

# Ohio EPA

1995

Toxic Release Inventory

Annual Report

Ohio Environmental Protection Agency

Division of Air Pollution Control

Toxic Release Inventory Program

April 1997

## 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. In 1988, the Ohio Right-to-Know Act charged Ohio EPA with the implementation of Section 313, establishing an annual filing fee, and establishing the authority to enforce Section 313. The Pollution Prevention Act of 1990 established new reporting requirements that supplement the annual TRI reports.

As of January 9, 1997, the Ohio EPA received TRI reports from 1,632 facilities. The following table represents the amount of toxic releases reported by Ohio facilities in 1994 and 1995. Three major changes were made to the list of reportable chemicals, which resulted in significant changes in the releases reported. U.S. EPA finalized the expansion of the list of chemicals reportable under TRI, adding over 280 chemicals and chemical categories. Non-aerosol forms of hydrochloric acid are no longer reportable. U.S. EPA redefined ammonia and ammonium nitrate, and the method for reporting ammonia releases. **For purposes of comparing the data and calculating the percent change with previous year's data, the following table does not include releases of hydrochloric acid, ammonia and ammonium nitrate and chemicals which were added to the list.**

Environmental Medium	Amount released in 1994 in lbs/yr	Amount released in 1995 in lbs/yr	Percent Change
Air	61,397,902	52,810,108	-14.8%
Water	632,621	570,719	-9.8%
Deepwell Injection	8,212,911	11,783,468	43.4%

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Land on-site	21,629,206	30,105,213	39.2%
POTW*	6,620,495	6,328,025	-4.4%
Transfers Offsite for Disposal and Treatment	39,579,385	43,879,321	10.9%
Total Releases and Transfers	138,072,520	145,476,854	5.4%
Number of Reporting Facilities	1,632	1,526	-5.2%

\* POTWs - Publicly Owned Treatment Works or wastewater treatment plants

Environmental Medium	lbs/yr in 1994	lbs/yr in 1995	Percent Change
Energy Recovery On-site	95,046,765	83,506,776	-12.1%
Energy Recovery Off-site	37,167,529	37,430,957	0.71%
Recycling On-site	213,096,727	218,727,891	2.64%
Recycling Off-site	209,525,953	329,639,499	57.33%
Treated On-site	124,479,928	131,862,990	5.93%

## Forward

This is the eighth annual Toxic Release Inventory (TRI) Report published by Ohio Environmental Protection Agency. This report presents the data submitted by manufacturing facilities and represents the releases and transfers of toxic chemicals during calendar year 1995. This report is not intended to be an interpretation of data relative to health and environmental risks or effects, but is a summary of the information available.

The TRI reporting requirements continue to change. The 1995 data includes an additional 282 chemicals and chemicals categories which were added by U.S. EPA. For the purposes of presenting trends in this report, the additional chemicals are not included. Chemicals which were removed from the list of reportable chemicals were also removed from the data presented for past years within this report.

TRI is a constantly changing body of information. Ohio EPA receives revisions from facilities and regularly enters these changes into Ohio EPA's database. The numerical data in this report includes submissions and revisions received by Ohio EPA before January 6, 1997. Updates to the database will begin again after this report is published.

The TRI data has become a significant tool for Ohio EPA in its efforts to improve the quality of our environment as demonstrated by the following actions:

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The Division of Air Pollution Control (DAPC) uses the TRI data to assist in identifying facilities that will be subject to new regulations, such as Section 112(r), the Emergency Preparedness and Response Program required by the Clean Air Act. The TRI data is used to evaluate industries compliance with recently adopted rules concerning toxic releases. The TRI data is used to focus efforts in ambient air monitoring evaluations, and to determine county-wide levels of toxics for air pollution studies. The Office of Pollution Prevention used the TRI data to identify the top 100 facilities that report the most releases of toxic chemicals to the environment and invite them to participate in Ohio Prevention First. Under this program, facilities voluntarily develop comprehensive pollution prevention plans. The Division of Surface Water (DSW) uses the TRI data in the development of water quality based effluent limits in the National Pollutant Discharge Elimination System (NPDES) permits. DSW's pretreatment program also uses the TRI data when developing indirect discharge permits. The data is screened to determine if additional pollutants need to be evaluated for possible inclusion in the permit.

The TRI data has been used to fill information requests from private citizens, legislators, journalists, schools, consulting firms, attorneys, business and trade associations, environmental groups, industry, and various state and federal agencies.

The TRI data is used by the public to raise awareness regarding the toxic chemicals released from manufacturing industries within their communities.

## **INTRODUCTION**

### **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 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 their estimated releases and transfers of toxic chemicals to U.S. EPA and to the state where the facility is located. The TRI list for 1995 includes over 600 chemicals and chemical categories, a substantial expansion of the 1994 list. A separate report, called a Form R, is required for each chemical the facility has manufactured, processed or otherwise used in amounts exceeding the thresholds.

### **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.

## **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;
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:

Calendar year 1987 75,000 pounds

Calendar year 1988 50,000 pounds

Calendar year 1989

and subsequent years 25,000 pounds

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. Ohio facilities submitted an average of three TRI reports, or three chemicals per facility. The reporting criteria are such that only large users of toxic chemicals are obligated to file.

## **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 or 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. Over 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

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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 August 1, 1996 were not required to be reported for calendar year 1995. A one month extension was provided in 1996 from July 1 to August 1 due to federal Agency budget shut down.

The most significant change to the chemical list occurred on November 28, 1995, when U.S. EPA published the final rule which added 282 toxic chemicals 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 due July 1, 1996. The addition of these chemicals resulted in significant increase in the total releases reported under TRI. For example, 41 facilities report nitrate compounds, which accounted for over 11 million pounds of releases and transfers. The new chemicals were not included in the data used for trends analysis.

Four recent changes to the chemical list significantly affected the releases reported for calendar year 1996. On June 30, 1995, non-aerosol forms of sulfuric acid were delisted. Air releases of sulfuric acid are reportable; however, releases to water, land, deepwell injection or transfers off-site are no longer reportable. On June 13, 1995, acetone was delisted. On June 30, 1995, ammonium sulfate was delisted, while the ammonia portion of ammonium sulfate continues to be reportable. Guidance on reporting of ammonia also was issued. Facilities using ammonia may now report only 10% of the total aqueous ammonia released. This option applies to aqueous ammonia only. On July 25, 1996, non-aerosol forms of hydrochloric acid were delisted. This delisting is similar to the delisting of non-aerosol forms of sulfuric acid. Tables 1 and table 2 identify the changes to the chemical list.

Table 1: Chemicals removed from the TRI list or redefined

Chemical	Effective Date	Chemical	Effective Date
Titanium dioxide	06/20/88	Glycol ethers (redefined)	07/05/94
C.I. Acid Blue 9	10/07/88	Hydrogen sulfide (stayed)	08/22/94
Melamine	03/29/89	Methyl mercaptan (stayed)	08/22/94
Sodium sulfate	06/20/89	Butyl benzyl phthalate	02/17/95
Sodium hydroxide	12/15/89	Copper phthalocyanine (redefined)	04/11/95
Aluminum oxide (non-fibrous)	12/14/90	Acetone	06/13/95
Terephthalic acid	12/10/90	Ammonia (redefined)	06/30/95
C.I. Pigment Blue 15	05/23/91	Sulfuric acid (non-aerosol)	06/30/95
C.I. Pigment Green 7	05/23/91	Ammonium sulfate	06/30/95
C.I. Pigment Green 36	05/23/91	Hydrochloric acid (non-aerosol)	06/30/95

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n-Dioctyl phthalate	10/05/93	Ammonium nitrate	07/25/96
Barium sulfate	06/28/94	bis(2-ethylhexyl) adipate	07/31/96
		diethyl phthalate	07/29/96

Table 2: Chemicals Added to the TRI List

Chemical	Effective Date	Chemical	Effective Date
2,3-Dichloropropene	12/01/89	Halon 2402	8/03/90
m-Dinitrobenzene	12/01/89	Halon 1211	8/03/90
p-Dinitrobenzene	12/01/89	Halon 1301	8/03/90
o-Dinitrobenzene	12/01/89	CFC-11	8/03/90
Allyl alcohol	12/01/89	CFC-12	8/03/90
Isosafrole	12/01/89	CFC-114	8/03/90
Creosote	12/01/89	CFC-115	8/03/90
Toluene diisocyanate	12/01/89	34 RCRA chemicals	11/30/95
Dinitro toluene - mixed isomers	12/01/89	282 chemicals & categories	11/28/95

**WHAT IS REPORTED?**

**FORM R**

Facilities report to U.S. EPA and Ohio EPA using the toxic chemical release inventory reporting form, or Form R. Facilities may submit the reports using hard copy forms or on diskettes. Ohio EPA received over 50% of the reports electronically. The following information is reported on Form R:

the name and location of the facility  
the wastewater discharge, hazardous waste and deepwell injection permit numbers  
the identity of the listed toxic chemical  
how the chemical was used at the facility  
the maximum amount of chemical stored on-site  
the amount of toxic chemical transferred off-site for disposal, treatment, energy recovery, recycling or reuse  
waste treatment methods and efficiencies  
identification of on-site recycling or energy recovery processes  
amount of chemical used for energy recovery, on-site and off-site  
amount of chemical recycled on-site and off-site  
amount of chemical treated on-site and off-site  
amount of chemical released due to remedial action or catastrophic events  
production ratios  
source reduction activities implemented during the calendar year.

**SMALL SOURCE EXEMPTION**

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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 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 allowed 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 permitted to be filed August 1, 1996 (reflects a one month extension). Ohio EPA received 481 certification statements from 223 facilities.

### COMPLIANCE

Under the Ohio Right-to-Know Act, Ohio EPA has the authority to enforce the TRI reporting requirements. Failure to file reports undermines the integrity of the TRI program by denying the public the right to know what is being released into the environment. Failure to comply with the reporting requirements can result in penalties of up to \$25,000 per day for each violation. Ohio EPA annually inspects approximately 100 facilities. In calendar year 1996, Ohio EPA resolved 13 enforcement actions against facilities which had not filed TRI reports resulted in the collection of over \$40,000 in civil penalties. In addition, administrative orders are used to incorporate pollution prevention projects into settlements when appropriate.

### EXPLANATION OF TERMS

**Energy Recovery** - Recovery of useful energy from waste.

**Facility** - Defined for the purposes of TRI reporting as all buildings, equipment, structures, and other stationary items which are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person.

**Fugitive or Non-point Air Emissions** - Releases to the air which are not conveyed through stacks, vents, ducts, pipes, or other confined air streams. Examples include equipment leaks from valves, pump seals, flanges, compressors, sampling connections, open ended lines, and evaporative losses from surface impoundment and spills.

**Manufacture** - To produce, prepare, import or compound a toxic chemical.

**Off-Site Locations** - Locations outside the boundaries of a facility to which wastes are transported for treatment or disposal. Examples include transfers of a waste to a landfill or an incinerator. Transfers off-site for recycling and energy recovery are also reported, but are presented separately in this report.

**Otherwise Use** - Any use of a toxic chemical at a facility which is not covered by the definitions of manufacture or process. This includes any activities in which a listed toxic chemical does not become incorporated into the final product. Examples of otherwise use include degreasers, solvents in paints which are applied to a product, chemicals used in water treatment, and coolants or refrigerants.

**POTWs (Publicly Owned Treatment Works)** - a wastewater treatment facility which is owned by a unit of the government.

**Process** - Refers to the preparation of a listed toxic chemical after its manufacture, for distribution in commerce. Processing is usually the intentional incorporation of a toxic chemical into a product. It includes making mixtures, repackaging, and using a toxic chemical as a feedstock, raw material or starting material for making another chemical.

**Releases to Land** - Refers to land filling, surface impoundment, land treatment/application farming, or any other release of a toxic chemical to land within the boundaries of a facility.

**SARA (Superfund Amendments and Reauthorization Act)** - the 1986 federal act that reauthorized superfund and established "Emergency Planning & Community Right-to-Know", including Section 313 or Toxic Release Inventory reporting.

**SIC Code (Standard Industrial Classification Code)** - A two or four digit number code designated by the federal Department of Commerce which identifies an industry or industrial grouping.

**Stack or Point Source Air Emissions** - Releases to the air which are conveyed through stacks, vents, ducts, pipes, or other confined air streams. Examples include storage tank emissions and emissions from control equipment.

#### LIMITATIONS OF THE DATA

The TRI data has some significant limitations:

1. TRI covers only certain manufacturing industries. Many non-manufacturing industries release toxic chemicals into the environment. U.S. EPA is considering adding specific SIC codes to the scope of the reporting requirements.
2. For reporting year 1995, TRI covers approximately 600 toxic chemicals and chemical categories. U.S. EPA has added 282 additional chemicals and chemical categories to the list of reportable chemicals. These additional chemicals were reportable beginning with reports covering releases in calendar year 1995. The TRI data does not represent all chemicals used by manufacturing industry.
3. 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.
4. 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.
5. High volume releases of relatively non-toxic chemicals may appear to be a more serious problem than

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lower volume releases of highly toxic chemicals, when just the opposite may be true. TRI data summaries must be interpreted with care.

6. The TRI report contains information regarding the release of chemicals, not the public's exposure to the chemicals. Some chemicals break down or detoxify when exposed to the environment, most disperse rapidly when released into the environment, eliminating their threat to public health and to the environment, while other highly toxic chemicals may not disperse when released. Screening risk assessments must be completed before health and environmental assessments can be made.

7. 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 population to chemicals.

8. Because the TRI data is based on estimates, facilities are encouraged to revise their reports when the estimates are improved. Revisions are entered into the Ohio TRI database on an ongoing basis. Likewise, revisions are submitted to U.S. EPA and the national database is updated. At any time, the two databases may not provide corresponding data due to delays in revision entry as well as data quality errors.

### 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. U.S. EPA is making the following changes:

**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.

**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 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.

**Facility Expansion:** On June 27, 1996, U.S. EPA proposed the addition of industry sectors such as energy production, materials extraction and distribution, waste management and transportation to TRI. USEPA believes that these industries have significant releases of TRI listed chemicals. U.S. EPA is currently meeting with industries to evaluate their TRI releases and assess the benefit of including these releases in TRI. U.S. EPA anticipates a proposal date of April 1997.

**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 rulemaking (ANPR) on

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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.

### **POLLUTION PREVENTION**

**Pollution Prevention** means the use of source reduction techniques, a secondary preference, to environmentally sound recycling. Pollution prevention avoids cross-media transfers of waste and/or pollutants and is multi-media in scope. It addresses all types of waste and environmental releases to the air, water and land.

The Ohio EPA **Office of Pollution Prevention** (OPP) was established on July 1, 1993 as part of the 1993-94 state budget bill. While the rest of Ohio EPA focuses on controlling pollution after it is generated through regulatory requirements, 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. The Office of Pollution Prevention provides the following services on an ongoing basis:

Provides free on-site and other types of technical assistance for pollution prevention activities and provided assistance to more than 2,700 companies, individuals and/or organizations during 1996. Copies of hundreds of pollution prevention documents are available upon request and electronically through the Internet/World Wide Web at <http://www.epa.state.oh.us/oepa.html>. 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. 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. Provides recognition for pollution prevention efforts through the "Ohio Prevention First" voluntary pollution prevention planning program and the annual Governor's Awards program. Coordinates the integration of pollution prevention activities into other Ohio EPA Divisions. The Office of Pollution Prevention also coordinates a number of specific activities to help companies prevent pollution and to integrate pollution prevention concepts into the other environmental programs at Ohio EPA. Some of these activities include:

**Ohio Prevention First:** In 1993, Governor George V. Voinovich targeted the top 100 facilities that report the most releases to the environment, and asked Ohio EPA to work with each one to develop a comprehensive pollution prevention plan. Eighty-six of the top 100 facilities are in this program. In addition, 76 other facilities have volunteered to develop pollution plans. To date, participating companies have committed to reduce 1.38 billion pounds of hazardous waste, 780 million pounds of solid waste, and 130 million pounds of the total waste generated, as reported under TRI, by the year 2000 from 1988 levels. Facilities have also estimated that more than \$15.2 million in cost savings will be realized through these efforts. Facilities can participate at the *Leadership* level which includes preparation of a comprehensive pollution prevention plan, or at the *Partnership* level, which includes completion of one or more pollution reduction activities.

**Pollution Prevention Technical Assistance:** During 1996, the Office of Pollution Prevention has

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provided technical assistance to more than 2,700 companies, organizations and/or individuals. Part of this effort included 38 site visits to help Ohio companies implement pollution prevention programs. The Office has also provided the information companies need to complete pollution prevention activities through the distribution of over 12,200 pollution prevention documents throughout Ohio. Companies interested in receiving non-regulatory pollution prevention technical assistance should contact the Office of Pollution Prevention at (614) 644-3469.

**Ohio EPA Pollution Prevention Strategy:** In 1993, Ohio EPA developed a pollution prevention strategy to change the focus of Ohio EPA environmental programs from pollution control to pollution prevention. The Office of Pollution Prevention worked with each program to increase pollution prevention activity. The Office of Pollution Prevention works with the other Ohio EPA programs to revise this strategy on an annual basis and provides assistance in implementing recommendations. In 1996, the Office completed an assessment of strategy implementation activities and provided a series of training events to encourage strategy implementation.

**Pollution Prevention Loan Program:** In November 1994, Governor Voinovich established a \$10 million fund to provide low-interest loans for pollution prevention to be jointly administered by Ohio EPA and the Ohio Department of Development. As of March 1997, 16 loans totaling \$3 million have been approved for projects that should result in an estimated reduction of 3.2 million pounds of pollution and recycling of 27.8 million pounds of materials.

**State of Ohio Green Lights Program:** Ohio is an active partner in the federal Green Lights program. Ohio is the first state in the Midwest and one of the first large industrial states in the nation to become a partner. The state is currently in the process of converting to energy efficient lighting in its state-owned buildings that will save four million dollars in energy costs annually. Ohio is actively promoting the Green Lights partnership to large energy users throughout the state and has provided technical assistance to 81 Ohio companies for the Green Lights program. Ohio is one of the only states to expand its Green Lights promotion beyond corporations to universities, hospitals, and other non-profit institutions.

## SUMMARY OF DATA

In 1995, 145 million pounds of toxic chemicals were reported as having been released to the environment and transferred off-site for treatment or disposal. Changes to the list of reportable chemicals create difficulties in presenting the TRI data in an accurate and understandable form. This report presents the data in the following manner:

Chemicals which were no longer reportable for calendar year 1995 have been excluded from all years' TRI data. The 282 chemicals and chemical categories were added to the chemical list, which were reported for the first time for calendar year 1995 and are included in the data presented for 1995. This effort was referred to as "Phase 1 Expansion". Releases for chemicals which were "redefined" were modified in this report to reflect the change, if the change 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. Ammonium nitrate was delisted for calendar year 1995, however, the ammonia portion is still reportable. Due to the change in the reporting requirement for ammonia in 1994,

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only ten percent of the ammonia portion of ammonium nitrate was reportable for calendar year 1995. Only 10 percent of the ammonia portion of ammonium nitrate was included in the data presented in this report. Ammonia was "redefined" and for calendar year 1994, only 10% of aqueous ammonia is reportable.

Because this change requires a case by case evaluation, past years' data was not modified to reflect this change. The data presented for 1995, including the listings of top companies, chemicals and counties, reflects the TRI data as it was reportable July 1, 1996. The above mentioned changes are reflected in this data. 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 1995. 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 trends analysis would reflect true changes in the reported releases and not reflect changes in the reporting requirements. Table 3A: Summary of Tri Data in Million of Pounds Per Year

Including All Reported Chemicals Including Phase 1 Expansion Chemicals

Environmental Medium	1987	1988	1989	1990	1991	1992	1993	1994	1995
Air	136.81	140.37	132.74	115.09	104.40	91.77	83.24	79.13	74.20
Water	7.77	4.68	5.95	5.87	5.97	4.76	4.76	1.20	3.44
Deepwell Injection	22.30	17.08	16.31	24.79	28.38	24.03	25.19	14.49	14.47
Land On-Site	53.62	74.18	33.82	25.01	23.07	22.18	19.51	21.75	30.26
POTW	20.99	22.37	18.05	24.69	22.37	21.52	16.78	8.82	16.00
Transfers Off-Site for Treatment & Disposal	210.49	210.89	104.33	81.77	53.14	58.58	60.33	47.59	46.63
Total Releases & Transfers	451.98	469.57	311.20	277.23	237.34	222.85	209.81	172.98	185.01
Off-Site Energy Recovery	NA	NA	NA	NA	36.15	34.35	28.24	37.17	38.02
On-Site Energy Recovery	NA	NA	NA	NA	103.42	106.84	104.33	95.23	91.21
Off Site									

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Off-Site Recycling	NA	NA	NA	NA	153.55	188.72	203.34	228.41	220.91
On-Site Recycling	NA	NA	NA	NA	547.45	679.20	581.65	263.92	345.74
On-Site Treatment	NA	NA	NA	NA	448.97	487.75	383.10	266.38	162.62
No. of Reporting Facilities	1,395	1,613	1,770	1,787	1,753	1,754	1,747	1,713	1,632 **
No. of Form Rs	5,519	6,338	6,505	6,545	6,326	6,205	6,111	5,695	4,983
No. of Certification Statements	NA	NA	NA	NA	NA	NA	NA	NA	481
No. of Chemicals Reported	171	177	181	182	182	182	185	177	223

\*\* includes Form R and certifications statements

Table 3B: Summary of Data in Millions of Pounds Per Year

Excluding All Phase 1 Expansion Chemicals, Delisted Chemicals, and Redefined Chemicals (Ammonia, Hydrochloric Acid, Sulfuric Acid)

Environmental Medium	1987	1988	1989	1990	1991	1992	1993	1994	1995
Air	114.40	118.64	113.74	98.78	87.37	75.41	67.53	61.40	52.81
Water	1.42	1.34	1.46	0.57	1.46	0.79	0.55	0.63	0.57
Deepwell Injection	16.87	11.51	10.96	10.54	11.70	5.99	8.64	8.21	11.78
Land On-Site	53.30	74.13	33.76	24.96	23.01	22.11	19.38	21.63	30.11
POTW	12.96	15.49	12.79	13.84	11.79	10.52	8.80	6.62	6.33
Transfers Off-Site for Treatment & Disposal	181.34	164.75	77.14	62.85	37.47	37.52	35.16	39.58	43.88

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Total Releases & Transfers	380.29	385.86	249.86	211.54	172.80	152.35	139.87	138.07	147.48
Off-Site Energy Recovery	NA	NA	NA	NA	36.15	34.35	28.24	37.17	37.43
On-Site Energy Recovery	NA	NA	NA	NA	103.41	106.66	104.15	95.05	83.51
Off-Site Recycling	NA	NA	NA	NA	138.58	172.55	185.05	213.10	218.73
On-Site Recycling	NA	NA	NA	NA	168.38	294.01	240.44	209.53	329.64
On-Site Treatment	NA	NA	NA	NA	155.26	186.66	173.65	124.48	131.86

Figure 1, using Table 3B data [A Pie Graph of 1995 Toxic Releases & Transfers](#)

**TOTAL RELEASES AND TRANSFERS**

The following tables, as well as the pie chart (Figure 1, prior page) represent releases to the air, water, and Publicly Owned Treatment Works (POTWs) and transfers off-site for disposal or treatment only. Transfers off-site for recycling or energy recovery are addressed at the end of this report.

Table 4: Top 10 Counties . . . . . Table 5: Top 10 Facilities

	County	Total Releases (lbs/yr)		Facility	County	Total Releases (lbs/yr)
1	Washington	20,930,470	1	Elkem Metals Co.	Washington	15,683,648
2	Allen	18,556,484	2	GMC Powertrain	Defiance	14,763,322
3	Defiance	15,889,006	3	BP Chemicals Inc.	Allen	13,583,455
4	Cuyahoga	13,948,523	4	SCM Chemicals Plant II	Ashtabula	5,227,167
5	Hamilton	11,742,066	5	Armco Advanced Materials	Muskingum	4,571,693
6	Stark	7,128,837	6	Shepherd Chemical Co.	Hamilton	3,569,814

## Ohio EPA

7	Ashtabula	7,105,940	7	Arcadian Ohio, L.P.	Allen	3,523,015
8	Franklin	7,063,099	8	American Steel Foundries	Stark	2,804,855
9	Muskingum	5,173,423	9	LTV Steel Co. Cleveland Works	Cuyahoga	2,771,065
10	Lucas	4,354,928	10	Eveready Battery Co.	Washington	2,215,900

Figure 2, [A graph of 1995 Total Releases & Transfers](#)

Table 6: Top 10 Chemicals

	Chemical	Total Toxic Releases (lbs/yr)
1	Manganese & Compounds	24,487,608
2	Zinc & Compounds	19,909,807
3	Ammonia	15,979,609
4	Nitrate Compounds	10,888,840
5	Methanol	9,311,045
6	Xylene (mixed isomers)	6,790,848
7	Glycol Ethers	6,240,834
8	Chromium & Compounds	5,959,581
9	Toluene	5,529,296
10	Methyl Ethyl Ketone	5,447,513

The first map of Ohio illustrates the number of companies reporting under TRI for the reporting year 1995. The second map illustrates the total releases and transfers reported for the reporting year 1995.

**Map 1 [Number of Reporting Facilities by County](#)****Map 2 [Total Releases and Transfers by County](#)**

**RELEASES TO AIR**

Facilities filing TRI forms reported total air emissions of 74 million pounds in 1995. The air emissions resulted in 40% of the total toxic releases and transfers for 1995. The reported air emissions can be divided into 2 categories: stack and fugitive emissions. Stack or point source emissions are releases to the air from a discrete source, such as a smokestack or vent. Fugitive or non-point air emissions are releases to the air that are not conveyed from ducts, stacks, or pipes. In 1995, Ohio facilities reported 20 million pounds of fugitive air emissions and 54 million pounds of stack or point source air emissions.

Table 7: Top 10 Counties . . . . . Table 8: Top 10 Companies

	County	Air Releases (lbs/yr)		Facility	County	Air Releases (lbs/yr)
1	Washington	6,466,101	1	Elkem Metal Co.	Washington	4,315,648
2	Allen	4,893,708	2	Arcadian Ohio LP	Allen	3,472,910
3	Ashtabula	4,502,441	3	SCM Chemicals Plant II	Ashtabula	2,901,864
4	Cuyahoga	3,608,914	4	Stone Container Corp.	Coshocton	1,871,510
5	Union	3,520,968	5	Owens Corning Fiberglass	Licking	1,804,177
6	Lucas	3,376,170	6	Scotts Co.	Union	1,770,740
7	Coshocton	2,545,373	7	Mead Fine Paper Division	Ross	1,655,000
8	Summit	2,531,044	8	Honda of America	Union	1,479,365
9	Lorain	2,403,785	9	Dow Chemical Co.	Lawrence	1,166,610
10	Hamilton	2,336,916	10	SCM Chemicals Plant I	Ashtabula	1,123,384

Figure 3 Total Air Releases

Table 9: Top Chemicals

Ohio EPA

	Chemical	Air Releases (lbs/yr)
1	Ammonia	11,999,589
2	Xylene (mixed isomers)	6,014,319
3	Toluene	5,068,473
4	Glycol Ethers	4,829,830
5	Methanol	4,733,268
6	Methyl Ethyl Ketone	4,514,886
7	Carbonyl sulfide	4,101,030
8	Hydrochloric acid	2,979,456
9	n-Hexane	2,902,046
10	Styrene	2,229,683

**Air Pollution Control in Ohio**

Ohio EPA's Division of Air Pollution Control (DAPC) regulates new sources of toxic air emissions through an 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.

Currently, the TRI data is used by DAPC to: (1) help focus efforts in ambient air monitoring evaluation, (2) help determine county-wide levels of toxics for county-wide air pollution studies, and (3) help provide base-line data for non-routine (explosion or fire) air pollution episodes. The TRI data is used to estimate the release volumes of particular industries when evaluating proposed new source regulations or process modifications. Also, the TRI database is used to evaluate the compliance of industries with recently adopted rules concerning toxic releases.

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 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. The TRI data will be used by U.S. EPA to prioritize sources of air toxics that should be regulated. As these regulations are developed and implemented, the TRI data will be used to monitor the reduction of air toxics in Ohio.

Ohio EPA

U.S. EPA intends to regulate 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. A facility may gain a six year extension from the MACT standard if it decreased its emissions by 90% (95% for particulates) prior to the proposal of the MACT standard.

For additional information regarding the air toxics program, contact Paul Koval, Supervisor, Air Toxics Unit, Division of Air Pollution Control, Ohio EPA (614) 644-2270.

Map 3 [\*Total Air Releases by County\*](#)

**DISCHARGES TO WATER**

The TRI reports include toxic chemicals discharged by facilities to surface waters, such as rivers, lakes, ponds, and streams. In 1995, TRI facilities discharged 3.4 million pounds of toxic chemicals into Ohio's bodies of water. Nitrate compounds, which were reportable for the first time, accounted for 2.4 million pounds or 71% of the reportable releases to water.

Table 10: Top 10 Counties . . . . . Table 11: Top 10 Facilities

	County	Water Releases (lbs/yr)		Facility	County	Water Releases (lbs/yr)
1	Stark	1,471,967	1	J&L Specialty Steel Inc.	Stark	1,400,700
2	Washington	833,384	2	Elkem Metals	Washington	603,000
3	Hamilton	302,767	3	Monsanto	Hamilton	290,079
4	Coshocton	286,922	4	Armco Inc. Coshocton Stainless	Coshocton	286,906
5	Allen	146,580	5	Amoco Performance Products	Washington	130,510
6	Pickaway	69,254	6	Shell Chemical Co.	Washington	99,451
7	Trumbull	61,434	7	BP Oil - Lima Refinery	Allen	96,470
8	Franklin	54,514	8	Du Pont Circleville	Pickaway	66,781

## Ohio EPA

9	Wayne	32,018	9	Alliance Tubular Products	Stark	60,269
10	Defiance	27,135	10	Kraft Foods	Trumbull	52,000

Figure 4 - Toxic Trends [Total Discharges to Surface Waters](#)

Table 12: Top 10 Chemicals

	Chemical	Water Releases (lbs/yr)
1	Nitrate Compds.	2,371,853
2	Ammonia	486,179
3	Manganese & Compds.	210,620
4	Methanol	165,180
5	Formaldehyde	87,019
6	Ethylene glycol	41,387
7	Zinc & Compds.	16,519
8	Diethanolamine	14,010
9	Formic acid	6,500
10	Chromium & Compds.	6,213

**WATER POLLUTION CONTROL**

Ohio EPA's Division of Surface Water (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. The DSW uses the TRI data in the development of water quality based effluent limits in the NPDES permits. When evaluating a facility, TRI data is screened to determine if pollutants that are present may have the potential to cause an environmental hazard. Such pollutants will be further evaluated for possible inclusion in the permit. The TRI data can be used to confirm the presence of pollutants of concern when reviewing water quality monitoring data or could

potentially flag a parameter that had not been previously monitored.

**What are nitrate compounds?** Nitrate compounds were added to the list of TRI chemicals and were first reported for calendar year 1995. Nitrate is the stable, most oxidized form of nitrogen found in the aquatic environment. Nitrates are formed through the treatment of ammonia, a compound which is a natural human waste product. Industrial wastewater discharges to a publicly owned treatment works may also contribute ammonia or nitrate.

Nitrates are a nutrient. Excessive amounts contribute to eutrophication in the aquatic environment, reducing the oxygen available to aquatic organisms such as fish and macroinvertebrates (such as shellfish, crayfish, water striders, dragon flies etc.). Elevated nitrates in drinking water may hamper the ability of an infant's blood to carry and release oxygen.

The following map illustrates the releases to water in 1995 by county.

Map 4 [Releases to Water by County](#)

**UNDERGROUND INJECTION**

Some facilities dispose of liquid chemical waste by injecting the waste deep underground. Although only reported by 3 facilities in Ohio, underground injection accounted for 8% (14.5 million pounds) of the total TRI releases and transfers. There are additional facilities that dispose of waste via underground injection, however, these facilities are not required to report under TRI. The delisting of liquid hydrochloric acid and sulfuric acid resulted in a significant reduction of reportable deepwell injection.

Table 13: Top Counties . . . . . Table 14: Top Facilities

	County	Underground Injection (lbs/yr)		Facility	County	Underground Injection (lbs/yr)
1	Allen	13,160,730	1	BP Chemicals	Allen	13,160,730
2	Scioto	1,279,981	2	Aristech Chemical	Scioto	1,279,981
3	Lake	29,007	3	Zeneca Inc. Perry Plant	Lake	29,007

Figure 5 [Deepwell Injection](#)

Table 15: Top 10 Chemicals

	Chemical	Underground Injection (lbs/yr)
1	Acetonitrile	4,300,000
2	Acrylonitrile	2,200,000
3	Ammonia	1,942,000
4	Acrylamide	1,600,000
5	Acrylic acid	780,000
6	Cyanide Compounds	770,000
7	Methanol	730,000
8	Nitrate Compounds	640,000
9	Acetamide	490,000
10	Phenol	350,000

### Underground Injection Control In Ohio

Ohio EPA's Division of Drinking and Ground Waters (DDAGW) regulates facilities which use underground injection in Ohio. All deep injection wells are individually permitted and routinely monitored by Ohio EPA.

These permits include stringent requirements for monitoring pressures, volumes injected, and mechanical integrity of the wells.

The following map illustrates the reported underground injection in each county.

Map 5 [\*Deepwell Injection by County\*](#)

### RELEASES TO LAND ON-SITE

Facilities dispose of solid and liquid chemical waste on-site by either depositing or burying waste. These facilities reported over 30 million pounds of toxic chemicals released to land on-site. The methods of disposal include: (1) landfills; (2) surface impoundments (ponds where liquid wastes are left to evaporate); (3) land treatment, land application or farming; and (4) other disposal which includes leaks and spills.

Table 16: Top 10 Counties Table 17: Top 10 Facilities

## Ohio EPA

	County	Land On-site (lbs/yr)		Facility	County	Land On-Site (lbs/yr)
1	Defiance	13,852,909	1	GMC Powertrain	Defiance	13,808,6180
2	Washington	10,714,000	2	Elkem Metals Co.	Washington	10,714,000
3	Cuyahoga	2,537,212	3	LTV Steel Cleveland Works	Cuyahoga	2,503,930
4	Franklin	1,009,700	4	Griffin Wheel	Franklin	1,009,700
5	Butler	685,897	5	AK Steel Middletown	Butler	684,247
6	Trumbull	640,700	6	WCI Steel	Trumbull	639,660
7	Ottawa	335,069	7	Brush Wellman	Ottawa	335,069
8	Licking	90,570	8	Owen-Corning	Licking	90,570
9	Lorain	86,360	9	USS Kobe Steel Co.	Lorain	86,360
10	Marion	85,321	10	Whirlpool Corp.	Marion	85,321

Figure 6 [\*Total Releases to Land On-Site\*](#)

Table 18: Top 10 Chemicals

	Chemical	Land On-Site (lbs/yr)
1	Manganese & Compounds	15,306,224
2	Zinc & Compounds	12,742,814
3	Chromium & Compounds	1,004,081
4	Copper & Compounds	387,125
5	Lead & Compounds	290,990
6	Sodium nitrate	78,450
7	Formaldehyde	78,432
8	Ethylene glycol	74,630

Ohio EPA

9	Phosphoric acid	61,753
10	Ammonia	58,596

Regulating Land Disposal In Ohio

Ohio EPA's Division of Hazardous Waste Management (DHWM) regulates generators of hazardous waste and facilities which treat, store, or dispose of such waste in landfills and surface impoundments. Ohio EPA assigns an identification number to every waste generating facility regulated under the Resource Conservation and Recovery Act (RCRA). Facilities using surface impoundment to dispose of TRI chemicals may also fall under the regulations of the Clean Water Act and may 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. Contact DHWM's Data Management Section at (614) 644-2977 for more information about this report.

The following map illustrates the land on-site releases in each county.

Map 6 [\*Releases to Land On-Site by County\*](#)

**DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTW)**

In 1995, facilities reported 16 million pounds of toxic discharges to Publicly Owned Treatment Works (POTWs) or public sewage treatment plants. Nitrate compounds, reportable for the first time in 1995, accounted for 7.7 millions pounds, or 49% of the discharge to POTWs. (Figure 7, below, does not include delisted, added or modified chemicals, such as nitrate compounds.)

Table 19: Top 10 Counties . . . . . Table 20: Top 10 Facilities

	County	Discharges to POTWs (lbs/yr)		Facility	County	Discharges to POTWs (lbs/yr)
1	Hamilton	8,089,779	1	Shepherd Chemical Co.	Hamilton	3,565,353
2	Franklin	2,446,921	2	GE Super Abrasives	Franklin	1,869,649
3	Montgomery	1,020,235	3	Cincinnati Specialities (PMC)	Hamilton	1,848,640
4	Cuyahoga	642,991	4	Hilton Davis	Hamilton	882,598
				GMC-Delphi		

## Ohio EPA

5	Mahoning	531,398	5	Harrison Thermal Systems	Montgomery	809,394
6	Ashland	431,580	6	Henkel Corp. Emery Group	Hamilton	790,900
7	Summit	414,262	7	GE Austintown Products Plastics	Mahoning	530,005
8	Shelby	301,915	8	Tremco Inc. Ashland	Ashland	427,559
9	Butler	244,495	9	GE Chemical Products Plant	Cuyahoga	424,640
10	Lucas	241,140	10	Abitec Corp.	Franklin	406,109

Figure 7 *Total Discharges to POTWs*

Table 21: Top 10 Chemicals

	Chemical	Discharges to POTWs (lbs/yr)
1	Nitrate Compounds	7,765,741
2	Methanol	3,309,802
3	Ammonia	1,356,470
4	Glycol Ethers	1,077,729
5	Sodium nitrite	341,493
6	Phosphoric acid	253,580
7	Allyl alcohol	191,310
8	Ethylene glycol	172,636
9	Formaldehyde	163,649
10	Potassium	160,000

## Regulating Discharges to POTW's in Ohio

Any reported discharge to a POTW must be interpreted carefully. The discharge leaves the facilities as part

of a wastewater stream, but it is not released directly to surface waters. Some toxic chemicals are passed through the POTW to a receiving stream. Depending on the chemical, POTWs are capable of removing as little as 30% or more than 99% of the chemical pollutant from a wastestream. In some cases, chemicals are transferred to other segments of the environment in the form of air emissions or sewage sludge.

Ohio EPA's Division of Surface Water (DSW) regulates industries which discharge toxic chemicals to POTW's 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. Non-complying facilities face enforcement action by either the community or Ohio EPA.

The pretreatment program uses TRI data when developing indirect discharge permits. The data is screened to determine if additional pollutants need to be evaluated for possible inclusion in the permit.

**Map 7 [Discharges to POTWs by County](#)**

**TRANSFERS TO OFF-SITE LOCATIONS**

Ohio facilities sent over 44 million pounds of toxic chemicals off-site in 1995. The fate of chemicals transferred to off-site facilities varies. The chemicals may be deposited in landfills, injected into underground wells, or treated to reduce the toxicity before being released to the environment. Therefore, the amount of chemicals transferred to off-site locations does not directly indicate the amount or type of chemical eventually released to the environment. The following tables contain transfers off-site for treatment and disposal only. The additional information on recycling and energy recovery are covered in the next sections.

Table 22: Top 10 Counties . . . . . Table 23: Top 10 Facilities

	County	Transfers Off-site (lbs/yr)		Facility	County	Transfers Off-site (lbs/yr)
1	Cuyahoga	7,154,087	1	Armco Advanced Material	Muskingum	4,472,083
2	Muskingum	4,991,397	2	American Steel Foundries	Stark	2,260,060
3	Stark	4,506,832	3	SCM Chemicals Plant II	Ashtabula	2,318,903
4	Washington	2,857,739	4	Eveready Battery Co.	Washington	2,205,000
5	Ashtabula	2,589,300	5	Ford Motor Co. Casting Plant	Cuyahoga	2,004,670

## Ohio EPA

6	Pickaway	2,179,502	6	Imco Recycling of Ohio Inc.	Tuscarawas	1,681,560
7	Shelby	1,872,713	7	Chemical Solvents Inc. Denison	Cuyahoga	1,534,265
8	Tuscarawas	1,762,353	8	Du Pont Circleville Plant	Pickaway	1,451,949
9	Franklin	1,528,138	9	Honda of America Mfg.	Shelby	1,102,420
10	Montgomery	1,042,871	10	Occidental Chemical Corp.	Hardin	781,646

Figure 8 *Total Transfers Off-Site*

Table 24: Top 10 Chemicals

	Chemical	Transfers Off-site (lbs/yr)
1	Manganese & Compounds	8,237,227
2	Zinc & Compounds	6,674,081
3	Nitric acid	4,928,668
4	Chromium & Compounds	4,772,641
5	Aluminum (Fume & Dust)	2,093,877
6	Lead & Compounds	1,818,174
7	Ethylene Glycol	1,428,020
8	Nickel & Compounds	1,120,975
9	Phenol	1,130,354
10	Hydrogen fluoride	1,094,558

Regulating Transfers Off-site in Ohio

Ohio EPA's Division of Hazardous Waste Management and Division of Solid and Infectious Waste Management regulate many of the facilities which generate and receive waste. Resource Conservation and Recovery Act (RCRA) regulations cover hazardous and solid waste, however, not all TRI chemicals are considered hazardous. Some facilities are "Small Quantity Generators" which are not required to file reports under RCRA, but are required to file reports under TRI.

### **Map 8 Transfers for Treatment & Disposal by County**

#### **Transfers Off-Site for Recycling/Reuse**

If a waste cannot be prevented through source reduction, the Pollution Prevention Act established recycling or reuse as the most desired alternatives. Over 220 million pounds of toxic chemicals were transferred off-site to be recycled or reused during 1995. Recycling or reuse can include solvent recovery, metals recovery and acid regeneration. The amount of toxic chemical reported as transferred off-site for recycling is the amount sent from the facility to be recycled. This amount does not reflect the quantity of toxic chemical recovered through the recycling process. Table 28 lists the top 10 toxic chemicals reported as being recycled off-site.

#### **Transfers Off-Site for Energy Recovery**

A toxic chemical which is combustible and has a heating value high enough to sustain combustion, may be used in a combustion unit that is integrated into an energy recovery system, such as an industrial furnace, industrial kiln, or boiler. This use of the chemical as a fuel constitutes energy recovery. Approximately 38 million pounds of toxic chemicals were transferred off-site for energy recovery. Table 26 lists the toxic chemicals which were reported as being used in the greatest quantities as fuel for energy recovery.

Table 25: Top 10 Chemicals Recycled Off-Site Table 26: Top 10 Chemicals Used for Energy Recovery

	Chemical	Recycled Off-Site (lbs/yr)		Chemical	Transfer Off-site Energy Recovery (lbs/yr)
1	Copper & Compounds	63,956,886	1	Xylene (mixed isomers)	11,916,337
2	Zinc & Compounds	38,022,295	2	Toluene	5,218,184
3	Lead & Compounds	34,995,196	3	Methyl Ethyl Ketone	3,564,675
4	Chromium & Compounds	29,953,594	4	Methanol	2,934,124
5	Manganese & Compounds	16,638,245	5	Ethylene glycol	1,632,524

## Ohio EPA

6	Nickel & Compounds	12,816,339	6	n-Butyl alcohol	1,584,333
7	Xylene (mixed isomers)	5,000,632	7	Ethylbenzene	1,561,196
8	Ethylene Glycol	3,152,563	8	Glycol Ethers	1,534,122
9	Toluene	2,184,710	9	Methyl Isobutyl Ketone	1,520,945
10	Methyl Ethyl Ketone	2,043,721	10	Cumene	994,861

**WASTE MANAGEMENT**

As reported under TRI, waste that is generated 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 is 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. This table identifies the amount of waste generated in these four categories by industrial classification.

SIC Code	Major Business Sector	Number of Reporting Facilities	Releases to On-site Air, Water Deepwell, & Land	Discharges to POTW & Transfers Off-site for Treatment & Disposal	Transfers Off-site for Energy Recovery & Recycling	On-site Waste Management (Treatment, Recycling, and Energy Recovery)
20	Food	71	2,634,379	724,744	102,897	2,131,824
22	Textiles	10	1,810,008	438,551	1,280,250	3,565,781
23	Apparel	5	133,340	59,351	38,460	495,670
24	Lumber & Wood	19	690,137	54,948	663,975	3,166,828
25	Furniture	7	240,916	160,500	27,975	26,010
26	Paper	32	8,454,077	674,144	1,994,290	25,930,211
27	Printing & Publishing	21	719,515	31,952	205,174	577,349

## Ohio EPA

28	Chemicals	288	33,105,661	22,229,494	41,535,804	184,793,306
29	Petroleum & Coal	24	664,152	79,345	144,810	3,816,233
30	Rubber & Plastics	205	7,960,857	2,475,989	2,569,888	122,272,099
32	Stone, Clay & Glass	80	3,684,875	3,326,083	3,152,341	166,391,629
33	Primary Metals	229	41,947,675	18,773,234	87,424,219	32,746,397
34	Fabricated Metals	311	6,700,449	5,561,736	25,424,219	3,060,943
35	Machinery (excluding electrical)	101	1,076,464	1,614,723	12,346,988	7,134,301
36	Electrical & Electronic Equip.	73	2,051,606	2,605,272	36,058,796	9,120,066
37	Transportation Equip.	117	9,58,413	3,674,776	41,749,204	134,191
38	Instruments	17	163,020	139,788	1,312,283	3,422,357
39	Miscellaneous Mfg.	15	393,574	17,703	2,664,522	58,100
	Federal Facilities	7	335,590	11	15,340	6,200
Totals		1632	122,373,758	62,642,344	258,932,342	599,575,029

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 figure on the left illustrates the statewide management of waste on-site. The on-site waste management data, when combined with the amounts released on-site and transferred off-site, are important in understanding the overall amount of waste which is generated at a facility annually.

***Management of Total Waste***

## *On-Site Waste Management*

### **Source Reduction**

Approximately 397 facilities implemented source reduction activities during calendar year 1995. Source reduction means any practice which : (1) reduces the amount of any chemical entering any waste stream or released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal; and (2) reduces the hazards to public health and the environment associated with the releases of such substances.

Source reduction includes equipment or technology modifications, process or procedure modifications, reformulations or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training or inventory control. It does not include any practice which alters the physical, chemical, or biological characteristics or the volume of a pollutant through a process or activity which itself is not integral to and necessary for the production of a product or the providing of a service. Methods used to identify source reduction activities include internal pollution prevention audits, external pollution prevention audits, state or federal government technical assistance programs, employee recommendations, team management, and trade association or industry technical assistance programs.

### **One-Time Releases**

Facilities reported one-time releases as the total quantity of toxic chemicals released directly into the environment or sent off-site for recycling, waste treatment, energy recovery or disposal during the reporting year due to: (1) remedial actions; (2) catastrophic events such as earthquakes, fires or floods; or (3) one-time events not associated with normal production processes. The purpose of this requirement is to separate releases associated with normal or routine production operations from those that are not. This requirement also separates the quantities that are more likely to be reduced or eliminated by process-oriented source reduction activities from those releases that are largely unpredictable and are less amenable to such source reduction activities. For example, spills that occur as a routine part of production can be reduced by improved handling procedures. These spills are not included in this section. A total loss of containment resulting from a tank rupture caused by a tornado would be included in the quantity reported in this section.

Although one-time releases are not associated with the production process, in many cases, these releases are authorized by the Ohio EPA. A facility would contact Ohio EPA when conducting a remedial action to clean up the environmental contamination resulting from past practices. Approximately 63 Ohio facilities reported 339,751 pounds released due to remedial actions, catastrophic events or one-time events not associated with production processes. Approximately 0.2% of the toxic releases reported under TRI are the result of one-time releases.

The one-time releases reported by Uniroyal Chemical in Painesville accounted for 45% of the one-time releases reported, or approximately 153,800 pounds of toxic chemicals. This reported one-time release was a direct result of the June 29, 1995 heat exchanger tube failure which resulted in the release of 153,800 pounds of 1,3-butadiene into the cooling water, which was then released to the environment over time. The facility has installed cooling tower monitors to prevent similar events from occurring.

### Production Ratio

Facilities are required to provide a current reporting year to prior reporting year production ratio or similar activity index. This is to demonstrate the relative use of the particular toxic chemical; whether recycled, used for energy recovery, treated, or disposed. This ratio or index may vary for different chemicals used within a facility. This ratio or index must be based on some variable of production or activity which reflects the toxic chemicals or material usage ( a ratio of 1.1 would indicate a 10% increase in production related to the Form R chemical). Indexes based on chemical usage may reflect source reduction rather than changes in business activity. Approximately 51% of the facilities reported an increase in production during 1995. Approximately 9% of the businesses did not report a ratio. Table 27 represents the changes in production reported by facilities covered by TRI.

Table 27: Production Ratio

Changes in Production (value indicated on form R)	% of Reporting Industry
Production increased more than 30% (1.3 +)	13%
Production increased between 20%-30% (1.2 - 1.3)	10%
Production increased between 10%-20% (1.1 - 1.2)	13%
Production increased by less than 10% (1.0 - 1.1)	15%
No change in production (1.0)	7%
Production decreased by less than 10% (0.9 - <1.0)	15%
Production decreased between 10% - 20% (0.8 - 0.9)	9%
Production decreased between 20%-30% (0.7 - 0.8)	4%
Production decreased more than 30% (< 0.7)	5%
Not Reported	9%

### 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 28 presents Ohio's national ranking for each type of release and transfer up to calendar year 1994. Because the 1995 national data was not available prior to the national data release, the national rankings for 1995 were not yet available.

Table 28: Ohio's National Ranking

## Ohio EPA

Environmental Medium	1987 Ranking	1988 Ranking	1989 Ranking	1990 Ranking	1991 Ranking	1992 Ranking	1993 Ranking	1994 Ranking
Air	2	2	3	3	3	4	4	5
Surface Water	11	12	9	5	4	6	4	12
Land On-Site	7	7	6	8	5	5	3	4
Underground Injection	5	4	4	6	6	7	5	7
POTW	8	10	7	6	2	7	7	9
Off-Site Transfers	2	1	1	3	2	3	2	3
Total Releases & Transfers for Treatment & Disposal	3	3	3	3	3	7	3	3
Number of Reporting Facilities	2	2	2	2	2	2	2	1

## Where the TRI Releases Occur

The following tables identify the top-ranked states for 1994 toxic releases and transfers (from U.S.EPA's 1994 TRI Annual Report).

Releases to Air		
Rank	State	RY 1994 pounds
1	Texas	127,035,162
2	Tennessee	92,272,213
3	Alabama	88,789,209
4	Louisiana	84,123,511
5	Ohio	79,097,065

## Releases to Water

Rank	State	RY 1994 pounds
1	Louisiana	22,548,999
2	California	4,258,256
3	Georgia	3,683,579
4	Illinois	3,147,040
5	Texas	2,719,512
12	Ohio	1,311,012

## Releases to Land On-Site

Rank	State	RY 1994 pounds
1	Florida	45,221,983
2	Montana	43,511,944
3	Arizona	25,148,267
4	Ohio	22,310,025
5	Illinois	21,279,269

## Discharges to POTW

Rank	State	RY 1994 pounds
1	New Jersey	33,192,402
2	Illinois	29,962,872
3	Texas	21,026,621
4	Missouri	20,076,933

## Ohio EPA

5	California	17,367,170
9	Ohio	9,578,101

**Total Releases & Transfers**

Rank	State	RY 1994 pounds
1	Texas	319,538,206
2	Tennessee	183,299,461
3	Ohio	179,575,834
4	Louisiana	163,148,208
5	Illinois	161,771,587

**Deepwell Injection**

Rank	State	RY 1994 pounds
1	Texas	106,410,443
2	Mississippi	57,032,511
3	Tennessee	56,071,774
4	Louisiana	42,382,121
5	Wyoming	20,073,524
7	Ohio	14,504,001

**Transfers for Treatment & Disposal**

Rank	State	RY 1994 pounds
1	Pennsylvania	74,700,976
2	Alabama	52,817,527

Ohio EPA

3	Ohio	52,766,630
4	Michigan	50,025,892
5	Texas	48,386,294

**Number of Reporting Facilities**

Rank	State
1	Ohio
2	California
3	Illinois
4	Pennsylvania
5	Texas

**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 within DAPC.

Access of hardcopy report - The reports submitted by facilities are available for review at Ohio EPA's office located at the Lazarus Government Center, 122 South Front Street in Columbus from 8:00 a.m. to 4:00 p.m., Monday through Friday. Photocopies may be obtained.

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) 644-4830 during business hours.

Information through the Internet - The TRI staff maintain a TRI site on Ohio EPA's web page. The complete Ohio database and copies of this report can be accessed through the web page. The TRI data can be found at the following Internet address: [www.ohio.epa.gov/tri/tri.html](http://www.ohio.epa.gov/tri/tri.html)

1995 Toxic Release Inventory Public Data Release - U.S. EPA's most recent annual TRI report. 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 toll-free hotline at 1-800-535-0202. (The anticipated publication date for the 1995 national data is July, 1997.)

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

Ohio EPA

TRI Program  
Ohio EPA/DAPC  
Lazarus Government Center  
122 South Front Street  
P.O. Box 1049  
Columbus, Ohio 43266-1049

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### **APPENDICES**

**Please call us at (614) 644-4830 to receive a copy of the appendices**