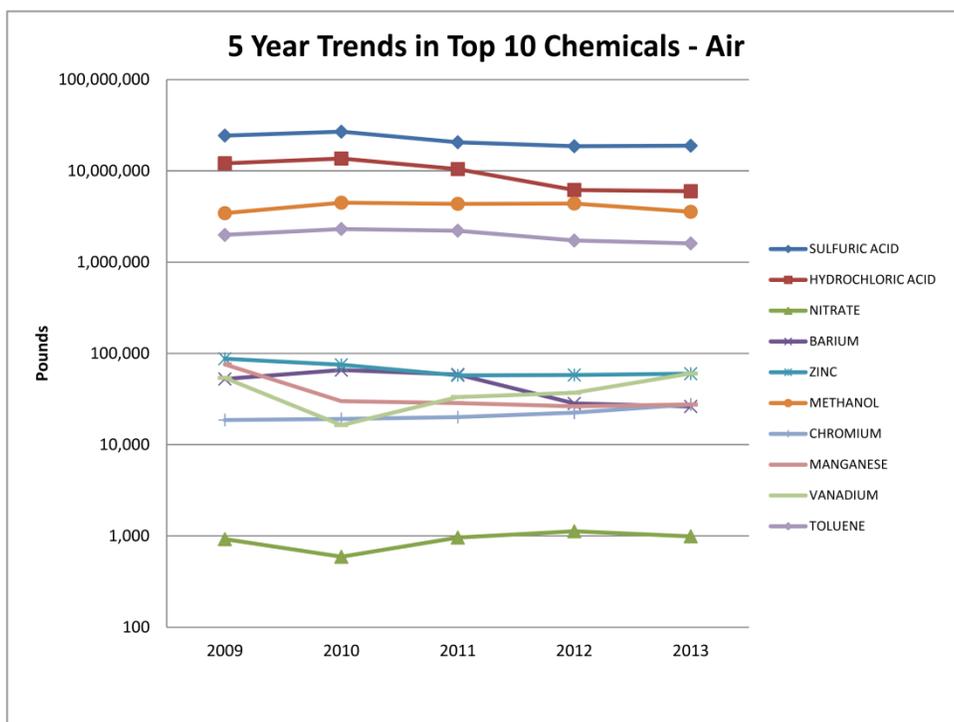


Figure 3.

Releases to land of the top 10 chemicals for 2013 have remained relatively steady with an upward trend for 2009 through 2011 for barium but then dropped back down in 2012 and 2013. Forty percent of all releases of barium, the highest chemical with disposal to land, is associated with one facility that disposes of waste in an on-site landfill. All other land releases fluctuated up and down over the 5 years.

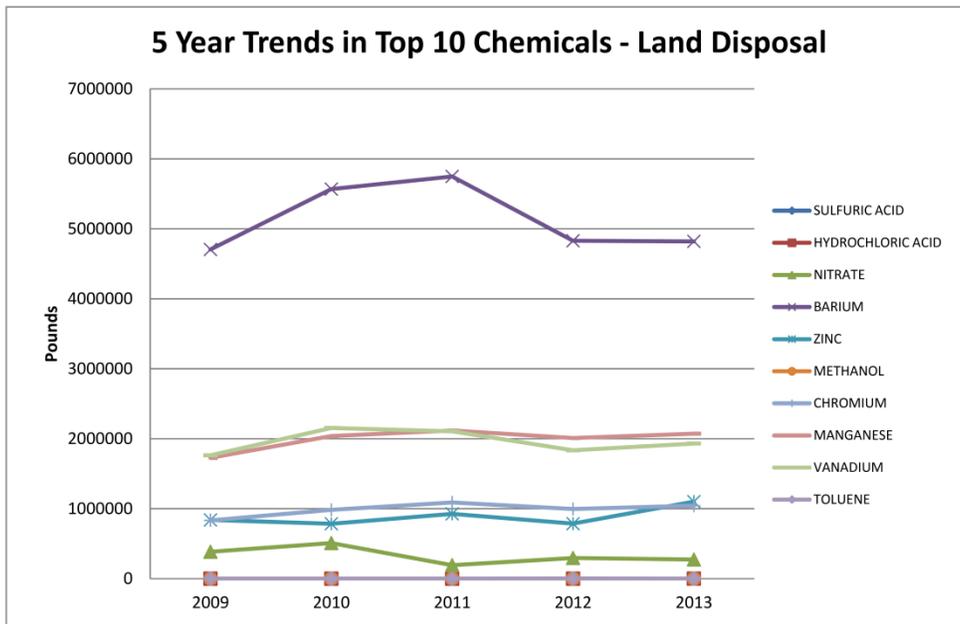


Figure 4.

Surface water discharges for these top 10 chemicals remained relatively the same from 2009 to 2013 with a gradual downward trend for methanol and a significant drop in toluene in 2013 after a one year elevated report from one facility in 2012.

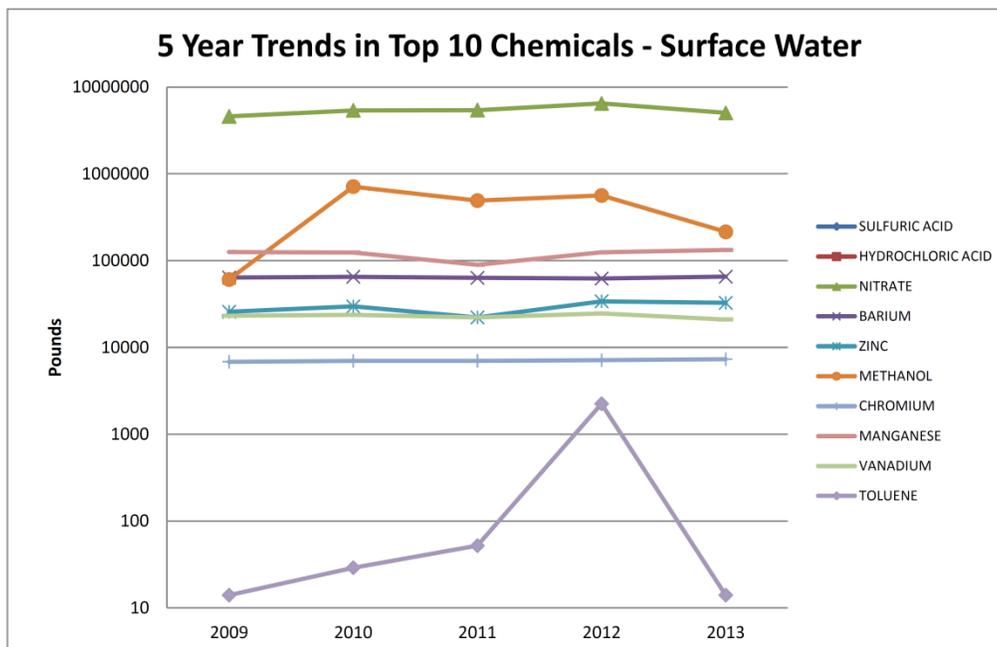


Figure 5.

Top Counties

The ten counties with the highest total releases in 2013 are shown on Table 7. The top 10 counties comprise 74% of all Kentucky releases for 2013. Carroll County with 6 facilities reporting was followed by Jefferson County (67 facilities), and Muhlenberg County (7 facilities) for total releases. All three counties have facilities that reported sulfuric acid mists and hydrochloric acid, the top two chemicals reported in the TRI data for Kentucky facilities. Carroll County also has the largest source of nitrate, the third highest chemical reported to TRI in Kentucky for 2013. The top 10 counties for on-site releases in 2013 are shown in Table 8. The top 8 counties for on-site releases rank the same as those for total releases. Trimble and Marshall counties complete the top 10.

The top 10 counties for 2012 are shown for comparison on Table 9 and 10. It is notable that Ballard County, with two reporting facilities, dropped significantly from the 2012 to 2013 reporting and is no longer in the top 10 counties for 2013. The reported releases for methanol from a paper company in Ballard County dropped by more than half.

Total releases from the top 10 facilities decreased by over 3 million pounds from 2012 to 2013. On-site releases decreased by over 1.3 million pounds from 2012 to 2013.

County	Pounds
Carroll	14,633,307
Jefferson	9,552,357
Muhlenberg	6,299,106
Henderson	4,556,428
Hancock	4,019,014
Mason	3,394,197
McCracken	3,190,241
Lawrence	2,873,457
Marshall	2,559,864
Trimble	2,478,522

Table 8. Top 10 Kentucky Counties: On-Site Releases for 2013	
County	Pounds
Carroll	10,107,411
Jefferson	8,737,957
Muhlenberg	6,298,806
Henderson	4,523,723
Hancock	3,949,230
Mason	3,386,629
McCracken	3,187,308
Lawrence	2,871,730
Trimble	2,478,505
Marshall	2,255,829

Table 9. Top 10 Kentucky Counties: Total Releases for 2012	
County	Pounds
Carroll	15,393,481
Jefferson	9,606,630
Muhlenberg	7,820,761
Marshall	4,111,349
Hancock	4,045,468
Henderson	3,908,194
McCracken	3,327,450
Ballard	3,132,251
Lawrence	2,816,079
Mason	2,726,466

Table 10. Top 10 Kentucky Counties: On-site Releases for 2012	
County	Pounds
Carroll	10,048,847
Jefferson	8,737,926
Muhlenberg	7,820,529
Hancock	3,974,349
Henderson	3,879,331
McCracken	3,326,033
Ballard	3,132,250
Lawrence	2,814,808
Trimble	2,696,498
Mason	2,679,466

Top Facilities

The top 10 facilities for on-site, off-site, and combined releases were identified and are shown on Tables 11, 12, and 13, respectively. Eight of the top ten facilities in Kentucky with on-site and total releases or disposal are in the electric utility industry sector. Total releases decreased for five of the top 10 facilities in 2012 to 2013. Other than North American Stainless, total releases primarily reflect on-site releases or disposal and off-site releases were lower than on-site releases.

Facility	Total On-site Disposal or Other Releases
Kentucky Utilities Co Ghent Station (Carroll)	7,170,841
US TVA Paradise Fossil Plant (Muhlenberg)	5,535,196
Louisville Gas & Electric Co - Mill Creek Station (Jefferson)	4,630,308
Big Rivers Electric Corp Reid/Green/HMP&L Station II (Henderson)	3,909,125
US TVA Shawnee Fossil Plant (McCracken)	2,907,235
Spurlock Power Station (Mason)	2,900,471
North American Stainless (Carroll)	2,900,160
American Electric Power Big Sandy Plant (Lawrence)	2,871,730
Louisville Gas & Electric Co - Trimble County Station (Trimble)	2,478,505
Wickliffe Paper Co (Ballard)	1,865,884

Facility	Total Off-site Disposal or Other Releases
North American Stainless (Carroll)	4,373,786
Gallatin Steel Co (Gallatin)	494,700
Owensboro Municipal Utilities Elmer Smith Station (Daviess)	376,211
Gerdau Ameristeel US Inc (Marshall)	282,013
Momentive Specialty Chemicals Inc (Jefferson)	233,571
Clariant Corp 12th Street Facility (Jefferson)	204,838
Akebono - Elizabethtown Plant (Hardin)	182,800
Dow Corning Corp (Carroll)	152,083
Akebono Brake Corp - Glasgow (Barren)	147,520
Novelis Corp (Madison)	137,723

Table 13. Top 10 Facilities for Total Releases or Disposal (2013 Reporting Year)	
Facility	Total Disposal or Other Releases
North American Stainless (Carroll)	7,273,946
Kentucky Utilities Co Ghent Station (Carroll)	7,170,842
US TVA Paradise Fossil Plant (Muhlenberg)	5,535,205
Louisville Gas & Electric Co - Mill Creek Station (Jefferson)	4,630,309
Big Rivers Electric Corp Reid/Green/HMP&L Station II (Henderson)	3,909,125
US TVA Shawnee Fossil Plant (McCracken)	2,907,237
Spurlock Power Station (Mason)	2,900,471
American Electric Power Big Sandy Plant (Lawrence)	2,873,457
Louisville Gas & Electric Co - Trimble County Station (Trimble)	2,478,522
Wickliffe Paper Co (Ballard)	1,865,884

The top 10 facilities for 2012 were identified for on-site, off-site, and total releases and the change in their reported releases and disposal from 2012 to 2013 was calculated and is shown in Tables 14, 15, and 16, respectively. Releases from three of the eight power plants decreased from 2012 to 2013. These changes reflect changes in processes, reduction in industrial operations, or improvements in pollution control. The TVA Paradise plant upgraded the wet limestone scrubber performance in 2012 with a resulting 21% reduction in reported releases, primarily in sulfuric acid aerosols, and dropped in ranking for Kentucky facilities from first in 2012 to second in 2013. Wickliffe Paper in Ballard County reduced its fugitive air emissions by almost 1 million pounds from 2012 to 2013 with a total of 40% reduction in reported emissions from 2012 to 2013. Other facilities reported higher releases to the environment from 2012 to 2013.

Table 14. Top 10 Facilities for On-Site Releases or Disposal in 2012 and Percent Change	
Facility	Percent Change from 2012 to 2013
US TVA Paradise Fossil Plant (Muhlenberg)	-21.3%
Kentucky Utilities Co Ghent Station (Carroll)	6.9%
Louisville Gas & Electric Co - Mill Creek Station (Jefferson)	-3.7%
Big Rivers Electric Corp Reid/Green/HMP&L Station II (Henderson)	18.8%
North American Stainless (Carroll)	-10.9%
Wickliffe Paper Co (Ballard)	-40.2%
US TVA Shawnee Fossil Plant (McCracken)	0.6%
American Electric Power Big Sandy Plant (Lawrence)	2.0%
Louisville Gas & Electric Co - Trimble County Station (Trimble)	-8.1%
Spurlock Power Station (Mason)	31.4%

Table 15. Top 10 Facilities for Off-Site Releases or Disposal in 2012 and Percent Change	
Facility	Percent Change from 2012 to 2013
North American Stainless (Carroll)	-15.5%
Gerdau Ameristeel US Inc (Marshall)	-82.8%
Safety-Kleen Systems Inc (Henry)	-90.0%
Momentive Specialty Chemicals Inc (Jefferson)	-17.3%
Kentucky Electric Steel (Boyd)	-79.6%
Novelis Corp (Madison)	-40.0%
Owensboro Municipal Utilities Elmer Smith Station (Daviess)	72.3%
Akebono - Elizabethtown Plant (Hardin)	-0.9%
Gallatin Steel Co (Gallatin)	177.2%
Dow Corning Corp (Carroll)	-9.5%

Table 16. Top 10 Facilities for Total Releases or Disposal in 2012 and Percent Change	
Facility	Percent Change from 2012 to 2013
North American Stainless (Carroll)	-13.7%
US TVA Paradise Fossil Plant (Muhlenberg)	-21.3%
Kentucky Utilities Co Ghent Station (Carroll)	6.9%
Louisville Gas & Electric Co - Mill Creek Station (Jefferson)	-3.7%
Big Rivers Electric Corp Reid/Green/HMP&L Station II (Henderson)	18.8%
Wickliffe Paper Co (Ballard)	-40.2%
US TVA Shawnee Fossil Plant (McCracken)	0.6%
American Electric Power Big Sandy Plant (Lawrence)	2.0%
Louisville Gas & Electric Co - Trimble County Station (Trimble)	-8.1%
Spurlock Power Station (Mason)	31.4%

Facility Increases and Decreases

The Kentucky TRI data were also evaluated to identify the top ten facilities with increases by pounds and percentage, and the top ten facilities with decreases by pounds and percentage from the 2012 to 2013 reporting years. The results of the analysis are shown in Appendix C. The top 10 facilities with increases had a total of 4,162,832 pounds in increased releases or disposal. The top 10 facilities with decreases reduced a total of 8,925,776 pounds of releases or disposal. The top ten facilities with the greatest percentage increase and the top ten facilities with the greatest percentage decrease are both presented in Appendix C. Additionally, Appendix C includes the top ten facilities reporting in both 2012 and 2013 with percentage decreases since some facilities with 2012 reports may have ceased operations or changed operations and therefore did not report in 2013. The top ten reported total releases ranged from 82.8 to 99.7% reduction from 2012 releases.

Top Industry Sectors

The top 5 industry sectors in 2013 and the reported releases are shown below in Table 17 for on-site releases, Table 18 for off-site releases or disposal, and Table 19 for total releases or disposal. The top five sectors for on-site releases in reporting year 2013 were the same as 2012 with releases and disposal dropping for all sectors except electric utilities which increased by one percent. Electric utilities make up 57% of total pounds released or disposed in 2013. On-site releases are primarily from electric utilities, and primary metals production is in the top 2 for both on-site and off-site releases and disposal.

Industry Sector	On-site Releases
NAICS 2211 - Electric Utilities	40,842,860
NAICS 331 - Primary Metals	6,290,047
NAICS 325 - Chemicals	4,821,746
NAICS 322 - Paper	3,908,392
NAICS 311/312 - Food/Beverages/Tobacco	1,914,917

Industry Sector	Off-site Releases
NAICS 331 - Primary Metals	5,570,516
NAICS 325 - Chemicals	1,066,892
NAICS 336 - Transportation Equipment	798,212
NAICS 2211 - Electric Utilities	416,400
NAICS 332 - Fabricated Metals	216,793

Industry Sector	Total Releases
NAICS 2211 - Electric Utilities	41,259,260
NAICS 331 - Primary Metals	11,860,563
NAICS 325 - Chemicals	5,888,638
NAICS 322 - Paper	3,908,726
NAICS 336 - Transportation Equipment	2,018,952

TRI Data for Electrical Utilities

Since the electric utilities industry sector makes up a large percentage of the total TRI reported releases and disposal in Kentucky, the electric utilities sector was evaluated specifically to consider trends in power plant emissions. The combined fugitive and stack air releases for 2010, 2011, 2012, and 2013 TRI data were evaluated and ranked by state. Kentucky has had the highest reported air releases from power plants for all four years, which correlates with the role that coal-fired electrical generation plays in Kentucky’s energy portfolio. However, air releases from power plants in Kentucky have shown a downward trend dropping by 23.7% in 2011, 20.9% in 2012, and essentially staying the same in 2013 with a 0.1% increase. This is an overall reduction in reported air emissions of 39.6% from 2010 to 2013.

These reductions may be due to a combination of changes in fuel from coal to other fuels, improved pollution control, economic factors reducing power demand, or closing of facilities. The top ten states in 2013 with air releases from the electrical utilities sector are listed in Table 20 with corresponding rank for each year listed and the change in reported releases for each of

the last four years. The data for all states is listed in Appendix D. Nationally, releases from the electric utilities sector dropped by 17.7% from 2010 to 2011, 25.2% from 2011 to 2012, 38.5% from 2010 to 2012, and increased 2.7% from 2012 to 2013.

Table 20. 2013 Air Emissions from Power Plants					
Rank	State	Air Emissions	Change from 2012 (2012 rank)	Change from 2011 (2011 rank)	Change from 2010 (2010 rank)
1	Kentucky	24,540,942	0.1% (1)	-20.9% (1)	-39.6% (1)
2	Indiana	23,886,319	35.8% (3)	3.1% (3)	-10.0% (4)
3	Ohio	21,009,235	-0.8% (2)	-30.8% (2)	-42.5% (2)
4	Pennsylvania	16,439,669	1.9% (4)	-23.0% (4)	-47.8% (3)
5	West Virginia	12,474,527	-4.2% (5)	-14.6% (6)	-31.2% (5)
6	Michigan	10,710,730	-17.0% (6)	-38.5% (5)	-31.3% (7)
7	Florida	10,401,140	6.2% (7)	-21.0% (7)	-37.8% (6)
8	Georgia	10,010,735	16.2% (8)	-11.7% (8)	-26.1% (9)
9	Mississippi	8,429,221	80.3% (14)	51.5% (15)	110.9% (17)
10	Alabama	6,087,893	-0.7% (9)	-23.8% (11)	-27.3% (14)
	TOTAL	197,942,764	2.7%	-23.2%	-36.8%

Dioxins

In the Toxic Release Inventory Program, dioxin and dioxin equivalents are reported separately from other chemicals. Thirty-six Kentucky facilities reported releases of dioxins or dioxin-like compounds in 2013. On-site releases ranged from 0.0002 to 56.2 grams (0.12 pounds). Off-site releases ranged from 0.00025 to 5,924 grams (13 pounds). The top five facilities for on-site and off-site releases are shown in the Table 21 and 22 below.

Table 21. Top 5 Facilities with On-site Releases of Dioxin and Dioxin-Like Compounds (grams)	
Aleris Recycling Inc (Butler)	56.219
Westlake Vinyls Inc (Marshall)	19.3366
Hydro Aluminum Metals USA LLC (Henderson)	14.8771
Carmeuse Lime & Stone Maysville Facility (Mason)	4.19367
Kentucky Utilities Co Ghent Station (Carroll)	2.9908

Table 22. Top 5 Facilities With Off-Site Releases Of Dioxins And Dioxin-Like Compounds (Grams)	
Westlake Vinyls Inc. (Marshall)	5,924.18
Nemak Glasgow Plant (Barren)	117.4083824
Owl's Head Alloys Inc (Warren)	2.36
Dow Corning Corp (Carroll)	1.397738
Novelis Corp (Madison)	0.00062

Other Management

In addition to on-site and off-site releases and disposal, facilities also report on the amount of TRI chemicals that undergo on-site recycling, energy recovery, and treatment; transfers off-site for recycling, energy recovery, or treatment; and transfers to a POTW. During the 2013 calendar year 109,193,555 pounds of chemicals were transferred off-site for further waste management and 633,288,803 pounds were treated, recycled or used for energy recovery on-site. The total releases, disposal and other management of TRI chemicals were 806,261,259 pounds during calendar year 2013. Of the total production-related waste that was managed during 2013, 91% was recycled, treated or used for energy recovered rather than released or disposed.

Pollution Prevention

The U.S. EPA TRI Program included enhanced Pollution Prevention (P2) reporting in Section 8 of Form R during reporting year 2013. Facilities can voluntarily select activity codes and provide additional descriptive text for pollution prevention activities implemented during the reporting year. This allows the facility to give additional detail of activities that affect reductions and changes in releases and disposal. Source reduction activities include good operating practices, process modifications, spill and leak prevention, and raw material and product modifications. Nationally, 3,362 facilities reported initiating 10,623 source reduction activities during 2013. The U.S. EPA has the P2 Search Tool that provides an opportunity to evaluate practices being used at facilities that report to TRI. The tool was used to obtain all data in the database for Kentucky facilities. Table 23 lists the 10 facilities with the greatest reductions in releases and the practices that were implemented in 2013.

Table 23. Top Ten Reductions in Releases from 2012 to 2013 and Associated Pollution Prevention Activities

FACILITY NAME	CHEMICAL	Difference in Pounds	POLLUTION PREVENTION INFORMATION (ACTIVITY CODES/TEXT)
CLARIANT CORP CRITTENDEN DRIVE FACILITY	Nitrate Compounds	723,958	W39: Other spill or leak prevention.
SEKISUI SPECIALTY CHEMICALS AMERICA LLC	Methanol	114,973	W52: Modified equipment, layout, or piping - Six mechanical seals on the polykettles (reactors) were upgraded to reduce fugitive emissions from equipment leaks. Method(s) to Identify P2 Activities: T01 [Internal Pollution Prevention Opportunity Audit(S)] - An opportunity to reduce fugitive equipment leak emissions from the polykettles was identified by the maintenance department and engineering group. Six mechanical seals on the polykettles (reactors) were upgraded to reduce fugitive emissions from equipment leaks. An opportunity to reduce fugitive equipment leak emissions from the polykettles was identified by the maintenance department and engineering group. The design of the mechanical seals on the top of six polykettles was upgraded to a design specific for agitator service. The conventional design was originally a pump seal adapted to agitator service. The upgraded configuration is designed to tolerate shaft movement, and this has increased the reliability of the new seal. This has resulted in the reduction of methanol fugitive emissions.
AMERICAN SYNTHETIC RUBBER CO	Toluene	108,222	W42: Substituted raw materials. W58: Other process modifications
KIMBERLY-CLARK CORP OWENSBORO OPERATIONS	Nitrate Compounds	51,488	W19: Other changes in operating practices.
REPUBLIC CONDUIT MANUFACTURING	Chromium Compounds (Except Chromite Ore Mined In The Transvaal Region)	39,763	W19: Other changes in operating practices - improved material purchasing to just in time, in so doing have eliminated potential spills and material going out of date. Plant installed a H2SO4 filtration system that has extended the life of the material 4 fold.
BRAKE PARTS INC	Copper	31,292	W42: Substituted raw materials - Used less Copper in formulation.

JLOK CORP	Styrene	14,998	W19: Other changes in operating practices. W21: Instituted procedures to ensure that materials do not stay in inventory beyond - Decrease amount of aged inventory that needed to be disposed of. W52: Modified equipment, layout, or piping - Catalyst piping change to help increase run rate. W58: Other process modifications - Use of film from Czech Republic reduced seal issues. Method(s) to Identify P2 Activities: T11 [Other] - Overall decreased waste on line by 19%. Pounds to the landfill decreased by 17% for 2012. Over all decreased waste on line by 19%. Pounds to the landfill decreased by 17% for 2012. Decrease amount of aged inventory that needed to be disposed of. Catalyst piping change to help increase run rate. Use of film from Czech Republic reduced seal issues.
REPUBLIC CONDUIT MANUFACTURING	Zinc Compounds	10,292.99	W29: Other changes in inventory control Method(s) to Identify P2 Activities: T11 [Other] - improved operation of zinc reclaim unit, IE: operate more, thus able to reuse material at the plant more improved operation of zinc reclaim unit, IE: operate more, thus able to reuse material at the plant more.
BRAKE PARTS INC	Antimony Compounds	9,942	W42: Substituted raw materials - Formulation Changes.
CLARIANT CORP CRITTENDEN DRIVE FACILITY	Antimony Compounds	9,094.5	W52: Modified equipment, layout, or piping.

Application and Conclusions

The data reported to the U. S. EPA and the states through the Toxic Release Inventory provides a tool for communication and informing residents near facilities, and allows state and U.S. EPA officials to evaluate chemical releases, disposal, and management and pollution prevention activities from 1988 to present. The reported data represent the pounds of production-related chemicals that were managed during the calendar year 2013.

Chemicals reported through the TRI Program do not directly reflect exposure to these chemicals. Over 91% of the chemicals amounts reported during the 2013 TRI reports are not released to environmental media (air, water, or landfill) but rather are recycled, treated, or used for energy recovery. In order to evaluate exposure and risk, it is necessary to consider dispersion and dilution factors and the toxicity of the chemicals. The TRI chemicals have varying toxicity where some chemicals have more serious effects than others. The chemicals that are released or disposed in the greatest amount are not necessarily the ones that are of greatest concern once potential exposure is considered. The U.S. EPA has developed a Risk Screening for Environmental Indicators (RSEI) model to take those factors into consideration. That tool is available on U.S. EPA's website (<http://www.epa.gov/opptintr/rsei/>) for comparing areas on a site-specific basis using TRI data, generic dispersion modeling, toxicity scores, and population characteristics to calculate a RSEI score.

Kentucky's facilities continue to improve their processes and make progress toward reducing releases and disposal. Releases and disposal have decreased since the beginning of the TRI Program. Considering the chemicals and industries that were part of the initial 1988 reporting cycle, the following chart illustrates reductions in total releases both on-site and off-site. The primary contributor to on-site releases is air emissions and the downward trend in total on- and off-site releases correlates with the downward trend in on-site air releases. This illustrates the effect of environmental regulations and continued efforts to reduce releases and disposal during the last 25 years of TRI reporting. As new chemicals and industry sectors have been added, releases and disposals continue to exhibit a downward trend that reflects efforts to reduce toxic releases and disposal. With reduction in reported releases, the potential impact on communities that may be disproportionately impacted has also decreased. There is remaining work to be done as new pollution control technologies become available and facilities in Kentucky evaluate their processes and make facility upgrades to improve their processes. The Kentucky Department for Environmental Protection will continue to assist facilities in Kentucky with compliance with their environmental permits and pollution control activities.

Results of the 2013 Toxic Release Inventory analysis were:

- On-site releases in Kentucky for 2013 were 63,811,627 pounds, off-site releases were 8,282,154 pounds, and total on-site and off-site releases and disposal were reported as 72,093,781 pounds in 2013.

- On-site 2013 releases decreased 3,522,948 pounds (5.2%) from 2012 reports, off-site releases decreased 2,369,589 pounds (22.2%), and total reductions of 5,892,538 pounds were reported compared to the 2011 reporting year, which is a 7.6% decrease for total releases.
- Over 91% of the amount reported for TRI chemicals was to recycling, treatment, energy recovery, rather than released or disposed of in environmental media.
- Trends in reported releases for the last 5 years and the core chemicals and industries since 1988 have shown a downward trend that specifically reflects the success of the Clean Air Act and air quality standards.
- Total releases in seven out of the top ten Kentucky counties with the highest amounts in 2012 decreased in the 2013 reporting year. On-site releases in five of the top ten 2012 Kentucky counties decreased from 2012 to 2013.
- Additionally, total releases for seven out of the top ten facilities in 2013 in Kentucky decreased from 2012 to 2013.
- Air emissions from Kentucky electrical utilities in 2013 decreased from 2012 and 2011 values.
- With reduction in reported releases, the potential impact on communities that may be disproportionately impacted has also decreased.

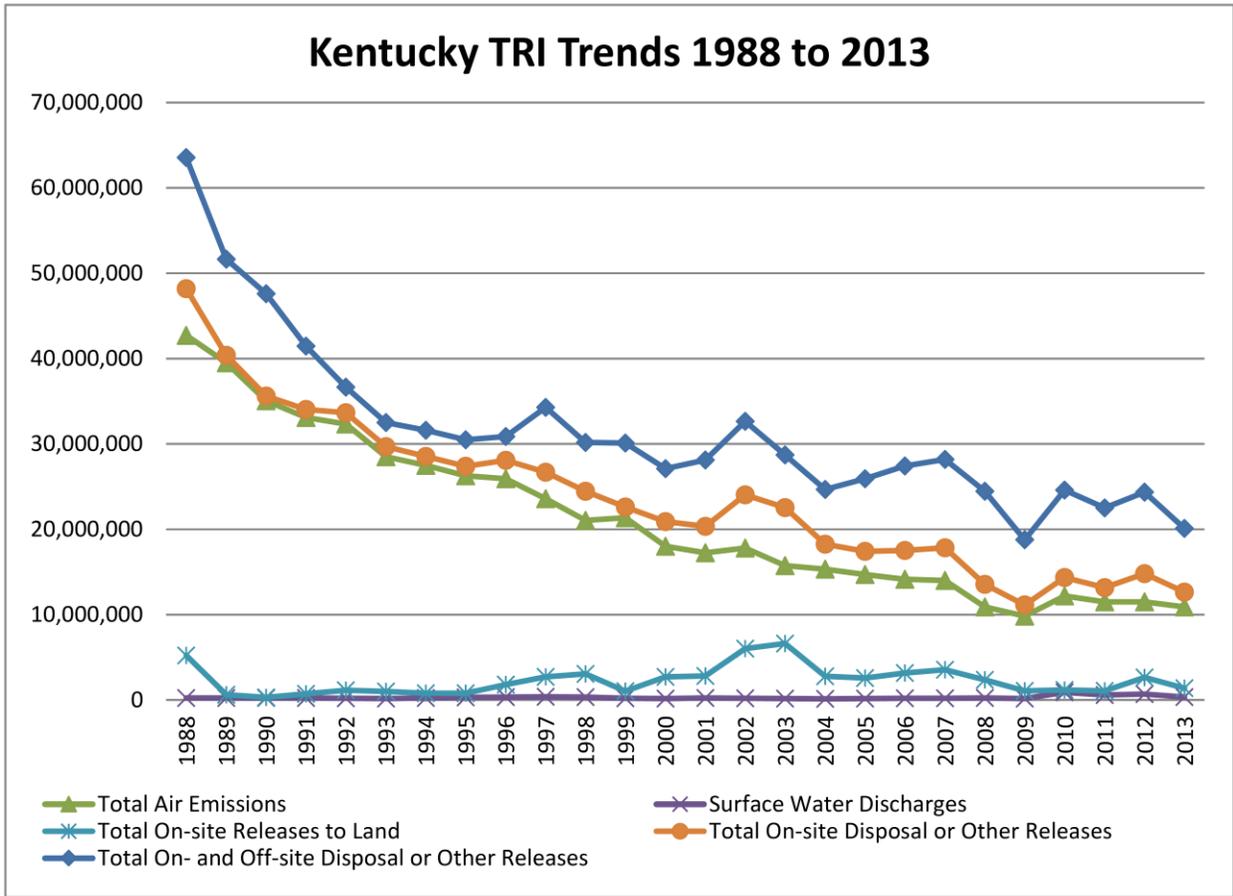


Figure 6.

Appendices

Appendix A

2013 TRI Releases for Kentucky by Chemical			
Chemical	Onsite	Offsite	Total
1,1,1-TRICHLOROETHANE	767		767
1,1,2,2-TETRACHLOROETHANE	84		84
1,1,2-TRICHLOROETHANE	250		250
1,1-DICHLORO-1-FLUOROETHANE	9,720		9,720
1,2,4-TRIMETHYLBENZENE	311,622	1,658	313,280
1,2-DICHLORO-1,1-DIFLUOROETHANE	24,586		24,586
1,2-DICHLOROETHANE	16,968	4	16,972
1,2-DICHLOROETHYLENE	36		36
1,2-DICHLOROPROPANE			
1,3-BUTADIENE	72,301	5	72,306
1-CHLORO-1,1,2,2-TETRAFLUOROETHANE	1,068		1,068
1-CHLORO-1,1-DIFLUOROETHANE	125,459		125,459
2,2-DICHLORO-1,1,1-TRIFLUOROETHANE	31,723		31,723
2,4-DINITROPHENOL	1,300		1,300
2,4-DINITROTOLUENE	5,500		5,500
2,6-DINITROTOLUENE	1,600		1,600
2-CHLORO-1,1,1,2-TETRAFLUOROETHANE	18,423		18,423
2-CHLORO-1,1,1-TRIFLUOROETHANE	22,044		22,044
2-METHOXYETHANOL	434		434
3-iodo-2-propynyl butylcarbamate	7	55	62
4,4'-ISOPROPYLIDENEDIPHENOL	28		28
ACETALDEHYDE	161,012		161,012
ACETONITRILE	108	0	108
ACRYLAMIDE	427		427
ACRYLIC ACID	7,932	813	8,745
ACRYLONITRILE	3,884	3,099	6,983
ALLYL ALCOHOL	8		8
ALLYL CHLORIDE	128		128
ALUMINUM (FUME OR DUST)	1,108,849	212,908	1,321,756
ALUMINUM OXIDE (FIBROUS FORMS)	10		10
AMMONIA	1,036,520	40,073	1,076,593
ANTHRACENE	310	1	310
ANTIMONY	1	0	1
ANTIMONY COMPOUNDS	24,822	79,692	104,514
ARSENIC	5	4	9
ARSENIC COMPOUNDS	591,287	18,782	610,069

BARIUM	1,094	255	1,349
BARIUM COMPOUNDS	4,920,766	201,393	5,122,159
BENZENE	64,159	47	64,206
BENZO(G,H,I)PERYLENE	34,652	802	35,455
BENZOYL PEROXIDE	5	10,000	10,005
BERYLLIUM COMPOUNDS	60,184	0	60,184
BIPHENYL	425	211	636
BUTYL ACRYLATE	14,262	22	14,284
CADMIUM	1	0	1
CARBON DISULFIDE	4,679		4,679
CARBON TETRACHLORIDE	2,702		2,702
CARBONYL SULFIDE	954,063		954,063
CATECHOL	86		86
CERTAIN GLYCOL ETHERS	521,340	3,767	525,107
CHLORINE	31,434		31,434
CHLORINE DIOXIDE	22,092		22,092
CHLOROBENZENE	622	3	625
CHLORODIFLUOROMETHANE	895,309		895,309
CHLOROETHANE	0		0
CHLOROFORM	1,420	7,791	9,211
CHLOROMETHANE	39,508		39,508
CHLOROPRENE	23		23
CHLOROTHALONIL	3	583	586
CHROMIUM	5,614	30,332	35,946
CHROMIUM COMPOUNDS(EXCEPT CHROMITE ORE MINED IN THE TRANSVAAL REGION)	1,077,416	2,508,916	3,586,332
COBALT	8	1,976	1,984
COBALT COMPOUNDS	114,068	5,425	119,494
COPPER	273,937	266,120	540,057
COPPER COMPOUNDS	837,019	466,318	1,303,337
CREOSOTE	7,213		7,213
CRESOL (MIXED ISOMERS)	21,734		21,734
CUMENE	9,006	218	9,224
CUMENE HYDROPEROXIDE	67		67
CYANIDE COMPOUNDS	450	20,789	21,239
CYCLOHEXANE	336,003	1,009	337,012
DAZOMET			
DECABROMODIPHENYL OXIDE			
DIBUTYL PHTHALATE	34,337		34,337
DICHLOROFUOROMETHANE	260		260

DICHLOROMETHANE	112,831		112,831
DICHLOROTETRAFLUOROETHANE (CFC-114)	56,705		56,705
DICYCLOPENTADIENE	5,969		5,969
DIETHANOLAMINE	0		0
DIETHYL SULFATE	4,503		4,503
DIISOCYANATES	7,594	48,026	55,620
DIMETHYL SULFATE	10		10
DIMETHYLAMINE			
DINITROTOLUENE (MIXED ISOMERS)	93,632		93,632
DIOXIN AND DIOXIN-LIKE COMPOUNDS	**	**	**
ETHYL ACRYLATE	12,770	1,117	13,887
ETHYLBENZENE	36,253	3,223	39,476
ETHYLENE	197,839	0	197,839
ETHYLENE GLYCOL	37,673	4,175	41,848
ETHYLENE OXIDE	2,955		2,955
ETHYLENEBISDITHIOCARBAMIC ACID, SALTS AND ESTERS			
ETHYLIDENE DICHLORIDE	56		56
FLUORINE			
FORMALDEHYDE	55,723	3,145	58,868
FORMIC ACID	6,200		6,200
HEXACHLOROBENZENE	910	98	1,008
HYDROCHLORIC ACID (1995 AND AFTER "ACID AEROSOLS" ONLY)	5,985,067		5,985,067
HYDROGEN FLUORIDE	1,346,796	602	1,347,398
HYDROGEN SULFIDE	255,101		255,101
ISOPRENE	1		1
LEAD	42,622	4,661	47,283
LEAD COMPOUNDS	1,027,370	176,175	1,203,545
LITHIUM CARBONATE	0	4,980	4,980
M-XYLENE	8,094		8,094
MALEIC ANHYDRIDE	3,017		3,017
MANGANESE	34,759	96,066	130,825
MANGANESE COMPOUNDS	2,232,354	1,072,888	3,305,241
MERCURY	631	87	718
MERCURY COMPOUNDS	5,647	478	6,125
METHANOL	3,777,868	2,382	3,780,250
METHYL ACRYLATE	1,436	0	1,437
METHYL IODIDE	10		10
METHYL ISOBUTYL KETONE	104,576	2,038	106,614
METHYL METHACRYLATE	69,630	4,689	74,319

METHYL TERT-BUTYL ETHER	17		17
MOLYBDENUM TRIOXIDE	1,314	1,178	2,492
N,N-DIMETHYLFORMAMIDE	246		246
N-BUTYL ALCOHOL	420,743	209	420,952
N-HEXANE	528,694	173	528,867
N-METHYL-2-PYRROLIDONE	11,132		11,132
N-METHYLOLACRYLAMIDE	2,679		2,679
NAPHTHALENE	50,453	128	50,581
NICKEL	5,935	69,852	75,787
NICKEL COMPOUNDS	986,130	463,047	1,449,178
NICOTINE AND SALTS	2,269	55,630	57,899
NITRATE COMPOUNDS	5,305,617	41,104	5,346,721
NITRIC ACID	113,530	750	114,280
NITROBENZENE			
NITROGLYCERIN	118,370		118,370
O-CRESOL	210		210
PERACETIC ACID	0		0
PHENANTHRENE	8,011	1	8,011
PHENOL	76,461	129,437	205,898
PHOSPHORUS (YELLOW OR WHITE)	5		5
PHTHALIC ANHYDRIDE	498	4,173	4,671
POLYCHLORINATED BIPHENYLS			
POLYCYCLIC AROMATIC COMPOUNDS	314,375	9,566	323,941
PROPYLENE	48,493	0	48,493
PROPYLENE OXIDE	2,494		2,494
SEC-BUTYL ALCOHOL	33,176		33,176
SELENIUM COMPOUNDS	35,592	0	35,592
SILVER COMPOUNDS	61	5	66
SODIUM NITRITE	27,291	51,480	78,771
STYRENE	475,082	148,481	623,563
SULFURIC ACID (1994 AND AFTER "ACID AEROSOLS" ONLY)	18,873,425		18,873,425
TERT-BUTYL ALCOHOL	586		586
TETRACHLOROETHYLENE	4,726	2,084	6,810
THALLIUM COMPOUNDS	177,424	0	177,424
TITANIUM TETRACHLORIDE	7		7
TOLUENE	1,604,095	24,286	1,628,381
TOLUENE DIISOCYANATE (MIXED ISOMERS)	2,929		2,929
TOLUENE-2,4-DIISOCYANATE	2		2
TRICHLOROETHYLENE	28,351		28,351
TRIETHYLAMINE	579		579

VANADIUM (EXCEPT WHEN CONTAINED IN AN ALLOY)			
VANADIUM COMPOUNDS	2,013,000	9,082	2,022,082
VINYL ACETATE	145,506		145,506
VINYL CHLORIDE	50,061		50,061
VINYL FLUORIDE	9,974		9,974
VINYLDENE CHLORIDE	5,730	29	5,759
XYLENE (MIXED ISOMERS)	243,791	12,441	256,232
ZINC (FUME OR DUST)	13,103	6,407	19,510
ZINC COMPOUNDS	2,677,671	1,944,697	4,622,367
Total	63,811,627	8,282,154	72,093,781

Appendix B
5-Year Trends for Top 10 Chemicals from 2013

Air

	2009	2010	2011	2012	2013
SULFURIC ACID	24,401,578	26,887,953	20,613,304	18,630,673	18,873,425
HYDROCHLORIC ACID	12,102,016	13,669,849	10,468,017	6,179,743	5,984,777
NITRATE	921	591	959	1,124	990
BARIUM	52,442	65,657	58,760	28,294	26,230
ZINC	87,442	74,977	57,507	58,004	59,957
METHANOL	3,441,837	4,484,542	4,353,751	4,389,227	3,562,546
CHROMIUM	18,651	19,157	20,038	22,396	27,575
MANGANESE	75,745	29,968	28,601	26,294	27,544
VANADIUM	53,937	16,394	33,267	37,058	60,211
TOLUENE	1,987,557	2,308,671	2,212,281	1,724,867	1,604,048

Land Disposal

	2009	2010	2011	2012	2013
SULFURIC ACID	0	0	0	0	0
HYDROCHLORIC ACID	0	0	0	0	290
NITRATE	384,217	509,098	192,959	295,638	273,363
BARIUM	4,705,284	5,568,187	5,749,707	4,829,852	4,821,313
ZINC	839,031	784,528	926,728	786,077	1,100,915
METHANOL	5	37	171	538	778
CHROMIUM	833,129	984,713	1,089,893	995,045	1,042,518
MANGANESE	1,726,474	2,039,944	2,118,021	2,010,047	2,072,201
VANADIUM	1,763,227	2,155,033	2,107,036	1,833,975	1,931,775
TOLUENE	0	227	189	1,832	33

Surface Water

	2009	2010	2011	2012	2013
SULFURIC ACID	0	0	0	0	0
HYDROCHLORIC ACID	0	0	0	0	0
NITRATE	4,581,323	5,385,770	5,419,765	6,461,103	5,031,265
BARIUM	63,791	65,152	63,301	62,086	65,285
ZINC	25,747	29,682	22,174	33,978	32,584
METHANOL	60,638	712,924	491,946	562,760	214,545
CHROMIUM	6,844	6,987	7,001	7,126	7,323
MANGANESE	125,745	124,245	89,586	124,372	132,608
VANADIUM	23,175	23,700	22,218	24,618	21,014
TOLUENE	14	29	52	2,244	14

Appendix C
Top 10 Facility Increases and Decreases by Pounds and Percentage

Top 10 Increases by Pounds from 2012 to 2013					
Facility	Onsite	Facility	Offsite	Facility	Total
Spurlock Power Station. (Mason)	693,086	Gallatin Steel Co. (Gallatin)	316,257	Spurlock Power Station. (Mason)	693,086
Big Rivers Electric Corp Reid/Green/HMP&L Station II. (Henderson)	617,466	Clariant Corp 12th Street Facility. (Jefferson)	204,838	Big Rivers Electric Corp Reid/Green/HMP&L Station II. (Henderson)	617,466
Century Aluminum Sebree LLC. (Henderson)	607,799	Owensboro Municipal Utilities Elmer Smith Station. (Davies)	157,892	Century Aluminum Sebree LLC. (Henderson)	607,799
Kentucky Utilities Co Ghent Station. (Carroll)	460,022	Akebono Brake Corp - Glasgow. (Barren)	124,134	Kentucky Utilities Co Ghent Station. (Carroll)	460,023
Duke Energy Kentucky Inc - East Bend Generating Station. (Boone)	385,142	Vanderbilt Chemicals LLC - Murray Div. (Calloway)	94,456	Duke Energy Kentucky Inc - East Bend Generating Station. (Boone)	385,142
Kentucky Utilities Co - E W Brown Station. (Mercer)	344,251	Bowling Green Metalforming. (Warren)	76,570	Kentucky Utilities Co - E W Brown Station. (Mercer)	344,239
Ahlstrom Filtration LLC. (Hopkins)	278,019	Nemak Glasgow Plant #1. (Barren)	70,811	Gallatin Steel Co. (Gallatin)	317,561
Clariant Corp Crittenden Drive Facility. (Jefferson)	185,620	Big Rivers Electric Corp Coleman Station. (Hancock)	38,372	Ahlstrom Filtration LLC. (Hopkins)	278,019
Catlettsburg Refining LLC. (Boyd)	158,699	BASF Corp. (Jefferson)	31,932	Clariant Corp 12th Street Facility. (Jefferson)	245,319
Big Rivers Electric Corp Coleman Station. (Hancock)	132,156	Monument Chemical Kentucky LLC. (Meade)	31,162	Clariant Corp Crittenden Drive Facility. (Jefferson)	214,178

Top 10 Decreases By Pounds From 2012 To 2013					
Facility	Onsite	Facility	Offsite	Facility	Total
US TVA Paradise Fossil Plant. (Muhlenberg)	-1,501,014	Gerdau Ameristeel Us Inc. (Marshall)	-1,354,088	US TVA Paradise Fossil Plant. (Muhlenberg)	-1,501,048
Wickliffe Paper Co. (Ballard)	-1,254,723	North American Stainless. (Carroll)	-802,709	Gerdau Ameristeel Us Inc. (Marshall)	-1,354,089
Aleris Recycling Inc. (Butler)	-1,165,555	Safety-Kleen Systems Inc. (Henry)	-337,052	Wickliffe Paper Co. (Ballard)	-1,254,723
Perdue Cromwell Processing Plant. (Ohio)	-931,343	Kentucky Electric Steel. (Boyd)	-184,190	Aleris Recycling Inc. (Butler)	-1,161,034
Alcan Primary Products Corp Sebree Works. (Henderson)	-565,947	Sud-Chemie Inc 12th Street Facility. (Jefferson)	-161,663	North American Stainless. (Carroll)	-1,158,643
Cooper Power Station. (Pulaski)	-423,421	Guardian Automotive-Morehead Plant. (Rowan)	-133,334	Perdue Cromwell Processing Plant. (Ohio)	-931,343
North American Stainless. (Carroll)	-355,934	Sun Chemical. (Greenup)	-126,250	Alcan Primary Products Corp Sebree Works. (Henderson)	-565,947
Louisville Gas & Electric Co - Trimble County Station. (Trimble)	-217,993	Novelis Corp. (Madison)	-91,902	Cooper Power Station. (Pulaski)	-423,421
Louisville Gas & Electric Co - Mill Creek Station. (Jefferson)	-177,921	RT Vanderbilt Co Inc - Murray Div. (Calloway)	-57,095	Safety-Kleen Systems Inc. (Henry)	-349,133
Domtar Paper Co LLC Hawesville Mill. (Hancock)	-136,134	Republic Conduit Manufacturing. (Jefferson)	-50,109	Sud-Chemie Inc 12th Street Facility. (Jefferson)	-226,395

Top 10 Increases By Percent From 2012 To 2013					
Facility	Onsite	Facility	Offsite	Facility	Total
Continental Refining Co LLC. (Pulaski)	31700.0%	Avantor Performance Materials. (Bourbon)	1118200%	Phoenix Fabricators & Erectors Inc. (Webster)	201,000%
American Howa Kentucky Inc. (Warren)	4900.0%	Emhart Teknologies. (Christian)	32550%	Continental Refining Co LLC. (Pulaski)	48,600%
Carbide Industries LLC. (Jefferson)	4100.0%	Dana Commercial Vehicle Manufacturing LLC. (Henderson)	16356%	Emhart Teknologies. (Christian)	21,746%
Osram Sylvania. (Woodford)	740.0%	BASF Corp. (Jefferson)	4398%	Dana Commercial Vehicle Manufacturing LLC. (Henderson)	15,388%
Trace Die Cast Inc. (Warren)	562.6%	Nuplex Resins LLC. (Jefferson)	2629%	American Howa Kentucky Inc. (Warren)	4900%
Hausner Hard-Chrome Of Kentucky. (Daviess)	506.0%	PMC Organometallic Inc. (Carroll)	2400%	Carbide Industries LLC. (Jefferson)	4100%
Safety-Kleen Systems. (Fayette)	300.0%	US DOE Paducah Site. (McCracken)	1100%	NASF Corp. (Jefferson)	2149%
Griffin Industries LLC. (Pendleton)	266.5%	Sumitomo Electric Wiring Systems Inc. (Allen)	1000%	Sumitomo Electric Wiring Systems Inc. (Allen)	1000%
YKK (USA) Inc Snap & Button Products. (Anderson)	213.3%	Owensboro Specialty Polymers Inc. (Daviess)	620%	US DOE Paducah Site. (McCracken)	678%
T.Rad NA Inc. (Christian)	199.4%	Pilgrims Pride Corp Mayfield KY Facility.(Graves)	587%	Arvin Sango Inc. (Henry)	654%

Top 10 Decreases By Percent From 2012 To 2013					
Facility	Onsite	Facility	Offsite	Facility	Total
Alcan Primary Products Corp Sebree Works. (Henderson)	-100%	Sud-Chemie Inc 12th Street Facility. (Jefferson)	-100%	Alcan Primary Products Corp Sebree Works. (Henderson)	-100%
Sud-Chemie Inc Crittenden Drive Facility. (Jefferson)	-100%	Sun Chemical. (Greenup)	-100%	Sud-Chemie Inc 12th Street Facility. (Jefferson)	-100%
CTA Acoustics Inc. (Knox)	-100%	RT Vanderbilt Co Inc - Murray Div. (Calloway)	-100%	Sud-Chemie Inc Crittenden Drive Facility. (Jefferson)	-100%
Sud-Chemie Inc 12th Street Facility. (Jefferson)	-100%	Sud-Chemie Inc Crittenden Drive Facility. (Jefferson)	-100%	Sun Chemical. (Greenup)	-100%
Arch Chemicals Inc. (Meade)	-100%	Amfine Chemical Corp. (Christian)	-100%	CTA Acoustics Inc. (Knox)	-100%
Solae LLC dba Dupont Soy Polymers. (Jefferson)	-100%	PPG Architectural Finishes Inc. (Jefferson)	-100%	RT Vanderbilt Co Inc - Murray Div. (Calloway)	-100%
Eagle Industries LLC. (Warren)	-100%	Nexeo Solutions LLC - Louisville. (Jefferson)	-100%	Arch Chemicals Inc. (Meade)	-100%
Kellogg Co. (Boone)	-100%	North American Galvanizing Co Louisville. (Jefferson)	-100%	Solae LLC dba Dupont Soy Polymers. (Jefferson)	-100%
Square D Co. (Fayette)	-100%	Ticona Polymer. (Boone)	-100%	Eagle Industries LLC. (Warren)	-100%
ICG Hazard LLC Flint Ridge Washer. (Breathitt)	-100%	JL French Glasgow Plant #1. (Barren)	-100%	Kellogg Co. (Boone)	-100%

Top 10 Decreases By Percent (For Facilities With Reported Releases In Both Years)					
Facility	Onsite	Facility	Offsite	Facility	Total
Akebono - Elizabethtown Plant. (Hardin)	-98.0%	Dana Commercial Vehicle Products LLC. (Barren)	-99.8%	Dana Commercial Vehicle Products LLC. (Barren)	-99.7%
GE Lexington Lamp Plant. (Fayette)	-98.0%	Felker Brothers. (Barren)	-99.3%	Katayama American Co Inc. (Shelby)	-99.6%
Daicel Safety Systems. (Ohio)	-96.2%	Katayama American Co Inc. (Shelby)	-98.7%	Firestone Industrial Products. (Whitley)	-95.4%
Akebono Brake Corp - Glasgow. (Barren)	-96.0%	Guardian Automotive-Morehead Plant. (Rowan)	-98.5%	Joy Global. (Bourbon)	-91.3%
Gibbs Die Casting Corp. (Henderson)	-94.9%	Firestone Industrial Products. (Whitley)	-98.5%	Chevron Louisville Terminal/Lubricants Blend Plant. (Jefferson)	-90.0%
Joy Global. (Bourbon)	-91.3%	Forth Technologies Inc. (Jefferson)	-98.2%	Safety-Kleen Systems Inc. (Henry)	-89.8%
Kentucky Electric Steel. (Boyd)	-90.0%	Marathon Petroleum Co - Covington KY Terminal. (Kenton)	-96.5%	Amfine Chemical Corp. (Christian)	-89.3%
Caldwell Tanks Inc. (Jefferson)	-89.2%	US TVA Shawnee Fossil Plant. (McCracken)	-94.3%	Hunter Manufacturing LLP. (Fayette)	-84.8%
Republic Conduit Manufacturing. (Jefferson)	-86.6%	Safety-Kleen Systems Inc. 3700 Lagrange Rd, Smithfield Kentucky 40068 (Henry)	-90.0%	Libertas Copper LLC. (Henry)	-83.1%
Ensign-Bickford Aerospace & Defense Co. (Muhlenberg)	-84.7%	Chevron Louisville Terminal/Lubricants Blend Plant. (Jefferson)	-90.0%	Gerdau Ameristeel US Inc. (Marshall)	-82.8%

Appendix D. Air and Total Releases from the Electric Utilities Sector

2010

Rank	State	Air Emissions	Total On- and Off-site Disposal or Other Releases
1	Kentucky	40,642,049	58,939,036
2	Ohio	36,521,078	56,250,294
3	Pennsylvania	31,520,487	47,115,341
4	Indiana	26,540,627	47,614,328
5	West Virginia	18,118,582	30,816,676
6	Florida	16,711,674	25,221,362
7	Michigan	15,579,860	32,557,682
8	North Carolina	14,699,212	26,311,978
9	Georgia	13,547,104	29,076,847
10	Tennessee	9,897,919	24,178,138
11	Virginia	9,496,989	12,805,901
12	South Carolina	9,440,208	12,156,930
13	Texas	8,506,277	39,268,142
14	Alabama	8,373,651	25,074,635
15	Missouri	5,114,784	17,059,145
16	Illinois	4,746,755	24,903,531
17	Mississippi	3,995,991	8,278,454
18	Puerto Rico	3,678,002	3,747,507
19	Wisconsin	3,576,761	10,007,255
20	Maryland	3,154,296	6,432,939
21	Delaware	2,945,885	3,131,785
22	New Hampshire	2,845,904	2,991,899
23	Iowa	2,368,897	11,103,517
24	Nebraska	2,154,986	10,186,351
25	New York	2,030,475	4,793,285
26	New Jersey	1,716,079	1,797,992
27	Louisiana	1,533,231	10,294,187
28	Massachusetts	1,422,596	1,497,729
29	Hawaii	1,307,716	1,434,730
30	Kansas	1,279,174	9,857,841
31	Minnesota	1,266,121	11,609,985
32	Arkansas	1,078,438	8,113,721
33	Oklahoma	1,076,050	3,300,121

34	North Dakota	992,678	16,686,624
35	Utah	937,115	6,834,385
36	Colorado	905,373	8,168,090
37	Arizona	850,646	10,391,425
38	Montana	613,462	14,809,660
39	Wyoming	565,403	12,597,287
40	New Mexico	327,286	7,264,646
41	Nevada	247,231	1,859,917
42	California	210,928	462,405
43	Connecticut	209,044	440,298
44	South Dakota	113,164	834,041
45	Oregon	112,835	524,849
46	Guam	100,253	100,253
47	Washington	93,041	3,541,069
48	Virgin Islands	30,261	30,261
49	Rhode Island	24,988	24,988
50	Alaska	17,508	548,555
51	District Of Columbia	53	2,623
52	Maine	5	7
	TOTAL	313,239,133	703,050,647

2011

Rank	State	Air Emissions	Change from 2010	Total On- and Off-site Disposal or Other Releases
1	Kentucky	31,008,237	-9,633,812	49,405,915
2	Ohio	30,366,900	-6,154,178	47,821,465
3	Indiana	23,164,181	-8,356,306	42,830,375
4	Pennsylvania	21,359,036	-5,181,591	36,210,825
5	Michigan	17,406,693	-711,889	32,928,460
6	West Virginia	14,609,499	-2,102,175	28,142,456
7	Florida	13,159,886	-2,419,974	19,240,009
8	Georgia	11,340,526	-3,358,686	23,528,455
9	Tennessee	10,688,693	-2,858,411	22,690,431
10	North Carolina	9,271,514	-626,405	20,251,318
11	Alabama	7,988,013	-1,508,976	22,781,077
12	South Carolina	6,949,547	-2,490,661	9,340,657
13	Virginia	6,721,820	-1,784,457	9,103,617

14	Texas	5,711,761	-2,661,890	39,358,098
15	Mississippi	5,563,926	449,142	8,394,177
16	Illinois	4,973,625	226,870	24,542,045
17	Missouri	4,462,408	466,417	16,708,373
18	Puerto Rico	3,420,388	-257,614	3,473,430
19	Maryland	3,150,930	-425,831	5,651,232
20	Wisconsin	2,769,863	-384,433	7,308,539
21	Iowa	2,106,487	-839,398	9,375,450
22	Nebraska	1,768,252	-1,077,652	9,379,566
23	Delaware	1,767,327	-601,570	2,024,714
24	New Hampshire	1,741,528	-413,458	1,805,579
25	Louisiana	1,693,588	-336,887	7,879,491
26	Wyoming	1,421,069	-295,010	9,749,232
27	Hawaii	1,351,593	-181,638	1,551,712
28	New York	1,316,190	-106,406	2,856,166
29	Kansas	1,160,927	-146,789	9,916,429
30	Oklahoma	1,138,209	-140,965	3,967,119
31	Arkansas	1,097,168	-168,953	8,192,448
32	North Dakota	1,036,969	-41,469	17,625,061
33	Utah	905,144	-170,906	6,885,587
34	Colorado	827,842	-164,836	7,694,473
35	Massachusetts	760,890	-176,225	849,847
36	Arizona	760,548	-144,825	11,070,738
37	Minnesota	673,574	-177,072	10,874,619
38	Montana	509,858	-103,604	12,109,464
39	California	362,537	-202,866	475,473
40	New Mexico	341,997	14,711	7,674,960
41	New Jersey	339,605	92,374	418,072
42	Nevada	256,584	45,656	1,147,283
43	Oregon	130,237	-78,807	406,147
44	South Dakota	91,714	-21,450	658,530
45	Guam	69,078	-43,757	69,078
46	Washington	45,020	-55,233	1,686,451
47	Virgin Islands	25,478	-67,563	25,478
48	Alaska	5,813	-24,448	504,890
49	Rhode Island	4,307	-20,681	4,307
50	Connecticut	1,405	-16,103	1,449
51	District Of Columbia	221	168	224
52	Maine	4	-1	4
	TOTAL	257,798,610	-55,440,523	616,590,993

2012

Rank	State	Air Emissions (Pounds)	Change from 2011	Change from 2010	Total On- and Off-site Disposal or Other Releases
1	Kentucky	24,517,354	-20.9%	-39.7%	40,654,408
2	Ohio	21,174,351	-30.3%	-42.0%	34,615,109
3	Indiana	17,583,643	-24.1%	-33.7%	34,940,680
4	Pennsylvania	16,139,816	-24.4%	-48.8%	32,064,638
5	West Virginia	13,025,933	-10.8%	-28.1%	25,736,857
6	Michigan	12,903,861	-25.9%	-17.2%	26,450,220
7	Florida	9,797,423	-25.6%	-41.4%	13,616,506
8	Georgia	8,614,084	-24.0%	-36.4%	17,253,373
9	Alabama	6,130,047	-23.3%	-26.8%	19,181,157
10	North Carolina	6,086,092	-34.4%	-58.6%	15,532,044
11	Tennessee	5,510,022	-48.4%	-44.3%	13,707,935
12	Illinois	5,305,017	6.7%	11.8%	36,325,224
13	Texas	4,989,485	-12.6%	-41.3%	33,530,508
14	Mississippi	4,675,317	-16.0%	17.0%	7,690,182
15	South Carolina	4,464,786	-35.8%	-52.7%	6,025,619
16	Virginia	3,781,565	-43.7%	-60.2%	5,922,349
17	Puerto Rico	3,146,005	-8.0%	-14.5%	3,231,836
18	Missouri	2,937,813	-34.2%	-42.6%	12,065,368
19	Maryland	2,121,937	-32.7%	-32.7%	3,191,659
20	Wisconsin	1,802,585	-34.9%	-49.6%	5,091,285
21	Iowa	1,650,865	-21.6%	-30.3%	7,502,916
22	Nebraska	1,636,427	-7.5%	-24.1%	7,445,641
23	Louisiana	1,555,178	-8.2%	1.4%	7,634,393
24	Hawaii	1,403,413	3.8%	7.3%	1,598,259
25	Arkansas	1,186,622	8.2%	10.0%	7,791,041
26	North Dakota	1,042,109	0.5%	5.0%	19,919,560
27	Oklahoma	1,004,614	-11.7%	-6.6%	3,104,088
28	Wyoming	1,003,705	-29.4%	77.5%	10,159,003
29	Utah	965,912	6.7%	3.1%	6,483,610
30	Kansas	880,454	-24.2%	-31.2%	6,415,937
31	Minnesota	699,093	3.8%	-44.8%	12,864,352
32	Colorado	692,605	-16.3%	-23.5%	8,046,108

33	New York	642,431	-51.2%	-68.4%	1,253,631
34	Arizona	512,901	-32.6%	-39.7%	9,343,388
35	Montana	481,472	-5.6%	-21.5%	10,564,918
36	Massachusetts	419,519	-44.9%	-70.5%	431,174
37	New Jersey	389,742	14.8%	-77.3%	444,528
38	Guam	335,264	385.3%	234.4%	335,265
39	New Mexico	322,081	-5.8%	-1.6%	6,803,062
40	New Hampshire	306,304	-82.4%	-89.2%	328,623
41	Delaware	292,557	-83.4%	-90.1%	549,556
42	Nevada	212,839	-17.0%	-13.9%	658,455
43	Oregon	106,447	-18.3%	-5.7%	484,928
44	South Dakota	104,445	13.9%	-7.7%	890,145
45	California	81,262	-77.6%	-61.5%	113,402
46	Northern Mariana Islands	75,910	2012 Only	2012 Only	76,163
47	Washington	43,344	-3.7%	-53.4%	824,182
48	Connecticut	14,073	901.6%	-93.3%	14,138
49	Alaska	8,146	40.1%	-53.5%	368,109
50	Rhode Island	1,344	-68.8%	-94.6%	1,344
51	Virgin Islands	1,062	-95.8%	-96.5%	1062
52	District Of Columbia	0	-100.0%	-100.0%	6
53	Maine	0	-100.0%	-100.0%	0
	TOTAL	192,779,273	-25.2%	-38.5%	519,277,944

2013

Rank	State	Air Emissions (Pounds)	Change from 2012	Change from 2011	Change from 2010	Total On- and Off-site Disposal or Other Releases
1	Kentucky	24,540,942	0.1%	-20.9%	-39.6%	41,259,260
2	Indiana	23,886,319	35.8%	3.1%	-10.0%	41,340,349
3	Ohio	21,009,235	-0.8%	-30.8%	-42.5%	35,511,421
4	Pennsylvania	16,439,669	1.9%	-23.0%	-47.8%	33,586,456
5	West Virginia	12,474,527	-4.2%	-14.6%	-31.2%	25695895
6	Michigan	10,710,730	-17.0%	-38.5%	-31.3%	25,533,756
7	Florida	10,401,140	6.2%	-21.0%	-37.8%	15,726,154
8	Georgia	10,010,735	16.2%	-11.7%	-26.1%	17,553,962
9	Mississippi	8,429,221	80.3%	51.5%	110.9%	11,479,137
10	Alabama	6,087,893	-0.7%	-23.8%	-27.3%	17,900,522

11	Texas	5,323,016	6.7%	-6.8%	-37.4%	36,233,865
12	Tennessee	5,176,381	-6.1%	-51.6%	-47.7%	13,842,347
13	Illinois	5,008,457	-5.6%	0.7%	5.5%	45,293,313
14	Virginia	4,669,994	23.5%	-30.5%	-50.8%	8,070,310
15	North Carolina	4,082,430	-32.9%	-56.0%	-72.2%	10,971,526
16	Missouri	3,035,732	3.3%	-32.0%	-40.6%	14,708,875
17	South Carolina	3,017,311	-32.4%	-56.6%	-68.0%	4,072,664
18	Puerto Rico	2,648,761	-15.8%	-22.6%	-28.0%	2,732,641
19	Maryland	2,207,074	4.0%	-30.0%	-30.0%	3,572,366
20	Nebraska	1,806,411	10.4%	2.2%	-16.2%	8,319,986
21	Iowa	1,613,437	-2.3%	-23.4%	-31.9%	7,267,112
22	Wisconsin	1,594,116	-11.6%	-42.4%	-55.4%	7,475,687
23	Louisiana	1,589,497	2.2%	-6.1%	3.7%	6,725,823
24	Hawaii	1,264,684	-9.9%	-6.4%	-3.3%	1,877,453
25	Arkansas	1,220,477	2.9%	11.2%	13.2%	7,977,119
26	Oklahoma	944,940	-5.9%	-17.0%	-12.2%	3,470,032
27	North Dakota	923,499	-11.4%	-10.9%	-7.0%	18,313,456
28	Utah	847,547	-12.3%	-6.4%	-9.6%	7,394,528
29	Kansas	801,618	-9.0%	-31.0%	-37.3%	7,032,043
30	Wyoming	707,511	-29.5%	-50.2%	25.1%	9,691,734
31	New York	674,505	5.0%	-48.8%	-66.8%	1,605,972
32	Colorado	627,435	-9.4%	-24.2%	-30.7%	7,185,674
33	Arizona	580,153	13.1%	-23.7%	-31.8%	10,585,928
34	Minnesota	561,720	-19.7%	-16.6%	-55.6%	12,718,385
35	Montana	536,116	11.3%	5.2%	-12.6%	11,904,665
36	New Jersey	427,072	9.6%	25.8%	-75.1%	471,252
37	New Hampshire	385,180	25.8%	-77.9%	-86.5%	417,215
38	Nevada	336,342	58.0%	31.1%	36.0%	848,618
39	New Mexico	328,361	1.9%	-4.0%	0.3%	6,754,922
40	Guam	313,711	-6.4%	354.1%	212.9%	314,130
41	Massachusetts	150,845	-64.0%	-80.2%	-89.4%	214,840
42	Delaware	142,730	-51.2%	-91.9%	-95.2%	280,115
43	Oregon	117,545	10.4%	-9.7%	4.2%	693,059
44	South Dakota	104,502	0.1%	13.9%	-7.7%	905,517
45	California	99,053	21.9%	-72.7%	-53.0%	107,304
46	Washington	52,471	21.1%	16.6%	-43.6%	1,133,157
47	Northern Mariana Islands	12,326	-83.8%	No 2011 Data	No 2010 Data	12,440
48	Connecticut	11,566	-17.8%	723.2%	-94.5%	11,693
49	Rhode Island	4,662	246.9%	8.2%	-81.3%	4,662
50	Alaska	2,232	-72.6%	-61.6%	-87.3%	299,767

51	Virgin Islands	931	-12.3%	-96.3%	-96.9%	931
52	Maine	1	No 2012 Data	-75.0%	-80.0%	1
53	District Of Columbia	0	No 2012 Data	-100.0%	-100.0%	765,130
	TOTAL	197,942,764	2.7%	-23.2%	-36.8%	547,865,172

Appendix E. Pollution Prevention Activities Reported to TRI

FACILITY NAME	CHEMICAL	POLLUTION PREVENTION INFORMATION (ACTIVITY CODES/TEXT)
3M CO - CYNTHIANA	Cyclohexane; Toluene	W73: Substituted coating materials used
AHLSTROM FILTRATION LLC	Formaldehyde; Phenol; Methanol	<p>W49: Other raw material modifications - Over the last couple of years, we have added more urea to our chemistry. Urea is a benign filler that in our case adds the benefit of scavenging free formaldehyde, thus reducing the amount of formaldehyde air emissions. Over the last couple of years, we have added more urea to our chemistry. Urea is a benign filler that in our case adds the benefit of scavenging free formaldehyde, thus reducing the amount of formaldehyde air emissions. We have a corporate edict in place to remove formaldehyde from our resin chemistry, but our customers aren't entirely supportive because the current alternatives offer equal to or less performance and with higher costs. Nonetheless, we are keeping at the efforts to eventually go in that direction.</p> <p>W14: Changed production schedule to minimize equipment and feedstock changeovers. W13: Improved maintenance scheduling, recordkeeping, or procedures to limit how much methanol and resins we have to "make up", we collect any unused resin to later use back when on the particular production grade.</p>
AICHI FORGE USA INC	Lead	The customer changed from leaded to non-leaded steel for their products
AMERICAN SYNTHETIC RUBBER CO	Toluene; Hydrochloric Acid (1995 And After "Acid Aerosols" Only); Sulfuric Acid (1994 And After "Acid Aerosols" Only); Hydrogen Fluoride; Lead Compounds; Mercury; Ammonia Compounds; Acrylonitrile; Acrylic Acid; 1,3-Butadiene;	<p>W42: Substituted raw materials; W58: Other process modifications; W13: Improved maintenance scheduling, recordkeeping, or procedures; W14: Changed production schedule to minimize equipment and feedstock changeovers W32: Improved procedures for loading, unloading, and transfer operations; W52: Modified equipment, layout, or piping; W39: Other spill or leak prevention</p>

	Cyclohexane	
ARKEMA INC LOUISVILLE PLANT	Ethyl Acrylate; Methyl Methacrylate	W39: Other spill or leak prevention - End of line spring loaded valves W52: Modified equipment, layout, or piping - TVM project End of line spring loaded valves TVM project
BANDO USA INC	Toluene	W13: Improved maintenance scheduling, recordkeeping, or procedures
BASF CORP	Manganese Compounds; 3-Iodo-2-Propynyl Butylcarbamate; Nitrate Compounds; Vanadium Compounds; Copper Compounds; Sodium Nitrite	W89: Other product modifications
BELDEN WIRE & CABLE	Antimony Compounds; Zinc Compounds; Copper	W19: Other changes in operating practices - n/a Method(s) to Identify P2 Activities: T04 [Participative Team Management] - n/a Inventory reduction following lean manufacturing principles are used at the facility.
BENEKE WIRE CO	Nitrate Compounds	W51: Instituted recirculation within a process - circulation added to prevent disposal and adding of nitrate salt resulting in less usage. Method(s) to Identify P2 Activities: T03 [Materials Balance Audits] - using less product therefore less waste. Circulation added to prevent disposal and adding of nitrate salt resulting in less usage. Using less product therefore less waste.
BOWLING GREEN METALFORMING	Chromium; Lead; Manganese; Zinc Compounds; Copper	W36: Implemented inspection or monitoring program of potential spill or leak sources W74: Improved application techniques
BRAKE PARTS INC	Copper; Antimony Compounds; Zinc Compounds	W42: Substituted raw materials - Used less Copper in formulation Used less Copper in formulation; W42: Substituted raw materials - Formulation Changes Formulation Changes; W29: Other changes in inventory control - Less inventory on hand Less inventory on hand
BYK ADDITIVES INC	Certain Glycol Ethers	W14: Changed production schedule to minimize equipment and feedstock changeovers
CELANESE ENGINEERED MATERIALS	Antimony Compounds; Aluminum (Fume Or Dust);	W14: Changed production schedule to minimize equipment and feedstock changeovers

	Zinc Compounds; Lead Compounds; Cobalt Compounds	
CLARIANT CORP 12TH STREET FACILITY	Molybdenum Trioxide; Copper Compounds; Manganese Compounds; Nickel Compounds; Chromium Compounds(Except Chromite Ore Mined In The Transvaal Region); Zinc Compounds	W31: Improved storage or stacking procedures; W52: Modified equipment, layout, or piping; W58: Other process modifications;
CLARIANT CORP CRITTENDEN DRIVE FACILITY	Nitrate Compounds; Antimony Compounds; Nitric Acid; Zinc Compounds; Silver Compounds; Copper Compounds; Nickel Compounds	W39: Other spill or leak prevention; W52: Modified equipment, layout, or piping;
COLOR CORP OF AMERICA	Lead Compounds; Naphthalene; Ethylene Glycol; 1,2,4-Trimethylbenzene; Sec-Butyl Alcohol; Certain Glycol Ethers; Xylene (Mixed Isomers); Vanadium Compounds; Copper Compounds; Antimony Compounds; Manganese Compounds; Cobalt Compounds; Chromium Compounds(Except Chromite Ore Mined In The	W14: Changed production schedule to minimize equipment and feedstock changeovers. W52: Modified equipment, layout, or pipingW68: Improved rinse equipment operation

	Transvaal Region); Zinc Compounds	
COOPER STANDARD AUTOMOTIVE	Zinc Compounds	Continually searching for new recyclers for rubber scrap material, as it is not an easy material to recycle with traditional methods.
COVALENCE ADHESIVES	Zinc Compounds	W19: Other changes in operating practices W74: Improved application techniques Method(s) to Identify P2 Activities: T01 [Internal Pollution Prevention Opportunity Audit(S)] - Storm water audits; T04 [Participative Team Management] - Management participation with storm water audits Storm water audits Management participation with storm water audits
CREATION TECHNOLOGIES-LEXINGTON	Lead Compounds	We have switched a lot of our assemblies to a LEAD FREE Solder process and utilize a NO CLEAN Process.
DARAMIC LLC	Cyclohexane; N-Hexane	W36: Implemented inspection or monitoring program of potential spill or leak sources. The facility is always looking for opportunities to improve on solvent recovery and reduce solvent usage. There are projects in place in 2014 designed to improve in this area. W52: Modified equipment, layout, or piping. The facility is always looking for opportunities to improve on solvent recovery and reduce solvent usage. There are projects in place in 2014 designed to improve in this area.
DUPONT LOUISVILLE PLANT	Chromium Compounds(Except Chromite Ore Mined In The Transvaal Region); Vinyl Fluoride	W58: Other process modifications; W52: Modified equipment, layout, or piping
DUPONT WURLAND PLANT	Sulfuric Acid (1994 And After "Acid Aerosols" Only)	W39: Other spill or leak prevention. Updated the containment areas of the facility.
EBONITE INTERNATIONAL INC	Dichloromethane; Styrene	W42: Substituted raw materials; W14: Changed production schedule to minimize equipment and feedstock changeovers
ENERSYS DELAWARE INC	Lead Compounds; Antimony Compounds	W81: Changed product specifications

FEDERAL-MOGUL VSP	Zinc (Fume Or Dust); Lead; Copper	W19: Other changes in operating practices F-M is looking into reduced copper formulas for brake pads, which will reduce the amount of brass in some blocks, which will decrease the amount of brass used, thus reducing copper, lead, and zinc.; W19: Other changes in operating practices FM is committed to working on reduced copper formulas.
FELKER BROTHERS	Nitric Acid; Hydrogen Fluoride; Lead Compounds; Nitrate Compounds;	W52: Modified equipment, layout, or piping - Equipment upgrades. Felker Brothers Practices Employee Empowerment in all its Processes. Equipment upgrades; W49: Other raw material modifications. Felker Brothers Practices Employee Empowerment in all its Processes.; W42: Substituted raw materials Felker Brothers Practices Employee Empowerment in all its Processes.;
HAUSNER HARD-CHROME OF KENTUCKY	Lead Compounds; Chromium Compounds(Except Chromite Ore Mined In The Transvaal Region)	W13: Improved maintenance scheduling, recordkeeping, or proceduresW19: Other changes in operating practices
HENNESSY INDUSTRIES INC BADA DIV	Antimony; Lead	W58: Other process modifications. Bada emphasizes responsible environmental stewardship to all employees and contractors.
HITACHI AUTOMOTIVE SYSTEMS AMERICAS INC - HK	Lead	W42: Substituted raw materials - Moving toward Lead Free Solders graduallyW58: Other process modifications Method(s) to Identify P2 Activities: T01 [Internal Pollution Prevention Opportunity Audit(S)] - Gradual phase in of more efficient selective Solder machines that use less solder. Gradual phase in of more efficient selective Solder machines that use less solder. Hitachi recycles all waste Lead. Hitachi sends all Lead solder dross from wave and selective solder machines for recycling, and collects all scrap printed circuit boards for recycling. Although printed circuit boards have minimal Lead on them, they are still collected and sent out to assure no Lead ends up in the landfill. In coming years, Hitachi's production rates will steadily increase, however, most new business will become Lead free Solder products. The amount of Lead in Hitachi-HK products will gradually decrease. Moving toward Lead Free Solders gradually
HOLLEY PERFORMANCE PRODUCTS	Lead	W41: Increased purity or raw materialsW49: Other raw material modifications Method(s) to Identify P2 Activities: T04 [Participative Team Management] - Active review of all processes and operations Active review of all processes and operations Actively pursuing adjusting the batch schedule to minimize product

		changes and reduce waste from cleanouts and loss of chemical property.
HUNTER DOUGLAS	Zinc Compounds	W13: Improved maintenance scheduling, recordkeeping, or procedures
HUNTER MANUFACTURING LLP	Lead	W19: Other changes in operating practices W58: Other process modifications W81: Changed product specifications W89: Other product modifications. We have stopped using leaded inks to print our decals for glassware decoration. We now use only organic inks.
INGERSOLL RAND CAMPBELLSVILLE OPERATIONS	Copper	W13: Improved maintenance scheduling, recordkeeping, or procedures. Improvements in tube flaring machining reduced ELF, Early Life Failure, rate. This improvement in quality reduced the use of Copper even with a growth in sales.
INTERNATIONAL PAPER - HENDERSON MILL	Lead Compounds	W51: Instituted recirculation within a process - Installed a PETAX filtration system resulting in significant reduction in fresh water consumption and corresponding reduction in mill effluent to the POTW. Please see comments above, W52: Modified equipment, layout, or piping - Installed a new economizer for the boiler. Resulted in lower natural gas consumption thus lower stack emissions. W58: Other process modifications - Reduction in tertiary fine screen rejects flow. Results in less material to the landfill. Please see comments above. Method(s) to Identify P2 Activities: T04 [Participative Team Management] - Project was initiated and managed by the facility personnel. Installed a PETAX filtration system resulting in significant reduction in fresh water consumption and corresponding reduction in mill effluent to the POTW. Please see comments above, Project was initiated and managed by the facility personnel. Installed a new economizer for the boiler. Resulted in lower natural gas consumption thus lower stack emissions. Reduction in tertiary fine screen rejects flow. Results in less material to the landfill. Please see comments above. The facility manufactures 100% recycled containerboard that is used to produce corrugated packaging. The raw material used is recycled old corrugated containers (OCC), approximately 95% of which is post-consumer waste. There are numerous stages in the cleaning and screening process to remove contaminants. The contaminants that are removed along with some usable fiber in the waste stream (referred to as "rejects") ultimately go to a landfill. One of these rejects

		streams (tertiary fine screen rejects) is now generally operated at a lower flow rate, thus keeping more of the material in the system and sending less to the landfill. In addition to reducing the amount of waste to a landfill, this reduces costs by reduced waste hauling fees and increases yield of good fiber. Final product quality dictates how much of this waste stream can be kept within the system. This effort was initiated by facility personnel primarily for fiber yield improvement. In 2011, the facility implemented a PETAX filtration system designed to reduce water usage by 410,000 gallons per day. This has resulted in approximately 55% reduction in effluent discharged in 2013 from the amount discharged in 2010. A new boiler economizer was brought online in 2012 resulting in better heat efficiency and lower natural gas consumption.
ITW RAMSET RED HEAD	Nitrate Compounds	W13: Improved maintenance scheduling, recordkeeping, or procedures
JIM BEAM BRANDS CO	Hydrochloric Acid (1995 And After "Acid Aerosols" Only); Lead Compounds; Lead	W58: Other process modifications Jim Beam continuing to reduce coal usage at this location supplementing with natural gas as fuel
JLOK CORP	Styrene	W19: Other changes in operating practices. W21: Instituted procedures to ensure that materials do not stay in inventory beyond - Decrease amount of aged inventory that needed to be disposed of W52: Modified equipment, layout, or piping - Catalyst piping change to help increase run rate. W58: Other process modifications - Use of film from Czech Republic reduced seal issues Method(s) to Identify P2 Activities: T11 [Other] - Over all decreased waste on line by 19%. Pounds to the landfill decreased by 17% for 2012. Over all decreased waste on line by 19%. Pounds to the landfill decreased by 17% for 2012. Decrease amount of aged inventory that needed to be disposed of Catalyst piping change to help increase run rate. Use of film from Czech Republic reduced seal issues
KIMBERLY-CLARK CORP OWENSBORO OPERATIONS	Nitrate Compounds	W19: Other changes in operating practices
LUBRIZOL ADVANCED MATERIALS INC	Hydrochloric Acid (1995 And After "Acid Aerosols" Only)	W52: Modified equipment, layout, or piping

MCCREARY US PENITENTARY	Lead	USP McCreary has a fully functional recycle center. All trash taken from the facility is sorted. We have reduced our landfill waste by 70 % over the last 2 years. We recycle all material, for example: Aluminum - all soda cans and other aluminum is taken out of the waste stream / Styrofoam - all Styrofoam is collected, shredded and melted down 90-1 ration. Sold back to vender. / Cardboard - collected, baled and sold back to a vendor / Food Waste - food collected from the trash is collected and sent to our compost area. / Scrap Metal - wire and metal is separated and sold back to a vender / Pallets - collected and sold back to vender / Batteries - AA - D batteries and auto batteries are collected and sold to vender / Shredded paper - collected and sold to vender
MITSUBISHI ELECTRIC AUTOMOTIVE AMERICA	Lead	W42: Substituted raw materials - The wave solder machine started using a lead free solder material. The wave solder machine started using a lead free solder material.
MONUMENT CHEMICAL KENTUCKY LLC	Ammonia	Utilizing by-product ammonium hydroxide to replace raw material aqua ammonia as a wastewater treatment nutrient.
MOUSER CUSTOM CABINETRY	Toluene; Xylene (Mixed Isomers)	W14: Changed production schedule to minimize equipment and feedstock changeovers. W52: Modified equipment, layout, or piping. W73: Substituted coating materials used; W58: Other process modifications. W73: Substituted coating materials used
NEMAK GLASGOW PLANT #1	Hydrochloric Acid (1995 And After "Acid Aerosols" Only)	W43: Substituted a feedstock or reagent chemical with a different chemical W49: Other raw material modifications
OLYMPIA LUMBER & POST OLYMPIA	Chromium Compounds(Except Chromite Ore Mined In The Transvaal Region)	Our CCA pressure treatment facility consumes 100% of the chemical solution we purchase in the treatment process. The process itself is housed in a facility designed to contain any spill in concrete-constructed holding area, with equipment in place to recapture and reuse any and all unintended releases. Once treated, our product spends at least the minimum required time naturally releasing any excess chemical for further recapture. We regularly inspect our soil and water exceeding compliance with EPA requirements to ensure no measurable amount of the chemical has been released to the ground or water. To date, no results from any testing have come back outside compliance.

O'NEAL STEEL INC	Manganese; Nickel	W13: Improved maintenance scheduling, recordkeeping, or procedures - Facility utilizes preventative maintenance schedules and tracks work orders and process efficiency on a routine basis.W52: Modified equipment, layout, or piping - Facility utilizes preventative maintenance schedules and tracks work orders and process efficiency on a routine basis. Method(s) to Identify P2 Activities: T11 [Other] - Facility utilizes preventative maintenance schedules and tracks work orders and process efficiency on a routine basis. Facility utilizes preventative maintenance schedules and tracks work orders and process efficiency on a routine basis.
OWENSBORO MUNICIPAL UTILITIES ELMER SMITH STATION	Dioxin And Dioxin-Like Compounds; Mercury Compounds; Ammonia; Hydrogen Fluoride; Vanadium Compounds; Hydrochloric Acid (1995 And After "Acid Aerosols" Only); Lead Compounds; Arsenic Compounds; Copper Compounds; Zinc Compounds; Nickel Compounds; Chromium Compounds(Except Chromite Ore Mined In The Transvaal Region); Manganese Compounds; Sulfuric Acid (1994 And After "Acid Aerosols" Only); Barium Compounds	W19: Other changes in operating practices
PELLA CORP - MURRAY OPERATIONS	Styrene	W51: Instituted recirculation within a process
PHOENIX FABRICATORS & ERECTORS INC	Manganese	W13: Improved maintenance scheduling, recordkeeping, or procedures

PMC ORGANOMETALLIX INC	Benzene; Chlorobenzene; Methanol; Triphenyltin Hydroxide; Lead; Chloromethane; Chlorine; Toluene; Xylene (Mixed Isomers)	Current pollution prevention activities include the use of a thermal oxidizer to reduce air emissions, incineration for on-site energy recovery, and biological wastewater treatment to reduce effluent concentrations. Current pollution prevention activities include incineration for recovery of tin and biological wastewater treatment to reduce effluent concentrations. Lead is present as an impurity in tin, which is used as a raw material. The tin is purchased at a high purity. Other pollution prevention activities include the use of biological wastewater treatment to remove solids from the wastewater and incineration for off-site metals reclamation. Methyl chloride is used as a reactant in a primarily closed system. Current pollution prevention activities include the use of a thermal oxidizer to reduce air emissions. Current pollution prevention activities include the use of a scrubber to reduce air emissions and biological wastewater treatment to reduce effluent concentrations. On some occasions, solvents is also be recycled where possible.
PPG ARCHITECTURAL COATINGS	Xylene (Mixed Isomers); Cobalt Compounds	W49: Other raw material modifications
REPUBLIC CONDUIT MANUFACTURING	Chromium Compounds(Except Chromite Ore Mined In The Transvaal Region); Zinc Compounds; Lead; Nitric Acid	W19: Other changes in operating practices - improved material purchasing to just in time, in so doing have eliminated potential spills and material going out of date Plant installed a H2SO4 filtration system that has extended the life of the material 4 fold. improved material purchasing to just in time, in so doing have eliminated potential spills and material going out of date. W29: Other changes in inventory control Method(s) to Identify P2 Activities: T11 [Other] - improved operation of zinc reclaim unit, IE: operate more, thus able to reuse material at the plant more improved operation of zinc reclaim unit, IE: operate more, thus able to reuse material at the plant more. Increased operational time on zinc reclaim oven, thus increasing amount of zinc reclaimed (recycled) on site which increased the amount of lead recycled because it is a very small impurity in zinc. W39: Other spill or leak prevention Method(s) to Identify P2 Activities: T11 [Other] - improved the amount of carryover, that would have wound up going to the WWT increased the amount of on site recycling, by installing balers for cardboard and plastic improved the amount of carryover, that would have wound up going to the WWT.

ROHM & HAAS - LOUISVILLE PLANT	Methyl Methacrylate	W58: Other process modifications
SEKISUI SPECIALTY CHEMICALS AMERICA LLC	Methanol; Vinyl Acetate	W52: Modified equipment, layout, or piping - Six mechanical seals on the polykettles (reactors) were upgraded to reduce fugitive emissions from equipment leaks. Method(s) to Identify P2 Activities: T01 [Internal Pollution Prevention Opportunity Audit(S)] - An opportunity to reduce fugitive equipment leak emissions from the polykettles was identified by the maintenance department and engineering group. Six mechanical seals on the polykettles (reactors) were upgraded to reduce fugitive emissions from equipment leaks. The design of the mechanical seals on the top of six polykettles was upgraded to a design specific for agitator service. The conventional design was originally a pump seal adapted to agitator service. The upgraded configuration is designed to tolerate shaft movement, and this has increased the reliability of the new seal. This has resulted in the reduction of methanol and vinyl acetate fugitive emissions.
SENSUS PRECISION DIE CASTING	Aluminum (Fume Or Dust)	W58: Other process modifications Modification to the furnace fluxing methods were tried.
SOUTHERN GRAPHIC SYSTEMS LLC	Copper Compounds	W13: Improved maintenance scheduling, recordkeeping, or procedures
STEMCO MOTOR WHEEL COMMERCIAL VEHICLE SYSTEMS INC	Nickel; Manganese; Chromium	W89: Other product modifications - In Q3 2012, Stemco Motor Wheel Vehicle Operations in Berea, KY stopped making the Ductile Iron Hub castings and full cast iron drums which contained Nickel, manganese, and chromium. In 2013, there was no production of the product. Method(s) to Identify P2 Activities: T11 [Other] - No longer work with products, which contained Nickel, manganese, and chromium. No longer work with products, which contained Nickel, manganese, and chromium. In Q3 2012, Stemco Motor Wheel Vehicle Operations in Berea, KY stopped making the Ductile Iron Hub castings and full cast iron drums which contained Nickel, manganese, and chromium. In 2013, there was no production of the product.

SUMITOMO ELECTRIC WIRING SYSTE MS INC	Copper	W58: Other process modifications
SUPERIOR BATTERY MANUFACTURING CO INC	Lead Compounds	W13: Improved maintenance scheduling, recordkeeping, or procedures
TOPY AMERICA INC	Toluene	Improved RTO Maintenance and efficiency. Using lower levels of toluene for cleaning.
TOYOTA BOSHOKU KENTUCKY LLC - BARDSTOWN	Cyclohexane	W19: Other changes in operating practicesW74: Improved application techniques
TRACE DIE CAST INC	Nickel; Manganese; Lead; Chromium; Ethylene Glycol; Copper; Aluminum (Fume Or Dust)	W58: Other process modifications; W41: Increased purity or raw materials; W13: Improved maintenance scheduling, recordkeeping, or proceduresW36: Implemented inspection or monitoring program of potential spill or leak sources;
VANDERBILT CHEMICALS LLC - MURRAY DIV	Antimony Compounds; Carbon Disulfide; Zinc Compounds; Molybdenum Trioxide; Lead Compounds	Pollution prevention previously implemented are continued:(1) attention to material handling to minimize fugitive air emissions, (2) attention to accuracy of raw material charges. The later minimizes filtration waste. (3) attention to leak detection and repair programs that minimize fugitive emissions from material handling components. The plant is studying new storage tank systems to further minimize material handling emissions. In the report year, lead was present as an impurity in raw materials. To the extent possible, the company works with vendors to keep lead impurities as low as possible.
WEBASTO ROOF SYSTEMS INC	Diisocyanates; Ethylene Glycol	W19: Other changes in operating practicesW36: Implemented inspection or monitoring program of potential spill or leak sourcesW49: Other raw material modificationsW52: Modified equipment, layout, or piping - We have renovated all of our Polyurethane Presses, feeder and piping systems. This has improved our overall chemical usage. In our renovation project, we not only updated our processing equipment and storage tanks, but we also improved our utility usage, but installed electrically driven presses rather than older hydraulic style presses. This has also helped to reduce the amount of chemical spills that occurred in the plant. We have renovated all of our Polyurethane Presses, feeder and piping systems. This has improved our overall chemical usage. W21: Instituted procedures to ensure that materials do not stay in inventory beyond W36:

		<p>Implemented inspection or monitoring program of potential spill or leak sources</p> <p>W49: Other raw material modifications - We have moved from 2 polyol's to 1. This reduces our overall usage of ethylene glycol.</p> <p>W52: Modified equipment, layout, or piping - We have changed out all of our Polyurethane Injection Molding pressing and feeder systems. This has allowed for better use of the chemical product. We have moved from 2 polyol's to 1. This reduces our overall usage of ethylene glycol. We have changed out all of our Polyurethane Injection Molding pressing and feeder systems. This has allowed for better use of the chemical product.</p>
ZEON CHEMICALS LP	Ethyl Acrylate; 1,3-Butadiene; Acrylonitrile	W50: Optimized reaction conditions or otherwise increased efficiency of synthesis