



2013 Toxic Release Inventory Annual Report



Division of Air Pollution Control

April 2014

What is the Toxic Release Inventory?

The Toxic Release Inventory (TRI) program was authorized in 1986 by the Federal Emergency Planning and Community Right-to-Know Act (EPCRA), Section 313. The intent of the program is to provide to the public the “right-to-know” information about hazardous chemicals being used, manufactured, processed and/or released into the environment. This Act requires U.S. EPA and the states to collect data annually on releases and transfers of certain toxic chemicals from industrial facilities and make it available to the public.

In 1988, the Ohio General Assembly passed Substitute Senate Bill 367. This bill provides for state implementation of the federal EPCRA. Ohio EPA is charged with the administration of Chapter 3751 of the Revised Code. The law gave Ohio EPA authority to administer, inspect, enforce and establish a filing fee schedule in Ohio. Ohio EPA has designated the Division of Air Pollution Control to coordinate the TRI program in Ohio.

The TRI reporting elements were expanded when Congress passed the Pollution Prevention Act of 1990, which required facilities to report additional data on waste management and source reduction to U.S. EPA. The TRI program was amended to provide communities with information about toxic chemical releases and waste management activities. The information also supports decision making by industry, government, non-governmental organizations and the public.

The annual TRI report provides citizens with vital information about their communities. The TRI program collects information on certain toxic chemical releases to the air, water and land, as well as information on waste management and pollution prevention activities by facilities across the state. TRI data are submitted annually to Ohio EPA by facilities in industry sectors such as manufacturing, metal mining, electric utilities and commercial hazardous waste facilities.

U.S. EPA finalized the Electronic Reporting of Toxics Release Inventory Data rule, which requires facilities to submit non-trade secret TRI reporting forms electronically to EPA. The rule was published in the Federal Register on August 27, 2013 (78 FR 52860) and became effective on January 21, 2014. Reports that are not submitted electronically using TRI-MEweb will not be processed as acceptable submissions. However, facilities submitting TRI reports containing trade secrets will still submit their reports to EPA on paper, not via TRI-MEweb. This electronic reporting requirement includes late submissions for prior reporting years, revisions, and withdrawals.

U.S. EPA no longer accepts TRI reporting forms for reporting years prior to reporting year 1991. The Electronic Reporting of Toxics Release Inventory Data rulemaking mentioned above restricts late submittals, revisions, and withdrawals of TRI back to reporting year 1991. Facilities no longer may submit, revise, or withdraw TRI reporting forms for reporting years prior to reporting year 1991.

TRI-MEweb now allows facilities to submit, revise, and/or withdraw reporting forms for reporting years 1991 – 2004. Facilities preparing and submitting TRI reporting forms for these reporting years must send a copy of their forms on paper to the Ohio EPA TRI program. For reporting years 2005 – 2013, TRI-MEweb will continue to provide a copy to the Ohio EPA TRI program through the TRI Data Exchange (TDX) network.

A direct final rule was published on Nov. 7, 2013 (78 FR 66848) to add o-nitrotoluene to the list of chemicals required for TRI reporting. Facilities that manufacture, process, or otherwise use o-nitrotoluene should begin collecting release information on the chemical for reporting year 2014 (forms due July 1, 2015) if TRI chemical use and other thresholds are met.

On June 20, 2013, U.S. EPA announced that it is proposing to add a nonylphenol category to the TRI list of reportable chemicals. The Agency's proposal is part of an ongoing effort to examine the scope of TRI chemical coverage and provide communities with more complete information on toxic chemical releases. Nonylphenol is highly toxic to aquatic organisms and has been found in natural waters. Because of nonylphenol's toxicity, chemical properties and widespread use to make other chemicals, concerns have been raised over the potential risks to aquatic organisms from exposure to nonylphenol.

New Green Chemistry Source Reduction codes that describe green chemistry practices have been added to the list of selections available for completing Section 8.10 of Form R.

Figure 1: Information Collected Under TRI



What are the limitations of TRI data?

Users of the TRI data should be aware of its limitations in order to accurately interpret its significance. The TRI data limitations are:

- TRI does not cover all industries that release toxic chemicals.
- For reporting year 2013, TRI covers over 650 toxic chemicals and chemical categories.
- Releases are reported as total annual releases. This alone is not sufficient to assess health or environmental impact of toxic chemicals released.
- The majority of releases are based on estimates. Facilities are required to report releases based on monitoring data, if such data is available. When monitoring data is not available, estimates are used. Estimates result in significant variability among reporting facilities.
- The TRI report contains information regarding the release and/or waste management of chemicals, not public exposure to chemicals. Screening risk assessments must be completed before health and environmental assessments can be made. **TRI data summaries must be interpreted with care.**

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What do the 2013 TRI data show?

Over the past 10 years, total releases and transfers to the environment have decreased 45 percent, despite a 0.7 percent increase from 2012 to 2013.

For reporting year 2013, Ohio facilities reported 160 million pounds of TRI regulated chemicals or compounds that were released, disposed, or managed. That number dropped to 155.5 million pounds after subtracting releases that were transferred off-site to other Ohio facilities that, in turn, reported the same chemical under TRI. Ohio EPA received 5,311 TRI reports from 1,372 facilities. While one-third of these facilities reported a single chemical, the average number of chemicals reported was three. Table 1 compares reporting years 2012 and 2013 TRI data for all reporting facilities. Total releases and transfers decreased by 1 percent between 2012 and 2013 (based on un-adjusted total releases), with the number of reporting facilities increasing by 31.

Table 1: Comparison of 2012 and 2013 TRI Data

Comparison	2012 Amount	2013 Amount	Change
Releases to Air	47,537,145	47,178,740	-0.75%
Releases to Water	7,582,964	6,627,139	-12.60%
Deepwell Injection	14,737,033	17,093,435	16.00%
Releases to Land On-Site	22,451,168	25,536,230	13.74%
Discharges to POTW	22,517,795	18,914,579	-16.00%
Off-Site Disposal/Treatment	44,737,501	44,919,939	0.41%
Total Releases and Transfers*	155,787,500	155,494,678	-0.2%
Energy Recovery On-Site	113,682,023	96,924,461	-14.70%
Energy Recovery Off-Site	32,802,173	43,689,129	33.19%
Recycling On-Site	102,209,560	89,806,982	-12.1%
Recycling Off-Site	174,140,153	162,226,653	-6.84%
Treatment On-Site	379,306,956	401,834,360	5.94%
Number of Chemicals Reported	296	296	0.00%
Number of Reporting Facilities	1,341	1,372	2.31%
Number of Form R's	4,724	4,728	0.09%
Number of Form A's	559	583	4.29%
* Does not include releases that were transferred off-site to facilities that reported the same chemical under TRI.			

Persistent Bioaccumulative Toxic (PBT) chemicals accounted for 3.3 million pounds or 2.12 percent of reported releases and transfers. Of that total, lead and lead compounds accounted for 98 percent, or 3.23 million pounds, of PBTs. Total disposal or other releases for mercury and mercury compounds were 16,304 pounds and, for dioxin and dioxin-like compounds, total disposal and other releases were 680 grams.

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Increases and decreases are attributable to many factors including changes in production, types of measurement used, and efforts to minimize releases and develop uses or find markets for what might otherwise have been a waste. For many Resource Conservation and Recovery Act (RCRA) facilities, subject to TRI reporting in 1998, minor waste stream and market changes greatly affected TRI reporting.

Why does TRI data change over time?

In 2013 reports, approximately 155.5 million pounds of toxic chemicals were released to the environment or transferred off-site for treatment or disposal. The data presented for 2013 reflects the TRI data reports due July 1, 2014. Ohio EPA's TRI Unit continually reviews this data and works with reporting facilities to assure data quality. Additional and revised data provided subsequent to July 1, 2014 has been incorporated into this report to the extent possible considering publication deadlines. Changes to the list of reportable chemicals create difficulties in presenting historical TRI data in an accurate and consistent format.

Figure 2: TRI On-Site and Off-Site Releases and Transfers

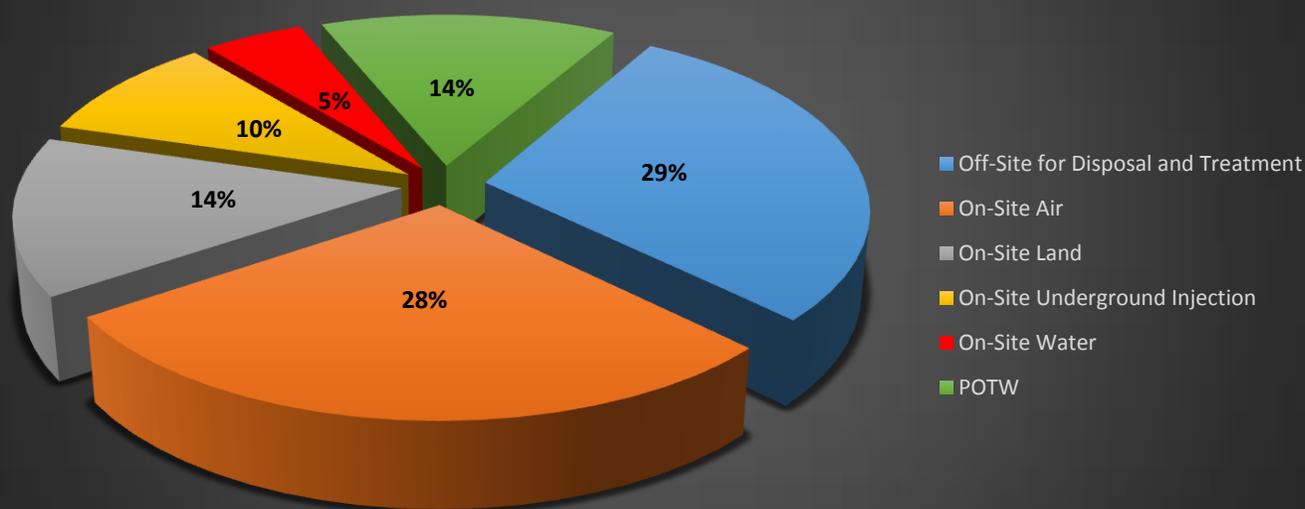
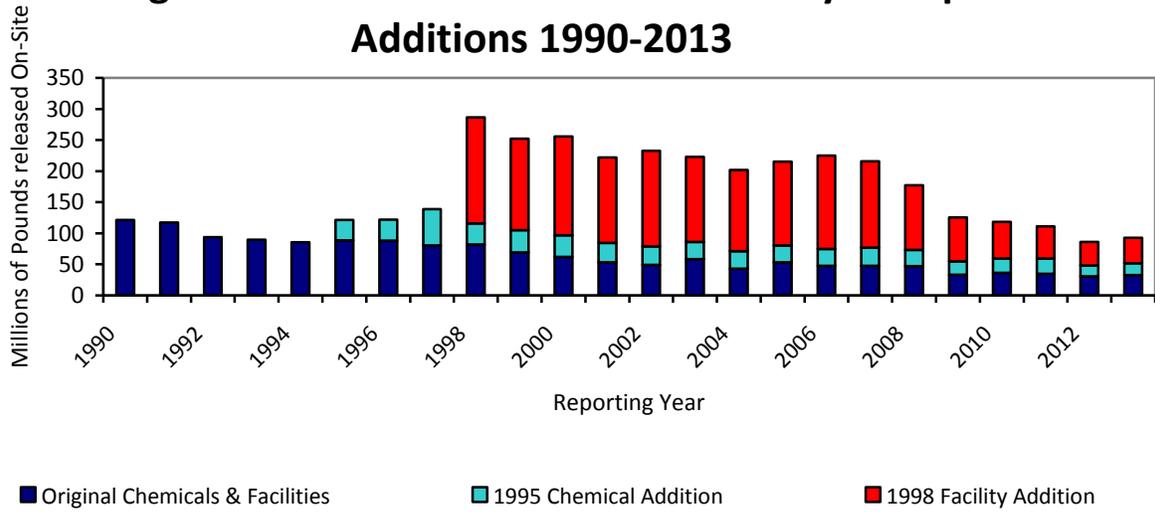
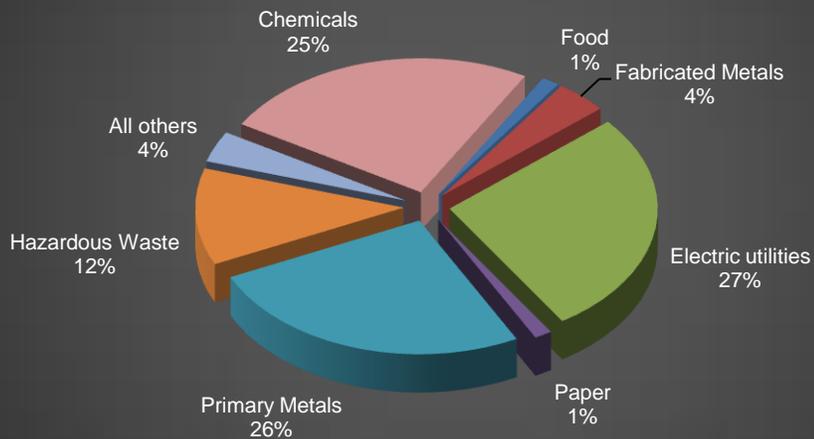


Figure 3: Effect of Chemical and Facility Group Additions 1990-2013



Note: Figure 3 Includes releases to air, water, deepwell injection and land on-site for all 1998 reportable chemicals.

Figure 4: 2013 TRI Total Disposal or Other Releases by Industrial Sector (131 million pounds)



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Ohio EPA contacted facilities reporting significant increases or decreases in waste management or releases from 2012 to 2013 to determine what caused the change. The following information was developed through summary data and facility responses:

<p>Air Releases</p>	<p>Air releases decreased by 1 percent or 0.36 million pounds for 2013, with facilities reporting 47.2 million pounds. As in previous years, power-generating facilities in Ohio reported the largest TRI air releases, representing seven of the top 10 facilities. Power-generating facility releases primarily contain hydrochloric and sulfuric acid aerosols, resulting from coal combustion. These two chemicals make up 49 percent of all reported air releases.</p> <p>Duke Energy's Zimmer Station (Clermont County) reported an increase of 1.2 million pounds. That increase was due to increased generation and fuel consumption in 2013 compared to 2012. In 2013 electrical generation and coal consumption were each up about 92% compared to 2012.</p> <p>First Energy Eastlake Plant (Lake County) reduced releases by more than 2.3 million pounds. The decrease was due to the two largest units of the five coal-fired units at the plant being idled. The facility has no plans to operate them in the future.</p>
<p>Water Releases</p>	<p>Water releases decreased by 12.6 percent or 1.0 million pounds from the 2012 report. Nitrate releases accounted for roughly 92 percent of all reported releases to Ohio waterways in 2013. Nitrate compounds are manufactured through the treatment of nitric acid and are routinely permitted and monitored under the terms of National Pollutant Discharge Elimination System (NPDES) permits.</p> <p>Materion Brush (Ottawa County) reported a decrease of 0.6 million pounds released to water. The decrease was primarily due to a change in the method of disposing of waste nitric acid generated at the facility.</p> <p>Sands Hill Mining (Vinton County) reported a decrease of 0.16 million pounds of ammonia discharges to water in 2013. Ammonia was used to treat wastewater acidity; the use of ammonia was stopped in 2013.</p> <p>AK Steel (Coshocton County) reported a decrease of 0.1 million pounds compared to 2012. The difference was due to a decrease in nitrate discharges. The facility uses different product types which require more or less nitric acid use in the steel production. Also, it depends on the frequency of changing the acid bath batch.</p>
<p>Deepwell Injection</p>	<p>Only two facilities reported TRI deepwell injection for 2013, showing an increase of 16 percent when compared to 2012 data.</p> <p>Vickery Environmental Services (Sandusky County), a RCRA-regulated disposal facility in Vickery, reported an increase of 2.6 million pounds. The increase in injection and subsequently total releases relates to the increases in waste received by the facility for disposal by deepwell injection.</p> <p>INEOS USA, LLC in Lima (Allen County) reported 7.2 million pounds, a 0.2 million pound decrease from 2012. INEOS USA, LLC notes the decrease was due to decreased production levels.</p>

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<p>Land On-Site</p>	<p>Land releases on-site were up in 2013, increasing by 13.7 percent to slightly over 25.5 million pounds.</p> <p>Arcelormittal Cleveland (Cuyahoga County) reported an increase of 0.86 million pounds. The facility generated 127.8 million more pounds of residual waste in 2013 in comparison to the quantity generated in 2012 due to increased production. The residual waste is deposited in a landfill which would account for the increase in land totals.</p> <p>Duke Energy Zimmer Station (Clermont County) reported an increase of 0.7 million pounds. The increase resulted from increased generation and fuel consumption in 2013. The generation and consumption were up by 92% which resulted in an increase in ash production and therefore an increase in land releases.</p> <p>Duke Energy Beckjord Generating Station (Clermont) reported a decrease of 0.37 million pounds. The decrease was due to decreased generation and fuel consumption in 2013. The generation and consumption were down by 21% which resulted in a decrease in ash production and therefore a decrease in land releases.</p>
<p>Total Releases and Transfers</p>	<p>Total releases and transfers in 2013 were up by 0.4%. Ohio facilities reported 160.3 million pounds in 2013 compared to 159.7 million pounds in 2012.</p> <p>Vickery Environmental (Sandusky County) reported an increase of 2.6 million pounds. The increase in injection and subsequently total releases relates to the increases in waste received by the facility for disposal by deepwell injection.</p> <p>Veolia Technical Solutions (Montgomery County) reported an increase of 2.5 million pounds. The increase was due to the increase in production in 2013. The facility suffered significant damage due to a fire in 2009 and during the rebuilding of the facility minimal operations were conducted. The facility was re-opened in 2012, and became fully operational in 2013.</p> <p>First Energy Eastlake Plant (Lake County) reported a decrease of 3.0 million pounds. The decrease was due to the two largest units of the five coal-fired units at the plant being idled. The facility has no plans to operate them in the future.</p> <p>Shepherd Chemical Co. (Hamilton County) reported a decrease of 2.2 million pounds. The facility has several different products that generate nitrates as well as several that don't. Depending on what products and how much they make in a year nitrate concentration will go down or up. In 2013 they ran products that had less nitrate generation.</p> <p>Research Organic (Cuyahoga County) reported a decrease of 2.0 million pounds. The facility completed a number of projects to reduce emissions at the facility in 2013. The projects included process improvement to reduce methanol in wastewater, installation of a flare, and reducing emissions.</p>
<p>POTW Releases</p>	<p>Publicly Owned Treatment Works (POTWs) in Ohio reported TRI total releases were down by 16 percent for 2013, from 22.5 million in 2012 to slightly more than 18.9 million pounds in 2013. Nitrate compounds represent the largest POTW releases,</p>

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	<p>accounting for 83 percent of total statewide releases.</p> <p>Shepherd Chemical Co. (Hamilton County) reported a decrease of 2.2 million pounds. The facility has several different products that generate nitrates as well as several that don't. Depending on what products and how much they make in a year nitrate concentration will go down or up. In 2013 they ran products that had less nitrate generation.</p> <p>Research Organic (Cuyahoga County) reported a decrease of 1.9 million pounds. The facility completed a number of projects to reduce emissions at the facility in 2013. The projects included process improvements to reduce methanol in wastewater to POTW by more than 1.9 million pounds.</p>
<p>Energy Recovery On-Site</p>	<p>Energy recovery on-site decreased by more than 14 percent statewide, down by more than 16.8 million pounds in 2013.</p> <p>Kraton Polymers U.S. (Washington County) reported a 3.3 million pounds increase. That increase was attributed to a mistake with the 2012 reporting year which reported 3,372,670 pounds. The 2012 report should be corrected to 6,380,616 pounds, which is within normal fluctuation over the past ten years based on production volumes at the site. Kraton will be revising the 2012 TRI report to reflect this change.</p> <p>Lafarge NA (Paulding County) reported a more than 6.6 million pound decrease. The decrease was due to decreased waste fuel used in the cement kilns. The availability of waste fuel is market driven plus the amount the facility burns is dependent on kiln up time. Both can vary from year to year.</p> <p>Haverhill Chemicals (Scioto County) reported a 7.3 million pound decrease in on-site energy recovery. The decrease resulted after installing process equipment that allowed the company to minimize the "product" constituents that were contained in the final process column bottoms that comprise the on-site waste fuel. Those process changes reduced the phenol content in the fuel from 20% to 5%.</p>
<p>Energy Recovery Off-Site</p>	<p>Statewide, energy recovery off-site increased by 33.2 percent (10.9 million pounds) for 2013. Most energy recovery activity was reported by chemical manufacturers and RCRA regulated treatment, storage and disposal (TSD) facilities.</p> <p>Veolia ES Technical Solutions (Montgomery County) reported an increase of 16.7 million pounds. The facility had a fire in May 2009 and was idle until May 2012. The facility started to fuel blend materials onsite again in May 2012. The tank farm and distillation operations operated for about roughly six months of 2012. The facility became fully operational in 2013.</p> <p>Clean Harbors Recycling Services of Ohio (Licking County) reported a decrease of 4.3 million pounds. The decrease was due to less material containing TRI chemicals sent off-site for energy recovery.</p>
<p>Recycling On-Site</p>	<p>On-site recycling decreased by 12.4 million pounds to 89.8 million pounds in 2013.</p>

	<p>PPG Industries Ohio (Pickaway County) reported an increase of 4 million pounds. The total on-site recycling value for 2013 was evaluated by the facility and found to be incorrect. The correct value for 2013 was 9.1 million pounds. This number was significantly reduced over 2012 due to the shutdown of one of the solvent still vessels. This vessel was replaced and controls were upgraded in 2014.</p> <p>PPG Industries Inc. Barberton (Summit County) reported an increase of 3.1 million pounds. This increase was based on interpretation of the recycling definitions found in the USEPA guidance document. Trichloroethylene (TCE) is otherwise used at the facility to remove mineral oils from a manufactured plastic sheet. PPG is required to route fugitive and process vent emissions through a carbon bed adsorption system to reduce atmospheric emissions of TCE. These carbon beds are then flushed with steam to recharge the carbon, and the TCE is recovered from this steam cycle and stored in a bulk tank. As the levels of TCE decline in the process lines from evaporation and incorporation with the removed mineral oil, TCE is pumped from the bulk tank back to the process lines. This make-up to the process lines is recorded, and the make-up quantities minus any virgin TCE additions to the bulk tank are considered to be on-site recycling. As air pollution control equipment is not considered integral to the process, this was counted as on-site recycling in reporting year 2013 TRI report.</p> <p>Tier Environmental (Cuyahoga County) reported a decrease of 4 million pounds. The reduction was due to the constant change in customers and streams of waste received by the facility.</p> <p>Materion Brush Performance (Lorain County) reported an increase of 0.4 million pounds. Originally the facility reported a decrease of 3.6 million pounds. After reviewing the TRI report information for 2012 and 2013, the facility determined that the 5.5 million pounds of on-site recycling reported in 2012 was incorrect. The review revealed that incorrect figures were submitted to the preparer of the TRI report and were then used to calculate the pounds of on-site recycling, causing the result to be inflated. The correct result for on-site recycling for 2012 was 1.5 million pounds, which shows an increase of only 0.4 million pounds.</p>
<p>Recycling Off-site</p>	<p>Off-site recycling was down 6.8 percent from 174 million pounds in 2012 to 162 million pounds in 2013.</p> <p>North Star BlueScope Steel (Fulton County) reported an increase of more than 5 million pounds in off-site recycling. The facility produced 76,000 more liquid tons of steel in 2013. With the increase in steel production, there is an increase in the amount of dust collected. The vast majority of this reporting category is comprised of metals contained in dust collected by the facility's electric arc furnace baghouses. The collected material is sent off site for metals recovery.</p> <p>Vehtek Systems Inc. (Wood County) reported a decrease of more than 4.5 million pounds in off-site recycling. The reason for the significant decrease in recycled off-site volumes of material from 2012 to 2013 was based on using a different calculation method. The 2013 analysis was based on Certified Chemical Analysis Sheets generated from metallurgical testing provided with each delivered load of material while the 2012 information was based on Material Safety Data Sheets (MSDS) generated for the material.</p>

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	<p>The Certified Chemical Analysis Sheet provided a source of information for the most accurate reporting. For example, the MSDS for the steel material identifies the range of copper to be 0.01 to 3.75 percent. For 2012 the average of this range (1.85 percent) was used to calculate the volume of copper on the Form R submittal. In 2013, the average copper identified on the Certified Chemical Analysis Sheet was 0.04 percent which was used to calculate and report on the Form R submittal. The Certified Chemical Analysis Sheets were used to generate the data for Chromium, Copper, Manganese, Nickel, Phosphorus and Zinc Compounds resulting in significant decrease in the total volume of elements reported for recycling.</p>
Treatment On-Site	<p>Treatment on-site increased by 5.9 percent or about 22.5 million pounds. It is the primary waste management activity reported by facilities. Traditional manufacturing, power generation, and RCRA treatment, storage and disposal facilities (TSDs) all reported on-site waste treatment.</p> <p>American Electric Power (Jefferson County) reported an increase of 11.9 million pounds. The increase was due to an increase in production and the addition of a Flue Gas Desulfurization unit.</p> <p>Duke Energy Zimmer Station (Clermont County) reported an increase of 0.7 million pounds. The increase resulted from increased generation and fuel consumption in 2013. The generation and consumption were up by 92% which resulted in an increase in ash production and therefore an increase in land releases.</p> <p>American Electric Power Gavin (Gallia County) reported a decrease of 8 million pounds. The decrease was due to a decrease in production and a reduction in the ash and sulfur content of the coal.</p>

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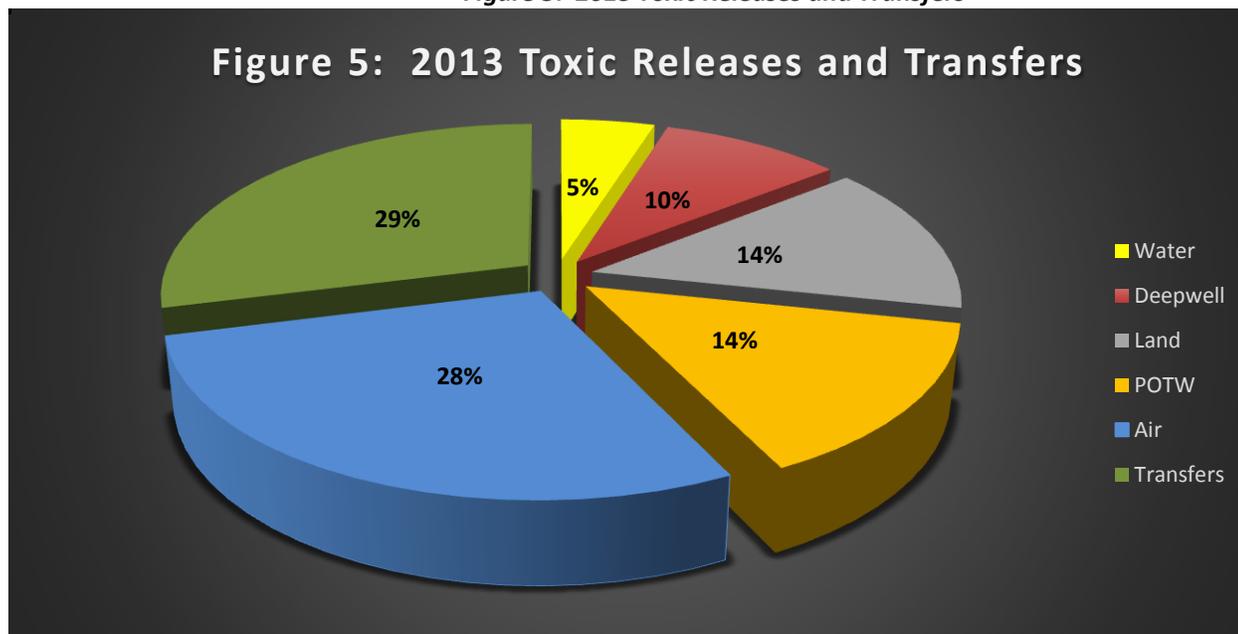
Statewide totals of on-site releases, off-site transfers, and on-site waste management for reporting years 2004 to 2012 are provided in Tables 2 and 3. Table 2 represents all data including the data for delisted, added and modified chemicals and the expansion industrial sectors. Table 3 does not include data for: (1) chemicals that have been delisted, added or modified; and (2) new industrial sectors which were added to TRI in order to allow for historical trend analysis.

Table 2: 10-Year-Trend: All Facilities and Chemicals (millions of pounds)

Comparison	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Releases to Air	128.2	126.4	120.3	114.9	90.4	74.6	65.0	58.4	47.5	47.2
Releases to Water	8.0	6.9	8.3	9.3	8.5	6.2	9.2	8.8	7.6	6.6
Deepwell Injection	22.6	24.5	22.5	22.5	23.0	13.9	19.4	18.1	14.7	17.1
Releases to Land On-Site	49.7	62.5	79.5	74.1	59.2	35.1	28.0	26.6	22.5	25.5
Discharges to POTW	18.6	19.8	16.6	17.8	17.4	16.5	18.2	20.1	22.5	18.9
Off-Site Disposal/ Treatment	71.3	82.5	97.5	80.3	63.3	42.9	47.7	57.4	44.7	44.9
Total Releases and Transfers*	258.6	276.9	290.5	276.3	224.1	158.5	154.8	150.4	155.4	155.5
Energy Recovery On-Site	84.3	82.1	97.5	73.9	69.4	42.3	56.7	73.8	113.7	96.9
Energy Recovery Off-Site	37.6	36.0	35.0	31.7	31.3	25.9	25.7	28.3	32.8	43.7
Recycling On-Site	157.8	132.4	98.1	108.9	84.9	67.5	75.9	90.6	102.2	89.8
Recycling Off-Site	148.4	160.2	162.5	165.2	158.5	107.6	143.3	153.4	174.1	162.0
Treatment On-Site	385.4	338.7	351.3	381.6	403.6	428.2	368.9	370.1	379.3	401.8
Number of Reporting Facilities	1,647	1,636	1,602	1,529	1,476	1,378	1,375	1,395	1,341	1,372

* Does not include releases that were transferred off-site to facilities that reported the same chemical under TRI.

Figure 5: 2013 Toxic Releases and Transfers



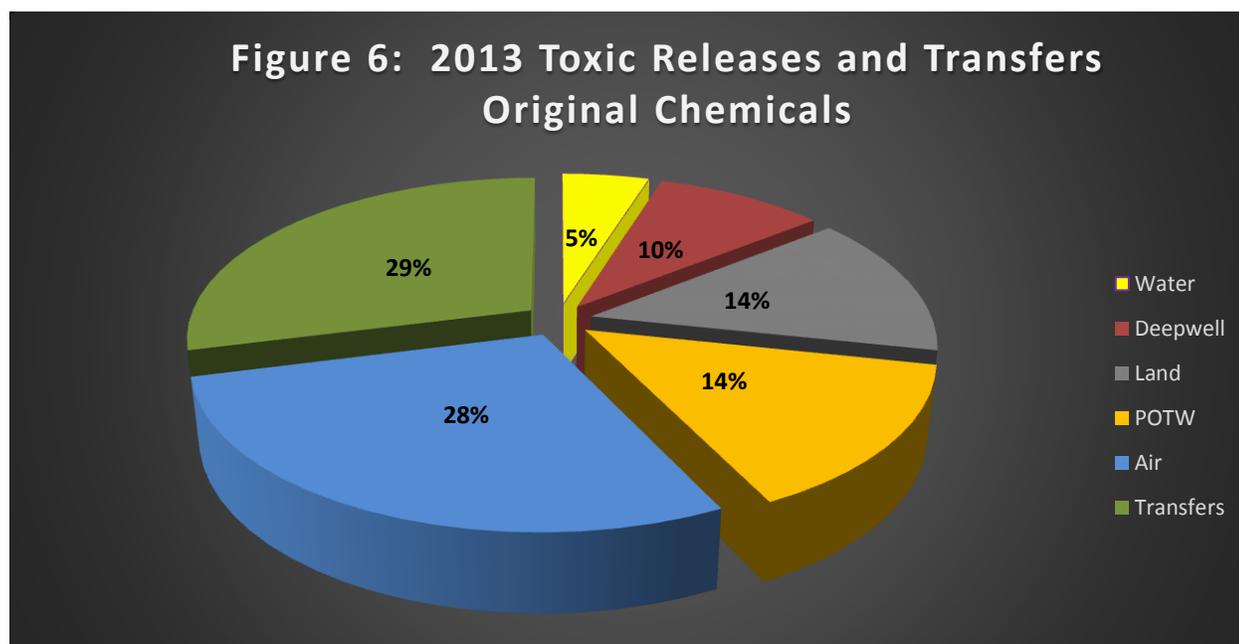
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Table 3: 10 Year-Trend: Original Facilities and Chemicals (millions of pounds)

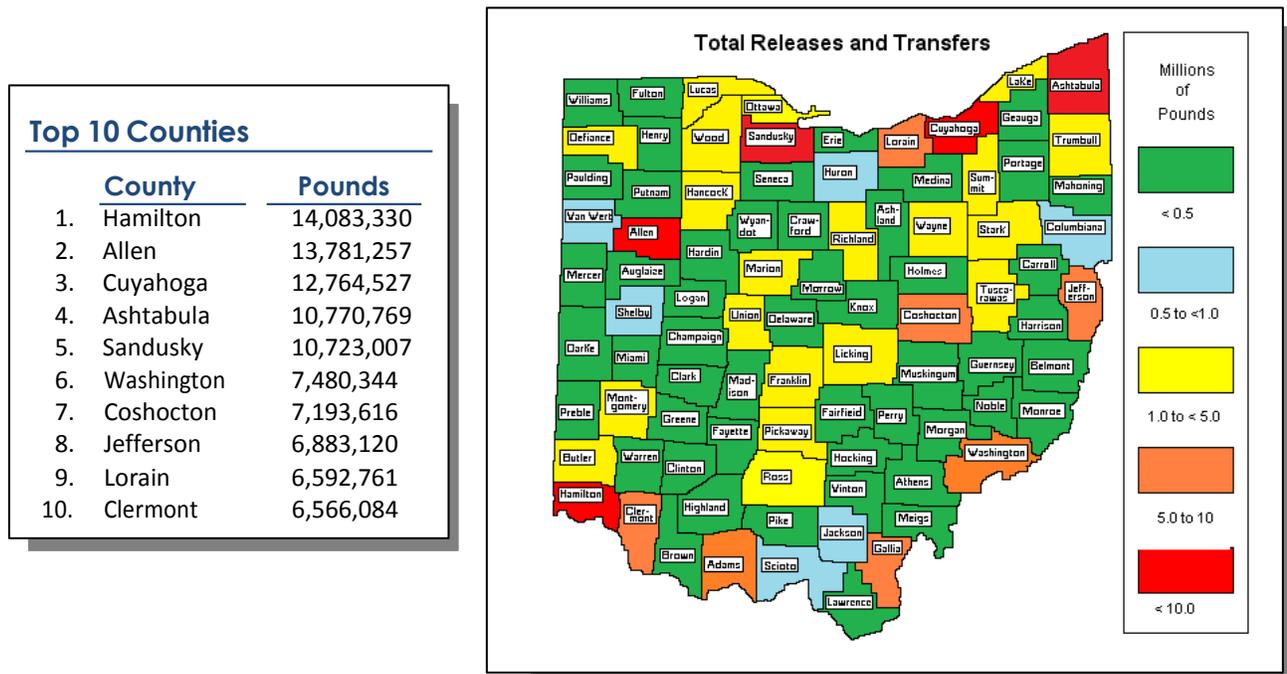
Comparison	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Releases to Air	27.5	26.2	25.7	23.9	21.5	16.1	15.4	15.4	15.3	15.2
Releases to Water	0.3	0.4	0.4	0.3	0.4	0.3	0.3	0.4	0.3	0.3
Deepwell Injection	8.6	14.2	10.0	7.6	9.0	7.5	8.3	7.0	5.7	5.4
Releases to Land On-Site	7.6	13.1	12.7	16.4	16.7	9.3	12.8	12.6	10.9	12.4
Discharges to POTW	4.7	5.6	4.6	4.2	3.1	4.3	2.5	2.8	4.8	2.6
Off-Site Disposal/ Treatment	56.5	64.9	83.5	65.3	50.7	31.1	35.9	42.9	32.6	28.6
Total Releases and Transfers*	105.1	124.4	136.8	117.7	101.4	68.6	75.3	81.0	69.3	64.5
Energy Recovery On-Site	81.6	81.6	93.8	70.7	67.3	41.0	55.1	70.0	101.6	88.7
Energy Recovery Off-Site	21.9	20.0	26.4	19.2	17.4	14.9	16.6	12.3	14.0	13.0
Recycling On-Site	78.2	63.8	64.0	59.8	54.7	43.4	52.1	70.3	85.6	71.1
Recycling Off-Site	142.2	142.3	139.0	130.6	128.0	128.0	113.6	121.5	148.2	134.6
Treatment On-Site	149.7	110.9	106.8	108.0	110.0	100.9	104.4	114.2	107.5	105.3
Number of Reporting Facilities	1,423	1,419	1,407	1,341	1,283	1,195	1,193	1,213	1,166	1,195

* Does not include releases that were transferred off-site to facilities that reported the same chemical under TRI.

**Figure 6: 2013 Toxic Releases and Transfers
(Original Chemicals)**



Total Releases and Transfers for 2013*



Top 10 Chemicals

Chemical	Pounds
1. Nitrate compounds	22,215,734
2. Zinc and zinc compounds	19,515,301
3. Manganese and manganese compounds	14,098,823
4. Sulfuric acid (aerosols)	12,571,805
5. Hydrochloric acid (aerosols)	10,811,759
6. Ammonia	8,896,252
7. Methanol	6,068,346
8. Barium and barium compounds	5,793,933
9. Nitric Acid	5,722,983
10. Copper and Copper compounds	5,071,521

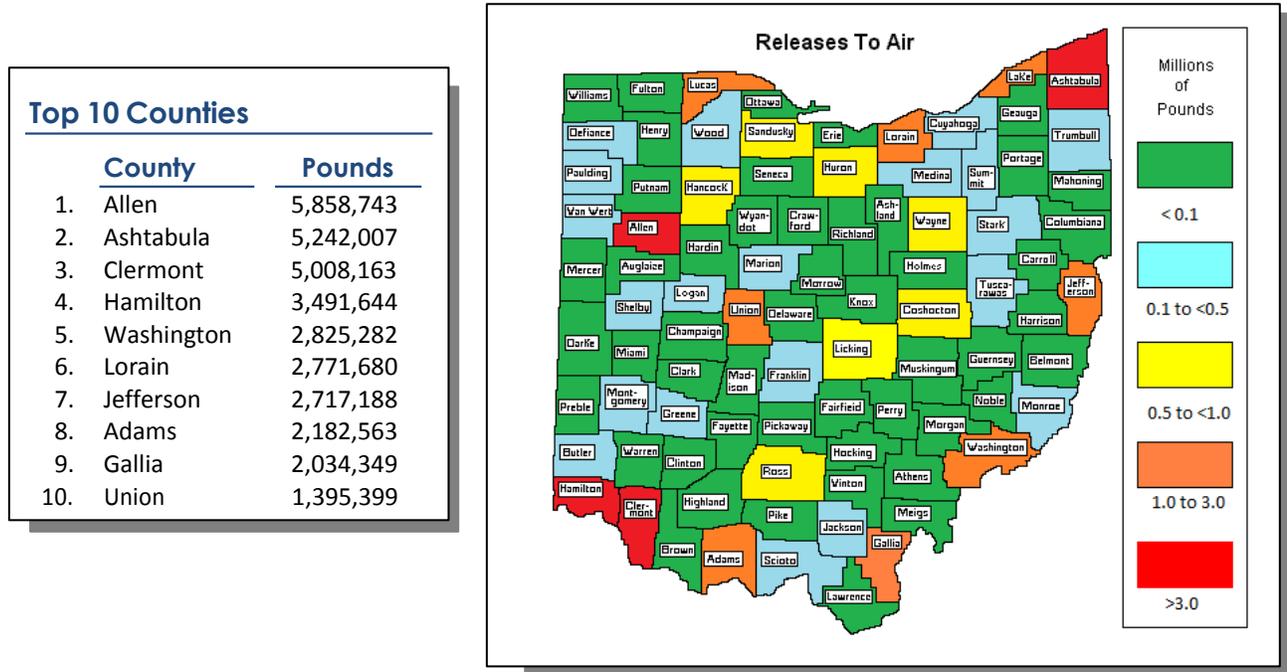
Top 10 Facilities

Facility/County	Pounds
1. Vickery Environmental Inc./Sandusky	9,952,606
2. Shepherd Chemical Co./Hamilton	7,348,911
3. Ineos USA LLC/Allen	7,259,276
4. Arcelormittal Cleveland LLC/Cuyahoga	6,140,021
5. Cristal USA Inc.-2426 Middle RD/Ashtabula	5,588,053
6. PCS Nitrogen Ohio L.P./Allen	5,568,152
7. AK Steel Corp Coshocton Works/Coshocton	4,587,283
8. J.M Stuart Station/Adams	4,122,041
9. Cristal USA Inc.-2900 Middle RD/Ashtabula	3,946,577
10. W. H. Sammis Plant/Jefferson	3,882,188

* All data included.

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Releases to Air for 2013*



Top 10 Chemicals

Chemical	Pounds
1. Sulfuric acid (aerosols)	12,571,805
2. Hydrochloric acid (aerosols)	10,496,946
3. Ammonia	6,430,630
4. Carbonyl sulfide	4,621,471
5. Methanol	1,829,329
6. Certain glycol ethers	1,766,033
7. N-Hexane	1,195,263
8. Hydrogen fluoride	1,104,301
9. Styrene	960,581
10. N-Butyl alcohol	754,121

Top 10 Facilities

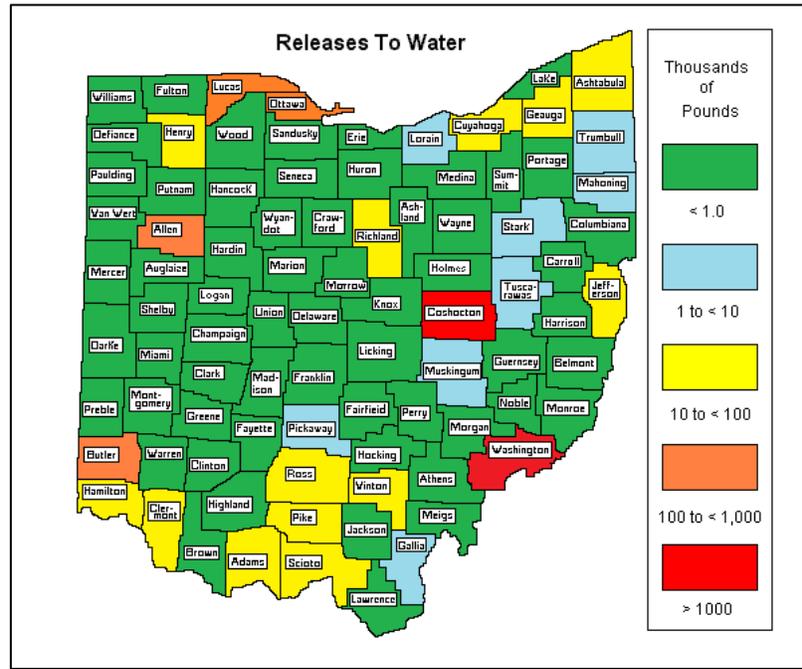
Facility/County	Pounds
1. PCS Nitrogen Ohio L.P./Allen	5,476,742
2. Cristal USA, Inc.-2426 Middle Rd/Ashtabula	3,124,721
3. Duke Energy Miami Fort LLC/Hamilton	2,805,173
4. Duke Energy Ohio Inc. W. C. Beckjord/Clermont	2,701,651
5. Avon Lake Power Plant/Lorain	2,389,872
6. Duke Energy Zimmer Station LLC/Clermont	2,245,388
7. W. H. Sammis Plant/Jefferson	1,933,258
8. American Electric Power Muskingum River Plant/Washington	1,929,334
9. J.M. Stuart Station/Adams	1,731,361
10. Cristal USA Inc.-2900 Middle Rd/Ashtabula	1,432,897

* All data included.

Releases to Water for 2013*

Top 10 Counties

County	Pounds
1. Coshocton	4,233,479
2. Washington	1,207,146
3. Ottawa	240,006
4. Allen	185,914
5. Butler	131,981
6. Lucas	125,329
7. Ashtabula	76,761
8. Pike	55,200
9. Jefferson	47,134
10. Vinton	46,928



Top 10 Chemicals

Chemical	Pounds
1. Nitrate compounds	6,108,657
2. Manganese and manganese compounds	292,864
3. Ammonia	98,377
4. Methanol	23,897
5. Barium and barium compounds	22,242
6. Copper and copper compounds	21,711
7. Zinc and zinc compounds	16,316
8. Nickel and nickel compounds	5,762
9. Lead and lead compounds	5,743
10. Formic acid	5,090

Top 10 Facilities

Facility/County	Pounds
1. AK Steel Corp. Coshocton Works/Coshocton	4,201,150
2. Kraton Polymers US LLC/Washington	975,074
3. Materion Brush Inc./Ottawa	240,004
4. Eramet Marietta Inc./Washington	166,989
5. AK Steel Corp./Butler	127,898
6. BP-Husky Refining LLC/Lucas	125,020
7. Lima Refining Co/Allen	94,503
8. PCS Nitrogen of Ohio LP/Allen	91,409
9. Cristal USA Inc./Ashtabula	63,000
10. Solvay Specialty Polymers USA LLC/Washington	58,796

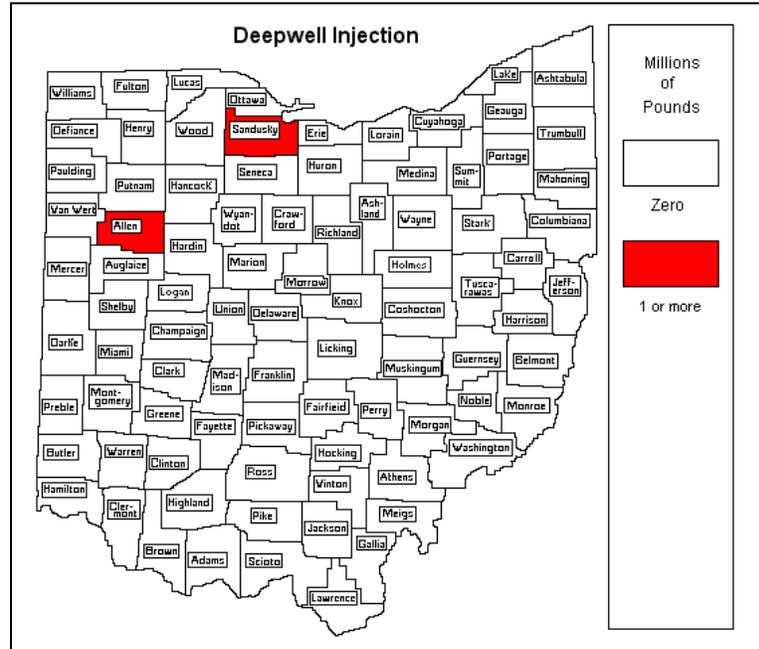
* All data included.

Deepwell Injection for 2013*

Top Counties

County	Pounds
1. Sandusky	9,936,327
2. Allen	7,157,108

Note: Only 2 facilities reported on-site deepwell injection.



Top 10 Chemicals

Chemical	Pounds
1. Nitric acid	3,409,664
2. Zinc and zinc compounds	2,495,719
3. Copper and copper compounds	2,279,292
4. Acetonitrile	2,004,764
5. Ammonia	1,712,830
6. Acrylamide	1,119,214
7. Acrylonitrile	681,661
8. Methanol	555,751
9. Hydrogen fluoride	503,432
10. Chromium and chromium compounds	374,358

Top Facilities

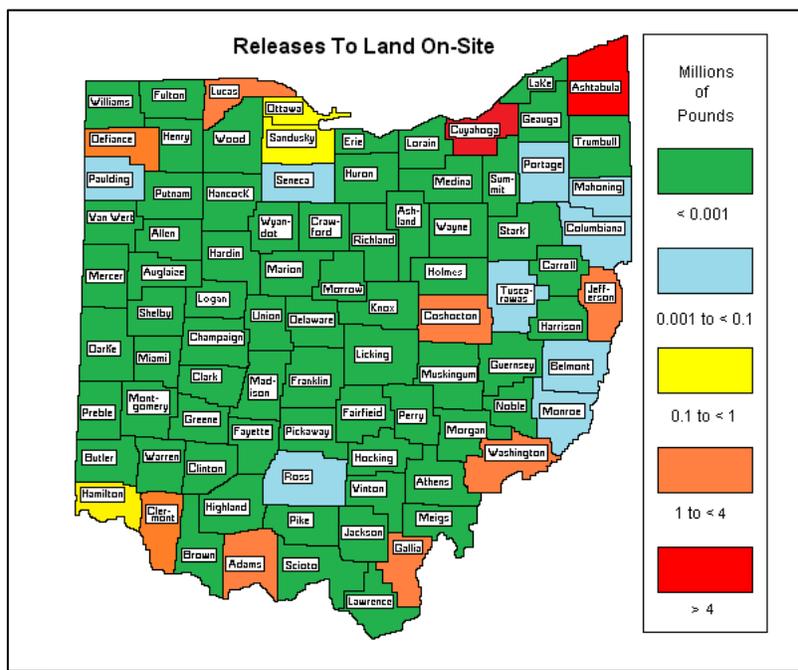
Facility/County	Pounds
1. INEOS USA LLC/Allen	9,936,327
2. Vickery Environmental Inc./Sandusky	7,157,108

* All data included.

Releases to Land On-Site for 2013*

Top 10 Counties

County	Pounds
1. Ashtabula	4,900,510
2. Cuyahoga	4,846,945
3. Gallia	3,215,589
4. Adams	3,021,936
5. Jefferson	1,868,382
6. Lucas	1,755,510
7. Washington	1,454,818
8. Clermont	1,306,391
9. Defiance	1,211,352
10. Coshocton	1,000,200



Top 10 Chemicals

Chemical	Pounds
1. Manganese and manganese compounds	4,900,510
2. Zinc and zinc compounds	4,846,945
3. Barium and barium compounds	3,215,589
4. Lead and lead compounds	3,021,936
5. Vanadium and vanadium compounds	1,868,382
6. Copper and copper compounds	1,755,510
7. Chromium and chromium compounds	1,454,818
8. Nickel and nickel compounds	1,306,391
9. Arsenic and arsenic compounds	1,211,352
10. Cobalt and cobalt compounds	1,000,200

Top 10 Facilities

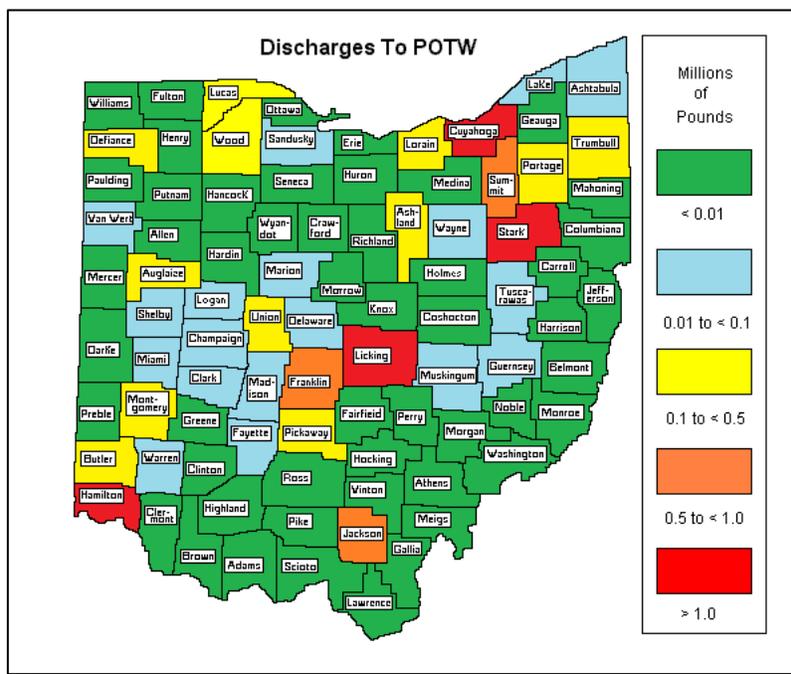
Facility/County	Pounds
1. Arcelormittal Cleveland Inc./Cuyahoga	4,900,510
2. American Electric Power Gavin Plant/Gallia	4,846,945
3. Cristal USA Inc.-2426 Middle Rd/Ashtabula	3,215,589
4. Cristal USA Inc.-2900 Middle Rd/Ashtabula	3,021,936
5. J.M. Stuart Station/Adams	2,000,163
6. American Electric Power Cardinal Plant/Jefferson	1,755,510
7. Envirosafe Services of Ohio Inc./Lucas	1,454,818
8. Duke Energy Zimmer Station LLC/Clermont	1,306,391
9. GM Defiance Casting Operations/Defiance	1,211,352
10. Eramet Marietta Inc./Washington	1,000,200

* All data included.

Discharges to POTW for 2013*

Top 10 Counties

County	Pounds
1. Hamilton	8,991,704
2. Licking	1,944,349
3. Cuyahoga	1,600,532
4. Stark	1,548,005
5. Summit	733,823
6. Franklin	595,444
7. Jackson	543,405
8. Lorain	391,115
9. Butler	263,137
10. Ashland	239,955



Top 10 Chemicals

Chemical	Pounds
1. Nitrate compounds	15,699,252
2. Methanol	1,339,861
3. Ammonia	313,793
4. Sodium Nitrite	303,205
5. Ethylene Glycol	236,688
6. Certain Glycol Ethers	204,091
7. Allyl Alcohol	191,418
8. Formaldehyde	158,909
9. Acrylonitrile	81,224
10. Nitric Acid	74,143

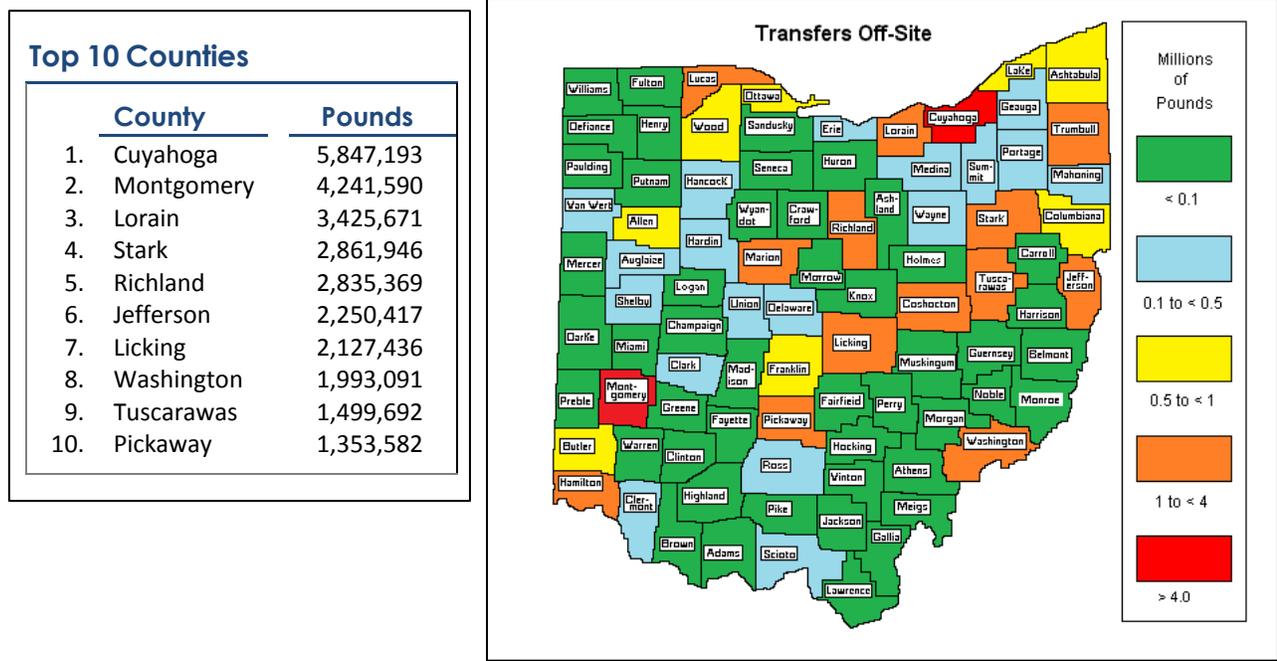
Top 10 Facilities

Facility/County	Pounds
1. Shepherd Chemical Co./Hamilton	7,344,111
2. Anomatic Corp./Licking	1,230,490
3. Envirote Of Ohio Inc./Stark	805,054
4. Jewel Acquisition LLC – Louisville/Stark	638,341
5. Research Organics Inc. DBA SAFC/Cuyahoga	592,018
6. Ohio Precious Metals LLC/Jackson	543,405
7. Anomatic Corp. – Plant II/Licking	540,299
8. Swagelok Manufacturing Co LLC/Licking	446,438
9. Solvay USA Inc./Hamilton	417,484
10. PPG Industries Inc. Barberton/Summit	404,594

* All data included.

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Transfers Off-Site To Disposal or Treatment for 2013*



Top 10 Chemicals

Chemical	Pounds
1. Zinc and zinc compounds	5,847,193
2. Manganese and manganese compounds	4,241,590
3. Toluene	3,425,671
4. Methanol	2,861,946
5. Barium and barium compounds	2,835,369
6. Nitric Acid	2,250,417
7. Chromium and chromium compounds	2,127,436
8. Xylene (Mixed Isomers)	1,993,091
9. Phenol	1,499,692
10. Copper and copper compounds	1,353,582

Top 10 Facilities

Facility/County	Pounds
1. AK Steel Corp. – Mansfield Works/Richland	5,847,193
2. Veolia ES Technical Solutions LLC/Montgomery	4,241,590
3. Envirote of Ohio Inc./Stark	3,425,671
4. Clean Harbors Recycling Services/Licking	2,861,946
5. Chemtron Corp./Lorain	2,835,369
6. W.H. Sammis Plant/Jefferson	2,250,417
7. Energizer Battery Mfg. Inc./Washington	2,127,436
8. DuPont Electronic Polymers/Montgomery	1,993,091
9. Arcelormittal Cleveland LLC/Cuyahoga	1,499,692
10. Warren Steel Holdings LLC/Trubmull	1,353,582

* All data included.

PBT Chemicals

Persistent, bioaccumulative and toxic chemicals (PBTs) are highly toxic, long-lasting substances that can build up in the food chain to levels that are harmful to human and ecosystem health. They are associated with a range of adverse human health effects including effects on the nervous system, reproductive and developmental problems, cancer and genetic impacts. The challenge in reducing risks from PBTs stems from the chemicals' ability to travel long distances; to transfer among air, water and land; and to linger for generations in the environment. The populations especially at risk from PBTs such as mercury, dioxins and polychlorinated biphenyls (PCBs) are children and the developing fetus.

The PBT chemical list consists of 16 individual chemicals and 4 chemical categories. The chemical categories are dioxin and dioxin-like compounds, lead compounds, mercury compounds and polycyclic aromatic compounds (PACs). The four PBTs with the largest volume of reported releases, transfers and treatment in Ohio for 2013 were lead and lead compounds; PACs; mercury and mercury compounds; and benzo(g,h,i)perylene.

Overall releases and transfers of PBT chemicals increased 36.3 percent for reporting year 2013. There was a 5.8 percent increase (6,686 pounds) in releases of PBTs to the air.

In 2013, 783 Form Rs were submitted for PBT chemicals. Mercury and mercury compounds were reported by 86 facilities in 2013, compared to 88 in 2012. Reporting facilities include power plants, paper mills, steel works, refuse systems, glass manufacturing and electric light manufacturers.

A total of 492 reports were submitted for lead and lead compounds in 2013, compared to 485 reports for 2012. Lead and lead compounds were reported from nearly every major NAICS code classification required to report to TRI. EnviroSafe Services of Ohio Inc. (Lucas County) reported more than 878,000 pounds of lead and lead compounds released or disposed on-or off-site, while ArcelorMittal Cleveland LLC (Cuyahoga County) reported more than 208,000 pounds of lead and lead compounds released or disposed on-or off-site. Retrieval Technologies Inc. (Fairfield County) reported more than 21 million pounds of lead sent off-site for recycling.

Most PACs, including individually listed benzo(g,h,i)perylene, are constituents of fossil fuels. Other industrial processes that produce PACs include hot mix asphalt plants, asphalt roofing manufacturers, iron foundries, primary aluminum producers, coke ovens, pulp mills, Portland cement kilns and carbon black manufacturers. A total of 136 Ohio facilities reported PACs and/or benzo(g,h,i)perylene in 2012.

Dioxin and dioxin-like compounds were reported by 41 facilities, two facilities less than 2012. Those industries reporting dioxin and dioxin-like compounds include fossil fuel power plants, paper mills, foundries and petroleum refineries. Small quantities of dioxins are formed as a result of combustion processes, chlorine bleaching pulp and paper, certain types of chemical manufacturing and processing and other industrial processes.

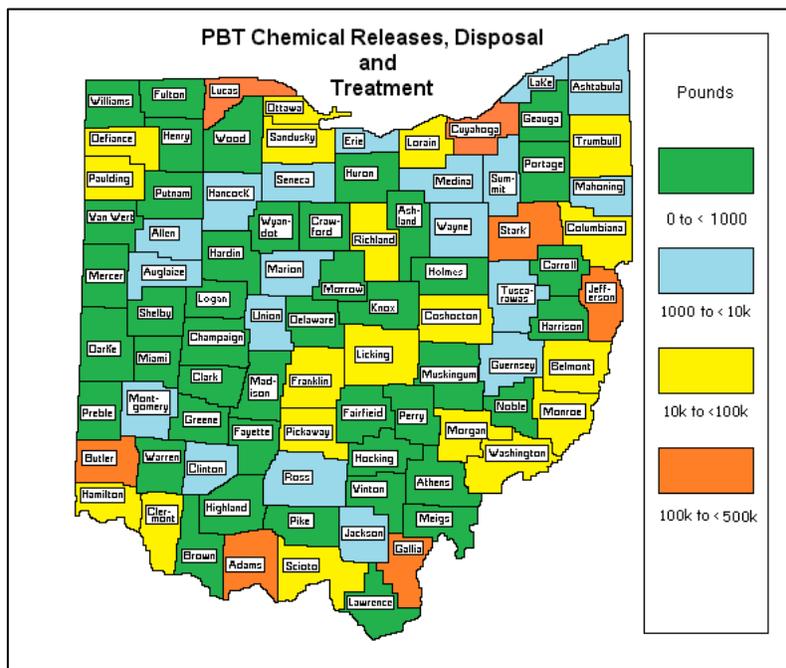
Pendimethalin is a selective herbicide used to control most annual grasses and certain broadleaf weeds in field corn, potatoes, rice, cotton, soybeans, tobacco, peanuts and sunflowers. It is also used on crops, residential lawns and ornamental shrubs and trees. The chemical was reported by five companies in Ohio: Turf Care Supply (Belmont County); Anderson Lawn Products (Lucas County); Ross Incineration Services (Lorain County); Scotts Co. (Wayne County); and The Scotts Company (Union County).

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PBT Chemical Releases, Disposal and Treatment for 2013

Top 10 Counties

County	Pounds
1. Lucas	889,258
2. Cuyahoga	478,733
3. Stark	164,730
4. Butler	164,114
5. Gallia	121,486
6. Jefferson	119,738
7. Adams	109,894
8. Pickaway	91,494
9. Trumbull	89,313
10. Belmont	86,942



PBT Chemical Release, Disposal and Treatment Summary†

PBT Chemical	Air	Water	Deepwell Injection	Land	POTW	Off-Site Disposal / Treatment
Aldrin	0.06	0	0	0	0	0.002
Benzo(G,H,I)perylene	784.8	33.12	0	1.39	1	1,868.19
Chlordane	4.74	0	0	0	0	649.08
Dioxin & compounds	31.803gr	2.156 gr	0	514.025 gr	0	144.612 gr
Heptachlor	2.52	0	0	0	0	495.53
Hexachlorobenzene	3.49	0	0	0	4	3,481.61
Isodrin	0	0	0	0	0	0
Lead & compounds	24,224.41	5,742.62	10,142	1,689,576.95	7,137.96	1,220,187.78
Mercury & compounds	4,004.76	301.14	49	8299.91	29.232	3,063.72
Methoxychlor	2.42	0	238	0	0	566.93
Pendimethalin	355	5.03	0	0	5	4,572.43
Pentachlorobenzene	131.05	0	0	0	0	143.7
PCBs	0	0	0	254.9	0.004	2,012.1
PACs	18,968.7	186.24	0	122.9	5.62	26,909.23
Tetrabromobisphenol A	0	0	0	0	0	0
Toxaphene	1.45	0	17	131	0	687.82
Trifluralin	100	0	0	0	0	0

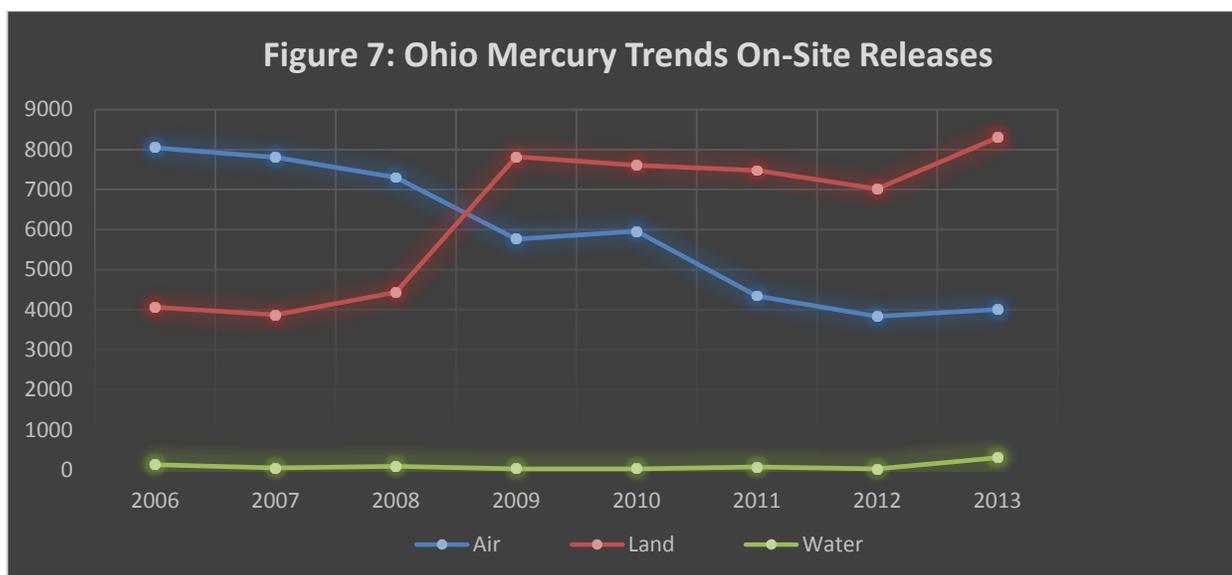
† Units are pounds unless specified otherwise

* All data included.

Mercury and Mercury Compounds

Mercury and mercury compounds were reported by 86 facilities, compared to 88 in 2012. Reporting facilities include power plants, paper mills, steel works, refuse systems, glass manufacturing and electric light manufacturers.

Facilities in Ohio reported an increase of 15.9 percent of on-site releases of mercury and mercury compounds. Ohio Valley Coal Co. (Belmont County) reported 2,538 pounds of mercury released on-site, American Energy Corp. (Monroe County) reported 2,473 pounds of mercury released on-site, and American Electric Power Gavin Plant (Gallia County) reported 1,690 pounds of mercury released on-site. ASHTA Chemicals Inc. (Ashtabula County) reported 3,648 pounds recycled off-site in 2013.

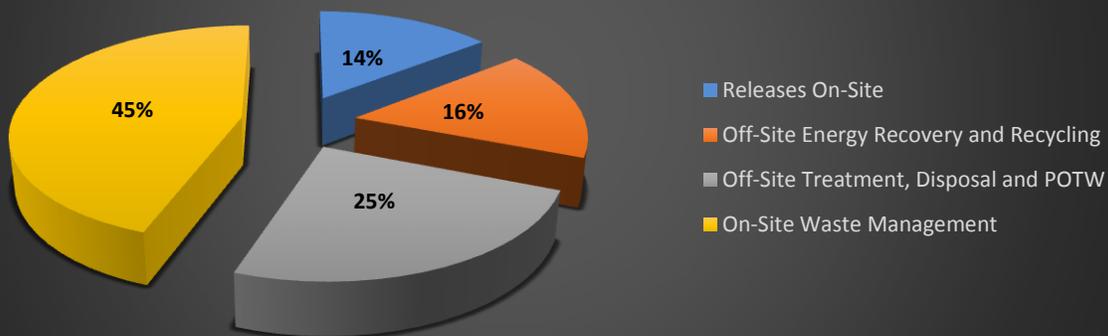


Management of TRI Chemicals in Waste

The Pollution Prevention Act (PPA) of 1990 required facilities to report information about the quantities of TRI chemicals in waste managed both on and off-site. The PPA established a hierarchy of waste management options in which source reduction is the preferred approach to manage waste. Source reduction is defined as a means of preventing waste from being generated. In situations where source reduction cannot be implemented, the preferred management techniques in order of preference are recycling, energy recovery and treatment.

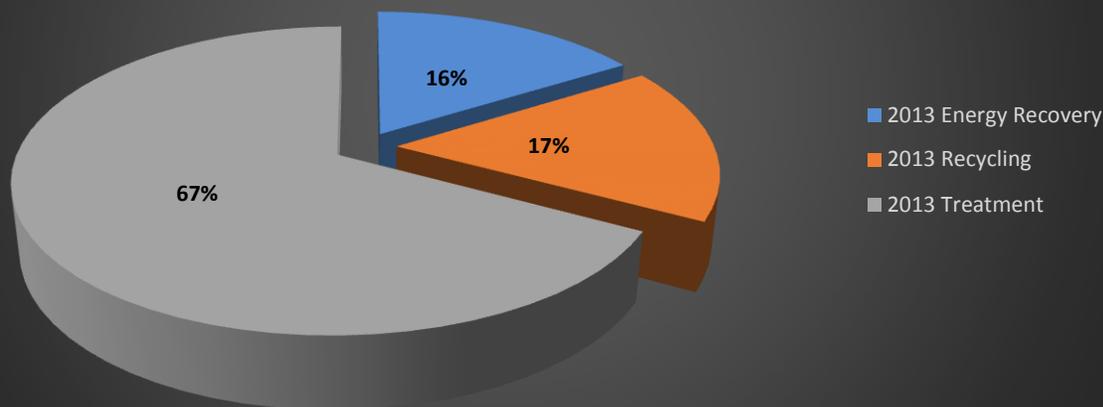
The TRI data can be used to analyze trends in total quantities of TRI chemicals to determine if facilities are reducing the amount generated. As reported under TRI, waste falls under one of four categories based on its final disposition. The first category is releases on-site, which include releases to air, water, deepwell injection and land on-site. The second is discharges to POTWs and transfers off-site for treatment and disposal. The third category is transfers off-site for recycling and energy recovery, and includes waste recycled or used as fuel. The fourth category is waste management on-site, which includes on-site treatment, recycling and energy recovery. The following provides the percentages of waste generated in these four categories. As illustrated by Figure 8, much of the waste never leaves the facility, but is managed on-site through treatment, recycling or energy recovery.

**Figure 8: Management Of Total Waste
(All industries and chemicals)**



The on-site waste management data, when combined with the amounts released on-site and transferred off-site, is important to understand the overall annual amount of waste generated by a facility.

**Figure 9: On-Site Waste Management
(All industries and chemicals)**



Nearly 205 facilities implemented source reduction activities during 2013 for more than 511 chemicals. Source reduction means any activity which: (1) reduces the amount of any chemical entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment or disposal; and (2) reduces the hazard to public health and the environment associated with releases of such substances. Source reduction includes equipment or technology modifications, process or procedure

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modifications, reformulation or redesign of products, substitution of raw materials, and improvements to housekeeping, maintenance, training or inventory control. This continued level of source reduction by the reporting facilities demonstrates a commitment to continue to reduce toxic releases beyond environmental regulations.

Six codes that describe green chemistry and green engineering practices were first added to the list of source reduction activity codes in reporting year 2012. These codes fell into the good operating practices and raw material, process and product modifications categories. Approximately 16 facilities reported the new green codes for more than 22 chemicals.

Facilities also reported their production ratios or an activity index for the current reporting year as compared to the prior reporting year. This ratio is to demonstrate the relative (to the prior year) use of a particular toxic chemical. The production ratio (or index) must be based on some variable of production or activity, which reflects the toxic chemical usage. A ratio of 1.1 would indicate a 10 percent increase in production related to the reported chemical. In 2013, nearly 50 percent of TRI reports indicated an increase in production when compared to 2012 data. Table 4 indicates the changes in production reported by facilities covered by TRI.

Table 4: Changes in Production from 2012 to 2013

Change in Production (Production Ratio)	Number of Form Rs	Percent Reporting
Increase by \geq 30%	414	7.9%
Increase by \geq 20%, less than 30%	248	4.7%
Increase by \geq 10%, less than 20%	470	8.9%
Less than 10% increase	1501	28.5%
No Change	574	10.9%
Less than 10% decrease	943	17.9%
Decrease by \geq 10%, less than 20%	472	9.0%
Decrease by \geq 20%, less than 30%	286	5.4%
Decrease by \geq 30%	364	6.9%

National Perspective

Ohio, a leader in technology and industry, continues to represent a significant portion of the national TRI reporting industries and releases. Table 5 shows Ohio's national ranking for each type of release. The following tables are based on U.S. EPA's national database.

Table 5: Ohio's National Rank

National Rank In:	2011	2012	2013
Air Releases	2	3	3
Water Releases	7	10	13
Land On-Site Releases	12	14	14
Deepwell Injection	5	4	4
Reporting Facilities	1,366	1,341	1,372

Table 6: Number of Reporting Facilities

Number of Reporting Facilities – RY 2013		
Rank	State	Number of Facilities
1	Texas	1,718
2	Ohio	1,372
3	California	1,263
4	Pennsylvania	1,168
5	Illinois	1,085

Table 7: Top States for 2013 Releases

Medium	Rank	State	Release (pounds)
Air	1	Texas	62,581,108
	2	Louisiana	51,494,131
	3	Ohio	4,191,526
	4	Georgia	44,697,510
	5	Indiana	44,403,409
Water	1	Indiana	21,488,206
	2	Texas	15,418,719
	3	Georgia	14,143,796
	4	Alabama	13,060,646
	5	Louisiana	12,460,138
	13	Ohio	6,618,375
Land On-Site	1	Alaska	969,332,991
	2	Utah	516,797,034
	3	Nevada	363,966,077
	4	Arizona	66,628,990
	14	Ohio	26,636,090
Deepwell Injection	1	Texas	81,348,374
	2	Louisiana	44,284,492
	3	Florida	30,407,530
	4	Ohio	17,093,435
	5	Mississippi	15,282,172

Additional Information

Ohio EPA's Division of Air Pollution Control has the primary responsibility in Ohio for collecting, processing and distributing information submitted under TRI. Additional information not contained in this report is available to the public through the division's TRI program.

Information Requests

TRI information can be obtained electronically through one of the following web resources. If you cannot find the information you are looking for, or need more information, please send your request to Rich Boudier, Ohio EPA's public records manager. You can find more information about public records request and file reviews at: <http://www.epa.state.oh.us/portals/47/facts/records.pdf>

Web Resources

Ohio EPA TRI	epa.ohio.gov/dapc/tri/tri.aspx
U.S. EPA TRI	epa.gov/TRI/
U.S. EPA TRI Explorer	http://iaspub.epa.gov/triexplorer/tri_release.chemical
Toxnet	toxnet.nlm.nih.gov
Envirofacts	epa.gov/enviro/
RTK Network	rtknet.org

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