

Ohio EPA

1997

**Toxic Release Inventory
Annual Report**

Ohio Environmental Protection Agency
Division of Air Pollution Control

May 1999

Executive Summary

Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) provides for the collection and public release of annual Toxic Release Inventory (TRI) reports regarding the release of toxic chemicals into the community. Since the first TRI reports were made available to the public more than ten years ago, TRI has expanded to include more data on waste generation, and the list of reportable chemicals has nearly doubled. U.S. EPA has expanded reporting to include seven new industries. TRI reports from these new industries will be submitted for the first time in July 1999.

Since the first TRI reports were filed in 1988, facilities have made impressive strides toward reducing toxic chemicals usage, waste and releases. As of March 8, 1999, the Ohio EPA received TRI reports from 1,607 facilities. Now, examining 11 years of TRI data, we see smaller increases and decreases in the total releases and transfers reported.

A change in production or the methods used to manage waste by a few large facilities can result in significant changes in the TRI data. This report presents the 1997 TRI data, and examines these changes in the releases reported.

TRI is only a tool; the TRI data can be used in many ways, as long as the limitations of the data are understood. TRI provides the public with the ability to track toxic chemicals in their community, city, or county. The success of TRI relies on the public using the available information. Ohio EPA invites you to use the TRI data to become more informed about the releases within your community.

Environmental Medium	Amount Released in 1996 in lbs/yr	Amount Released in 1997 in lbs/yr	Percent Change
Releases to Air	70,857,041	67,577,546	-4.63%
Releases to Water	6,113,124	5,984,057	-2.11%
Deepwell Injection	13,680,825	11,584,640	-15.3%
Releases to Land On-site	28,351,737	26,470,035	-6.64%
Discharges to POTW	16,502,268	16,803,056	1.82%
Transfers Off-site for Disposal and Treatment	48,293,625	58,177,296	20.47%
Total Releases and Transfers	183,798,620	186,596,630	1.52%
Energy Recovery On-site	96,003,418	107,753,316	12.24%
Energy Recovery Off-site	40,746,914	37,034,487	-9.11%
Recycling Off-site	194,451,978	188,134,646	-3.25%
Recycling On-site	327,825,935	221,608,353	-32.4%
Treatment On-site	156,292,298	140,595,881	-10.00%
Number of Reporting Facilities	1,636	1,607	-1.77%

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WHAT IS THE TOXIC RELEASE INVENTORY?

The Toxic Release Inventory, or TRI, is a publicly available database that contains specific toxic chemical release and transfer information from manufacturing facilities. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), which Congress passed to provide information to the public about the presence and release of toxic and hazardous chemicals in communities. The first TRI reports were filed July 1, 1988, covering releases in calendar year 1987. The Pollution Prevention Act of 1990 expanded TRI to include mandatory reporting of additional waste management and pollution prevention activities. Each year, manufacturing facilities meeting chemical use thresholds must report estimated releases and transfers of toxic chemicals to U.S. EPA and to the state where the facility is located. The TRI chemical list includes more than 600 chemicals and chemical categories.

OHIO'S TRI PROGRAM

In 1988, the Ohio General Assembly passed the Ohio Right-to-Know Act, Substitute Senate Bill 367. This law provided for state implementation of EPCRA. Under this law, Ohio EPA is charged with the administration of Section 313 (Ohio Administrative Code 3745-100). The law gave Ohio EPA authority to enforce Section 313 and established filing fees for covered facilities to support the TRI Program. Ohio EPA's Division of Air Pollution Control coordinates the TRI Program.

Ohio EPA annually inspects approximately 100 facilities. In calendar year 1998, Ohio EPA resolved 14 enforcement actions against facilities which had not filed TRI reports.

WHO MUST REPORT

A facility is required to report if it meets each of the following requirements:

1. It has 10 or more full-time employees;
2. It is included in the Standard Industrial Classification codes 20 through 39 (Additional industrial sectors will report July 1999);
3. It manufactured or processed a reportable toxic chemical in quantities exceeding the thresholds established by EPA for that year, or it otherwise used 10,000 pounds or more of a reportable toxic chemical for that calendar year. The threshold amounts for manufacturing and processing a toxic chemical are 75,000 pounds for calendar year 1987, 50,000 pounds for calendar year 1988, and 25,000 pounds for calendar year 1989 and subsequent years.

Facilities must submit a Form R for any listed chemical used in amounts that exceed the reporting threshold, even if the chemical is not released to the environment. Facilities which generate less than five hundred pounds of a listed chemical which is released to the environment, treated, recycled, or used for energy recovery, and use less than one million pounds of the toxic chemical in a calendar year can file a certification statement or Form A instead of a full Form R.

FEDERAL FACILITIES

President Clinton issued an executive order under which federal facilities must comply with the planning and reporting provisions of EPCRA and the Pollution Prevention Act (PPA) of 1990. Executive Order #12856 requires all federal facilities that manufacture, process or otherwise use any listed chemical above the reporting threshold to submit a toxic chemical release inventory Form R. The first reports for federal facilities were submitted July 1, 1995 for calendar year 1994.

CHEMICALS

The list of reportable toxic chemicals has evolved since the enactment of Section 313. More than 600 toxic chemicals and 20 chemical categories are currently subject to reporting under Section 313. These chemicals vary widely in form (solid, liquid and gas) and in toxicity.

The Administrator of U.S. EPA has the authority to modify the list of chemicals that must be reported. Petitions to add and delete chemicals have been submitted by industry, environmental groups, and the state governors. U.S. EPA is currently evaluating chemicals which may be added or deleted from the list of reportable chemicals. Chemicals are removed from the list because they have not been shown to cause significant adverse human health or environmental effects. Chemicals which were delisted prior to July 1, 1998 were not required to be reported for calendar year 1997.

Prior to July 1, 1998, U.S. EPA removed two chemicals from the TRI chemical list: 2-bromo-2-nitropropane (bronopol) and 2,6-dimethylphenol. These changes had a minimal impact on the Ohio data, as only one facility in Ohio reported 2,6-dimethylphenol in 1996. The list of reportable chemicals can be obtained from Ohio EPA or US EPA, and is available on the Internet at www.epa.gov/opptintr/tri.

LIMITATIONS OF THE DATA

The user of the TRI data should be aware of the limitations of the data in order to accurately interpret its significance. The TRI data has some significant limitations:

- TRI covers only certain manufacturing industries. Many non-manufacturing industries release toxic chemicals into the environment. U.S. EPA has added seven additional non-manufacturing SIC codes, which will be reporting July 1, 1999.
- For reporting year 1997, TRI covers approximately 600 toxic chemicals and chemical categories. The TRI data does not represent all chemicals used by manufacturing industry.
- Releases are reported as total annual releases without reference to frequency or duration. The annual release totals alone are not sufficient to assess the health or environmental impact of the toxic chemical released.
- The majority of releases are based on estimates. Facilities are required to base releases on monitoring data when available; otherwise, estimates are used. Estimates result in significant variability among reporting facilities.
- High volume releases of relatively non-toxic chemicals may appear to be a more serious problem than lower volume releases of highly toxic chemicals, when just the opposite may be true. TRI data summaries must be interpreted with care.
- The TRI report contains information regarding the release of chemicals, not the public's exposure to the chemicals. Some chemicals break down when exposed to the environment. Some chemicals disperse rapidly when released into the environment, eliminating their threat to public health and to the environment. Other highly toxic chemicals may not disperse when released. Screening risk assessments must be completed before health and environmental assessments can be made.
- Some reported releases result in no potential exposure to the public. In particular, the disposal of toxic chemicals in underground injection wells does not expose the public since the material is injected thousands of feet into the ground. Also, off-site transfers may not expose the community to chemicals.
- Ohio EPA conducts extensive data quality efforts to make every attempt to ensure that the data compiled in this report accurately reflects the data reported by the facilities; however, we acknowledge the possibility of errors due to data entry or problems with the reporting software. Because the TRI data is based on estimates, facilities are encouraged to revise their reports when the estimates are improved. Revisions and corrections of these errors are entered into the Ohio TRI database on an ongoing basis.

TRI REGULATORY CHANGES

The TRI Program continued to grow and change during the past year and it appears that the expansion of the program will continue into coming years. The following list identifies the significant changes which U.S. EPA has finalized, or has formally proposed.

Chemical List Expansion: On November 28, 1994, U.S. EPA published the final rule which added 282 toxic chemicals and chemical categories to the list of reportable chemicals. Approximately 170 of these chemicals are active ingredients in pesticides. These chemicals were reportable beginning with calendar year 1995, with the first reports filed July 1, 1996.

Materials Accounting: U.S. EPA is examining additional data elements including throughput information to measure waste management. U.S. EPA published an advanced notice of proposed rule making (ANPR) on October 1, 1996 to seek comment on the addition of this information which includes the quantity of chemical used, the quantity remaining in the final product, and quantity remaining in the waste stream. This expansion may occur after the Facility Expansion.

Persistent and Bioaccumulative Toxic Chemicals

On January 5, 1999, U.S. EPA proposed to add certain persistent and bioaccumulative toxic chemicals to the list of chemicals reportable under TRI. The proposal includes a lower reporting threshold for these chemicals, and for the persistent and bioaccumulative toxic chemicals currently reportable under TRI. U.S. EPA is currently seeking comments regarding this expansion.

Small Source Exemption: On November 28, 1994, U.S. EPA finalized an exemption for facilities which generate a small quantity of waste. This exemption is the result of a petition submitted by the national Small Business Administration to exempt low level releases. The exemption applies to facilities which generate less than five hundred pounds of a listed chemical which is released to the environment, treated, recycled, or used for energy recovery, and use less than one million pounds of the toxic chemical in a calendar year. The facility would be permitted to file a certification statement instead of a full Form R. This exemption is also referred to as the alternative threshold. The first certification statements were accepted July 1, 1996. This alternate threshold reporting form is referred to as Form A.

Facility Expansion: On May 1, 1997, U.S. EPA finalized the addition of non-manufacturing industry sectors. Seven industrial groups were added: metal mining, coal mining, coal and oil-fired electricity generating facilities, commercial hazardous waste treatment facilities, chemicals and allied products (wholesale), petroleum bulk stations (wholesale), and solvent recovery services. Reports for these facilities will be filed July 1, 1999, covering calendar year 1998.

OHIO EPA MANAGEMENT OF TRI CHEMICALS

The availability of TRI data has increased awareness of toxic chemicals within Ohio, and has focused attention on the reduction and management of these chemicals. EPCRA does not mandate the control of toxic releases or require reduction of the releases of toxic chemical or chemical usage. There are numerous other programs within Ohio EPA that directly impact the management of TRI chemicals through the issuance of permits or through other regulatory or non-regulatory activities. Most releases reported under TRI are regulated through air, water, and/or land disposal permits. The following descriptions provide an understanding of how some of these programs contribute toward reducing TRI releases, waste generation, and the risks associated with toxic chemicals.

Pollution Prevention: The Office of Pollution Prevention (OPP) was established on July 1, 1993 as part of the state budget bill. OPP works with companies on a voluntary, non-regulatory basis to help them modify their operating processes to generate less pollution in a cost-effective and technically feasible manner. OPP provides several services to industrial facilities. OPP provides free on-site and other types of technical assistance for pollution prevention activities. Copies of hundreds of pollution prevention documents are available upon request and electronically through the World Wide Web at <http://www.epa.state.oh.us/opp>. OPP provides free assistance with completing pollution prevention plans; provides assistance in identifying and implementing pollution prevention credit projects to mitigate portions of environmental enforcement penalties in conjunction with other Ohio EPA Divisions and the Ohio Attorney General's Office. OPP provides low-interest loans (2/3rds of prime) from \$25,000 to \$350,000 to businesses and facilities with less than 500 employees on-site in conjunction with the Ohio Department of Development. OPP also provides recognition for pollution prevention efforts through the "Ohio Prevention First" voluntary pollution prevention planning program and the annual Governor's Awards program.

Division of Surface Water: Ohio EPA's Division of Surface Water (DSW) regulates industries which discharge toxic chemicals to Publicly Owned Treatment Works or POTWs through its pretreatment program. These industries are regulated by the community if the community has a state-approved pretreatment program, otherwise, Ohio EPA directly regulates these industries. In either case, significant industrial facilities are issued permits which contain discharge limitations as well as requirements for monitoring the waste streams. Noncomplying facilities face enforcement action by either the community or Ohio EPA.

DSW regulates surface water discharges in Ohio primarily through the issuance of National Pollutant Discharge Elimination System (NPDES) permits. Of the approximately 400 pollutants regulated by NPDES permits, 126 have been designated as priority pollutants under the Clean Water Act. Approximately 80 of these are TRI chemicals.

Division of Drinking and Ground Water: Ohio EPA's Division of Drinking and Ground Water (DDAGW) regulates facilities which use underground injection in Ohio. All deep injection wells are permitted and routinely monitored by Ohio EPA. These permits include stringent requirements for monitoring pressures, volumes injected, and mechanical integrity of the wells.

Division of Hazardous Waste Management: Ohio EPA's Division of Hazardous Waste Management (DHWM) regulates generators of hazardous waste and facilities which treat, store, or dispose of such waste. Ohio EPA assigns an identification number to hazardous waste handlers regulated under the Resource Conservation and Recovery Act (RCRA). Facilities using a surface impoundment to dispose of TRI chemicals may also fall under the regulations of the Clean Water Act and be regulated by the Division of Surface Water. Not all TRI chemicals are considered hazardous under RCRA. Some discharges to land may be considered solid waste, which is not regulated as hazardous. Large quantity generators and facilities that have a permit to treat, store, or dispose of RCRA-regulated waste must submit an Annual Hazardous Waste Report to DHWM.

Division of Air Pollution Control: Ohio EPA's Division of Air Pollution Control (DAPC) regulates new sources of toxic air emissions through the air permitting program. Each potential new source of air toxics undergoes a technical evaluation through which each toxic chemical's potential threat to human health and the environment is reviewed.

Six TRI chemicals are currently regulated under U.S. EPA's National Emission Standards for Hazardous Air Pollutants (NESHAP). They are benzene, asbestos, inorganic arsenic, vinyl chloride, beryllium and mercury. U.S. EPA creates NESHAP emission standards for air pollutants which may pose a serious health hazard on a national level, but are not covered by the National Ambient Air Quality Standards. The National Ambient Air Standards are levels of air quality established by U.S. EPA to protect the public and the environment. These levels have been adopted for ozone, lead, nitrogen dioxide, sulfur dioxide, particulate matter, and carbon monoxide.

The Clean Air Act Amendments of 1990 requires U.S. EPA to regulate 189 additional air toxic chemicals, 173 of which are on the TRI list. U.S. EPA regulates sources of air toxics by issuing maximum achievable control technology (MACT) standards for source categories of air toxics. U.S. EPA was mandated to issue MACT standards for 40 source categories by November 1992, with all categories covered in 10 years.

Section 112(r) of the Clean Air Act Amendments of 1990 created a risk management planning program. The purpose of these regulations is to prevent accidental releases of regulated substances and to reduce the severity of those releases that do occur. A facility is subject to the regulation if they have any listed regulated substance above a given threshold in a single on-site process. U.S. EPA estimates that the program affects approximately 1,700 facilities in Ohio. We anticipate that many of the facilities reporting under TRI will also report under 112(r). The risk management plans will be submitted in June 1999. Last year, legislation was passed through which Ohio EPA was granted authority to administer and enforce the program.

EXPLANATION OF TERMS

Discharge to Publicly Owned Treatment Works (POTWs) - A POTW is a wastewater treatment facility owned by a municipality or other unit of local government. Some TRI facilities generate wastewater which is transferred through pipes or sewers to a POTW. Treatment or removal of a chemical from the wastewater depends upon the nature of the chemical, as well as the treatment methods present at the POTW. Chemicals that are easily utilized as nutrients by microorganisms, or have a low solubility in water, are likely to be removed to some extent. Chemicals that are volatile and have a low solubility in water may evaporate into the atmosphere. Not all TRI chemicals can be treated or removed by a POTW. Some chemicals, such as metals, may be removed but are not destroyed, and may be disposed of in landfills or discharged into receiving waters.

Quantity Recycled Off-Site - This is the quantity of toxic chemical that was shipped for recycling, not the amount of chemical recovered at the off-site location.

Quantity Recycled On-Site - This is the quantity of toxic chemical recovered at the facility that generated it and made available for further uses.

Quantity Treated On-Site - This is the quantity of toxic chemical destroyed or converted to a chemical that is not reportable under TRI in on-site waste treatment operations.

Quantity Used for Energy Recovery - This is the quantity of toxic chemical that was combusted in some form of energy recovery device, such as a furnace or a boiler. The toxic chemical should have a heating value high enough to sustain combustion. The use of a chemical as a fuel constitutes energy recovery.

Releases to Air - Releases to air are reported as stack or fugitive emissions. Stack emissions are releases to air that occur through stacks, vents or other confined air streams. Fugitive emissions are releases that are not through a confined air stream. Fugitive emissions include evaporative losses from surface impoundments, spills, and releases from building ventilation systems.

Releases to Water - Releases to water include discharges to streams, rivers, lakes, and other bodies of water. Releases due to stormwater runoff are also reportable under TRI.

Releases to Land - Releases to land occur within the boundaries of the reporting facility. Releases to land included disposal of toxic chemicals in landfills, land treatment/application farming (in which a waste containing a listed chemical is applied to or incorporated into soil), surface impoundments (which are uncovered holding areas used to evaporate and/or settle waste materials), and other land disposal methods (such as leaks, spills, or waste piles)

Transfers Off-site for Treatment and Disposal - Waste transferred off-site for disposal is generally either released to land at an off-site facility or injected underground. Toxic chemicals transferred off-site for treatment may be treated through a variety of methods including neutralization, incineration, and physical separation. These methods result in varying degrees of destruction of the chemical.

Underground or Deepwell Injection - Underground injection is the contained release of a fluid into a subsurface well for the purpose of waste disposal. Class I wells are used to inject liquid hazardous wastes or dispose of industrial and municipal waste waters beneath the lowermost underground source of drinking water.

SUMMARY OF DATA

In 1997, 186 million pounds of toxic chemicals were reported as having been released to the environment and transferred off-site for treatment or disposal. The data presented for 1997, including the listings of top companies, chemicals and counties, reflects the TRI data as it was reportable July 1, 1998. Changes to the list of reportable chemicals create difficulties in presenting historical TRI data in an accurate and understandable form. This report presents the data in the following matter:

- Chemicals which were no longer reportable for calendar year 1997 have been excluded from all years' TRI data.
- U.S. EPA added 282 chemicals and chemical categories to the chemical list. These chemicals were reported for the first time for calendar year 1995 and are included in the data presented for 1995, 1996 and 1997. This addition is referred to as "Phase 1 Expansion."
- Releases for chemicals which were "redefined" were modified in this report to reflect the change if it did not require a case by case evaluation. Non-aerosol forms of hydrochloric acid are no longer reportable. Therefore, only air releases of hydrochloric acid were included in the TRI data presented in this report. Ammonia was "redefined" for calendar year 1994; only 10% of aqueous ammonia is now reportable. Because this change requires a case by case evaluation, past years' data was not modified. Ammonium nitrate was delisted for calendar year 1995. However, the ammonia portion is still reportable and the nitrate portion is reportable as nitrate compounds. Due to the change in the reporting requirement for ammonia in 1994, only ten percent of the ammonia portion of ammonium nitrate was reportable for calendar year 1995. Only ten percent of the ammonia portion of ammonium nitrate was included in the data presented in this report.
- To accurately represent trends in the toxic releases, the Phase 1 expansion chemicals and all chemicals which were "redefined" or delisted were not included in the calculation of trends for the executive summary and the figures representing trends within this report. Table 3A represents the TRI data as reportable in 1997. The changes summarized above were made to all years of data. Table 3B represents the TRI data as it was used to calculate trends. All Phase 1 expansion chemicals, delisted chemicals or "redefined" chemicals were excluded from this data, so that the historical trends analysis would reflect true changes in the reported releases and not reflect changes in the reporting requirements.
- Throughout this report, TRI data are referred to as "total releases and transfers." Total releases and transfers refer to on-site releases to air, water, land; deepwell injection; discharges to POTWs; and off-site transfers for treatment and disposal only. The Pollution Prevention Act of 1990 added the reporting of transfers off-site for recycling and energy recovery. For the purpose of this report, transfers for recycling and energy recovery are grouped separately from transfers for treatment and disposal.

Statewide totals of on-site releases, off-site transfers, and on-site waste management for reporting years 1987 to 1997 are provided in Table 1A and 1B. Table 1A represents the TRI data as reported by facilities. U.S. EPA routinely changes the list of reportable chemicals to add or remove chemicals. Table 1B does not include data from chemicals that have been delisted or chemicals that have been added or modified. Data on delisted, added, and modified chemicals are part of the public TRI database, and are included in Table 1A, but are excluded from Table 1B in order to allow for historical trend analysis.

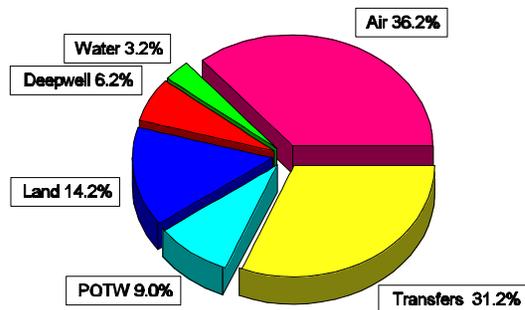
Table 1A: Summary of TRI Data in Millions of Pounds Per Year - All Reported Chemicals Including Phase 1 Expansion Chemicals

Environmental Medium	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Air	136.82	140.37	132.76	115.09	104.55	91.82	83.48	79.54	75.23	70.86	67.58
Water	7.77	4.68	5.95	5.87	5.98	4.76	4.76	1.20	5.82	6.11	5.98
Deepwell Injection	22.30	17.08	16.31	24.80	28.38	24.03	25.19	14.49	14.47	13.68	11.58
Land On-site	53.62	74.18	33.81	25.01	23.07	22.18	19.51	21.75	30.26	28.35	26.47
POTW	20.99	22.37	18.05	24.69	22.38	21.53	16.79	8.86	16.26	16.50	16.80
Transfers Off-site for Treatment & Disposal	211.46	210.91	104.35	81.81	53.15	58.63	60.57	47.35	46.16	48.29	58.18
Total Releases & Transfers	452.96	469.59	311.23	277.28	237.50	222.96	210.29	173.18	188.20	183.80	186.60
Off-Site Energy Recovery	NA	NA	NA	NA	36.15	34.38	28.25	37.21	38.10	40.47	37.03
On-Site Energy Recovery	NA	NA	NA	NA	103.43	106.84	104.33	95.23	90.47	96.00	107.75
Off-Site Recycling	NA	NA	NA	NA	153.65	189.95	205.46	229.63	222.05	194.45	188.13
On-Site Recycling	NA	NA	NA	NA	547.45	679.20	581.66	263.94	348.99	327.83	221.61
On-Site Treatment	NA	NA	NA	NA	448.99	487.77	383.26	266.57	162.82	156.29	140.60
Number of Reporting Facilities	1,397	1,611	1,774	1,795	1,760	1,766	1,774	1,750	1,692	1,636	1,607
Number of Form R's	5,524	6,342	6,514	6,554	6,339	6,224	6,157	5,752	5,084	4,852	4,587
Number of Form A's	NA	489	554	752							
No. of Chemicals Reported	171	177	181	182	182	185	191	184	234	223	213

**Table 1B: Summary of TRI Data in Millions of Pounds Per Year
Excluding Chemicals Which Were Not Reportable in All Reporting Years**

Environmental Medium	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Air	114.41	118.64	113.76	98.79	87.52	75.47	67.58	61.78	53.71	49.53	47.92
Water	1.42	1.35	1.46	0.57	1.46	0.79	0.55	0.63	1.16	1.49	1.04
Deepwell Injection	16.87	11.51	10.96	10.54	11.70	5.99	8.64	8.21	11.78	11.57	9.42
Land On-site	53.30	74.13	33.76	24.96	23.01	22.11	19.38	21.63	30.10	28.25	26.35
POTW	12.97	15.49	12.79	13.84	11.80	10.53	8.80	6.66	6.34	7.47	7.67
Transfers Off-site for Treatment & Disposal	182.31	164.77	77.16	62.88	37.47	37.57	35.39	39.34	44.25	46.20	56.38
Total Releases & Transfers	381.27	385.88	249.89	211.58	172.96	152.46	140.35	138.26	147.35	144.50	148.78
Off-Site Energy Recovery	NA	NA	NA	NA	36.14	34.38	28.25	37.21	37.51	40.25	36.38
On-Site Energy Recovery	NA	NA	NA	NA	103.42	106.66	104.15	95.05	82.76	87.19	98.14
Off-Site Recycling	NA	NA	NA	NA	138.68	173.78	187.18	214.32	220.31	192.98	186.45
On-Site Recycling	NA	NA	NA	NA	168.38	294.01	240.46	209.55	332.98	302.82	201.11
On-Site Treatment	NA	NA	NA	NA	155.26	186.66	173.66	124.56	132.71	138.25	124.65

Figure 1: 1997 Toxic Releases and Transfers
as reported for calendar year 1997



TRI TRENDS

From 1988 to 1995, Ohio facilities steadily decreased releases. In 1996 and 1997, total releases and transfers have increased slightly. There are several noteworthy differences between 1996 and 1997, as shown in Table 1B and Figure 2. Increases and decreases in releases can be attributed to many factors, including changes in production, a change in the product produced, and pollution prevention efforts made by facilities to decrease releases. Approximately 38% of facilities increased total releases and transfers, while 43% of facilities decreased total releases and transfers.

Air emissions decreased by 4.63% between 1996 and 1997. Several facilities contributed to this decrease. The facility with the largest impact was Elkem Metals, which reported a decrease in air emissions of over one million pounds.

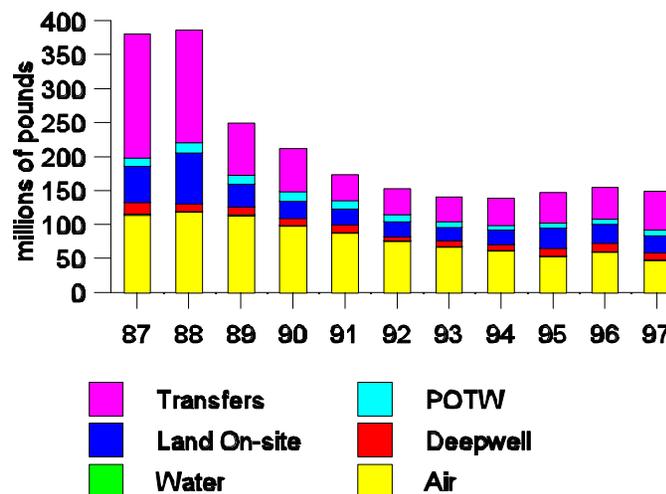
Releases to land on-site decreased by 6.64%. The facility contributing the largest reduction was GM Powertrain Defiance, reporting a decrease of nearly one million pounds. This decrease corresponded with a decrease in production in 1997.

Deepwell Injection decreased 15.3% between 1996 and 1997. Only two facilities reported on-site deepwell injection in 1997. Aristech Chemical closed its deepwell in May 1996, which accounted for an 800,000 pound reduction in 1997 deepwell injection. BP Chemical reduced its production in 1997, which resulted in a decrease of nearly 1.3 million pounds.

Transfers Off-site for treatment and disposal increased approximately 10 million pounds, or 20.47 percent between 1996 and 1997. Several facilities contributed to this increase, with three facilities reporting increases of more than one million pounds. The largest increase of 3.94 million pounds was due to Timken Co. Faircrest, who reported a change in waste management activities. This increase in transfers off-site corresponds to a decrease in the amount of waste sent off-site for recycling.

There were significant changes in the waste management activities reported under TRI. However, a limitation of this data is the lack of clear guidance from U.S. EPA regarding how to report waste management activities. Changes in the interpretation of the TRI requirements by facilities result in significant changes in the data reported. U.S. EPA is developing on national guidance for waste management activities which should result in the data being consistently reported each year.

Figure 2: 1987 - 1997 TRI Trends



On-site recycling decreased by 32.4%. The largest reduction was reported by Elkem Metals (-101 million pounds). This reduction was due to a revised interpretation of recycling. Off-site recycling decreased 3.25% from 1996 to 1997. Two facilities, Delphi Packard Electric and Honda of America, reported decreases of 10.8 and 7.8 million pounds respectively. These changes were due a change in the interpretation of what is reportable as a waste. A toxic chemical being directly re-used without prior treatment is not required to be classified as a waste. The directly re-used chemical would therefore not be reported as recycled on the Form R. Both facilities reported the chemical as recycled off-site in the prior year. Offsetting these large reported decreases, nine facilities reported increases in recycling of more than one million pounds each.

Energy recovery on-site increased by 12%. This was primarily due to a production increase by Lafarge Corporation, who reported an increase of more than 12 million pounds. Off-site energy recovery decreased by 9%. The largest reductions were reported by Chemical Solvents (-5.5 million pounds), Perstorp Polyols (-2.9 million pounds), and BASF Corporation, (-2.1 million pounds). These changes were largely attributed to better calculations and the decreased use of toxic chemicals. In addition, a chemical previously sent off-site for energy recovery in 1996 was sold as product in 1997, and no longer considered a waste.

Approximately 262 facilities implemented source reduction activities during calendar year 1997. Source reduction means any activity which: (1) reduces the amount of any chemical entering any waste stream or released into the environment prior to recycling, treatment, or disposal; and (2) reduces the hazard to public health and the environment associated with the releases of such substances. Source reduction includes equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control. This continued level of source reduction by the reporting facilities demonstrates their commitment to continue to reduce toxic releases beyond environmental regulations.

Facilities also report 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 use of a particular toxic chemical. This 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% increase in production related to the reported chemicals. In 1997, 47.8% of the TRI facilities reported an increase in production. Table 2 represents the changes in production reported by facilities covered by TRI.

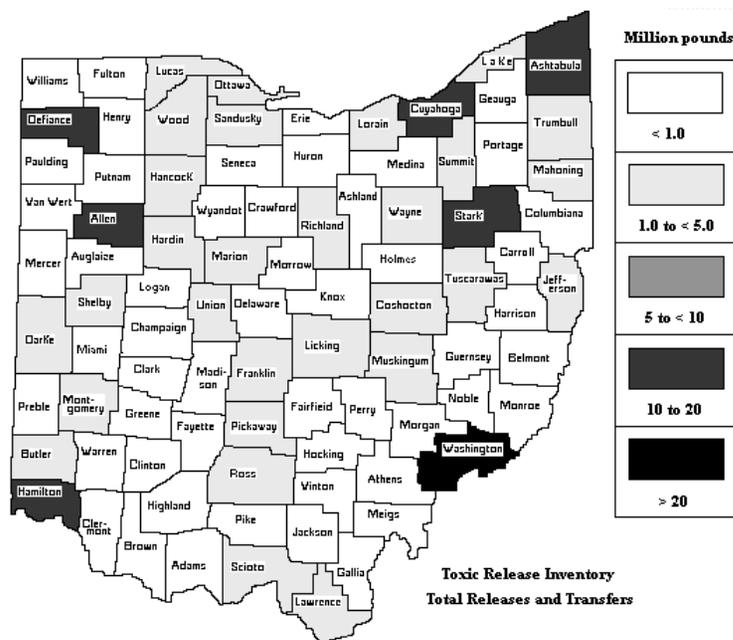
Table 2: Changes in Production from 1996 to 1997

Changes in Production (production ratio)	% of Reporting Industry
Production increased more than 30%	11.6
Production increased between 20% - 30%	5.9
Production increased between 10% - 20%	11.1
Production increased less than 10%	19.2
No change in production	6.4
Production decreased less than 10%	14.3
Production decreased between 10% - 20%	6.6
Production decreased between 20% - 30%	3.5
Production decreased more than 30%	7.3
Not reported	14.1

TOTAL RELEASES AND TRANSFERS FOR 1997

10 Top Counties

	<u>Counties</u>	<u>Pounds</u>
1.	Washington	23,352,639
2.	Allen	16,369,685
3.	Defiance	14,808,962
4.	Hamilton	11,952,654
5.	Stark	11,869,341
6.	Ashtabula	11,403,949
7.	Cuyahoga	11,134,252
8.	Franklin	4,962,359
9.	Coshocton	4,657,614
10.	Muskingum	4,207,040



10 Top Chemicals

	<u>Chemical</u>	<u>Pounds</u>
1.	Manganese & Compounds	28,645,157
2.	Zinc & Compounds	24,309,534
3.	Ammonia	14,024,769
4.	Nitrate Compounds	12,934,967
5.	Methanol	9,208,481
6.	Xylene - mixed isomers	5,702,408
7.	Certain Glycol Ethers	5,504,306
8.	Nitric Acid	5,356,870
9.	Carbonyl Sulfide	5,226,032
10.	Chromium & Compounds	4,727,164

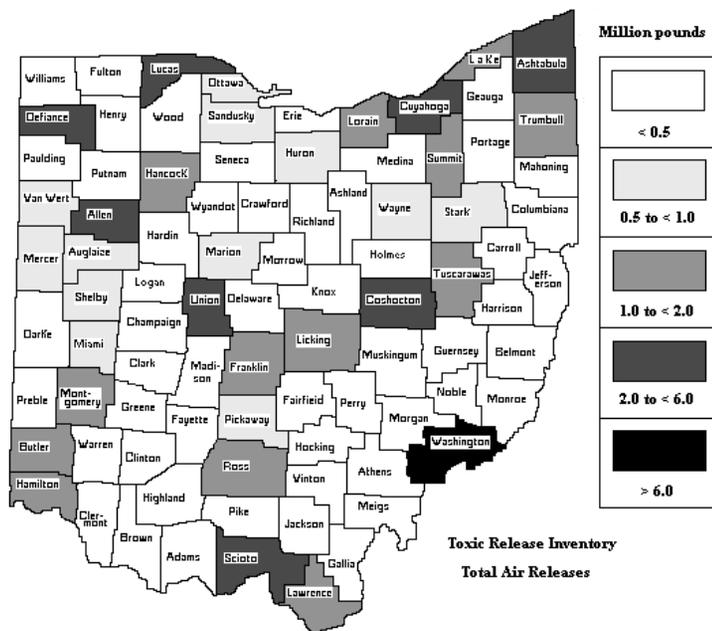
10 Top Facilities

	<u>Facility - County</u>	<u>Pounds</u>
1.	Elkem Metals Co. - Washington	15,811,776
2.	GM Powertrain Defiance - Defiance	13,424,906
3.	BP Chemical - Allen	11,933,925
4.	Millennium Inorganic Chem. Plant 2 - Ashtabula	6,500,892
5.	Timken Co. Faircrest Steel - Stark	5,502,201
6.	Millennium Inorganic Chem Plant 1- Ashtabula	4,004,225
7.	Armco Inc.- Muskingum	3,695,199
8.	Shepherd Chemical Co. - Hamilton	3,542,622
9.	Shell Chemical Co. - Washington	3,312,744
10.	Eveready Battery Co. - Washington	2,891,800

AIR RELEASES FOR 1997

10 Top Counties

<u>Counties</u>	<u>Pounds</u>
1. Washington	6,168,742
2. Ashtabula	5,492,031
3. Allen	4,133,746
4. Cuyahoga	3,678,214
5. Lucas	3,425,193
6. Scioto	2,510,577
7. Defiance	2,230,056
8. Union	2,228,195
9. Coshocton	2,132,793
10. Summit	1,920,167



10 Top Chemicals

<u>Chemical</u>	<u>Pounds</u>
1. Ammonia	10,789,137
2. Carbonyl Sulfide	5,226,032
3. Xylene - mixed isomers	4,976,816
4. Methanol	4,123,451
5. Certain Glycol Ethers	4,050,749
6. Methyl Ethyl Ketone	3,909,759
7. Toluene	3,686,100
8. n-Hexane	2,699,985
9. Hydrochloric Acid	2,698,010
10. Dichloromethane	1,994,197

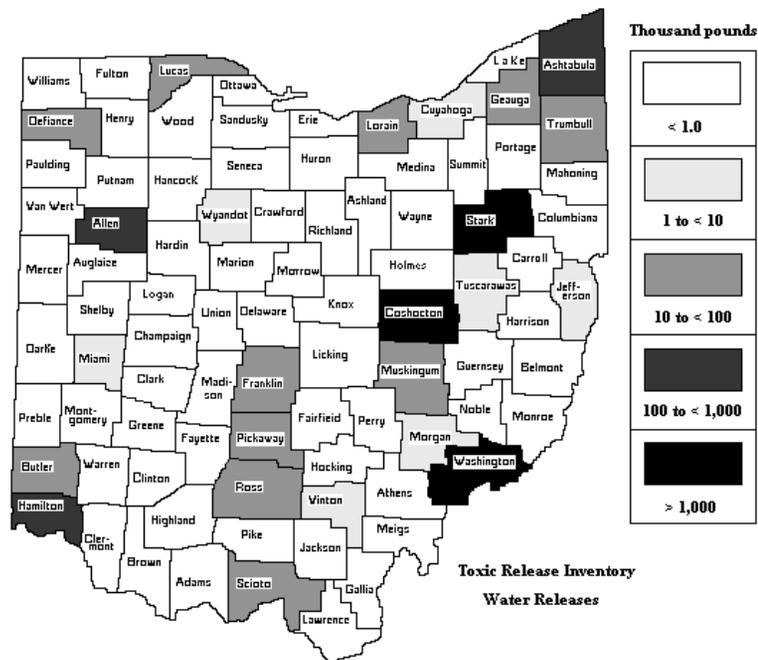
10 Top Facilities

<u>Facility - County</u>	<u>Pounds</u>
1. Elkem Metal Co. - Washington	4,424,776
2. Millennium Inorganic Chemicals Plant 2 - Ashtabula	3,510,892
3. PCS Nitrogen of Ohio LP - Allen	2,825,285
4. Owens-Corning - Licking	1,696,482
5. New Boston Coke Corp. - Scioto	1,680,290
6. Millennium Inorganic Chemicals Plant 1 - Ashtabula	1,604,225
7. Stone Container Corp. - Coshocton	1,534,804
8. Mead Fine Paper Div. - Ross	1,287,274
9. Scotts Co. - Union	1,200,390
10. Dow Chemical Hanging Rock - Lawrence	1,179,785

RELEASES TO WATER FOR 1997

10 Top Counties

Counties	Pounds
1. Coshocton	2,016,581
2. Stark	1,486,128
3. Washington	1,370,689
4. Ashtabula	343,453
5. Allen	141,360
6. Hamilton	131,581
7. Lorain	83,764
8. Franklin	65,313
9. Pickaway	53,686
10. Muskingum	51,628



10 Top Chemicals

Chemical	Pounds
1. Nitrate Compounds	4,459,413
2. Manganese & Compounds	805,251
3. Ammonia	404,628
4. Methanol	86,106
5. Sodium Nitrite	71,700
6. Diethanolamine	26,005
7. Ethylene Glycol	25,677
8. Barium & Compounds	18,175
9. Formaldehyde	15,241
10. Zinc & Compounds	14,148

10 Top Facilities

Facility - County	Pounds
1. Armco Inc. Coshocton Stainless - Coshocton	2,016,573
2. J&L Specialty Steel Inc. - Stark	940,218
3. Elkem Metals Co. - Washington	784,000
4. Shell Chemical Co. - Washington	520,849
5. Washington Steel Corp. Massilon Plant - Stark	437,282
6. Millennium Inorganic Chemicals Plant 1 - Ashtabula	200,000
7. Millennium Inorganic Chemicals Plant 2 - Ashtabula	140,000
8. BP Oil Co - Lima Refinery - Allen	92,500
9. Alliance Midwest Tubular - Stark	90,092
10. USS/Kobe Steel Co. - Lorain	82,250

DEEPWELL INJECTION FOR 1997

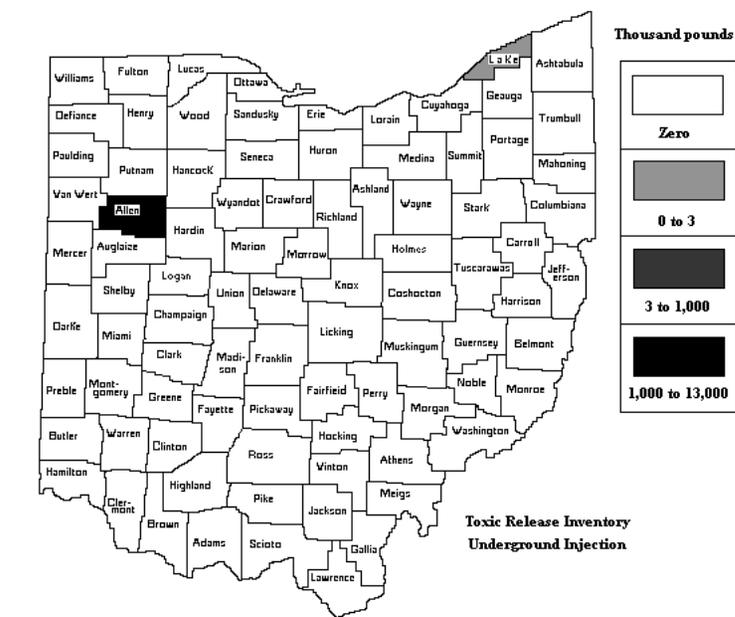
Counties

Counties	Pounds
1. Allen	11,582,920
2. Lake	1,720

Note - Only two facilities currently report on-site deepwell injection.

10 Top Chemicals

Chemical	Pounds
1. Acetonitrile	4,655,000
2. Ammonia	1,777,700
3. Acrylamide	1,600,000
4. Cyanides	1,089,000
5. Acetamide	630,000
6. Acrylic Acid	538,000
7. Acrylonitrile	490,000
8. Nitrate Compounds	355,000
9. Pyridine	121,000
10. Hydroquinone	80,000



Facilities

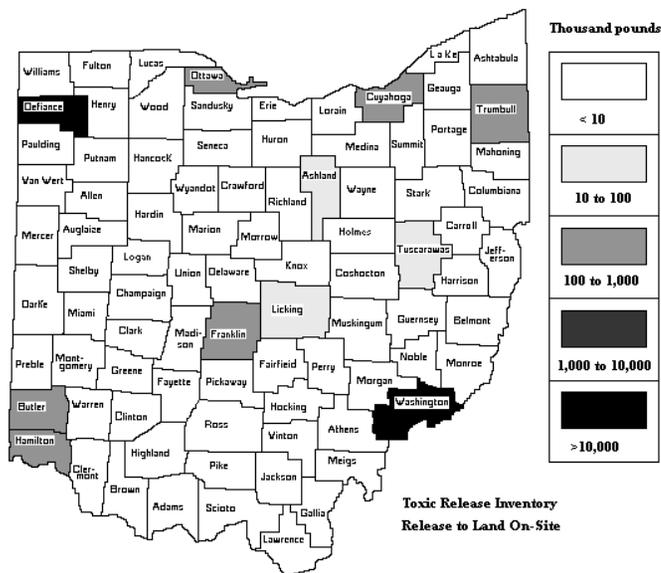
Facility - County	Pounds
1. BP Chemicals - Allen	11,582,920
2. Tomen Agro Perry - Lake	1,720

Note - Only two facilities currently report on-site deepwell injection.

RELEASES TO LAND ON-SITE FOR 1997

10 Top Counties

Counties	Pounds
1. Defiance	12,473,336
2. Washington	10,479,000
3. Franklin	933,647
4. Butler	629,125
5. Cuyahoga	629,085
6. Trumbull	615,994
7. Ottawa	327,828
8. Hamilton	156,200
9. Licking	83,726
10. Tuscarawas	58,400



10 Top Chemicals

Chemical	Pounds
1. Manganese & Compounds	13,344,582
2. Zinc & Compounds	10,820,028
3. Chromium & Compounds	899,511
4. Lead & Compounds	406,127
5. Copper & Compounds	382,622
6. 1,2,4-Trichlorobenzene	156,200
7. Formaldehyde	88,344
8. Ethylene Glycol	59,400
9. Ammonia	56,993
10. Nickel & Compounds	56,042

10 Top Facilities

Facility - County	Pounds
1. GM Powertrain Defiance - Defiance	12,405,339
2. Elkem Metals - Washington	10,479,000
3. Griffin Wheel Co. - Franklin	933,647
4. AK Steel Corp. Middletown Works - Butler	628,800
5. LTV Steel Co. Cleveland Works - Cuyahoga	626,480
6. WCI Steel Inc. - Trumbull	615,980
7. Brush Wellman Inc. - Ottawa	327,828
8. Phthalchem Inc. - Hamilton	156,200
9. Owens-Corning - Licking	83,206
10. Johns Manville International - Defiance	67,388

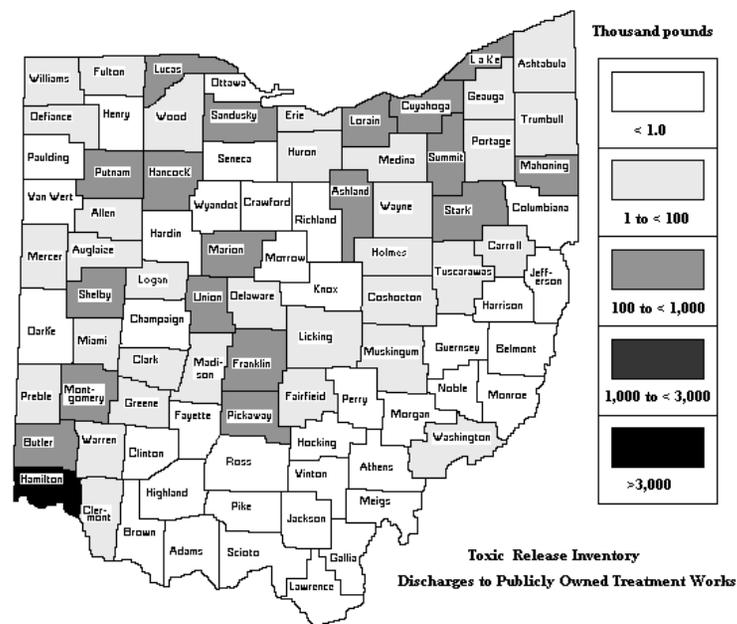
DISCHARGES TO POTW FOR 1997

10 Top Counties

<u>Counties</u>	<u>Pounds</u>
1. Hamilton	9,119,524
2. Franklin	988,299
3. Montgomery	983,907
4. Cuyahoga	770,086
5. Ashland	732,089
6. Mahoning	571,315
7. Hancock	441,608
8. Summit	379,950
9. Putnam	300,950
10. Shelby	229,236

10 Top Chemicals

<u>Chemical</u>	<u>Pounds</u>
1. Nitrate Compounds	7,701,920
2. Methanol	4,473,902
3. Certain Glycol Ethers	1,068,912
4. Ammonia	700,851
5. Phosphoric Acid	633,193
6. Sodium Nitrite	574,948
7. Formaldehyde	198,382
8. Ethylene Glycol	134,801
9. Potassium Dimethyldithiocarbamate	127,219
10. Barium & Compounds	117,732



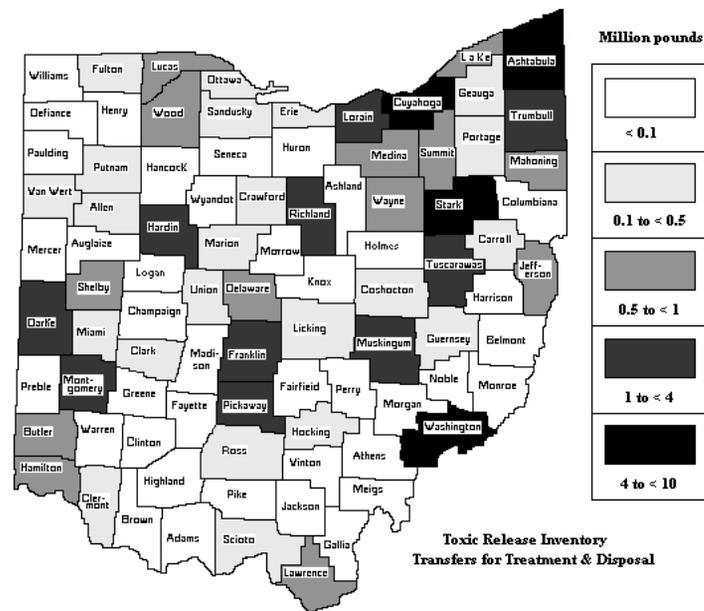
10 Top Facilities

<u>Facility - County</u>	<u>Pounds</u>
1. Shepherd Chemical Co. - Hamilton	3,528,257
2. Cincinnati Specialties - Hamilton	2,125,301
3. Henkel Corp. Chemical Group - Hamilton	1,181,311
4. GE Superabrasives - Franklin	760,413
5. Tremco Inc. Ashland - Ashland	710,000
6. Procter & Gamble Co. - Hamilton	670,360
7. BF Goodrich Hilton Davis - Hamilton	623,009
8. GE Austintown Products - Mahoning	570,580
9. GMTG Moraine Assembly - Montgomery	511,996
10. GE Chemical Products Plant - Cuyahoga	453,620

TRANSFERS OFF-SITE FOR 1997

10 Top Counties

<u>Counties</u>	<u>Pounds</u>
1. Stark	9,370,794
2. Cuyahoga	6,052,649
3. Ashtabula	5,565,214
4. Washington	5,249,228
5. Muskingum	3,899,845
6. Tuscarawas	2,297,239
7. Richland	1,523,625
8. Trumbull	1,454,867
9. Franklin	1,390,140
10. Pickaway	1,367,151



10 Top Chemicals

<u>Chemical</u>	<u>Pounds</u>
1. Manganese & Compounds	13,968,883
2. Zinc & Compounds	13,041,690
3. Nitric Acid	4,973,850
4. Chromium & Compounds	3,691,584
5. Lead & Compounds	2,420,669
6. Cyclohexane	2,040,825
7. Barium & Compounds	1,692,526
8. Aluminum (fume & dust)	1,578,859
9. Nickel & Compounds	1,458,530
10. Phenol	1,381,744

10 Top Facilities

<u>Facility - County</u>	<u>Pounds</u>
1. Timken Co. Faircrest Steel - Stark	5,490,280
2. Armco Inc. - Muskingum	3,485,350
3. Eveready Battery Co. - Washington	2,880,000
4. Millennium Inorganic Chemicals Plant 2 - Ashtabula	2,850,000
5. Millennium Inorganic Chemicals Plant 1 - Ashtabula	2,200,000
6. Shell Chemical Co. - Washington	2,121,385
7. Ford Motor Co. Casting - Cuyahoga	1,824,000
8. Armco Inc. Dover - Tuscarawas	1,324,958
9. Occidental Chemical - Hardin	1,270,012
10. American Steel Foundries - Stark	1,124,570

RELEASES BY INDUSTRY

Table 4 presents the TRI releases and transfers by industrial group or Standard Industrial Classification (SIC) codes. Facilities report their SIC codes on the Form R. Only manufacturing facilities in SIC codes 20 through 39 were required to report under TRI through 1997. U.S. EPA recently added seven additional SIC codes, which will be reporting for reporting year 1998. In addition, federal facilities are required to report to TRI under a presidential executive order. Federal facilities may fall in a variety of SIC codes, both within and outside of the manufacturing SIC code range. Federal facilities which fall outside of SIC codes 20 through 30 are grouped as "other" in Table 4.

In analyzing releases by industry, trends remain fairly constant. The industry groups with the largest quantities of TRI releases and transfers for treatment and disposal in 1997 were SIC code 33 - primary metals (67.6 million pounds) and SIC code 28 - chemicals (58.55 million pounds). TRI facilities submitted 4,587 Form Rs and 752 Form As. Form As are reports filed by facilities which generate less than five hundred pounds of waste. The following table represents the industrial categories and their reported releases and transfers under TRI.

The primary metals industry accounted for 14.6% of all facilities and 14.9 % of all forms; however, the industry accounted for 36.2% of the on-site releases, discharges to POTW, and transfers for treatment and disposal. The chemical industry accounted for 17.2% of all facilities reporting to TRI, 27.4% of all forms filed, and 31.4% of all on-site releases, discharge to POTW, and transfers for treatment and disposal. The industries with the largest quantities of transfers of TRI chemicals for treatment and disposal, or discharged to a POTW were chemicals (28.7 million pounds) and primary metals (25.69 million pounds).

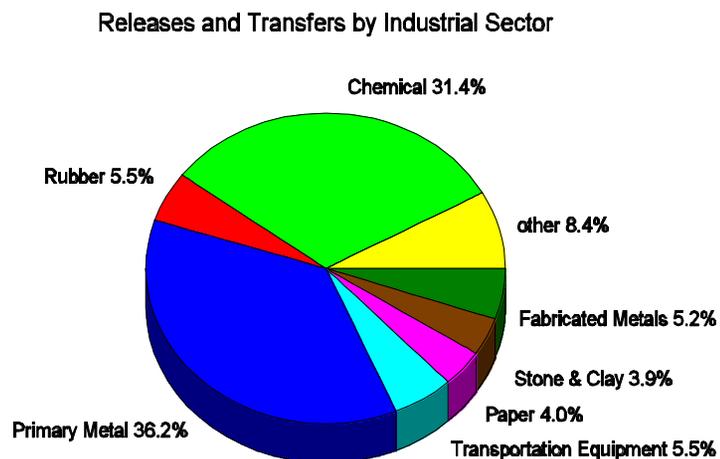


Table 4: Releases and Transfers by SIC Code

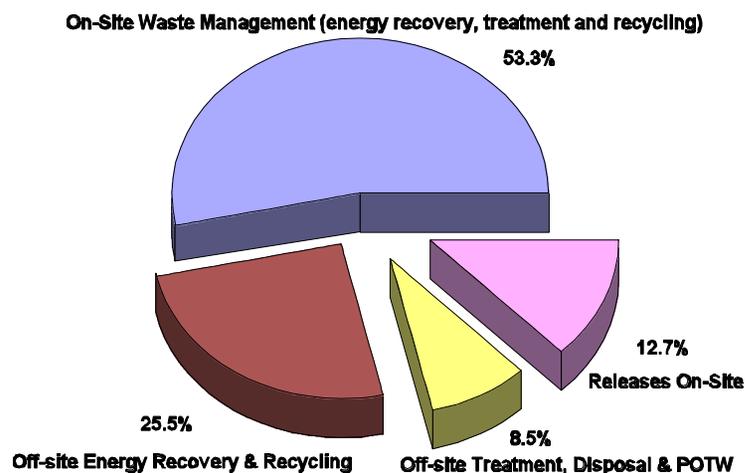
SIC Code	Industry Group	No. of Reporting Facilities	No. of Form Rs and Form As	On-Site Releases (Air, Water, Land On-site, and Deepwell Injection)	Discharges to POTW and Transfers Off-site for Treatment & Disposal	Transfers Off-site for Energy Recovery & Recycling	On-Site Recycling, Treatment, and Energy Recovery
20	Food & Kindred Products	72	130	2,341,035	523,048	567,617	2,168,807
22	Textile Mill Products	14	47	1,615,205	273,376	1,079,477	4,538,546
23	Apparel	5	18	140,678	42,200	89,974	600,295
24	Lumber & Wood Products	22	67	631,840	70,040	1,273,483	2,646,957
25	Furniture & Fixtures	8	15	260,136	163,936	631	500
26	Paper & Allied Products	33	123	6,702,846	707,469	1,872,347	23,914,325
27	Printing & Publishing	21	29	446,906	17,466	186,377	501,585
28	Chemicals & Allied Products	277	1,462	29,802,201	28,747,654	42,755,520	175,041,429
29	Petroleum Refining	20	109	673,368	115,009	132,675	20,879,482
30	Rubber & Miscellaneous Plastics	200	492	7,291,957	2,954,862	4,139,174	4,983,518
32	Stone, Clay, Glass & Concrete	78	204	4,782,224	2,467,211	3,436,375	134,650,835
33	Primary Metal Industries	235	794	41,914,032	25,686,530	82,602,300	50,772,002
34	Fabricated Metal Products	289	742	5,597,071	4,067,082	26,980,838	23,064,150
35	Industrial Machinery	105	303	870,100	1,186,583	7,847,927	1,962,831
36	Electronic Equipment	67	163	1,121,784	3,315,034	21,841,495	11,040,424
37	Transportation Equipment	125	536	6,937,419	3,353,097	26,066,904	9,682,999
38	Instruments and Medical Goods	13	20	62,340	198,718	1,173,905	22,508
39	Miscellaneous Manufacturing	20	62	367,132	822,871	2,651,033	3,381,391
other	Other	3	23	57,939	268,166	469,081	104,966

MANAGEMENT OF TRI CHEMICALS IN WASTE

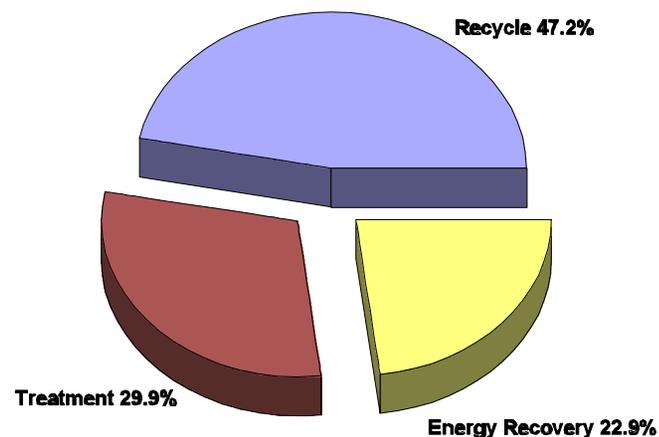
The Pollution Prevention Act (PPA) of 1990 required facilities to report information about the quantities of TRI chemicals managed in waste, both on-site and off-site. The PPA established a hierarchy of waste management options in which source reduction is the preferred approach to managing waste. Source reduction is defined as a means of preventing waste from being generated. In situations where source reduction cannot be implemented, the preferred pollution prevention 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 in waste to determine if facilities are reducing the amount of waste generated. As reported under TRI, waste falls under one of four categories based upon its final disposition. The first category is releases on-site, which includes releases to air, water, deepwell injection, and land on-site. The second category is discharges to POTWs and transfers off-site for treatment and disposal. The third category of transfers off-site for recycling and energy recovery, which 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 figures provide the relative percentages of the total amount of waste generated in these four categories. As illustrated by the pie chart, the majority of waste generated never leaves the facility, but is managed on-site through treatment, recycling, or energy recovery. The on-site waste management data, when combined with the amounts released on-site and transferred off-site, is important in understanding the overall annual amount of waste which is generated at a facility.

Management of Total Waste



On-Site Waste Management



THE 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 represents Ohio's national ranking for each type of release. Because the complete 1996 national data was not available prior to the drafting of this report, the complete national ranking for 1996 was not yet available. Tables 6 and 7 identify the top ranked states for 1997 TRI data based on US EPA's national TRI report.

Table 5: Ohio's National Rank

Environmental Medium	1995	1996	1997
Air	5	5	4
Water	10	7	9
Land On-Site	4	4	3
Deepwell Injection	4	4	4
Number of Reporting Facilities	1	1	1

Table 6: Top States for Number of Reporting Facilities

Number of Reporting Facilities in 1997		
Rank	State	Number of Facilities
1.	Ohio	1,589
2.	California	1,378
3.	Illinois	1,289
4.	Pennsylvania	1,222
5.	Texas	1,217

Table 6: Top States for Releases

Releases to Air in 1997			Releases to Water in 1997			Releases to Land On-Site in 1997			Deepwell Injection in 1997		
Rank	State	Emissions in pounds	Rank	State	Releases in pounds	Rank	State	Releases in pounds	Rank	State	Injection in pounds
1.	Texas	108,366,675	1.	Louisiana	46,909,318	1.	Montana	37,719,409	1.	Texas	89,929,406
2.	Tennessee	81,947,095	2.	Pennsylvania	38,517,920	2.	New Mexico	31,624,037	2.	Louisiana	54,243,582
3.	Louisiana	74,838,852	3.	Texas	20,788,710	3.	Ohio	28,674,261	3.	Florida	27,506,942
4.	Ohio	66,806,601	4.	Mississippi	11,945,812	4.	Utah	27,134,462	4.	Ohio	11,584,640
5.	Utah	65,561,602	5.	Florida	8,636,614	5.	Illinois	24,613,731	5.	Tennessee	9,273,267
			9.	Ohio	6,061,775						

ADDITIONAL INFORMATION

Ohio EPA's Division of Air Pollution Control (DAPC) 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 TRI Program located in DAPC.

- Access to hard copy reports - The reports submitted by facilities are available for review at Ohio EPA's office located at 122 South Front Street in Columbus from 8:00 a.m. to 5:00 p.m. Photocopies are also available.
- Information requests by telephone - TRI staff can take requests by phone to provide information on individual facilities. TRI information can be supplied by fax or by mail as either a hard copy or on a computer disk. Data searches and summaries can also be performed on the data. Call the TRI staff at (614) 644-2270 during business hours.
- Information through the Internet - The TRI staff maintains a TRI web site on Ohio EPA's web page. The complete Ohio database and an electronic version of this report can be accessed through the web page. The TRI data can be found at the following Internet address:
www.epa.state.oh.us/dapc/tri/tri.html
- 1997 Toxic Release Inventory Public Data Release - U.S. EPA's most recent annual TRI report is available. It covers information nationwide and provides a good perspective on how Ohio compares to other states. This report may be obtained by contacting U.S. EPA's hotline at 1-800-535-0202.

Questions or comments regarding TRI are welcome. Please direct questions, comments, or requests to:

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