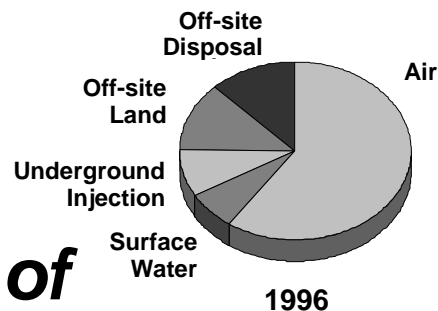

Chapter 2

National Overview of 1996 Toxics Release Inventory



Introduction

This chapter provides a summary of the information reported by facilities for calendar year 1996. This summary includes data for on- and off-site releases of TRI chemicals from the facility, on-site waste management of the chemicals, and transfers of the chemicals in waste to off-site locations for further management.

The chapter begins with a description of which release and other waste management categories are reportable to TRI; then describes information on toxicity and exposure considerations pertinent to use of TRI data. National, state, and chemical analyses of the 1996 data follow. Industry-specific analyses of 1996 TRI data appear in Chapters 4 through 10.

TRI Releases and Waste Management

Figure 2-1 illustrates on-site and off-site releases, on-site waste management activities, and transfers off-site for further waste management, as reportable to TRI. Box 2-1 describes reportable releases that may occur on-site at the facility or as a result of transferring chemicals off-site for disposal, and identifies types of activities that may contribute releases to various media. Box 2-2 lists

on-site waste management activities that are reportable to TRI. Box 2-3 describes transfers off-site for further waste management.

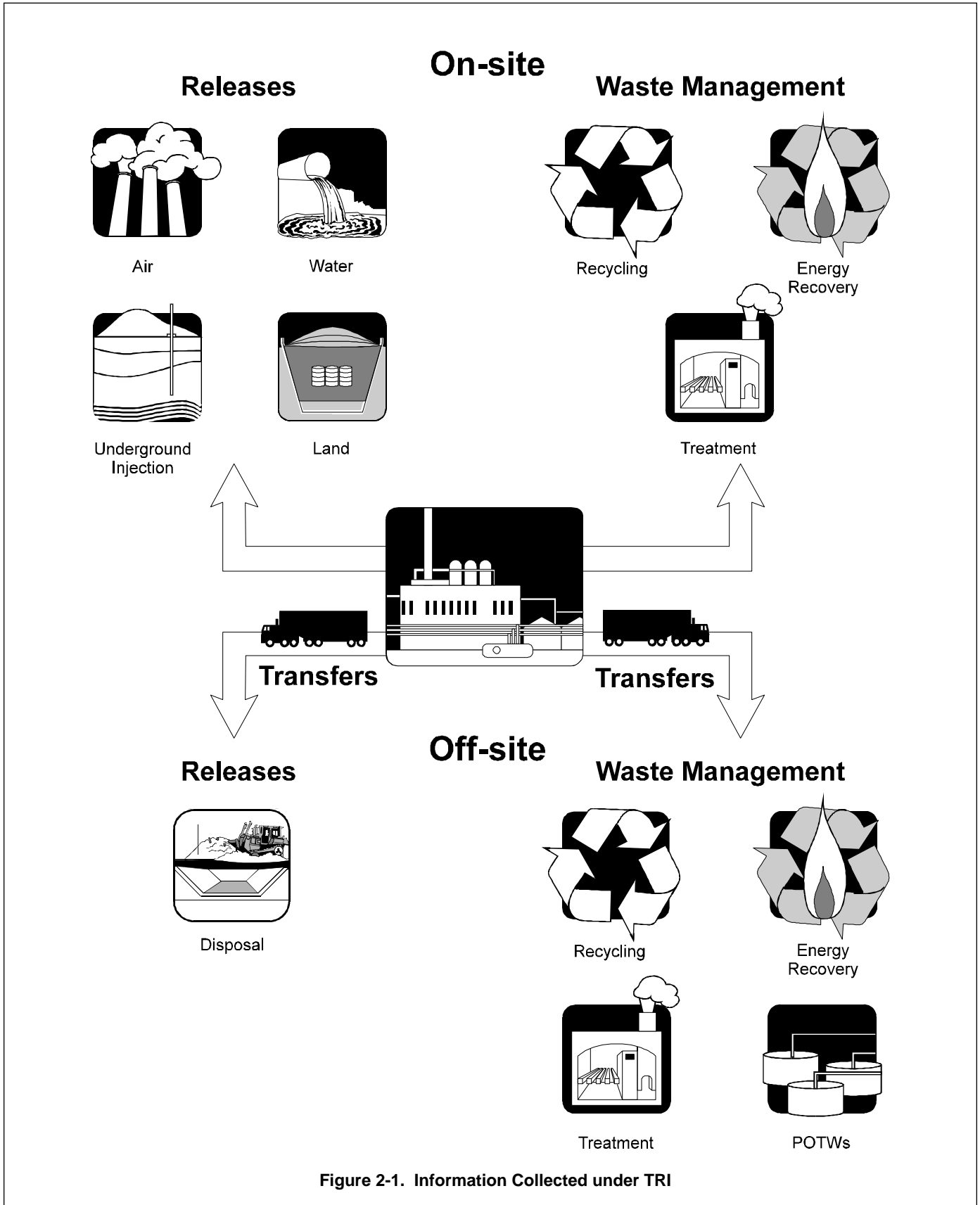
What to Consider When Using TRI Data

Users of TRI information should be aware that TRI data reflect releases and other waste management of chemicals, not exposures of the public to those chemicals. TRI data, in conjunction with other information, can be used as a starting point in evaluating exposures that may result from releases and other waste management activities which involve toxic chemicals. The determination of potential risk depends upon many factors, including the toxicity of the chemical, the fate of the chemical and the length of their exposure after it is released, and the human or other populations that are exposed to the chemical and the length of their exposure after its release. Listed below are some of the factors that should be considered when reviewing TRI data.

Toxicity of the Chemical

The TRI list consists of chemicals that vary widely in their ability to produce toxic effects.

- ◆ Some high-volume releases of less toxic chemicals may appear to be a more serious problem



**Box 2-1. An Explanation of On- and Off-site Releases****An Explanation of On- and Off-site Releases**

A release is a discharge of a toxic chemical to the environment. On-site releases include emissions to the air, discharges to bodies of water, releases at the facility to land, as well as into underground injection wells. Releases are reported to TRI by media type. Chemicals in waste transferred off-site for disposal are also released to the environment. On- and off-site releases thus include releases to the environment at the facility (reported in Section 5 for Form R) plus off-site transfers to disposal (reported in Section 6 of Form R).

Air Emissions. Releases to air are reported either as point source or fugitive emissions. Point source emissions, also referred to as stack emissions, occur through confined air streams, such as stacks, vents, ducts, or pipes. Fugitive emissions are all releases to air that are not released through a confined air stream. Fugitive emissions include equipment leaks, evaporative losses from surface impoundments and spills, and releases from building ventilation systems.

Surface Water Discharges. Releases to water include discharges to streams, rivers, lakes, oceans, and other bodies of water. This includes releases from contained sources, such as industrial process outflow pipes or open trenches. Releases due to runoff, including stormwater runoff, are also reportable to TRI.

Underground Injection. Underground injection is the subsurface emplacement of fluids through wells. TRI chemicals associated with manufacturing, the petroleum industry, mining, commercial and service industries, and Federal and municipal government related activities may be injected into Class I, II, III, V or V wells, if they do not endanger underground sources of drinking water (USDW), public health or the environment. The different types of authorized injection activities are described below:

- Class I industrial, municipal and manufacturing wells inject fluids into deep, confined and isolated formations below potable water supplies.
- Class II oil and gas related wells which re-inject produced fluids for disposal, enhanced recovery of oil, or hydrocarbon storage.
- Class III wells are associated with the solution mining of minerals.
- Class IV wells may inject hazardous or radioactive fluids directly or indirectly into USDW, only if the injection is part of an authorized CERCLA/RCRA clean up operation.
- Class V wells, which include all types of injection wells which do not fall under I-V, may inject only if they do not endanger USDW, public health or the environment. Class V wells are, generally, shallow drainage wells, such as floor drains connected to dry wells or drain fields.

Beginning with the 1996 reporting year, facilities separately report amounts injected into Class I wells and into all other wells.

On-site Land Releases. On-site releases to land occur within the boundaries of the reporting facility. Releases to land include disposal of toxic chemicals in landfills (in which wastes are buried), 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 volatilize and/or settle waste materials), and other land disposal methods (such as waste piles) or releases to land (such as spills or leaks). Beginning with the 1996 reporting year, facilities separately report amounts released to RCRA Subtitle C landfills from amounts released to other on-site landfills.

Transfers Off-site to Disposal. Toxic chemicals in waste that are transferred to a facility for disposal generally are either released to land at an off-site facility or are injected underground.



Box 2-2. An Explanation of On-site Waste Management

An Explanation of On-site Waste Management

On-site waste management activities are reported in Section 8 of Form R. These amounts do not include one-time events such as accidental releases or remediation (clean-up).

Recycled On-site. This is the quantity of the toxic chemical recovered at the facility and made available for further use. It is not the quantity that entered an on-site recycling or recovery operation.

Used for Energy Recovery On-site. This is the quantity of the toxic chemical that was combusted in some form of energy recovery device, such as a furnace (including kilns) or boiler. The toxic chemical should have a heating value high enough to sustain combustion. To avoid double-counting, the amount reported represents the amount destroyed in the combustion process, not the amount that entered the energy recovery unit. For example, 100,000 pounds of toluene entered a boiler that, on average, combusted 98% of the toluene. Any remaining toluene was discharged to air. A total of 98,000 pounds is reported as combusted for energy recovery (the remaining 2,000 pounds is reported as released).

Treatment On-site. This is the quantity of the toxic chemical destroyed in on-site waste treatment operations, not the amount that entered any treatment operation. For example, if 100,000 pounds of benzene were combusted in an incinerator that destroyed 99% of the benzene, the facility would report 99,000 pounds as treated on-site (the remaining 1,000 pounds would be reported as released).

Box 2-3. An Explanation of Transfers Off-site for Further Waste Management

An Explanation of Transfers Off-site for Further Waste Management

An off-site transfer, reported in Section 6 of Form R, is the transfer of toxic chemicals in waste to a facility that is geographically or physically separate from the facility reporting under TRI. Chemicals reported to TRI as transferred are sent to off-site facilities for the purposes of recycling, energy recovery, treatment, or disposal. The quantities reported represent a movement of the chemical away from the reporting facility. Except for off-site transfers to disposal, these quantities do not necessarily represent entry of the chemical into the environment. Transfers to disposal represent an off-site release (see Box 2-1).

Transfers Off-site to Recycling. Toxic chemicals in waste that are sent off-site for the purposes of recycling are generally recovered by a variety of recycling methods, including solvent recovery and metals recovery. The choice of the recycling method depends on the toxic chemical being sent for recycling. Once they have been recycled, these chemicals may be returned to the originating facility for further processing or made available for use in commerce.

Transfers Off-site to Energy Recovery. Toxic chemicals in waste sent off-site for purposes of energy recovery are combusted off-site in industrial furnaces (including kilns) or boilers that generate heat or energy for use at that location. Treatment of a chemical by incineration is not considered to be energy recovery.

Transfers Off-site to Treatment. Toxic chemicals in waste that are transferred off-site may be treated through a variety of methods, including biological treatment, neutralization, incineration, and physical separation. These methods typically result in varying degrees of destruction of the toxic chemical. In some cases (such as stabilization or solidification), the chemical is not destroyed but is prepared for further waste management, such as contained disposal.

Transfers to Publicly Owned Treatment Works (POTWs). A POTW is a wastewater treatment facility that is owned by a state or municipality. Wastewaters from facilities reporting under TRI are 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. In general, 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 to receiving waters.

Other Off-site Transfers. In this report, toxic chemicals in waste that were reported as transferred off-site but for which the off-site activity (i.e., treatment, disposal, energy recovery, or recycling) was not specified or was not an accepted code have been classified as “other off-site transfers.”



than lower-volume releases of more toxic chemicals, when just the opposite may be true. For example, phosgene is toxic in smaller quantities than methanol. A comparison between these two chemicals for setting hazard priorities or estimating potential health concerns, solely on the basis of volumes released, may be misleading.

Exposure Considerations

- ◆ **Potential degradation or persistence of the chemical in the environment.** Exposure to a chemical is dependent upon the chemical being available. The longer the chemical remains unchanged in the environment, the greater the potential for exposure. Sunlight, heat, or microorganisms may or may not decompose the chemical.
 - For example, microorganisms readily degrade some chemicals, such as methanol, into less toxic chemicals; volatile organic compounds, such as ethylene and propylene, react in the atmosphere and contribute to the formation of smog; metals are persistent and will not degrade upon release to the environment.
 - As a result, smaller releases of a persistent, highly toxic chemical may create a more serious problem than larger releases of a chemical that is rapidly converted to a less toxic form.
- ◆ **Bioconcentration of the chemical in the food chain.** As a chemical becomes incorporated in the food chain, it may concentrate or disperse as it moves up the food chain.
 - Some chemicals, such as mercury, accumulate as they move up the food chain.
 - Small releases of a chemical that bioaccumulates may result in significant exposures to consumers.
- ◆ **The environmental medium (air, water, land, or underground injection) to which the toxic chemical has been released.** Chemical exposure of a population depends on the environmental medium to which a chemical is released. The medium also affects the types of exposures possible, such as inhalation, dermal exposure, or ingestion.
 - Releases of a chemical to the air can result in exposures to organisms living near and downwind from facilities releasing toxic chemicals to the atmosphere. Persistent chemicals may fall or precipitate from air onto land or into water bodies, resulting in exposures via these environmental media.
 - Exposures that may result from releases to water bodies (streams, lakes, etc.) depend in part on the downstream uses of the water, including drinking, cooking, and bathing.
 - Injection of toxic chemicals into properly designed and constructed Class I wells will result in substantially lower exposure potential than more direct forms of environmental release. These wells are designed to entomb liquid wastes for at least 10,000 years.
- ◆ **The type of off-site facility receiving the chemical and the efficiency of its waste management practices.** The amount of a toxic chemical that ultimately enters the environment depends on how the chemical was handled during disposal, treatment, energy recovery, or recycling activities. Several factors to keep in mind when considering amounts sent off-site are presented below.
 - The efficiency of recycling operations varies depending on the method of recycling and the chemical being recycled.



- Use of a combustible toxic chemical for energy recovery typically results in the destruction of 95% to 99% or more of the toxic chemical. The remaining quantity may be either released to air or disposed of in ash to land.
- The efficiency of the treatment of toxic chemicals in waste sent to sewage treatment plants varies depending on the chemical and the sewage plant. Some high-volume pollutants such as methanol are readily degraded by most sewage treatment plants. Other high-volume chemicals such as ammonia are not readily treated by most sewage treatment plants and will pass through the plant into the aquatic environment. The efficiency of other treatment methods, such as incineration, also depends upon the specifications of the treatment facility and the nature of the chemical. Metals sent to sewage treatment plants, for example, may be removed with solid wastes and sent to landfills, or they may pass through the plant and be discharged into surface waters; they are not, however, destroyed.
- Toxic chemicals in waste sent off-site for disposal are typically released to land or injected underground.

◆ **On-site waste management of the toxic chemical.** As with off-site waste management, the amount of the toxic chemical released to the environment depends on how the chemical was handled during disposal, treatment, energy recovery, or recycling activities. However, since the waste management is on-site, any amount of the chemical that enters the environment after waste management is reported to TRI as part of that facility's releases.

1996 National Overview

This chapter discusses and analyzes data for 1996 for all chemicals reported under TRI. Chapter 3 examines chemical reporting over time, using only those “core chemicals” that have been reportable in all years in the period under discussion.

For 1996, 21,626 facilities filed 71,381 TRI reporting forms, an average of 3.3 forms per facility (see Table 2-1). One out of every 10 submissions was a Form A certification statement rather than the Form R detailed reporting form. EPA established the Form A certification option, beginning with the 1995 reporting year, for facilities that meet TRI reporting thresholds for a listed chemical (manufacturing or processing 25,000 pounds or otherwise using 10,000 pounds), but whose total annual reportable amount* for that chemical does not exceed 500 pounds and who do not manufacture,

Table 2-1. 1996 TRI Facilities and Forms

	Number
Total Facilities	21,626
Total Forms	71,381
Form Rs	64,147
Form As	7,234

process, or otherwise use more than 1 million pounds of the chemical. Form A certification statements do not report amounts of chemical releases, transfers, or other waste management activities. (Form A certification statements are further explained in Chapter 1.)

* The total annual reportable amount is defined as the sum of the waste management categories that would be reported to TRI: quantities released (including disposal), recovered as a result of recycling operations, combusted for energy recovery, or treated at the facility, plus amounts transferred off-site for recycling, energy recovery, treatment, or disposal. These amounts correspond to total production-related waste in this report.

Table 2-2. 1996 TRI On-site and Off-site Releases

	Pounds
Total On- and Off-site Releases	2,433,506,582
On-Site Releases	
Total Air Emissions	1,452,089,962
Fugitive Air	355,271,752
Point Source Air	1,096,818,210
Surface Water Discharges	173,288,209
Underground Injection	204,329,109
Class I Wells	203,572,710
Class II-V Wells	756,399
On-site Land Releases	309,063,206
RCRA Subtitle C Landfills	26,454,969
Other On-site Land Releases	85,252,669
Land Treatment	6,266,119
Surface Impoundments	84,862,374
Other Disposal	106,227,075
Total On-site Releases	2,138,770,486
Off-Site Releases	
Transfers Off-site to Disposal	294,736,096
Total Off-site Releases	294,736,096

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.

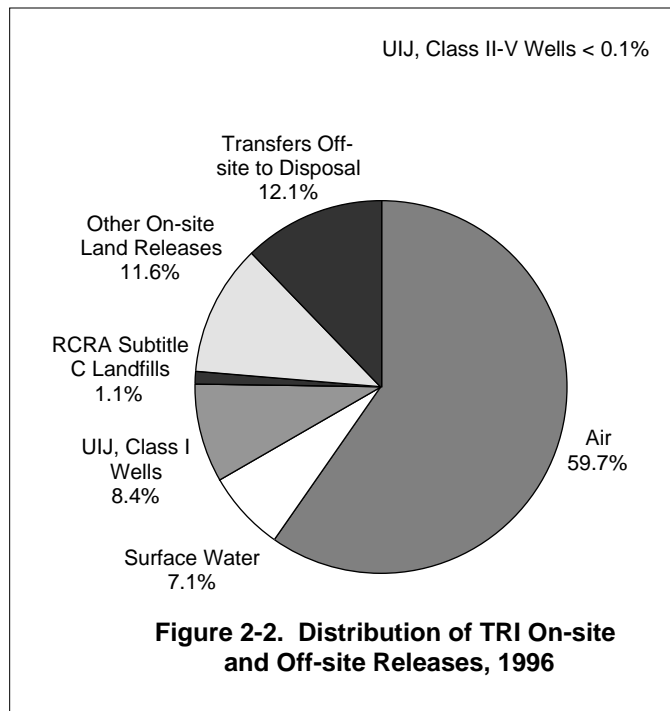


Figure 2-2. Distribution of TRI On-site and Off-site Releases, 1996

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R. UIJ = underground injection.

On- and Off-site Releases

These facilities reported on- and off-site releases of 2.43 billion pounds of toxic chemicals, as shown in Table 2-2. This includes amounts released directly to the air, water, or land, as well as disposal of toxic chemicals on-site or off-site in landfills, impoundments, waste piles, and underground injection wells.

Air emissions totaled 1.45 billion pounds, or 59.7% of all releases in 1996 (see Figure 2-2). Facilities report their air releases as either point source (stack) emissions or fugitive (non-point source) emissions. Three-quarters (75.5%) of air releases reported to TRI in 1996 were point source emissions.

Facilities discharged 173.3 million pounds of toxic chemicals into the nation’s rivers, lakes, bays, and other bodies of water in 1996. This represents 7.1% of all releases in 1996. A total of 204.3 million pounds (8.4%) of toxic chemicals were injected into underground wells, and 99.6% of this amount went to Class I wells (see description in Box 2-1). Another 309.1 million pounds (12.7% of all releases) were released on-site to land. Of these on-site land releases, 8.6% went to RCRA Subtitle C landfills; the largest portion, 34.4%, was reported as other disposal.

These on-site releases totaled 2.14 billion pounds. Off-site releases—that is, transfers to disposal—totaled 294.7 million pounds. Releases at the facility represented 87.9% of all on- and off-site releases, and transfers to disposal represented 12.1% of the total.

Other On-site Waste Management

Facilities reported on-site waste management—recycling, energy recovery, and treatment—totaling 17.74 billion pounds in 1996 (see Table 2-3). Recycling and treatment represented roughly equal portions of the total: 7.84 billion pounds recycled (44.2%) and 7.14 billion pounds treated (40.2%).



Table 2-3. 1996 Other On-site Waste Management

	Pounds
Total Other On-site Waste Management	17,744,196,508
Recycled On-site	7,842,595,142
Energy Recovery On-site	2,761,739,445
Treated On-site	7,139,861,921

Note: Data from Section 8 of Form R.

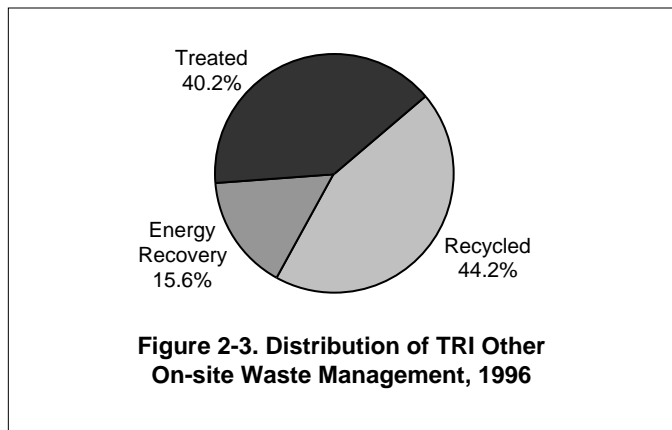


Figure 2-3. Distribution of TRI Other On-site Waste Management, 1996

Note: Data from Section 8 of Form R.

Table 2-4. 1996 TRI Transfers Off-site for Further Waste Management

	Pounds
Total Transfers Off-site for Further Waste Management	3,156,867,280
Transfers to Recycling	2,150,593,994
Transfers to Energy Recovery	477,056,570
Transfers to Treatment	290,096,828
Transfers to POTWs	235,813,508
Other Off-site Transfers	3,306,380

Note: Data from Section 6 of Form R excluding off-site transfers to disposal. Other Off-site Transfers are transfers reported without a valid waste management code.

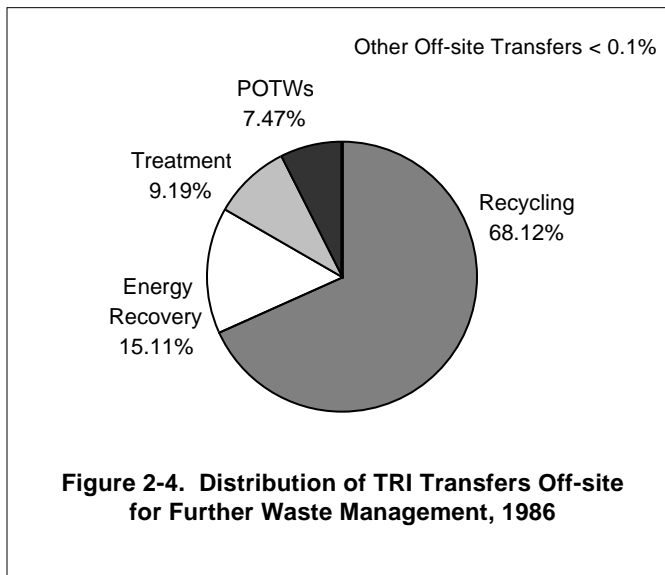


Figure 2-4. Distribution of TRI Transfers Off-site for Further Waste Management, 1986

Note: Data from Section 6 of Form R excluding off-site transfers to disposal. Other Off-site Transfers are transfers reported without a valid waste management code.

On-site energy recovery of 2.76 billion pounds (15.6%) accounted for the rest (see Figure 2-3).

Transfers Off-site for Further Waste Management

In 1996, facilities sent 3.16 billion pounds of toxic chemicals to off-site locations for further waste management: recycling, energy recovery, or treatment (see Table 2-4). The great majority of these off-site transfers (2.15 billion pounds, or 68.1%) were sent off-site to be recycled (see Figure 2-4). Another 477.1 million pounds (15.1%) of toxic chemicals were sent off-site to be burned for energy recovery. Transfers to other locations for treatment totaled 290.1 million pounds, or 9.2%, while transfers to Publicly Owned Treatment Works (POTWs, or sewage treatment plants) totaled 235.8 million pounds, or 7.5%.

Another 3.3 million pounds of toxic chemicals reported as transferred off-site were reported with no waste management codes or with invalid codes and are listed as “Other Off-site Transfers.”



1996 TRI Data by State

Tables 2-5 through 2-8 present the distribution of TRI releases (including transfers off-site to disposal), other on-site waste management, and transfers off-site for further waste management by state. No reports were received in 1996 for the Northern Mariana Islands.

On- and Off-site Releases

The top states for total releases for 1996 were Texas with 267.4 million pounds, Louisiana with 184.5 million pounds, and Ohio with 145.1 million pounds (see Table 2-5). These were also the top-ranking states for on-site releases. Ranking fourth and fifth for total releases, on- and off-site, were Pennsylvania with 122.4 million pounds and Indiana with 109.0 million pounds. Altogether, eight states reported more than 100 million pounds in releases; the others were Illinois with 107.7 million pounds, Tennessee with 103.9 million pounds, and Alabama with 102.9 million pounds.

Texas facilities reported primarily air emissions and underground injection to class I wells. Air releases of 127.2 million pounds (51.1 million as fugitive emissions and 76.1 million pounds as stack emissions) represented 47.6% of Texas releases. Underground injection of 92.0 million pounds accounted for another 34.4%. Texas reported more of both types of release than any other state. For air emissions, Tennessee (84.4 million pounds) and Louisiana (83.9 million pounds) ranked second and third. For underground injection, Louisiana (54.4 million pounds) and Florida (23.1 million pounds) followed Texas. All underground injection in the top three states was reported as injected to Class I wells.

Facilities in California reported the largest amount of injection to Class II-V wells, 702,000 pounds. Facilities in 33 states and territories reported no underground injection. (Some states are not geologically suitable for the practice of

underground injection. Others have banned this disposal method or have never implemented an underground injection control program.)

Louisiana led all states for surface water discharges, with 38.2 million pounds, followed by Pennsylvania with 22.8 million pounds and Texas with 18.9 million pounds.

Facilities reported larger total on-site land releases in Montana than in any other state, 44.4 million pounds, which comprised the great majority of that state's releases. Arizona followed with 37.5 million pounds and Ohio with 28.5 million pounds. Most of these were releases to non-RCRA subtitle C landfills. In five states, RCRA subtitle C landfills received half or more of on-site land releases (New York, 88.2% of on-site land releases, Indiana 75.6%, New Jersey 73.6%, Massachusetts 53.0%, and Illinois 52.2%), but only one of these had total on-site land releases of more than 10 million pounds (Illinois with 23.9 million pounds, ranked fourth for on-site land releases).

Top states for off-site transfers to disposal were Pennsylvania with 55.7 million pounds, Indiana with 34.3 million pounds, and Michigan with 31.7 million pounds. Nearly half (45.5%) of Pennsylvania's releases were transferred off-site for disposal, as were nearly one-third (31.5%) of Indiana's and more than one-third (35.1%) of Michigan's. These off-site releases account for Pennsylvania's and Indiana's ranking fourth and fifth among states for all releases, on- and off-site.

TRI facilities report the specific off-site locations to which they are transferring TRI chemicals. For each state, Table 2-6 summarizes transfers to disposal that were sent out of state, transferred within the state, or received into the state from TRI facilities elsewhere. The state shipping the largest amounts of TRI chemicals outside its borders for disposal was Pennsylvania, with 15.9 million pounds, which was 28.6% of all transfers to disposal from Pennsylvania facilities. States ranking second and third were Alabama (6.0



Table 2-5. TRI On-site and Off-site Releases by State, 1996

State	On-site Releases									Off-site Releases	Total On- and Off-site Releases Pounds
	Air		Surface Water Discharges Pounds	Underground Injection		On-site Land Releases			Total On-site Releases Pounds	Transfers Off-site to Disposal Pounds	
	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds		Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Total On-site Releases Pounds			
Alabama	14,679,468	64,451,577	3,530,565	0	10	737,142	6,625,949	90,024,711	12,897,823	102,922,534	
Alaska	444,665	5,433,523	1,024,160	20	400	0	6,015	6,908,783	0	6,908,783	
American Samoa	10,500	0	0	0	0	0	0	10,500	0	10,500	
Arizona	7,014,110	2,961,244	4,828	5	0	4,500	37,450,068	47,434,755	529,455	47,964,210	
Arkansas	7,489,372	20,697,670	1,399,842	1,750,002	0	129,326	1,031,917	32,498,129	1,533,946	34,032,075	
California	12,192,141	21,650,006	5,560,015	0	701,929	163,496	1,494,795	41,762,382	8,320,256	50,082,638	
Colorado	1,119,954	2,457,061	909,035	0	0	0	103,774	4,589,824	1,121,667	5,711,491	
Connecticut	2,410,477	4,059,776	658,631	0	0	10	59,251	7,188,145	997,034	8,185,179	
Delaware	650,470	2,633,596	226,013	0	0	0	26,495	3,536,574	123,446	3,660,020	
District of Columbia	3,900	10	300	0	0	0	5,000	9,210	250	9,460	
Florida	6,334,872	24,296,086	733,455	23,122,868	0	4,178	20,897,563	75,389,022	5,568,660	80,957,682	
Georgia	7,417,838	39,624,898	6,880,098	0	0	457,651	1,978,295	56,358,780	2,472,951	58,831,731	
Guam	0	0	3,000	0	0	0	0	3,000	0	3,000	
Hawaii	318,432	178,076	3,265	0	33,209	785	2,505	536,272	3,995	540,267	
Idaho	1,604,857	3,152,513	1,038,998	0	0	0	9,309,921	15,106,289	46,398	15,152,687	
Illinois	16,461,617	51,490,781	5,095,236	521	250	12,454,790	11,414,339	96,917,534	10,746,122	107,663,656	
Indiana	20,791,054	42,110,757	2,389,013	1,174,432	0	6,204,155	2,002,979	74,672,390	34,315,644	108,988,034	
Iowa	5,281,557	21,997,747	2,753,444	0	0	98,544	1,499,061	31,630,353	1,678,056	33,308,409	
Kansas	5,762,051	14,046,481	411,678	1,048,848	250	105,295	835,951	22,210,554	4,365,830	26,576,384	
Kentucky	8,113,822	29,867,564	1,468,738	0	0	184,646	1,750,422	41,385,192	5,981,671	47,366,863	
Louisiana	15,624,901	68,249,573	38,211,313	54,412,356	0	73,116	5,534,484	182,105,743	2,432,044	184,537,787	
Maine	1,057,853	6,396,001	603,236	0	0	4,148	188,765	8,250,003	1,101,262	9,351,265	
Maryland	1,696,511	6,861,660	1,837,147	0	0	1,065	1,916,394	12,312,777	785,974	13,098,751	
Massachusetts	2,297,145	4,265,577	81,830	0	0	8,453	7,491	6,660,496	3,316,675	9,977,171	
Michigan	9,614,347	36,587,819	1,989,436	6,617,820	14,683	64,693	3,590,258	58,479,056	31,679,546	90,158,602	
Minnesota	3,265,430	16,453,023	322,363	0	0	3,550	79,372	20,123,738	846,841	20,970,579	
Mississippi	9,785,463	29,717,453	7,566,742	83,315	0	1,924	5,665,772	52,820,669	2,025,693	54,846,362	
Missouri	8,399,325	27,099,218	3,008,012	750	0	314,575	16,719,376	55,541,256	4,253,324	59,794,580	
Montana	881,451	3,108,205	91,808	0	0	760	44,361,763	48,443,987	33,655	48,477,642	
Nebraska	2,538,818	5,771,457	319,530	0	0	6,000	568,617	9,204,422	3,818,356	13,022,778	
Nevada	318,825	1,037,572	0	0	0	2,800	2,331,464	3,690,661	75,975	3,766,636	
New Hampshire	442,696	1,766,521	30,398	0	0	0	10,845	2,250,460	217,777	2,468,237	
New Jersey	3,945,243	6,094,664	5,357,477	4	0	684,726	245,354	16,327,468	1,749,437	18,076,905	
New Mexico	692,433	1,226,068	12	0	0	0	17,972,637	19,891,150	72,559	19,963,709	
New York	6,074,255	20,790,492	3,879,544	262	2,308	954,758	127,225	31,828,844	3,825,159	35,654,003	
North Carolina	10,559,626	49,385,541	2,544,384	0	0	133,872	18,552,160	81,175,583	3,998,991	85,174,574	
North Dakota	398,228	1,605,737	317,631	0	0	0	758	2,322,354	2,766	2,325,120	
Ohio	20,232,510	50,007,417	5,740,395	13,680,825	0	1,134,058	27,364,552	118,159,757	26,980,078	145,139,835	
Oklahoma	5,056,004	16,223,849	567,182	1,007,056	2,600	24,913	101,573	22,983,177	3,438,632	26,421,809	
Oregon	10,725,114	13,293,388	2,529,329	0	0	250	2,460,571	29,008,652	727,041	29,735,693	
Pennsylvania	14,266,043	27,104,113	22,786,860	0	0	579,317	1,995,160	66,731,493	55,691,692	122,423,185	
Puerto Rico	3,339,480	4,425,402	220,557	0	0	250	6,845	7,992,534	556,244	8,548,778	
Rhode Island	928,458	1,401,883	8,734	0	0	0	10,538	2,349,613	252,371	2,601,984	
South Carolina	8,244,215	38,349,890	2,188,612	0	0	51,437	714,777	49,548,931	7,119,229	56,668,160	
South Dakota	516,550	1,140,757	3,401,460	0	0	0	1,002	5,059,769	136,305	5,196,074	
Tennessee	15,955,870	68,465,805	1,624,484	2,256,427	0	78,708	6,495,409	94,876,703	8,997,696	103,874,399	
Texas	51,110,064	76,109,816	18,881,567	91,979,394	0	1,631,980	13,693,639	253,406,460	14,034,326	267,440,786	
Utah	2,117,279	66,701,765	37,580	0	0	15,414	13,114,111	81,986,149	903,685	82,889,834	
Vermont	100,849	202,396	122,915	0	0	0	1,351	427,511	35,338	462,849	
Virgin Islands	961,406	506,479	31,720	0	0	0	6,526	1,506,131	8	1,506,139	
Virginia	11,367,098	40,624,192	1,190,080	5	5	762	1,016,173	54,198,315	1,893,878	56,092,193	
Washington	4,849,423	18,325,626	2,597,302	0	0	5,980	133,819	25,912,150	2,527,221	28,439,371	
West Virginia	4,202,081	12,360,503	8,337,073	0	0	122,693	519,919	25,542,269	3,295,461	28,837,730	
Wisconsin	4,656,892	21,988,474	2,761,776	0	0	10,249	427,823	29,845,214	17,177,877	47,023,091	
Wyoming	948,709	2,060,508	9,406	6,437,800	755	0	177,414	9,634,592	29,776	9,664,368	
Total	355,271,752	1,096,818,210	173,288,209	203,572,710	756,399	26,454,969	282,608,237	1,138,770,486	294,736,096	2,433,506,582	

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.



Table 2-6. Off-site Transfers for Disposal Sent Out of State, Within States and Received into State, 1996

State	Off-site Transfers to Disposal		
	Sent Out of State Pounds	Transferred Within State Pounds	Received Into State Pounds
Alabama	6,026,440	6,871,383	1,486,832
Alaska	0	0	0
Arizona	81,072	448,383	341,320
Arkansas	1,018,149	515,797	256,870
California	4,941,772	3,378,484	88,976
Colorado	781,300	340,367	1,574,962
Connecticut	643,592	353,442	233,620
Delaware	78,550	44,896	4,103
District of Columbia	250	0	0
Florida	4,306,141	1,262,519	66,248
Georgia	947,485	1,525,466	213,592
Hawaii	9	3,986	0
Idaho	22,769	23,629	1,452,466
Illinois	2,576,099	8,170,023	5,642,106
Indiana	4,089,152	30,226,492	2,716,060
Iowa	1,089,765	588,291	22,098
Kansas	1,053,498	3,312,332	182,591
Kentucky	4,064,375	1,917,296	1,479,261
Louisiana	955,387	1,476,657	2,141,215
Maine	49,932	1,051,330	5,277
Maryland	568,730	217,244	514,720
Massachusetts	2,803,710	512,965	298,699
Michigan	622,313	31,057,233	4,430,373
Minnesota	371,071	475,770	23,153
Mississippi	1,446,743	578,950	80,498
Missouri	2,365,525	1,887,799	429,547
Montana	33,641	14	785,525
Nebraska	2,984,052	834,304	20,307
Nevada	0	75,975	3,527,608
New Hampshire	151,415	66,362	211,235
New Jersey	1,305,202	444,235	248,402
New Mexico	16,634	55,925	750
New York	1,198,106	2,627,053	7,783,226
North Carolina	741,558	3,257,433	269,743
North Dakota	658	2,108	973,089
Ohio	4,436,753	22,543,325	18,230,605
Oklahoma	1,717,325	1,721,307	3,716,489
Oregon	55,757	671,284	1,196,970
Pennsylvania	15,913,070	39,778,622	5,742,150
Puerto Rico	211,462	344,782	4
Rhode Island	174,315	78,056	172,586
South Carolina	3,776,836	3,342,393	5,456,615
South Dakota	21,486	114,819	2,000
Tennessee	1,071,334	7,926,362	1,028,141
Texas	3,232,288	10,802,038	1,782,513
Utah	67,026	836,659	2,849,655
Vermont	32,083	3,255	242
Virgin Islands	8	0	0
Virginia	391,888	1,501,990	11,996
Washington	1,241,922	1,285,299	63,957
West Virginia	1,511,751	1,783,710	47,099
Wisconsin	240,291	16,937,586	455,761
Wyoming	23,282	6,494	0
Other*	—	—	3,192,717
Total	81,453,972	213,282,124	81,453,972

* "Other" includes waste sent to other countries and to sites not identified by state by the reporting facility.



Table 2-7. TRI Other On-site Waste Management by State, 1996

State	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Total Other On-site Waste Management Pounds
Alabama	247,765,725	35,866,493	316,900,305	600,532,523
Alaska	25,842	457,400	2,761,278	3,244,520
American Samoa	0	0	0	0
Arizona	629,813,584	695,864	7,501,763	638,011,211
Arkansas	202,786,365	33,421,106	113,334,864	349,542,335
California	48,933,381	18,173,050	1,102,173,175	1,169,279,606
Colorado	18,998,219	8,287,872	8,234,284	35,520,375
Connecticut	91,847,249	4,467,216	36,458,784	132,773,249
Delaware	29,782,121	219,184	50,920,120	80,921,425
District of Columbia	0	0	1,695	1,695
Florida	133,882,239	19,362,992	131,946,077	285,191,308
Georgia	246,187,301	48,222,623	196,531,036	490,940,960
Guam	0	0	0	0
Hawaii	6,611	0	3,590,519	3,597,130
Idaho	176,378	26,900	17,160,464	17,363,742
Illinois	316,452,083	35,570,868	120,405,877	472,428,828
Indiana	192,429,951	86,416,362	171,880,470	450,726,783
Iowa	142,535,240	1,827,848	28,677,544	173,040,632
Kansas	210,117,169	100,585,103	35,937,066	346,639,338
Kentucky	270,427,752	70,165,040	119,641,055	460,233,847
Louisiana	725,090,414	350,796,650	816,209,604	1,892,096,668
Maine	10,123,918	11,099,536	63,525,017	84,748,471
Maryland	17,008,373	13,397,901	34,005,595	64,411,869
Massachusetts	23,084,234	5,223,661	27,615,676	55,923,571
Michigan	304,344,692	87,992,757	94,427,464	486,764,913
Minnesota	147,195,055	10,743,037	32,157,870	190,095,962
Mississippi	215,890,406	18,567,578	104,186,585	338,644,569
Missouri	177,893,875	79,482,408	72,793,495	330,169,778
Montana	50,305,985	2,513,550	8,610,407	61,429,942
Nebraska	18,289,870	1,499,579	6,867,436	26,656,885
Nevada	2,125,936	0	8,595,388	10,721,324
New Hampshire	16,867,518	1,858,325	10,301,186	29,027,029
New Jersey	56,031,604	347,873,373	125,963,690	529,868,667
New Mexico	1,509,122	33,800,000	1,868,997	37,178,119
New York	176,304,149	25,633,557	112,267,207	314,204,913
North Carolina	362,510,160	25,898,390	147,228,500	535,637,050
North Dakota	44,438	3,300	4,853,566	4,901,304
Ohio	329,167,620	96,800,899	155,733,167	581,701,686
Oklahoma	53,640,688	52,550,449	16,068,996	122,260,133
Oregon	33,343,531	17,268,217	61,437,014	112,048,762
Pennsylvania	392,219,178	50,287,872	149,258,161	591,765,211
Puerto Rico	24,267,097	142,187	17,004,946	41,414,230
Rhode Island	13,987,327	226,963	7,123,050	21,337,340
South Carolina	303,352,841	78,185,193	112,054,076	493,592,110
South Dakota	30,204,647	1,050,000	1,894,335	33,148,982
Tennessee	164,053,491	49,580,975	106,752,628	320,387,094
Texas	965,065,180	836,485,137	1,375,842,159	3,177,392,476
Utah	9,803,457	25,620,841	317,147,921	352,572,219
Vermont	457,075	6,200	1,026,694	1,489,969
Virgin Islands	711,124	0	10,248,528	10,959,652
Virginia	178,353,110	29,707,489	317,770,559	525,831,158
Washington	80,436,589	18,590,204	90,430,822	189,457,615
West Virginia	121,297,058	10,237,138	146,675,430	278,209,626
Wisconsin	53,677,399	14,787,808	112,924,941	181,390,148
Wyoming	1,770,771	62,350	4,934,435	6,767,556
Total	7,842,595,142	2,761,739,445	7,139,861,921	17,744,196,508

Note: Data from Section 8 of Form R.



Table 2-8. TRI Transfers Off-site for Further Waste Management by State, 1996

State	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds	Other Off-site Transfers Pounds	Total Off-site Transfers Excluding Transfers to Disposal Pounds
Alabama	33,675,464	10,487,499	7,163,468	516,571	750	51,843,752
Alaska	235,463	6,325	137	0	0	241,925
American Samoa	0	0	0	0	0	0
Arizona	79,468,186	784,295	9,259,081	1,951,033	0	91,462,595
Arkansas	44,916,893	6,677,636	6,119,839	122,428	250	57,837,046
California	61,488,314	8,602,952	5,054,720	13,086,610	16,705	88,249,301
Colorado	18,194,235	4,033,682	1,230,695	795,799	5	24,254,416
Connecticut	24,122,459	2,226,821	6,085,697	1,304,464	250	33,739,691
Delaware	10,054,130	1,169,726	1,299,302	4,515,982	0	17,039,140
District of Columbia	12,151	0	5	180	0	12,336
Florida	17,546,126	2,201,015	7,115,310	5,617,773	0	32,480,224
Georgia	43,272,325	9,828,150	6,065,284	2,873,071	19,456	62,058,286
Guam	0	0	0	15,000	0	15,000
Hawaii	53,075	0	4,557	0	0	57,632
Idaho	600,108	154,988	89,400	274,987	0	1,119,483
Illinois	92,791,384	29,994,071	13,946,004	10,650,115	170,140	147,551,714
Indiana	227,040,410	11,888,870	7,427,771	3,313,075	7,896	249,678,022
Iowa	26,694,400	3,079,716	3,072,917	7,613,435	0	40,460,468
Kansas	56,635,370	2,745,539	4,395,674	1,081,427	0	64,858,010
Kentucky	50,702,619	9,357,605	8,070,093	1,515,709	45,591	69,691,617
Louisiana	52,355,796	15,998,779	9,371,461	52,168	0	77,778,204
Maine	4,949,244	379,964	308,126	181,137	0	5,818,471
Maryland	3,870,056	1,340,824	3,465,720	3,837,977	0	12,514,577
Massachusetts	28,308,038	6,713,380	4,766,282	5,334,593	17,752	45,140,045
Michigan	100,909,367	69,413,222	23,506,076	14,143,038	250	207,971,953
Minnesota	21,696,873	2,196,764	1,014,387	8,095,891	8,636	33,012,551
Mississippi	21,598,058	2,654,505	2,122,333	628,934	8,632	27,012,462
Missouri	58,339,188	23,850,564	9,826,440	6,394,678	7,890	98,418,760
Montana	579,043	26,048	42,733	4,168	0	651,992
Nebraska	26,709,177	446,647	216,005	618,762	250	27,990,841
Nevada	1,635,380	9,679	18,434	21,514	0	1,685,007
New Hampshire	12,146,978	224,756	754,064	201,695	0	13,327,493
New Jersey	33,315,528	30,358,462	8,331,546	18,766,215	83,937	90,855,688
New Mexico	1,055,552	157,296	194,084	270,890	250	1,678,072
New York	64,139,124	7,747,898	6,825,645	6,792,564	1,971,363	87,476,594
North Carolina	79,313,339	14,071,452	8,705,633	3,077,616	0	105,168,040
North Dakota	802,146	19,711	15,583	198,048	0	1,035,488
Ohio	186,144,474	40,468,374	20,701,110	16,401,171	24,544	263,739,673
Oklahoma	19,065,778	967,015	1,149,182	456,827	0	21,638,802
Oregon	20,516,944	1,313,460	6,024,151	10,719,550	13	38,574,118
Pennsylvania	138,842,336	17,612,095	16,632,816	8,461,731	132,237	181,681,215
Puerto Rico	13,509,670	10,621,929	5,210,764	2,179,129	44,588	31,566,080
Rhode Island	7,619,534	838,404	369,333	386,775	0	9,214,046
South Carolina	96,310,411	6,142,486	6,654,915	4,282,130	18,150	113,408,092
South Dakota	435,739	193,405	78,484	1,294,101	0	2,001,729
Tennessee	46,687,393	6,290,202	10,324,918	5,665,208	0	68,967,721
Texas	193,240,622	74,366,119	33,729,621	36,475,413	174,466	337,986,241
Utah	5,028,082	80,661	4,351,475	422,249	538,256	10,420,723
Vermont	2,454,769	18,950	252,374	3,025	0	2,729,118
Virgin Islands	96,920	4,834	377,449	0	0	479,203
Virginia	22,724,864	6,931,822	1,762,214	16,876,073	1,000	48,295,973
Washington	12,695,274	871,255	896,850	1,693,122	0	16,156,501
West Virginia	30,508,467	8,961,334	3,422,220	2,414,351	10,500	45,316,872
Wisconsin	55,169,040	22,521,811	12,270,738	4,214,840	2,623	94,179,052
Wyoming	317,678	3,573	3,708	266	0	325,225
Total	2,150,593,994	477,056,570	290,096,828	235,813,508	3,306,380	3,156,867,280

Note: Data from Section 6 of Form R excluding off-site transfers to disposal. Other Off-site Transfers are transfers reported without a valid waste management code.



million pounds, or 46.7% of its transfers to disposal) and California (4.9 million pounds, or 59.4%). Pennsylvania was also one of the largest recipient states, ranking third with 5.7 million pounds. The top two states receiving the largest amount of transfers to disposal from TRI facilities outside their borders were Ohio (18.2 million pounds) and New York (7.8 million pounds).

Other On-site Waste Management

Texas and Louisiana also led all states for on-site waste management, with 3.18 billion pounds and 1.89 billion pounds respectively (see Table 2-7). Ranking third was California, with 1.17 billion pounds. These were the only states whose facilities reported more than 1 billion pounds in total on-site waste management. In two other states, totals exceeded 600 million pounds: Arizona with 638.0 million pounds and Alabama with 600.5 million pounds.

Treatment represented the largest on-site waste management option for four of the top five states. For Texas and Louisiana, treatment amounted to 43.3% and 43.1%, respectively, of on-site waste management. For third-ranked California, treatment accounted for 94.3% of the total, and for fifth-ranked Alabama 52.8%. In contrast, 98.7% of on-site waste management reported in Arizona, ranked fourth overall, was recycling.

Texas facilities also reported the largest amounts in each on-site waste management activity: 965.1 million pounds recycled, 836.5 million pounds burned for energy recovery, and 1.38 billion pounds treated. Louisiana ranked second for both recycling (725.1 million pounds) and energy recovery (350.8 million pounds) and third for treatment (816.2 million pounds). California ranked second for treatment, with 1.10 billion pounds.

Transfers Off-site for Further Waste Management

Texas also ranked first for transfers off-site (excluding transfers to disposal), with 338.0 million pounds, as shown in Table 2-8. Ohio followed with 263.7 million pounds and Indiana with 249.7 million pounds. Another five states totaled more than 100 million pounds each in off-site transfers: Michigan (208.0 million pounds), Pennsylvania (181.7 million pounds), Illinois (147.6 million pounds), South Carolina (113.4 million pounds), and North Carolina (105.2 million pounds).

In all eight of these states, most off-site transfers were sent for recycling. Off-site recycling ranged from 90.9% of transfers in Indiana to 48.5% in Michigan. With 227.0 million pounds, Indiana led all states for recycling. Texas ranked second with 193.2 million pounds and Ohio third with 186.1 million pounds. For energy recovery, the top states were Texas (74.4 million pounds), Michigan (69.4 million pounds), and Ohio (40.5 million pounds).

Texas facilities also sent larger amounts off-site for treatment (33.7 million pounds) and to POTWs (36.5 million pounds) than facilities in any other state. Michigan ranked second for transfers to treatment with 23.5 million pounds and Ohio third with 20.7 million pounds. For transfers to POTWs, New Jersey was second (18.8 million pounds) and Virginia third (16.9 million pounds).

1996 TRI Data by Chemical

This section presents chemical-specific TRI data for 1996, including the chemicals with the largest releases. It also reviews data for several groups of TRI chemicals of particular concern: metals, chemicals identified as known or suspected OSHA



carcinogens, chemicals that may adversely affect children's health, and pesticides. Also included is information about the uses, toxicity, and environmental fate of the TRI chemicals with the largest reported releases. At the end of this chapter, Table 2-21 presents releases, on-site waste management, and off-site transfer data for all TRI chemicals for which 1996 reports were received.

Top 20 Chemicals for On- and Off-site Releases

Table 2-9 lists the top 20 chemicals—among all TRI chemicals—with the largest total releases. With 1.79 billion pounds in releases, these chemicals represented three-quarters (73.8%) of all on- and off-site releases reported to TRI in 1996. Methanol, the leading chemical, accounted for one-tenth (9.9%) of all TRI releases for the year, with 241.4 million pounds. Other chemicals reported in amounts greater than 100 million pounds were zinc compounds (207.0 million pounds), ammonia (193.0 million pounds), nitrate compounds (163.8 million pounds), and toluene (127.4 million pounds). These were also the top chemicals for on-site releases, although zinc compounds ranked fifth in that category, because more than half of its total releases were transfers off-site to disposal. Information on the uses, toxicity, and environmental fate of these top five chemicals appears below.

Methanol also led all chemicals for air releases with 206.4 million pounds total (28.0 million pounds fugitive emissions and 178.4 million pounds stack emissions). Ammonia and toluene followed with 154.8 million pounds and 125.4 million pounds total air emissions, respectively.

More nitrate compounds, a chemical category added to TRI reporting in 1995, were discharged to surface waters than any other chemical, with 117.7 million pounds. This amount was more than four times the releases to water of phosphoric acid (28.4 million pounds), the chemical ranked second for this environmental medium. Nitrate compounds

were also injected underground in larger amounts than any other chemical: 39.4 million pounds, virtually all to Class I wells. Ammonia and methanol were second and third with 24.4 million pounds and 24.3 million pounds, respectively, also predominantly to Class I wells.

Zinc compounds led all chemicals for on-site land releases with 94.8 million pounds. Of that amount, 15.0 million pounds were released to RCRA subtitle C landfills. Copper compounds and manganese compounds were second and third for on-site land releases, with 48.1 million pounds and 40.1 million pounds, respectively. Nearly 1 million pounds of the copper compounds were placed in RCRA landfills, as were 4.6 million pounds of the manganese compounds.

Zinc compounds also dominated off-site transfers to disposal among these top 20 chemicals, with 105.1 million pounds, more than four times the transfers to disposal of manganese compounds (26.7 million pounds) or of lead compounds (21.5 million pounds), ranked second and third.

Use, Toxicity, and Environmental Fate Information

TRI chemicals may cause a variety of adverse health and environmental effects. Information on use, toxicity, and environmental fate is provided here for the top five chemicals with the largest releases in 1996 (see Table 2-9).

Methanol

Uses. Methanol is used as a solvent, as a raw material in the synthesis of organic chemicals, as a fuel, as a de-icing agent, and to denature ethanol.

Toxicity. Methanol is readily absorbed from the gastrointestinal tract and the respiratory tract, and is toxic to humans in moderate to high doses. In the body, methanol is converted into formaldehyde and formic acid. Observed toxic effects at high dose levels include central nervous system damage



Table 2-9. Top 20 Chemicals with Largest Total On-site and Off-site Releases, 1996

CAS Number	Chemical	Air		Surface Water Discharges Pounds	Underground Injection	
		Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds		Class I Wells Pounds	Class II-V Wells Pounds
67-56-1	Methanol	27,987,712	178,370,259	7,353,977	23,801,105	499,383
—	Zinc compounds	2,327,688	3,506,502	1,065,164	129,498	0
7664-41-7	Ammonia	35,870,521	118,910,062	8,267,591	24,180,232	225,985
—	Nitrate compounds	12,981	334,102	117,714,518	39,398,312	250
108-88-3	Toluene	41,711,487	83,670,741	68,697	325,920	3,355
1330-20-7	Xylene (mixed isomers)	20,296,828	62,388,723	39,902	130,351	2,620
75-15-0	Carbon disulfide	3,212,583	69,569,637	66,555	3,788	0
110-54-3	n-Hexane	22,361,785	49,482,089	218,217	101,579	0
—	Manganese compounds	806,259	1,020,847	1,901,227	14,880	2,808
7782-50-5	Chlorine	1,119,170	65,308,331	465,787	74,196	0
7647-01-0	Hydrochloric acid	1,934,070	63,180,765	4,985	260,005	0
7664-38-2	Phosphoric acid	196,086	851,959	28,367,233	9,716	0
78-93-3	Methyl ethyl ketone	20,641,669	38,426,835	74,989	432,767	5
—	Copper compounds	1,198,319	666,754	62,013	298,693	14,683
75-09-2	Dichloromethane	21,519,922	31,900,543	10,060	749,507	0
100-42-5	Styrene	10,917,192	31,011,969	12,864	228,317	0
—	Glycol ethers	8,347,921	31,823,871	143,511	99,208	0
—	Chromium compounds	168,943	237,261	137,319	37,422	0
74-85-1	Ethylene	16,159,552	19,627,812	25,228	0	0
—	Lead compounds	434,594	752,764	50,186	794	0
	Subtotal	237,225,282	851,041,826	166,050,023	90,276,290	749,089
	Total	355,271,752	1,096,818,210	173,288,209	203,572,710	756,399

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.

and blindness. Inhalation of methanol at relatively high doses affects the liver and blood in animals.

Methanol is expected to have low toxicity to aquatic organisms and is not likely to persist in water or to bioaccumulate in aquatic life.

Environmental Fate. Methanol reacts in air to produce formaldehyde, which contributes to formation of air pollutants. In the atmosphere, it can react with other chemicals or be washed out by rain. Methanol is readily degraded by microorganisms in soils and surface waters.

Zinc Compounds

Uses. Zinc is used as a coating on iron and steel and in making brass metal alloys. Zinc compounds are widely used in industry to make paint, rubber, dye, wood preservatives, and ointments.

Toxicity. Zinc compounds are listed on TRI primarily because of concerns for the toxicity of the parent metal, zinc. EPA has categorized zinc as a Group D carcinogen, meaning that sufficient evidence is not available to classify zinc as to its cancer-causing potential. EPA has established an oral reference dose (RfD) of 0.3 mg/kg/day for soluble zinc salts. Zinc has been shown to damage

Table 2-9. Top 20 Chemicals with Largest Total On-site and Off-site Releases, 1996, Continued

CAS Number	Chemical	On-site Land Releases			Total On-site Releases Pounds	Off-site Releases	Total On- and Off-site Releases Pounds
		RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Transfers Off-site to Disposal Pounds			
67-56-1	Methanol	10,041	1,921,624	239,944,101	1,411,828	241,355,929	
—	Zinc compounds	14,985,107	79,857,092	101,871,051	105,122,823	206,993,874	
664-41-7	Ammonia	444,378	3,159,106	191,057,875	1,917,792	192,975,667	
—	Nitrate compounds	3,415	3,710,521	161,174,099	2,590,615	163,764,714	
108-88-3	Toluene	143,008	414,152	126,337,360	1,022,535	127,359,895	
330-20-7	Xylene (mixed isomers)	10,465	48,486	82,917,375	499,478	83,416,853	
75-15-0	Carbon disulfide	0	270	72,852,833	19,097	72,871,930	
110-54-3	n-Hexane	547	23,365	72,187,582	291,798	72,479,380	
—	Manganese compounds	4,583,105	35,566,390	43,895,516	26,664,625	70,560,141	
782-50-5	Chlorine	0	312,638	67,280,122	21,045	67,301,167	
647-01-0	Hydrochloric acid	0	23,148	65,402,973	236,994	65,639,967	
664-38-2	Phosphoric acid	43,325	31,417,396	60,885,715	2,331,930	63,217,645	
78-93-3	Methyl ethyl ketone	36,301	103,297	59,715,863	247,023	59,962,886	
—	Copper compounds	968,892	47,098,824	50,308,178	6,935,031	57,243,209	
75-09-2	Dichloromethane	15	4,942	54,184,989	116,409	54,301,398	
100-42-5	Styrene	90,680	176,010	42,437,032	3,251,349	45,688,381	
—	Glycol ethers	1,000	57,625	40,473,136	653,180	41,126,316	
—	Chromium compounds	864,202	25,270,469	26,715,616	11,759,262	38,474,878	
74-85-1	Ethylene	7,800	280	35,820,672	10,845	35,831,517	
—	Lead compounds	1,657,584	9,910,784	12,806,706	21,476,996	34,283,702	
	Subtotal	23,849,865	239,076,419	1,608,268,794	186,580,655	1,794,849,449	
	Total	26,454,969	282,608,237	2,138,770,486	294,736,096	2,433,506,582	

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.

the developing fetus at doses as low as 100 mg/kg/day in animal studies.

Environmental Fate. Many zinc salts are highly soluble in water. Zinc and its salts are highly toxic to aquatic organisms. Zinc is likely to persist in water. Its concentration in aquatic tissue is expected to be significantly higher than its concentration in surrounding water.

Ammonia

Uses. Ammonia is used in the manufacture of nitrogen compounds, including chemicals used as fertilizers or in making nylon and plastics. It is also

used in refrigeration, paper and pulp production, explosives, cleaners, and metal-treating operations.

Toxicity. Anhydrous ammonia is a corrosive and severely irritating gas with a pungent odor; it is irritating to the skin, eyes, nose, throat, and upper respiratory system.

Aqueous ammonia is moderately toxic to aquatic organisms. Because it is a source of nitrogen, an essential element for aquatic plant growth, ammonia may contribute to eutrophication of standing or slow-moving surface water, particularly in nitrogen-limited waters, such as the Chesapeake Bay.



Environmental Fate. Ammonia combines with sulfate ions in the atmosphere and is washed out by rainfall, resulting in rapid return of ammonia to the soil and surface waters. Ammonia is a central compound in the environmental cycling of nitrogen. Ammonia in lakes, rivers, and streams is converted to nitrate.

Nitrate Compounds

Uses. There are many compounds covered by the nitrate compounds category, and they have many uses. The most significant use is as fertilizers, either straight or blended to make complex fertilizers. Some compounds are also used as oxidizing agents and as constituents in some explosives and pyrotechnics. Nitrate compounds are also used as refining agents for removing air bubbles from melts in the glass and enamel industry and in metallurgy as heat-transfer baths for quench hardening and tempering of steel, light alloys, and copper alloys.

Toxicity. Nitrate compounds that are soluble in water release nitrate ion which can cause both human health and environmental effects. Human infants exposed to aqueous solutions of nitrate ion can develop a condition in which the blood's ability to carry oxygen is reduced. This reduced supply of oxygen can lead to damaged organs and death. Because it is a source of nitrogen, an essential element for aquatic plant growth, nitrate ion may contribute to eutrophication of standing or slow-moving surface water, particularly in nitrogen-limited waters, such as the Chesapeake Bay.

Environmental Fate. Nitrate-nitrogen is the form of nitrogen most available to plants. In the environment, nitrate ion is taken up by plants and becomes part of the natural nitrogen cycle. Excess nitrate can stimulate primary production of plants and can produce changes in the dominant species of plants, leading to cultural eutrophication and ultimately to deterioration of water quality.

Toluene

Uses. Toluene is a flammable liquid used in the manufacture of organic chemicals, as a solvent for paint, gums, and resins. It is also a constituent of gasoline.

Toxicity. Inhalation or ingestion of toluene can cause headaches, confusion, weakness, and memory loss. Toluene may also affect the way the kidneys and liver function. Some studies have shown that unborn animals were harmed when high levels of toluene were inhaled by their mothers, although the same effects were not seen when the mothers were fed large quantities of toluene.

Reactions of toluene in the atmosphere contribute to the formation of ozone in the lower atmosphere. Ozone can affect the respiratory system, especially in sensitive individuals such as asthma or allergy sufferers.

Environmental Fate. As a volatile organic chemical, toluene will react with other atmospheric components in the lower atmosphere, contributing to the formation of ozone and other air pollutants. The majority of releases to land and water will evaporate. Toluene may also be degraded by microorganisms.

Metals and Metal Compounds

Both metals and their metal compounds are listed on TRI. Releases, on-site waste management, and off-site transfers reported in 1996 for these chemicals appear in Tables 2-10 and 2-11. Under EPCRA section 313, facilities that manufacture, process, or otherwise use metal compounds report only the metal portion of the metal compound. For example, a facility that releases a copper compound, such as copper sulfate, would report as a release only the weight of the copper, not the weight of the entire copper compound. This is done to capture information on the targeted portion of each member of the category, so that



Table 2-10. TRI On-site and Off-site Releases of Metals and Metal Compounds, 1996

Chemical	Air		Surface Water Discharges Pounds	Underground Injection	
	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds		Class I Wells Pounds	Class II-V Wells Pounds
Antimony and antimony compounds	35,250	78,347	40,274	13,908	0
Arsenic and arsenic compounds	108,842	46,076	4,468	61,280	0
Barium and barium compounds	93,581	248,867	91,867	750	0
Beryllium and beryllium compounds	39	1,215	32	0	0
Cadmium and cadmium compounds	7,890	36,774	4,624	82	0
Chromium and chromium compounds	522,191	372,505	711,411	37,431	0
Cobalt and cobalt compounds	23,366	40,060	32,290	15,917	0
Copper and copper compounds	5,515,158	1,374,259	108,791	339,720	14,688
Lead and lead compounds	626,869	1,178,551	62,419	794	0
Manganese and manganese compounds*	7,558,035	1,405,101	2,018,602	14,881	2,815
Mercury and mercury compounds	12,155	4,942	541	9	0
Nickel and nickel compounds	335,509	371,280	88,809	90,253	250
Selenium and selenium compounds	1,991	45,318	2,501	3,100	0
Silver and silver compounds	9,277	15,322	8,296	370	0
Thallium and thallium compounds	0	0	0	0	0
Zinc and zinc compounds**	2,961,395	4,507,867	1,077,226	129,498	0
Total	17,811,548	9,726,484	4,252,151	707,993	17,753

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.

*One facility reported 6,211,171 pounds of fugitive air emissions of manganese in error for 1996; the correct amount is 750 pounds. Fugitive air emissions for manganese and manganese compounds should be 1,347,614 pounds.

**Only fume and dust forms of zinc metal are reportable.

information on the listed portion of the compound is collected in TRI.

Metals (including the metal portion of metal compounds) differ from other TRI chemicals because they do not degrade and are not destroyed. Other TRI-listed chemicals can be destroyed by sunlight, heat, microorganisms, or other chemicals. Although metals cannot be destroyed, they may be converted to a less toxic form. For example, many facilities convert hexavalent chromium (a known carcinogen) to the less toxic trivalent form before releasing or transferring it to off-site locations.

Other metal waste may be treated before disposal so that the metal will be less likely to be transported through soils. Although such treatment may limit the availability of the metal to the environment, it does not destroy the metal.

Releases of TRI metals and metal compounds in 1996 totaled 217.9 million pounds, as shown in Table 2-10. Note that a few other metals [for example, aluminum (fume or dust) and certain metal-containing pesticides] are also reportable to TRI, but are not included in this table because they do not have associated compound categories. The



Table 2-10. TRI On-site and Off-site Releases of Metals and Metal Compounds, 1996, Continued

Chemical	On-site Land Releases			Off-site Releases	Total On- and Off-site Releases Pounds
	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Total On-site Releases Pounds	Transfers Off-site to Disposal Pounds	
Antimony and antimony compounds	107,945	1,876,063	2,151,787	4,419,320	6,571,107
Arsenic and arsenic compounds	16,091	1,833,695	2,070,452	1,243,489	3,313,941
Barium and barium compounds	66,678	1,773,639	2,275,382	4,701,773	6,977,155
Beryllium and beryllium compounds	28,000	19,428	48,714	3,030	51,744
Cadmium and cadmium compounds	58,179	495,268	602,817	938,552	1,541,369
Chromium and chromium compounds	1,196,377	25,703,645	28,543,560	16,744,943	45,288,503
Cobalt and cobalt compounds	39,040	248,330	399,003	699,089	1,098,092
Copper and copper compounds	1,375,076	50,045,648	58,773,340	21,428,628	80,201,968
Lead and lead compounds	1,782,543	13,196,913	16,848,089	23,220,634	40,068,723
Manganese and manganese compounds*	4,627,631	45,562,235	61,189,300	40,570,018	101,759,318
Mercury and mercury compounds	6	531	18,184	25,884	44,068
Nickel and nickel compounds	156,007	3,803,581	4,845,689	8,238,804	13,084,493
Selenium and selenium compounds	0	211,266	264,176	62,275	326,451
Silver and silver compounds	0	51,999	85,264	31,868	117,132
Thallium and thallium compounds	0	0	0	0	0
Zinc and zinc compounds**	15,006,828	86,635,257	110,318,071	107,600,650	217,918,721
Total	24,460,401	231,457,498	288,433,828	229,928,957	518,362,785

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.

*One facility reported 6,211,171 pounds of fugitive air emissions of manganese in error for 1996; the correct amount is 750 pounds. Fugitive air emissions for manganese and manganese compounds should be 1,347,614 pounds.

**Only fume and dust forms of zinc metal are reportable.

large majority (88.7%) of on-site releases of metals and metal compounds were land releases. Off-site transfers to disposal are also often land releases. For metals and metal compounds, on-site land releases and off-site disposal together accounted for 93.7% of total releases. Zinc and its compounds and manganese and its compounds together accounted for 61.7% of on- and off-site releases presented in Table 2-10;¹ compounds of

both metals were among the top 20 TRI chemicals for releases (see Table 2-9).

On-site waste management of metals and metal compounds totaled 2.06 billion pounds in 1996, as shown in Table 2-11. By far the largest portion of this was recycled, 1.98 billion pounds or 96.0% of the total. Similarly, of the 1.81 billion pounds of metals and metal compounds sent off-site for further waste management, recycling accounted for 1.73 billion pounds or 95.4%. Copper and its compounds ranked first for recycling both at the facility and at other locations, with 926.9 million

¹ The error reported on Table 2-10 makes no significant difference (0.5%) in this analysis.



Table 2-11. TRI Other On-site Waste Management and Transfers Off-site for Further Waste Management of Metals and Metal Compounds, 1996

Chemical	Recycled On-site Pounds	Energy Recovery On-site* Pounds	Treated On-site Pounds	Total On-site Waste Management Pounds	Transfers to Recycling Pounds
Antimony and antimony compounds	9,687,071	109,302	1,314,869	11,111,242	5,814,806
Arsenic and arsenic compounds	6,123,353	0	162,032	6,285,385	1,119,459
Barium and barium compounds	37,231,106	220,521	6,952,920	44,404,547	2,864,642
Beryllium and beryllium compounds	38,389	0	921	39,310	111,128
Cadmium and cadmium compounds	8,335,956	0	136,455	8,472,411	1,105,529
Chromium and chromium compounds	55,956,018	61,449	5,735,179	61,752,646	113,926,660
Cobalt and cobalt compounds	3,993,972	0	1,254,768	5,248,740	8,639,502
Copper and copper compounds	926,877,740	123,156	47,438,898	974,439,794	733,814,441
Lead and lead compounds	605,496,338	89,267	3,753,868	609,339,473	319,323,729
Manganese and manganese compounds	167,198,587	21,216	1,271,142	168,490,945	142,331,048
Mercury and mercury compounds	850,230	0	4,115	854,345	25,748
Nickel and nickel compounds	42,663,278	54,474	3,716,271	46,434,023	98,921,322
Selenium and selenium compounds	601,563	0	29	601,592	133,241
Silver and silver compounds	1,180,088	0	3,994,082	5,174,170	3,055,284
Thallium and thallium compounds	0	0	0	0	0
Zinc and zinc compounds**	110,195,972	102,429	5,650,980	115,949,381	298,971,948
Total	1,976,429,661	781,814	81,386,529	2,058,598,004	1,730,158,487

Note: On-site Waste Management data from Section 8 and Transfers Off-site for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code.

*Metals do not burn and do not contribute to combustion. Therefore, metals should not be reported as combusted for energy recovery. Any value other than zero represents misreporting.

**Only fume and dust forms of zinc metal are reportable.

pounds recycled on-site and 733.8 million pounds off-site.

Some facilities reported transfers of metals in waste off-site for treatment by POTWs. Treatment processes employed at POTWs may remove the metal from a waste stream or convert the metal into a less toxic form, but they do not destroy the metal. For example, public sewage treatment plants will remove some fraction of the metals during treatment of the waste stream when removing solid materials. The amounts removed

are then generally sent to a landfill for disposal. The metal waste that is not removed remains in the wastewater and will pass through the treatment plant and into the aquatic environment.

OSHA Carcinogens

Some chemicals are listed in TRI because they are either known human carcinogens or suspect carcinogens (see Box 2-4). Known human carcinogens are those that have been shown to cause cancer in humans. Suspect carcinogens are those



Table 2-11. TRI Other On-site Waste Management and Transfers Off-site for Further Waste Management of Metals and Metal Compounds, 1996, Continued

Chemical	Transfers to Energy Recovery* Pounds	Other Transfers to Treatment Pounds	Transfers to POTWs Pounds	Off-site Transfers Pounds	Total Transfers for Further Waste Management Pounds
Antimony and antimony compounds	97,012	902,319	116,956	2	6,931,095
Arsenic and arsenic compounds	326	1,814,504	532	0	2,934,821
Barium and barium compounds	228,123	1,759,760	393,780	2,941	5,249,246
Beryllium and beryllium compounds	0	4,566	1	0	115,695
Cadmium and cadmium compounds	1,613	227,611	3,147	1	1,337,901
Chromium and chromium compounds	56,368	3,971,183	297,040	5,441	118,256,692
Cobalt and cobalt compounds	2,020	126,429	13,966	47,000	8,828,917
Copper and copper compounds	83,758	3,109,147	526,578	18,163	737,552,087
Lead and lead compounds	74,305	14,078,006	47,511	728,614	334,252,165
Manganese and manganese compounds	259,552	7,664,467	395,643	60,863	150,711,573
Mercury and mercury compounds	500	14,441	15	0	40,704
Nickel and nickel compounds	71,961	2,924,939	180,123	12,301	102,110,646
Selenium and selenium compounds	5,455	45,098	426	8,464	192,684
Silver and silver compounds	0	35,562	2,648	257	3,093,751
Thallium and thallium compounds	0	5	0	0	5
Zinc and zinc compounds**	372,253	43,049,381	429,381	71,441	342,894,404
Total	1,253,246	79,727,418	2,407,747	955,488	1,814,502,386

Note: On-site Waste Management data from Section 8 and Transfers Off-site for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code.

*Metals do not burn and do not contribute to combustion. Therefore, metals should not be reported as combusted for energy recovery. Any value other than zero represents misreporting.

** Only fume and dust forms of zinc metal are reportable.

chemicals that have been shown to cause cancer in animals. TRI thresholds for reporting known and suspect carcinogens in mixtures are lower than for other substances. Table 2-12 shows releases for these chemicals.

Clarification of the Basis for Carcinogen Listings on the EPCRA Section 313 List of Toxic Chemicals

Under section 313, a chemical does not have to be counted towards threshold and release calculations

if it is present in a mixture below a certain concentration. This is known as the section 313 “*de minimis*” concentration in mixture. When the section 313 rule was developed, EPA adopted the *de minimis* percentages from the Occupational Safety and Health Administration’s (OSHA) Hazard Communication Standards (29 CFR 1910.1200), because much of the information that industry would have relating to chemicals in mixtures would most likely be from the material safety data sheet (MSDS) on that mixture. The OSHA *de minimis* limitation is 0.1% if the chemical is a



Box 2-4. Basis of OSHA Carcinogen Listing for Individual Chemicals

Chemical	IARC	NTP	OSHA	Chemical	IARC	NTP	OSHA
Acetaldehyde	2B	P	—	2,4-D chlorocrotyl ester‡	2B	—	—
Acetamide	2B	—	—	2,4-D 2-ethylhexyl ester‡	2B	—	—
2-Acetylaminofluorene	—	P	Z	2,4-D 2-ethyl-4-methylpentyl ester‡	2B	—	—
Acrylamide	2A	P	—	2,4-Diaminoanisole	2B	—	—
Acrylonitrile	2A	P	Z	2,4-Diaminoanisole sulfate	—	P	—
2-Aminoanthraquinone	—	P	—	4,4'-Diaminodiphenyl ether	2B	—	—
4-Aminoazobenzene	2B	—	—	2,4-Diaminotoluene	2B	P	—
4-Aminobiphenyl	1	K	Z	Diaminotoluene (mixed isomers)	2B	P	—
1-Amino-2-methylantraquinone	—	P	—	1,2-Dibromo-3-chloropropane	2B	P	Z
Amitrole	2B	P	—	1,2-Dibromoethane	2A	P	—
o-Anisidine	2B	—	—	1,4-Dichlorobenzene	2B	P	—
o-Anisidine hydrochloride	—	P	—	Dichlorobenzene (mixed isomers)	2B	P	—
Arsenic and inorganic arsenic compounds	1	K†	Z	3,3'-Dichlorobenzidine	2B	P	Z
Asbestos (friable)	1	K	Z	3,3'-Dichlorobenzidine dihydrochloride	2B	P	—
Atrazine	2B	—	—	3,3'-Dichlorobenzidine sulfate	2B	P	—
Benzene	1	K	Z	1,2-Dichloroethane	2B	P	—
Benzidine	1	K	Z	Dichloromethane	2B	P	—
Benzoic trichloride	2B	P	—	trans-1,3-Dichloropropene	2B	—	—
Beryllium and beryllium compounds	1	P†	—	1,3-Dichloropropylene	2B	P	—
Bis(chloromethyl)ether	1	K	Z	Dichlorvos	2B	—	—
1,3-Butadiene	2A	P	—	Diepoxybutane	2B	P	—
C.I. Acid Red 114	2B	—	—	Di-(2-ethylhexyl)phthalate	2B	P	—
C.I. Direct Black 38	2A	P	—	Diethyl sulfate	2A	P	—
C.I. Direct Blue 6	2A	P	—	Diglycidyl resorcinol ether	2B	p	—
C.I. Direct Brown 95	2A	—	—	Dihydrosafrole	2B	—	—
C.I. Food Red 5	2B	—	—	3,3'-Dimethoxybenzidine	2B	P	—
C.I. Solvent Yellow 34 (Auramine)	2B	—	—	3,3'-Dimethoxybenzidine dihydrochloride	2B	P	—
Cadmium and cadmium compounds	1	P†	—	3,3'-Dimethoxybenzidine hydrochloride	2B	P	—
Carbon tetrachloride	2B	P	—	4-Dimethylaminoazobenzene	2B	P	Z
Chlordane	2B	—	—	3,3'-Dimethylbenzidine	2B	P	—
Chlorendic acid	2B	P	—	3,3'-Dimethylbenzidine dihydrochloride	2B	P	—
p-Chloroaniline	2B	—	—	3,3'-Dimethylbenzidine dihydrofluoride	2B	P	—
Chloroform	2B	P	—	Dimethylcarbaryl chloride	2A	P	—
Chloromethyl methyl ether	1	K	Z	N,N-Dimethylformamide	2B	—	—
3-Chloro-2-methyl-1-propene	—	P	—	1,1-Dimethylhydrazine	2B	P	—
Chlorophenols	2B	—	—	Dimethyl sulfate	2A	P	—
p-Chloro-o-toluidine	2B	—	—	1,4-Dioxane	2B	P	—
Chromium (VI) compounds	1	K	—	1,2-Diphenylhydrazine	—	P	—
Cobalt and cobalt compounds	2B	—	—	2,4-D isopropyl ester‡	2B	—	—
Creosote	2A	—	—	2,4-DP‡	2B	—	—
p-Cresidine	2B	P	—	2,4-D propylene glycol butyl ether ester‡	2B	—	—
Cupferron	—	P	—	2,4-D sodium salt‡	2B	—	—
2,4-D‡	2B	—	—	Epichlorohydrin	2A	P	—
2,4-D butoxyethyl ester‡	2B	—	—	Ethyl acrylate	2B	P	—
2,4-D butyl ester‡	2B	—	—	Ethyleneimine	—	—	Z

Note: The list of TRI chemicals meeting the OSHA carcinogen standard and, therefore, reported when in a mixture at a concentration level below the *de minimis* level of 0.1%, has been updated, and this list reflects the update.

IARC: 1—The chemical is carcinogenic to humans; 2A—The chemical is probably carcinogenic to humans; 2B—The chemical is possibly carcinogenic to humans.

NTP: K—The chemical is known to be carcinogenic; P—The chemical may reasonably be anticipated to be carcinogenic.

OSHA: Z—The chemical appears at 29 CFR Part 1910 Subpart Z.

† Certain compounds.

‡ Chlorophenoxy herbicides (IARC 2B).



Box 2-4. Basis of OSHA Carcinogen Listing for Individual Chemicals, Continued

Chemical	IARC	NTP	OSHA	Chemical	IARC	NTP	OSHA
Ethylene oxide	1	P	Z	Benzo(j)fluoranthene	2B	P	—
Ethylene thiourea	2B	P	—	Benzo(k)fluoranthene	2B	—	—
Formaldehyde	2A	P	Z	Benzo(rst)pentaphene	2B	—	—
Heptachlor	2B	—	—	Benzo(a)pyrene	2A	P	—
Hexachlorobenzene	2B	P	—	Dibenz(a,h)acridine	2A	P	—
Hexamethylphosphoramide	2B	P	—	Dibenz(a,j)acridine	2B	P	—
Hydrazine	2B	P	—	Dibenzo(a,h)anthracene	2B	P	—
Hydrazine sulfate	—	P	—	7H-Dibenzo(c,g)carbazole	2B	P	—
Lead and inorganic lead compounds	2B	—	Z	Dibenzo(a,e)pyrene	2B	P	—
Lindane	2B	P	—	Dibenzo(a,h)pyrene	2B	P	—
Mecoprop [†]	2B	—	—	Dibenzo(a,l)pyrene	2B	P	—
Methoxone [†]	2B	—	—	7,12-Dimethylbenz(a)anthracene	2B	—	—
Methoxone sodium salt [†]	2B	—	—	Indeno[1,2,3-cd]pyrene	2B	P	—
4,4'-Methylenebis (2-chloroaniline)	2A	P	—	5-Methylchrysene	2B	P	—
4,4'-Methylenebis (N,N-dimethyl) benzeneamine	2B	P	—	1-Nitropyrene	2B	—	—
4,4'-Methylenedianiline	2B	P	Z	Potassium bromate	2B	—	—
Michler's ketone	—	P	—	Propane sultone	2B	P	—
Mustard gas	1	K	—	beta-Propiolactone	2B	P	Z
alpha-Naphthylamine	—	—	Z	Propyleneimine	2B	P	—
beta-Naphthylamine	1	K	Z	Propylene oxide	2B	P	—
Nickel	2B	P	—	Saccharin (manufacturing)	2B	P	—
Nickel compounds	1	P [†]	—	Safrole	2B	P	—
Nitrilotriacetic acid	—	P	—	Sodium o-phenylphenoxide	2B	—	—
4-Nitrobiphenyl	—	—	Z	Styrene	2B	—	—
Nitrofen	2B	P	—	Styrene oxide	2A	—	—
Nitrogen mustard	2A	—	—	Tetrachloroethylene	2B	P	—
2-Nitropropane	2B	P	—	Thioacetamide	2B	P	—
N-Nitrosodi-n-butylamine	2B	P	—	4,4'-Thiodianiline	2B	P	—
N-Nitrosodiethylamine	2A	P	—	Thiourea	2B	P	—
N-Nitrosodimethylamine	2A	P	Z	Toluene-2,4-diisocyanate	2B	P	—
N-Nitrosodi-n-propylamine	2B	P	—	Toluene-2,6-diisocyanate	2B	P	—
N-Nitroso-N-ethylurea	2A	P	—	Toluene diisocyanate (mixed isomers)	2B	P	—
N-Nitroso-N-methylurea	2A	P	—	o-Toluidine	2B	P	—
N-Nitrosomethylvinylamine	2B	P	—	o-Toluidine hydrochloride	—	P	—
N-Nitrosomorpholine	2B	P	—	Toxaphene	2B	P	—
N-Nitrosornicotine	2B	P	—	Trichloroethylene	2A	—	—
N-Nitrosopiperidine	2B	P	—	2,4,6-Trichlorophenol	2B	P	—
Pentachlorophenol	2B	—	—	1,2,3-Trichloropropane	2A	—	—
Phenytoin	2B	P	—	Tris(2,3-dibromopropyl)phosphate	2A	P	—
Polybrominated biphenyls (PBBs)	2B	P	—	Trypan blue	2B	—	—
Polychlorinated biphenyls (PCBs)	2A	P	—	Urethane	2B	P	—
Polycyclic aromatic compounds (PACs):				Vinyl acetate	2B	—	—
Benz(a)anthracene	2A	P	—	Vinyl bromide	2A	—	—
Benzo(b)fluoranthene	2B	P	—	Vinyl chloride	1	K	Z
				2,6-Xylydine	2B	—	—

Note: The list of TRI chemicals meeting the OSHA carcinogen standard and, therefore, reported when in a mixture at a concentration level below the *de minimis* level of 0.1%, has been updated, and this list reflects the update.

IARC: 1—The chemical is carcinogenic to humans; 2A—The chemical is probably carcinogenic to humans; 2B—The chemical is possibly carcinogenic to humans.

NTP: K—The chemical is known to be carcinogenic; P—The chemical may reasonably be anticipated to be carcinogenic.

OSHA: Z—The chemical appears at 29 CFR Part 1910 Subpart Z.

[†] Certain compounds.

[‡] Chlorophenoxy herbicides (IARC 2B).



Table 2-12. TRI On-site and Off-site Releases of OSHA Carcinogens, 1996

CAS Number	Chemical	Air			Underground Injection	
		Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Class I Wells Pounds	Class II-V Wells Pounds
75-07-0	Acetaldehyde	1,637,438	10,938,582	198,485	468,662	0
60-35-5	Acetamide	5	14	2	1,169,000	0
79-06-1	Acrylamide	2,751	8,949	3,653	5,748,154	0
107-13-1	Acrylonitrile	291,729	1,003,720	590	3,595,236	0
60-09-3	4-Aminoazobenzene	0	0	0	203	0
92-67-1	4-Aminobiphenyl	0	0	0	2	0
90-04-0	o-Anisidine	1,443	74	28	0	0
7440-38-2	Arsenic	32,882	6,590	421	0	0
1332-21-4	Asbestos (friable)	1,398	1,362	2	0	0
1912-24-9	Atrazine	5,067	21,944	1,326	1	0
71-43-2	Benzene	3,365,712	4,753,759	27,376	312,016	750
98-07-7	Benzoic trichloride	7,925	66	16	0	0
7440-41-7	Beryllium	9	850	31	0	0
—	Beryllium compounds	30	365	1	0	0
542-88-1	Bis(chloromethyl) ether	0	0	0	0	0
106-99-0	1,3-Butadiene	1,429,487	1,296,809	11,001	1,000	0
7440-43-9	Cadmium	1,926	2,849	1,010	0	0
—	Cadmium compounds	5,964	33,925	3,614	82	0
56-23-5	Carbon tetrachloride	140,533	210,317	215	44,515	0
57-74-9	Chlordane	660	0	95	0	0
115-28-6	Chlorendic acid	0	43	0	0	0
106-47-8	p-Chloroaniline	97	47	407	0	0
67-66-3	Chloroform	3,086,308	6,235,110	340,396	45,387	0
107-30-2	Chloromethyl methyl ether	199	2,642	7	0	0
563-47-3	3-Chloro-2-methyl-1-propene	331	22,676	0	0	0
—	Chlorophenols	1,851	2,924	13	113,554	0
7440-48-4	Cobalt	19,372	13,129	4,330	0	0
—	Cobalt compounds	3,994	26,931	27,960	15,917	0
8001-58-9	Creosote	382,479	555,535	9,114	0	0
120-71-8	p-Cresidine	1,665	1,800	0	0	0
135-20-6	Cupferron	0	0	0	0	0
94-75-7	2,4-D (acetic acid)	2,218	3,771	832	0	0
1929-73-3	2,4-D butoxyethyl ester	262	401	0	0	0
1928-43-4	2,4-D 2-Ethylhexyl ester	2,160	1,065	5	0	0
101-80-4	4,4'-Diaminodiphenyl ether	9	7	182	0	0
95-80-7	2,4-Diaminotoluene	211	1,364	0	0	0
25376-45-8	Diaminotoluene (mixed isomers)	10,404	6,845	590	7,600	0
106-93-4	1,2-Dibromoethane	6,503	2,207	7	24	0
106-46-7	1,4-Dichlorobenzene	93,651	142,851	1,881	2,000	0
25321-22-6	Dichlorobenzene (mixed isomers)	239	13,808	0	0	0
91-94-1	3,3'-Dichlorobenzidine	1	1	0	0	0
612-83-9	3,3'-Dichlorobenzidine dihydrochloride	0	5	0	0	0
64969-34-2	3,3'-Dichlorobenzidine sulfate	0	0	0	0	0
107-06-2	1,2-Dichloroethane	434,047	610,525	1,848	5,126	0
75-09-2	Dichloromethane	21,519,922	31,900,543	10,060	749,507	0
10061-02-6	trans-1,3-Dichloropropene	810	30	0	0	0
542-75-6	1,3-Dichloropropylene	8,686	761	1,270	0	0
62-73-7	Dichlorvos	5	250	5	0	0
117-81-7	Di-(2-ethylhexyl) phthalate	80,785	383,644	274	0	0
64-67-5	Diethyl sulfate	3,024	184	0	0	0
101-90-6	Diglycidyl resorcinol ether	255	255	0	0	0
94-58-6	Dihydrosafrole	533	300	0	0	0
119-90-4	3,3'-Dimethoxybenzidine	0	0	0	0	0
20325-40-0	3,3'-Dimethoxybenzidine dihydrochloride	2	8	0	0	0
119-93-7	3,3'-Dimethylbenzidine	3	3	25	0	0
612-82-8	3,3'-Dimethylbenzidine dihydrochloride	0	0	0	0	0
68-12-2	N,N-Dimethylformamide	368,967	1,282,686	43,956	1,220,000	0
57-14-7	1,1-Dimethyl hydrazine	259	43	0	0	0

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.



Table 2-12. TRI On-site and Off-site Releases of OSHA Carcinogens, 1996, Continued

CAS Number	Chemical	On-site Releases to Land			Off-site Releases	Total On- and Off-site Releases Pounds
		RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Total On-site Releases Pounds	Transfers Off-site to Disposal Pounds	
75-07-0	Acetaldehyde	121	16,679	13,259,967	2,463	13,262,430
60-35-5	Acetamide	0	0	1,169,021	0	1,169,021
79-06-1	Acrylamide	149,156	0	5,912,663	301,575	6,214,238
107-13-1	Acrylonitrile	5	297	4,891,577	6,639	4,898,216
60-09-3	4-Aminoazobenzene	0	0	203	0	203
92-67-1	4-Aminobiphenyl	0	0	2	0	2
90-04-0	o-Anisidine	0	0	1,545	1	1,546
7440-38-2	Arsenic	2,181	96,577	138,651	47,420	186,071
1332-21-4	Asbestos (friable)	26,010	453,549	482,321	3,316,112	3,798,433
1912-24-9	Atrazine	0	614,353	642,691	188,963	831,654
71-43-2	Benzene	28,841	47,316	8,535,770	65,750	8,601,520
98-07-7	Benzoic trichloride	0	0	8,007	0	8,007
7440-41-7	Beryllium	28,000	3,240	32,130	1,590	33,720
—	Beryllium compounds	0	16,188	16,584	1,440	18,024
542-88-1	Bis(chloromethyl) ether	0	0	0	0	0
106-99-0	1,3-Butadiene	110	153	2,738,560	4,790	2,743,350
7440-43-9	Cadmium	4,561	46,859	57,205	39,864	97,069
—	Cadmium compounds	53,618	448,409	545,612	898,688	1,444,300
56-23-5	Carbon tetrachloride	0	0	395,580	9,245	404,825
57-74-9	Chlordane	0	0	755	0	755
115-28-6	Chlorendic acid	0	0	43	0	43
106-47-8	p-Chloroaniline	0	5	556	0	556
67-66-3	Chloroform	25,156	7,553	9,739,910	38,868	9,778,778
107-30-2	Chloromethyl methyl ether	0	0	2,848	70	2,918
563-47-3	3-Chloro-2-methyl-1-propene	0	0	23,007	0	23,007
—	Chlorophenols	0	0	118,342	2,290	120,632
7440-48-4	Cobalt	9,683	57,053	103,567	139,708	243,275
—	Cobalt compounds	29,357	191,277	295,436	559,381	854,817
8001-58-9	Creosote	460	250	947,838	7,333,126	8,280,964
120-71-8	p-Cresidine	0	0	3,465	0	3,465
135-20-6	Cupferron	0	0	0	0	0
94-75-7	2,4-D (acetic acid)	250	5	7,076	6,017	13,093
1929-73-3	2,4-D butoxyethyl ester	0	0	663	0	663
1928-43-4	2,4-D 2-Ethylhexyl ester	0	0	3,230	2,077	5,307
101-80-4	4,4'-Diaminodiphenyl ether	0	0	198	53	251
95-80-7	2,4-Diaminotoluene	0	0	1,575	0	1,575
25376-45-8	Diaminotoluene (mixed isomers)	0	10	25,449	23,286	48,735
106-93-4	1,2-Dibromoethane	0	1	8,742	0	8,742
106-46-7	1,4-Dichlorobenzene	0	480	240,863	0	240,863
25321-22-6	Dichlorobenzene (mixed isomers)	0	0	14,047	10	14,057
91-94-1	3,3'-Dichlorobenzidine	0	0	2	5,550	5,552
612-83-9	3,3'-Dichlorobenzidine dihydrochloride	0	0	5	0	5
64969-34-2	3,3'-Dichlorobenzidine sulfate	0	0	0	0	0
107-06-2	1,2-Dichloroethane	25,000	250	1,076,796	91,249	1,168,045
75-09-2	Dichloromethane	15	4,942	54,184,989	116,409	54,301,398
10061-02-6	trans-1,3-Dichloropropene	0	0	840	0	840
542-75-6	1,3-Dichloropropylene	0	0	10,717	0	10,717
62-73-7	Dichlorvos	0	0	260	1,228	1,488
117-81-7	Di-(2-ethylhexyl) phthalate	264	70,047	535,014	1,762,843	2,297,857
64-67-5	Diethyl sulfate	0	0	3,208	47	3,255
101-90-6	Diglycidyl resorcinol ether	0	0	510	0	510
94-58-6	Dihydrosafrole	0	0	833	0	833
119-90-4	3,3'-Dimethoxybenzidine	0	0	0	0	0
20325-40-0	3,3'-Dimethoxybenzidine dihydrochloride	0	0	10	0	10
119-93-7	3,3'-Dimethylbenzidine	0	0	31	229	260
612-82-8	3,3'-Dimethylbenzidine dihydrochloride	0	0	0	0	0
68-12-2	N,N-Dimethylformamide	1,350	278	2,917,237	184,053	3,101,290
57-14-7	1,1-Dimethyl hydrazine	0	1	303	425	728

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.



Table 2-12. TRI On-site and Off-site Releases of OSHA Carcinogens, 1996, Continued

CAS Number	Chemical	Air			Underground Injection	
		Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Class I Wells Pounds	Class II-V Wells Pounds
77-78-1	Dimethyl sulfate	4,977	819	0	0	0
123-91-1	1,4-Dioxane	41,019	78,937	226,998	0	0
120-36-5	2,4-DP	257	255	0	0	0
2702-72-9	2,4-D sodium salt	0	0	0	0	0
106-89-8	Epichlorohydrin	246,061	84,963	20,735	0	0
140-88-5	Ethyl acrylate	88,053	98,738	199	0	0
151-56-4	Ethyleneimine	0	2	0	0	0
75-21-8	Ethylene oxide	436,537	352,902	4,474	22,200	0
96-45-7	Ethylene thiourea	5	263	0	0	0
50-00-0	Formaldehyde	1,779,994	9,639,206	320,003	9,403,275	0
76-44-8	Heptachlor	198	0	5	0	0
118-74-1	Hexachlorobenzene	115	105	274	717	0
302-01-2	Hydrazine	7,797	2,646	23	0	0
10034-93-2	Hydrazine sulfate	0	0	0	350,000	0
7439-92-1	Lead	192,275	425,787	12,233	0	0
58-89-9	Lindane	255	255	5	0	0
93-65-2	Mecoprop	520	1,170	0	0	0
94-74-6	Methoxone	271	761	250	0	0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	251	255	0	0	0
101-61-1	4,4'-Methylenebis(N,N-dimethyl) benzene	0	1	0	0	0
101-77-9	4,4'-Methylenedianiline	8,227	1,535	23	41,120	0
505-60-2	Mustard gas	0	0	0	0	0
134-32-7	alpha-Naphthylamine	0	0	0	0	0
7440-02-0	Nickel	256,602	125,211	28,163	4,225	0
—	Nickel compounds	78,907	246,069	60,646	86,028	250
139-13-9	Nitrilotriacetic acid	10	0	78	1,500	0
79-46-9	2-Nitropropane	19,226	15,062	2,790	0	0
59-89-2	N-Nitrosomorpholine	0	0	0	0	0
87-86-5	Pentachlorophenol	8,164	4,977	8,236	0	0
57-41-0	Phenytoin	0	0	0	0	0
—	Polybrominated biphenyls	0	250	0	0	0
1336-36-3	Polychlorinated biphenyls (PCBs)	5	250	0	0	0
—	Polycyclic aromatic compounds	121,107	521,753	8,079	0	0
7758-01-2	Potassium bromate	5	0	0	0	0
1120-71-4	Propane sultone	0	0	0	0	0
75-55-8	Propyleneimine	366	36	0	0	0
75-56-9	Propylene oxide	226,160	354,701	45,393	12,141	0
81-07-2	Saccharin (manufacturing)	210	33	0	0	0
94-59-7	Safrole	500	5	0	0	0
100-42-5	Styrene	10,917,192	31,011,969	12,864	228,317	0
96-09-3	Styrene oxide	7	24	0	0	0
127-18-4	Tetrachloroethylene	3,095,666	4,765,504	1,311	13,436	0
62-56-6	Thiourea	1,093	119	339	5,000	0
584-84-9	Toluene-2,4-diisocyanate	3,247	4,086	0	0	0
91-08-7	Toluene-2,6-diisocyanate	6,262	7,404	0	0	0
26471-62-5	Toluenediisocyanate (mixed isomers)	22,122	23,191	0	0	0
95-53-4	o-Toluidine	8,997	8,584	260	17,450	0
79-01-6	Trichloroethylene	10,665,331	10,606,835	541	1,291	0
88-06-2	2,4,6-Trichlorophenol	136	155	28	0	0
96-18-4	1,2,3-Trichloropropane	8,068	695	0	0	0
51-79-6	Urethane	496	12,042	0	0	0
108-05-4	Vinyl acetate	829,617	3,010,281	2,393	300,768	0
593-60-2	Vinyl bromide	240	5,600	0	0	0
75-01-4	Vinyl chloride	272,926	746,882	356	333	0
87-62-7	2,6-Xylidine	0	53	0	0	0
	Subtotal	62,303,685	121,652,940	1,447,727	23,985,787	1,000
	Total for All TRI Chemicals	355,271,752	1,096,818,210	173,288,209	203,572,710	756,399

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.



Table 2-12. TRI On-site and Off-site Releases of OSHA Carcinogens, 1996, Continued

CAS Number	Chemical	On-site Releases to Land			Off-site Releases	Total On- and Off-site Releases Pounds
		RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Total On-site Releases Pounds	Transfers Off-site to Disposal Pounds	
77-78-1	Dimethyl sulfate	0	0	5,796	0	5,796
123-91-1	1,4-Dioxane	0	5,409	352,363	479,388	831,751
120-36-5	2,4-DP	5	0	517	39	556
2702-72-9	2,4-D sodium salt	0	0	0	0	0
106-89-8	Epichlorohydrin	1	2,204	353,964	4,137	358,101
140-88-5	Ethyl acrylate	0	516	187,506	32,734	220,240
151-56-4	Ethyleneimine	0	0	2	0	2
75-21-8	Ethylene oxide	0	551	816,664	1,048	817,712
96-45-7	Ethylene thiourea	0	0	268	4,071	4,339
50-00-0	Formaldehyde	755	113,651	21,256,884	329,509	21,586,393
76-44-8	Heptachlor	0	0	203	0	203
118-74-1	Hexachlorobenzene	0	0	1,211	23,449	24,660
302-01-2	Hydrazine	0	250	10,716	18,549	29,265
10034-93-2	Hydrazine sulfate	0	0	350,000	0	350,000
7439-92-1	Lead	124,959	3,286,129	4,041,383	1,743,638	5,785,021
58-89-9	Lindane	0	250	765	276	1,041
93-65-2	Mecoprop	250	5	1,945	3,896	5,841
94-74-6	Methoxone	250	0	1,532	4,778	6,310
101-14-4	4,4'-Methylenebis(2-chloroaniline)	0	750	1,256	5	1,261
101-61-1	4,4'-Methylenebis(N,N-dimethyl) benzeneamine	0	0	1	0	1
101-77-9	4,4'-Methylenedianiline	0	0	50,905	19,591	70,496
505-60-2	Mustard gas	0	0	0	0	0
134-32-7	alpha-Naphthylamine	0	0	0	0	0
7440-02-0	Nickel	54,458	206,208	674,867	3,480,910	4,155,777
—	Nickel compounds	101,549	3,597,373	4,170,822	4,757,894	8,928,716
139-13-9	Nitrilotriacetic acid	0	0	1,588	0	1,588
79-46-9	2-Nitropropane	0	0	37,078	0	37,078
59-89-2	N-Nitrosomorpholine	0	0	0	0	0
87-86-5	Pentachlorophenol	2,750	250	24,377	196,075	220,452
57-41-0	Phenytoin	0	0	0	12,800	12,800
—	Polybrominated biphenyls	0	0	250	375	625
1336-36-3	Polychlorinated biphenyls (PCBs)	9,205	0	9,460	51,086	60,546
—	Polycyclic aromatic compounds	0	14,439	665,378	1,248,088	1,913,466
7758-01-2	Potassium bromate	0	0	5	0	5
1120-71-4	Propane sultone	0	0	0	0	0
75-55-8	Propyleneimine	0	0	402	0	402
75-56-9	Propylene oxide	0	335	638,730	39,230	677,960
81-07-2	Saccharin (manufacturing)	0	0	243	1,200	1,443
94-59-7	Safrole	0	0	505	0	505
100-42-5	Styrene	90,680	176,010	42,437,032	3,251,349	45,688,381
96-09-3	Styrene oxide	0	0	31	0	31
127-18-4	Tetrachloroethylene	26,000	4,442	7,906,359	22,071	7,928,430
62-56-6	Thiourea	0	250	6,801	2,590	9,391
584-84-9	Toluene-2,4-diisocyanate	0	192	7,525	3,586	11,111
91-08-7	Toluene-2,6-diisocyanate	0	48	13,714	897	14,611
26471-62-5	Toluenediisocyanate (mixed isomers)	0	353	45,666	33,029	78,695
95-53-4	o-Toluidine	0	10	35,301	1,401	36,702
79-01-6	Trichloroethylene	5,550	17,590	21,297,138	76,327	21,373,465
88-06-2	2,4,6-Trichlorophenol	0	0	319	0	319
96-18-4	1,2,3-Trichloropropane	0	0	8,763	0	8,763
51-79-6	Urethane	0	0	12,538	3,675	16,213
108-05-4	Vinyl acetate	0	2,834	4,145,893	27,065	4,172,958
593-60-2	Vinyl bromide	0	0	5,840	0	5,840
75-01-4	Vinyl chloride	0	1	1,020,498	19,614	1,040,112
87-62-7	2,6-Xylidine	0	0	53	0	53
	Subtotal	800,550	9,505,822	219,697,511	31,045,829	250,743,340
	Total for All TRI Chemicals	26,454,969	282,608,237	2,138,770,486	294,736,096	2,433,506,582

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.



known or suspect carcinogen by virtue of appearing in one of three sources:

1. National Toxicology Program (NTP), “Annual Report on Carcinogens” (Latest Edition);
2. International Agency for Research on Cancer (IARC) “Monographs” (Latest Editions); or
3. 29 CFR 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration.

The *de minimis* limitation is 1.0% for chemicals that do not meet the above OSHA carcinogen criteria. The carcinogen designation in the list of chemicals relates to any chemical that the Agency determined met the above OSHA criteria for the 0.1% *de minimis* limitation. Box 2-4 shows the specific bases for which the individual chemical was designated as a known or suspect carcinogen. This list was updated for last year’s TRI data release, based on a review of the NTP, IARC, and OSHA sources.

Certain metal compound categories have two *de minimis* limitations. For example, hexavalent chromium compounds and inorganic arsenic compounds meet the OSHA carcinogen criteria, while trivalent chromium compounds and organic arsenic do not meet the OSHA criteria. These groups are included in Table 2-12, even though not all compounds may meet the criteria.

As shown in Table 2-12, TRI facilities reported releases of 250.7 million pounds of OSHA carcinogens in 1996. This represents 10.3% of all releases reported to TRI for the year. Releases were reported for 113 OSHA carcinogens, out of 164 such chemicals on the TRI list. Air emissions amounted to almost two-thirds of the total (73.4%, or 184.0 million pounds). Dichloromethane was released in the largest amount, 54.3 million pounds or about one-fifth (21.7%) of the total.

Chemicals Affecting Children’s Health

Children are especially vulnerable to toxic chemicals for a number of reasons, including their body weight relative to food and air intake, their behavior (play) patterns that result in the potential for higher outdoor exposures, their developing systems and their relative inability to identify and protect themselves from exposure that are not obvious threats. For those reasons, parents may wish to use TRI information to identify chemicals that may be of potential concern their child’s development.

In 1994, EPA added 286 toxic chemicals to the TRI list. A full one-third of these chemicals were added because of the developmental effects that they can cause. These chemicals may cause effects such as structural abnormalities, reduced birth weight, non-viable births (as shown in animal studies) as well as effects upon a growing child. In 1996, on-and off-site releases of these chemicals totaled 14.6 million pounds. Table 2-13 lists the top 10 of these chemicals for total releases.

Nitrate Compounds and Children’s Health

Of all of the chemicals added in the 1995 reporting year, Nitrate compounds were released in the greatest quantities in the 1996 reporting year. Since modern water treatment plants are required to monitor and control nitrate levels in drinking water, exposure to these compounds is limited. In addition to causing adverse environmental impacts, nitrates have been linked to infantile methemoglobinemia, or ‘blue-baby’ syndrome. This condition, which occurs in human infants exposed to aqueous solutions of nitrate ion and which can cause damage to developing organs and death, is caused by the reduced capacity of the blood to carry oxygen. Infants 0-3 months of age are the most sensitive population to nitrate-induced methemoglobinemia. This is primarily due to their higher stomach pH which favors the growth of nitrate-reducing bacteria, the immaturity of their metabolic enzyme systems, and reduced capacity of



Table 2-13. TRI On-site and Off-site Releases for Developmental Toxins Added to TRI for 1995 Reporting Year, Top 10 Chemicals for Total Releases, 1996

CAS Number	Chemical	Air		Surface Water Discharges Pounds	Underground Injection	
		Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds		Class I Wells Pounds	Class II-V Wells Pounds
872-50-4	N-Methyl-2-pyrrolidone	1,579,639	1,510,899	52,339	2,905,944	1,760
108-93-0	Cyclohexanol	66,799	133,202	122	3,630,080	0
7632-00-0	Sodium nitrite	75,141	210,769	1,302,379	727,000	0
—	Nicotine and salts	25,720	418,225	881	0	0
128-04-1	Sodium dimethyldithiocarbamate	1,453	1,381	10	0	0
1918-00-9	Dicamba	365	694	132	59,200	0
122-34-9	Simazine	1,007	3,584	93	0	0
137-42-8	Metham sodium	2,107	1,342	4	0	0
1689-99-2	Bromoxynil octanoate	270	251	0	0	0
333-41-5	Diazinon	286	15,301	21	0	0
	Subtotal	1,752,787	2,295,648	1,355,981	7,322,224	1,760
	Total for Developmental Toxins Added to TRI for 1995 Reporting Year	1,765,534	2,310,253	1,360,321	7,323,000	1,760

Table 2-13. TRI On-site and Off-site Releases for Developmental Toxins Added to TRI for 1995 Reporting Year, Top 10 Chemicals for Total Releases, 1996, Continued

CAS Number	Chemical	On-site Releases to Land			Off-site Releases	Total On- and Off-site Releases Pounds
		RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Total On-site Releases Pounds	Transfers Off-site to Disposal Pounds	
872-50-4	N-Methyl-2-pyrrolidone	40,336	26,613	6,117,530	550,926	6,668,456
108-93-0	Cyclohexanol	0	74	3,830,277	3,221	3,833,498
7632-00-0	Sodium nitrite	0	63,654	2,378,943	504,474	2,883,417
—	Nicotine and salts	0	0	444,826	426,142	870,968
128-04-1	Sodium dimethyldithiocarbamate	0	0	2,844	121,595	124,439
1918-00-9	Dicamba	0	0	60,391	0	60,391
122-34-9	Simazine	0	0	4,684	54,457	59,141
137-42-8	Metham sodium	0	2	3,455	15,937	19,392
1689-99-2	Bromoxynil octanoate	0	0	521	16,605	17,126
333-41-5	Diazinon	0	0	15,608	1,000	16,608
	Subtotal	40,336	90,343	12,859,079	1,694,357	14,553,436
	Total for Developmental Toxins Added to TRI for 1995 Reporting Year	40,596	90,343	12,891,807	1,723,751	14,615,558



their erythrocytes to reduce methemoglobin to hemoglobin. Information concerning this chemical is important to a family's right-to-know.

On- and off-site releases of nitrate compounds reported to TRI in 1996 totaled 163.8 million pounds, and as noted above, nitrate compounds ranked fourth among all TRI chemicals for total releases. Another 131.2 million pounds of nitrate compounds received other on-site waste management, and 70.8 million pounds were transferred off-site for further waste management. (TRI data for 1996 for all chemicals appear in Table 2-21, at the end of this chapter.)

Mercury and Children's Health

Exposure to high levels of mercury has been associated with serious neurological and developmental effects in humans. The fetal nervous system has been found to be more sensitive to mercury toxicity than that of adults. Women of child-bearing age are therefore at greatest risk. Fish consumption dominates the pathway for human and wildlife exposure to mercury. While most United States consumers need not be concerned about their exposure to mercury, some exposures may be of concern. Those who regularly and frequently consume large amounts of fish—either marine species that typically have much higher levels of mercury than other seafood, or freshwater fish that have been affected by mercury pollution—are more highly exposed. In the recent Mercury Study Report to Congress, EPA concluded that between 1% and 3% of women of child-bearing age eat sufficient amounts of fish to be at risk from mercury exposure.

In 1996, reporting of mercury and its compounds totaled 44,000 pounds of on- and off-site releases, 854,000 pounds of other on-site waste management, and 41,000 pounds transferred off-site for further waste management. Such reporting is expected to increase in the 1998 reporting year, as electric utilities and other industry sectors are added to TRI. (TRI data for 1996 for all chemicals appear in Table 2-21, at the end of this chapter.)

Ozone and Children's Health

EPA has also noted that there are special concerns relating to children's exposure to ozone. Children are most at risk from exposure to ozone because: children breathe more air per pound of body weight than adults; children are more susceptible than adults to environmental threats because of their developing respiratory systems; and children are outside most during the summer, when ozone levels are the highest. Also, because asthma is a growing concern in children, additional factors must be taken into account in understanding ozone exposure of asthmatic children. Concern has grown recently because children are 25% of the population and comprise 40% of the asthma cases; the asthma death rate is three times as great as 20 years ago; African-Americans die from asthma at a rate six times that of Caucasians; and ozone aggravates asthma, increasing use of medication, medical treatment, and visits to emergency clinics.

For ozone, 702,000 pounds were emitted to air in 1996, and another 2.2 million pounds were treated on-site. (TRI data for 1996 for all chemicals appear in Table 2-21, at the end of this chapter.) TRI also captures releases of many VOCs that contribute to ozone formation in the lower atmosphere. (See VOCs later in this chapter for more information.)

Diffuse Sources

In an effort to put the TRI data into perspective, the *1996 TRI Public Data Release* includes this section on diffuse sources. Depending upon the emission inventory, the definition of "diffuse sources" may differ. For the purposes of this data release, diffuse sources are those sources of chemicals that are not captured by TRI. While TRI provides some key environmental data, it also has some limitations, as noted in Chapter 1. Although additional sectors will begin reporting to TRI for the 1998 reporting year, TRI to date has covered only the manufacturing sector and, since 1994, federal facilities. Manufacturing represents a significant, but limited, portion of the industrial world handling toxic chemicals. For example, manufacturers of



fertilizers and pesticides must report their releases, transfers, and waste management to TRI, but the subsequent application and release of these chemicals by the agricultural sector is not captured in TRI. Similarly, the release of VOCs from non-industrial and mobile sources is not captured in TRI. In addition, manufacturing facilities are not required to report if they do not meet TRI's reporting thresholds.

By supplying more information on other sources of releases of certain chemicals and categories, the *1996 TRI Public Data Release* endeavors to help the public understand the relative role of industrial releases (those releases reported to TRI) versus those releases not reported to TRI. This section on diffuse sources includes three subsections: fertilizer use, pesticide use, and VOCs. The application of fertilizers and pesticides are major sources of releases that are not reported to TRI. Similarly, TRI reports include only a portion of total VOC emissions. Therefore, this year's data release has included a brief discussion on each to provide the public a context for those chemicals that are reported to TRI.

Fertilizer Use

In 1996, a total of 44 billion pounds of fertilizers were used in the United States (year ending June 30; *Chemical and Engineering News*, June 23, 1997). That total included 24.5 billion pounds of nitrogen, 9.0 billion pounds of phosphates, and 10.4 billion pounds of potash. Chemicals that are often used in the production of fertilizer and are currently reported to TRI include nitrate compounds (NO_3), ammonia (NH_3), and phosphoric acid (P_2O_5). Neither potash (K_2O), nor its primary ingredient potassium (K), are currently on the TRI list.

In 1996, TRI facilities reported 163.8 million pounds of nitrate compounds released both on- and off-site to the environment. Ammonia is the source of nearly all nitrogen fertilizers. TRI facilities reported on- and off-site releases of 193.0 million pounds of ammonia. Comparing the sum of the TRI reported releases of nitrate compounds and ammonia with the total amount of nitrogen applied as fertilizer, TRI reported releases make up approximately 1.8% the total amount of nitrogen applied as fertilizer in the United States during 1996.² It is important to note that not all of the nitrate compounds and ammonia reported to TRI were generated during the production of fertilizer. Although the most significant use is in the manufacture of fertilizers, nitrate compounds are also used as an oxidizing agent and as a constituent in explosives and pyrotechnics, as a refining agent in the glass and enamel industry, and in metallurgy as heat transfer baths for quench hardening and tempering of steel, light alloys, and copper alloys. In addition to fertilizers, ammonia is used in manufacturing nylon and plastics, refrigeration, paper and pulp production, explosives, cleaners, and metal-treating operations. This limited comparison is useful, however, in an attempt to gain perspective on the overall amounts of nitrogen that facilities reported to TRI compared with total releases of nitrogen through fertilizer use.

Similarly, TRI facilities reported 60.9 million pounds of phosphoric acid released on- and off-site in 1996. Phosphoric acid is the only form of phosphate reported to TRI. Comparing the sum of the TRI reported releases of phosphoric acid with the total amount of phosphate applied as fertilizer, TRI reported releases make up approximately 0.5% of the total amount of phosphate applied as fertilizer in the United States during 1996.³ It is

² Note that in making this comparison, a number of assumptions are necessary, including: (1) TRI requires reporting of only 10% of total aqueous ammonia to surface water, underground injection, and transfers. For the purposes of this comparison, total ammonia was determined by multiplying reported amounts by 10; and (2) in determining the amount of nitrogen reported to TRI, the ratio of the molecular weight of nitrogen to nitrate compounds and nitrogen to ammonia was calculated to determine the amount of nitrogen attributed to each reported chemical.

³ In comparing phosphoric acid reported to TRI with total phosphate used in fertilizers, the quantity of phosphoric acid reported to TRI was converted to the equivalent P_2O_5 , which is the standard unit of measure in the industry.

Table 2-14. Pesticide Use in Agricultural Crop Production, 1995, and TRI Releases and Transfers of Selected Pesticides, 1996

CAS Number	Chemical	1995	1996	1996	1996	TRI Total Releases
		Pesticide Use in Agricultural Crop Production Millions of Pounds of Active Ingredient	Total On- and Off-site Releases Pounds	Total Transfers Off-site for Further Waste Management Pounds	Total TRI Releases and Transfers Pounds	and Transfers as Percent of Pesticide Use in Agricultural Crop Production Percent
1912-24-9	Atrazine	70.50	831,654	252,417	1,084,071	1.5
21725-46-2	Cyanazine	26.50	5,031	22,422	27,453	0.1
—	Dichloropropene	40.50	21,790	360,285	382,075	0.9
94-75-7	2,4-D (acetic acid)	33.50	13,093	31,898	44,991	0.1
137-42-8	Metham sodium	51.50	19,392	6,496	25,888	0.1
74-95-3	Methylene bromide	42.50	99,292	0	99,292	0.2
40487-42-1	Pendimethalin	25.50	3,142	5,108	8,250	0.0
1582-09-8	Trifluralin	25.50	67,681	111,795	179,476	0.7
	Total	316.00	1,061,075	790,421	1,851,496	0.6

Note: Dichloropropene: represented by two TRI chemicals, 2,3-dichloropropene and trans-1,3-dichloropropene. Pesticide use amounts from “Pesticides Industry Sales and Usage,” EPA 733-R-97-002, August 1997, US Environmental Protection Agency, Washington, DC. **On-site Releases** from Section 5 of Form R. **Off-site Releases** from Section 6 (off-site transfers to disposal) of Form R. **Transfers Off-site for Further Waste Management** from Section 6 (excluding off-site transfers to disposal) of Form R.

important to note that most of the phosphoric acid produced in the United States is neutralized and not required to be reported to TRI. In addition, not all of the phosphoric acid reported to TRI is generated during the production of fertilizer. Phosphoric acid is used in the manufacture of ethylene gas, incandescent-light filaments, rubber, and textiles. It also has numerous uses in food production, including soft drinks and jellies. This limited comparison is useful, however, in an attempt to gain perspective on the overall amounts of phosphate uses that are reported to TRI compared with the application of phosphates through fertilizer use in the agricultural sector.

Pesticide Use

The majority of the active ingredients registered as pesticides (EPA registers approximately 875 pesticides) are “conventional pesticides” (i.e., chemicals developed and produced primarily for use as pesticides). A number of chemicals produced for other purposes are also often used as

pesticides. Of the 4.5 billion pounds of pesticides used in 1995 in the United States, approximately 1 billion pounds, or 22%, are considered conventional pesticides. To meet this demand, the United States produces approximately 1.3 billion pounds, imports approximately 0.2 billion pounds, and exports approximately 0.5 billion pounds. (U.S. EPA, *Pesticides Industry Sales and Usage: 1994 and 1995 Market Estimates*, EPA-733-R-97-002, August 1997)

Under TRI, EPA requires reporting of approximately 180 currently active pesticides registered with EPA’s Office of Pesticide Programs. The top eight conventional pesticides (in millions of pounds) used in United States agricultural crop production that are reported to TRI appear in Table 2-14.

These eight chemicals made up about 30% of the total 1 billion pounds of conventional pesticides used in the United States in 1995. A comparison of



the amounts of pesticides used on crops with releases reported by facilities covered by TRI shows that on- and off-site releases are quite small (i.e., less than 0.4%, for these eight chemicals, of the total amount used annually as pesticides by the United States agricultural sector). It is important to note that the estimate for pesticide use in U.S. crop production is for 1995, while the TRI amount is for 1996. In addition, the agricultural sector accounts for approximately 77% of the total U.S. annual pesticide usage (the remainder used in industry/government operations and by homeowners). However, this limited comparison is useful in an attempt to gain perspective on the overall amounts of pesticides reported to TRI from the manufacturing sector compared with the total usage of conventional pesticides in the United States agricultural sector.

Pesticides reportable to TRI for which reports were received in 1996 are denoted with an asterisk in Table 2-21, which appears at the end of this chapter and provides data for all TRI chemicals reported in 1996.

Volatile Organic Compounds

Under the Clean Air Act (40 CFR Parts 51 and 52), EPA defines volatile organic compounds (VOCs) as any compound of carbon that participates in atmospheric photochemical reactions. VOCs do not include carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, and they do not include those chemicals that have been determined to have negligible photochemical reactivity.

EPA's National Air Pollutant Emissions Trends report estimates total U.S. emissions of VOCs in 1996 at approximately 19.1 million tons or 38.2 billion pounds (U.S. EPA, *National Air Pollutant Emissions Trends, 1900-1996*, EPA-454/R-97-011, December 1997). This amount includes a number of sources, such as: industrial point sources (i.e., boilers and processes), utility sources (including fossil-fueled steam electric generating boilers and

gas turbines), non-road engines and vehicles (including all transportation sources that are not counted as highway vehicles), motor vehicles, area sources (solvent use and small stationary sources), and biogenic/natural sources. A number of these sources are required to report under TRI. All TRI chemicals are considered to be VOCs except for metals, metal-containing compounds, and inorganic chemicals on the list, as well as CFCs, HCFCs, methylene chloride, 1,1,1-trichloroethane, and tetrachloroethylene. By definition, 505 TRI chemicals are considered VOCs. Total VOC air emissions reported to TRI were 995 million pounds, approximately 2.6% of the total 38.2 billion pounds of all VOCs emitted in 1996. The 20 VOCs in TRI with the largest air emissions appear in Table 2-15.

1996 Data for All TRI Chemicals

Releases, on-site waste management, and off-site transfers for further waste management, for all TRI chemicals reported in 1996, are presented in Table 2-21, at the end of this chapter.

Prevention and Management of TRI Chemicals in Waste

The Pollution Prevention Act of 1990 (PPA) requires facilities to report information about the quantities of TRI chemicals managed in waste, both on- and off-site. The PPA also requires facilities to provide information about the efforts they have made to reduce or eliminate those quantities. Facilities began reporting this information for the 1991 reporting year. This section summarizes the PPA data provided by facilities in their 1996 TRI reports.

The Pollution Prevention Act established as national policy that source reduction is the



Table 2-15. TRI Air Emissions for Top 20 Volatile Organic Chemicals with Largest Total Air Emissions, 1996

CAS Number	Chemical	Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Total Air Emissions Pounds
67-56-1	Methanol	27,987,712	178,370,259	206,357,971
108-88-3	Toluene	41,711,487	83,670,741	125,382,228
1330-20-7	Xylene (mixed isomers)	20,296,828	62,388,723	82,685,551
75-15-0	Carbon disulfide	3,212,583	69,569,637	72,782,220
110-54-3	n-Hexane	22,361,785	49,482,089	71,843,874
78-93-3	Methyl ethyl ketone	20,641,669	38,426,835	59,068,504
100-42-5	Styrene	10,917,192	31,011,969	41,929,161
—	Glycol ethers	8,347,921	31,823,871	40,171,792
74-85-1	Ethylene	16,159,552	19,627,812	35,787,364
115-07-1	Propylene	10,546,131	15,859,826	26,405,957
71-36-3	n-Butyl alcohol	4,906,789	17,938,341	22,845,130
79-01-6	Trichloroethylene	10,665,331	10,606,835	21,272,166
463-58-1	Carbonyl sulfide	610,328	19,241,733	19,852,061
108-10-1	Methyl isobutyl ketone	4,570,658	14,312,039	18,882,697
75-07-0	Acetaldehyde	1,637,438	10,938,582	12,576,020
50-00-0	Formaldehyde	1,779,994	9,639,206	11,419,200
108-95-2	Phenol	2,456,348	7,096,154	9,552,502
100-41-4	Ethylbenzene	2,487,776	6,902,212	9,389,988
67-66-3	Chloroform	3,086,308	6,235,110	9,321,418
71-43-2	Benzene	3,365,712	4,753,759	8,119,471
	Subtotal for Top 20 TRI VOCs	217,749,542	687,895,733	905,645,275
	Subtotal for All TRI VOCs	249,297,328	746,154,897	995,452,225

preferred approach to managing waste. Source reduction means preventing waste from being generated. The PPA also established as national policy a hierarchy of waste management options, illustrated in Figure 2-5, for situations where source reduction cannot be implemented feasibly.

Although source reduction is the preferred method of reducing risk, environmentally sound recycling shares many of its advantages. Like source reduction, recycling reduces the need for treatment or disposal of waste and helps conserve energy and natural resources. Where source reduction and recycling are not feasible, waste can be treated. Release (including disposal) of a chemical is

viewed as a last resort, to be employed only if the preferred methods of waste management cannot be implemented. The PPA did not specifically address the combustion of waste for energy recovery as a waste management option. However, because energy recovery shares aspects of recycling and treatment, EPA chose to list this activity separately in the waste management hierarchy.

Throughout this book, data tables present waste management information in the order of the hierarchy: recycling, energy recovery, treatment, and release (including disposal).

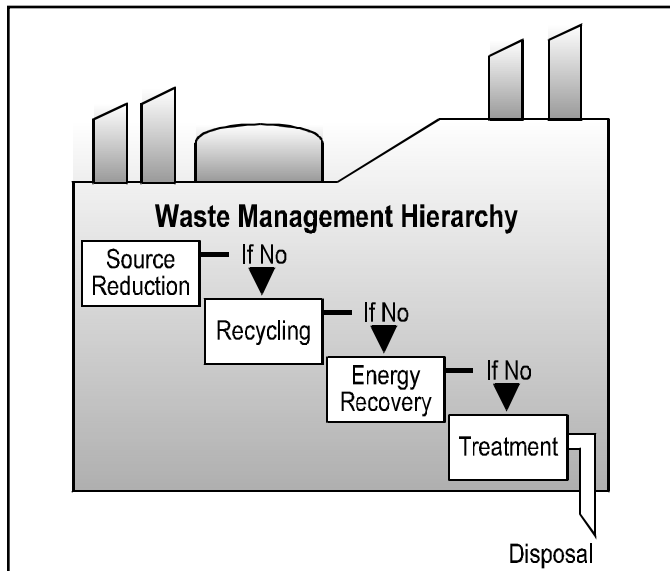


Figure 2-5. Waste Management Hierarchy

Waste Management Information Collected

The waste management information required by the PPA is collected in Section 8 of TRI's Form R. It includes: quantity released to the environment at the facility and sent off-site for disposal; quantities used for energy recovery at the facility or sent off-site for energy recovery; quantities recycled at the facility or sent off-site for recycling; and quantities treated at the facility or sent off-site for treatment. The amount of TRI chemicals in waste reported includes both waste generated by the facility and waste received by the facility for the purpose of waste management. Box 2-5 further describes waste management information reported to TRI.

Facilities report this waste management data as estimates for the reporting year (1996) and the previous year (1995) and as projections for the two following years (1997 and 1998). The PPA requires the projected data to encourage facilities to consider their future waste generation, opportunities for source reduction, and potential improvement in waste management options as presented in the hierarchy. Future-year estimates

are not commitments that facilities reporting to TRI must meet.

The individual quantities are mutually exclusive to avoid double-counting. For example, an incinerator may destroy 99% of the chemical in the waste; in this case, the amount reported as treated on-site is the amount destroyed by the incinerator, not the amount that entered the incinerator. The amount not destroyed in incineration (1%) is reported as released. The sum of the individual quantities in a given year equals the total quantity of TRI chemicals in waste resulting from routine production operations at a facility during that year.

For the reporting year only, facilities also must report the quantity of waste released (including disposal) as a result of activities other than routine production operations. This quantity appears in the data tables in this book as "non-production-related waste." It includes waste released to the environment at the facility or transferred off-site because of catastrophic events or remedial (clean-up) actions at the facility. Non-production-related waste is considered less amenable to source reduction because facilities cannot reasonably anticipate these quantities.

It is important to note that facilities may vary in how they interpret some of the reporting requirements under the PPA. EPA has not yet specifically defined in rulemaking the reporting requirements for these data elements, so some facilities may include in their reports amounts that other facilities do not believe they must include. Because of this, higher quantities of TRI chemicals in waste for a particular state or industry may reflect not only differences in actual quantities, but also different interpretations of the reporting requirements.

Source Reduction Activities

Facilities reporting to TRI also provide information about any source reduction activities they implemented during the reporting year. Source reduction activities are undertaken to reduce the amount of a

**Box 2-5. An Explanation of Waste Management Information****An Explanation of Waste Management Information**

Information about facilities management of TRI chemicals in waste is reported in Section 8 of Form R.

Recycled On-site. This is the quantity of the toxic chemical recovered at the facility and made available for further use. It is not the quantity that entered an on-site recycling or recovery operation.

Recycled Off-site. This is the quantity of the toxic chemical that left the facility boundary for recycling, not the amount recovered at the off-site location. This quantity includes the amount(s) reported in Section 6 of Form R as transferred off-site for recycling, less any amount(s) associated with non-routine events.

Used for Energy Recovery On-site. This is the quantity of the toxic chemical that was combusted in some form of energy recovery device, such as a furnace (including kilns) or boiler. The toxic chemical should have a heating value high enough to sustain combustion. To avoid double-counting, the amount reported represents the amount destroyed in the combustion process, not the amount that entered the energy recovery unit. For example, 100,000 pounds of toluene entered a boiler that, on average, combusted 98% of the toluene. Any remaining toluene was discharged to air. A total of 98,000 pounds is reported as combusted for energy recovery (the remaining 2,000 pounds is reported as released).

Used for Energy Recovery Off-site. This is the quantity of the toxic chemical that left the facility boundary for energy recovery, not the amount combusted at the off-site location. The toxic chemical must have a significant heating value, and the off-site location must have some form of energy recovery unit in place. This quantity includes the amount(s) reported in Section 6 of Form R as transferred off-site for energy recovery, less any amount(s) associated with non-routine events.

Treated On-site. This is the quantity of the toxic chemical destroyed in on-site waste treatment operations, not the amount that entered any treatment operation. For example, if 100,000 pounds of benzene were combusted in an incinerator that destroyed 99% of the benzene, the facility would report 99,000 pounds as treated on-site (the remaining 1,000 pounds would be reported as released).

Treated Off-site. This is the quantity of the toxic chemical that left the facility boundary and was sent to POTWs or other off-site locations for treatment, not the amount that was destroyed at the off-site location(s). This quantity includes the amount(s) reported in Section 6 of Form R as transferred to POTWs or other off-site locations for treatment, less any amount(s) associated with non-routine events.

Released On- and Off-site. This is the total quantity of the toxic chemical that was released to the environment or disposed of at the facility (directly discharged to air, land, and water, and injected underground) or sent off-site for disposal. This quantity is the sum of the amounts reported in Sections 5 and 6 of Form R (releases plus transfers to disposal only) less any amount(s) associated with non-routine events.

Released to the Environment Due to One-time Events. This amount is referred to as non-production-related waste and is the quantity released to the environment or sent off-site for recycling, energy recovery, treatment, or disposal due to one-time events not associated with routine production practices. Such events include catastrophic events, such as accidental releases, as well as remedial actions (clean up). This quantity is separated from the quantities recycled, used for energy recovery, treated, and released, to distinguish between quantities that are routinely associated with production operations and are more amenable to source reduction and those that are not routinely associated with production processes and are not so amenable to source reduction because they are not readily anticipated. This separation is important in assessing progress in source reduction at facilities.



toxic chemical which enters a waste stream or is otherwise released to the environment. By reducing the generation of toxic chemicals in waste, source reduction activities reduce the need to recycle, treat, or dispose of toxic chemicals. Box 2-6 explains source reduction as defined by the PPA.

A reported source reduction activity could have been implemented at any time during the reporting year. This is important to consider when analyzing the impact that source reduction activities may have had on the total quantity of waste that a facility managed during the year. Undertaking a source reduction activity late in the reporting year would have a smaller impact on the amount of waste that was managed during the year than implementing the same activity earlier in the year.

Table 2-16 summarizes national source reduction activity reporting by category for 1996. The most frequently reported categories of source reduction activities were good operating practices (8.6% of all forms), process modifications (6.0%), and spill and leak prevention (4.1%). These categories were also the most frequently reported in previous years. Nearly 5,900 facilities reported at least one source reduction activity, a little more than one-quarter of all reporting facilities. They submitted 13,988 forms that indicated at least one source reduction activity, 19.6% of all forms submitted in 1996.

Thus, for every form indicating source reduction activity in 1996, four did not.

Quantities of TRI Chemicals in Waste

National Overview

In 1996, facilities reported managing 23.42 billion pounds of TRI chemicals in production-related waste. They projected that their production-related waste will increase to 24.17 billion pounds by 1998, an increase of 3.2% (see Table 2-17). On-site waste management activities were projected to increase 5.8%, from 17.74 billion pounds to 18.78 billion pounds. This accounts for the projected overall increase, offsetting decreases of 3.4% in off-site waste management and 6.9% in releases on- and off-site over the two years. All on-site waste management types were projected to increase, and all off-site types to decrease. Thus, the projections indicate a small shift in where facilities expect to manage their waste, but little change in how they expect to do so and little foreseeable progress in moving up the waste management hierarchy.

Totals for 1996 reported in Section 8 of Form R and presented in Table 2-17 show little overall difference from comparable amounts reported in

Box 2-6. What is Source Reduction?

What is Source Reduction?

Through source reduction, risks to people and the environment can be reduced, financial and natural resources can be saved that would otherwise have to be expended on environmental clean-up or pollution control, and industrial processes can become more efficient. Source reduction is defined in the Pollution Prevention Act of 1990 as any practice that:

- reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions); and
- reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.

Source reduction practices can include modifications in equipment, process, procedure, or technology, reformulation or redesign of products, substitution of raw materials, and improvements in maintenance and inventory controls. Under this definition, waste management activities, including recycling, treatment, and disposal, are not considered forms of source reduction.



Table 2-16. Facilities and Forms Reporting Source Reduction Activity, by Category, 1996

Source Reduction Activity Categories	Facilities Reporting Source Reduction Activity		Forms Reporting Source Reduction Activity	
	Number	As Percent of All TRI Facilities Percent	Number	As Percent of All TRI Forms Percent
Good Operating Practices	2,652	12.3	6,145	8.6
Inventory Control	582	2.7	1,303	1.8
Spill and Leak Prevention	1,152	5.3	2,944	4.1
Raw Material Modifications	1,453	6.7	2,459	3.4
Process Modifications	2,001	9.3	4,254	6.0
Cleaning and Degreasing	638	3.0	958	1.3
Surface Preparation/Finishing	646	3.0	1,233	1.7
Product Modification	551	2.5	1,025	1.4
Any Source Reduction Activity	5,899	27.3	13,988	19.6

Note: All source reduction activities on a form are counted in the corresponding category. Totals do not equal the sum of the above categories because facilities and forms may report more than one source reduction activity.

Table 2-17. Current Year, and Projected Quantities of TRI Chemicals in Waste, 1996-1998

Waste Management Activity	Current Year 1996 Pounds	Projected 1997 Pounds	Projected 1998 Pounds
<u>On-site Waste Management</u>	17,744,196,508	19,069,339,345	18,777,856,416
Recycled On-site	7,842,595,142	9,058,050,236	8,519,036,977
Energy Recovery On-site	2,761,739,445	2,834,933,863	2,827,656,852
Treated On-site	7,139,861,921	7,176,355,246	7,431,162,587
<u>Off-site Waste Management</u>	3,257,227,459	3,123,106,723	3,146,215,747
Recycled Off-site	2,230,297,511	2,139,384,425	2,171,369,720
Energy Recovery Off-site	510,267,931	469,607,626	466,659,144
Treated Off-site	516,662,017	514,114,672	508,186,883
Quantity Released On- and Off-site	2,414,916,746	2,352,037,799	2,249,143,815
Total Production-related Waste	23,416,340,713	24,544,483,867	24,173,215,978

Note: Current year and projected year amounts are all taken from Section 8 of Form R for 1996.



Sections 5 and 6 of Form R and discussed earlier in this chapter (see Tables 2-2 and 2-4). Altogether, releases and transfers reported in Sections 5 and 6 totaled 85.0 million pounds (or 1.5%) less than corresponding data reported in Section 8. The largest absolute difference appeared in off-site recycling, which was 79.7 million pounds (or 3.5%) less when reported as off-site transfers in Section 6 than when reported as off-site waste management in Section 8. The largest difference in percentage terms was off-site energy recovery, where off-site transfers in Section 6 were 6.5% (or 33.2 million pounds) smaller than waste management quantities reported in Section 8. The only category with a smaller amount reported in Section 8 was treatment off-site, where 9.3 million pounds (or 1.8%) more were reported as transfers off-site to treatment and to POTWs in Section 6 than as treated off-site in Section 8. Metals reported in Section 6 should be reported in Section 8.1, not 8.7.

These differences can arise because Section 5 and 6 amounts include releases and transfers resulting from remedial actions or other one-time events; these are reported separately in Section 8. Furthermore, facilities can round off the quantities they report in Section 8 to two significant digits. In addition, some facilities may not understand that the total of the amounts that a facility reports in Section 5 and 6 should equal the total reported in the current year column of Section 8.

Waste Management Data by State

Table 2-18 provides the waste management data for each state and territory. Facilities in four states reported more than 1 billion pounds of total production-related waste in 1996: Texas (3.78 billion pounds), Louisiana (2.15 billion pounds), California (1.33 billion pounds), and Ohio (1.01 billion pounds).

As noted earlier in this chapter, Texas led all states in all types of on-site waste management, with 965.1 million pounds recycled, 836.5 million pounds burned for energy recovery, and 1.38 billion

pounds treated. Louisiana was second in recycling (725.1 million pounds) and energy recovery (350.8 million pounds). California was second for treatment (1.10 billion pounds).

Off-site recycling is the only waste management category in which Texas did not rank first. Facilities in Indiana reported 245.4 million pounds of TRI chemicals in waste sent off-site for recycling, followed by Ohio with 190.0 million pounds. Texas ranked third with 178.2 million pounds. For off-site energy recovery, Texas (with 72.8 million pounds) was followed by Michigan (70.9 million pounds) and Ohio (40.5 million pounds). These states also reported the largest quantities of off-site treatment, with Texas first (with 79.5 million pounds), but in this case Ohio was second (42.3 million pounds) and Michigan third (36.3 million pounds).

The states with the largest quantities released on- and off-site were Texas (273.3 million pounds), Louisiana (183.5 million pounds), and Ohio (152.7 million pounds). These positions correspond to their rankings for total releases reported in Sections 5 (on-site releases) and 6 (off-site transfers to disposal) of Form R, discussed earlier in this chapter.

States projecting the largest net increases in total production-related waste through 1998 were Michigan, with 360.6 million pounds (45.1% increase); Texas, with 153.3 million pounds (4.1%); and Virginia, with 115.4 million pounds (18.3%). No other state or territory had projections totalling an increase of more than 100 million pounds. States whose facilities projected the largest net decreases were Kansas, with 86.1 million pounds (19.6% decrease) and Arkansas, with 71.2 million pounds (16.4% decrease). No other state or territory projected a net decrease of more than 50 million pounds by 1998. Waste management quantities reported in 1996 for the current year, prior year, and (projected) future years, for all states and territories, appear in Table 2-19.



Table 2-18. Quantities of TRI Chemicals in Waste, by State, 1996

State	On-site Waste Management			Off-site Waste Management			Releases	Total Production-related Waste Pounds
	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Recycled Off-site Pounds	Energy Recovery Off-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	
Alabama	247,765,725	35,866,493	316,900,305	35,529,473	25,359,373	7,922,475	95,182,733	764,526,577
Alaska	25,842	457,400	2,761,278	235,363	5,869	943	6,908,058	10,394,753
American Samoa	0	0	0	0	0	0	10,500	10,500
Arizona	629,813,584	695,864	7,501,763	79,178,016	781,997	11,197,887	47,930,882	777,099,993
Arkansas	202,786,365	33,421,106	113,334,864	41,400,704	7,246,845	3,522,772	33,544,838	435,257,494
California	48,933,381	18,173,050	1,102,173,175	69,551,505	22,064,027	15,705,219	49,809,089	1,326,409,446
Colorado	18,998,219	8,287,872	8,234,284	18,399,440	4,139,362	1,752,199	5,164,556	64,975,932
Connecticut	91,847,249	4,467,216	36,458,784	24,608,796	2,207,815	7,282,528	8,426,865	175,299,253
Delaware	29,782,121	219,184	50,920,120	10,044,253	1,170,244	5,768,778	3,638,053	101,542,753
District of Columbia	0	0	1,695	12,000	0	181	9,295	23,171
Florida	133,882,239	19,362,992	131,946,077	18,166,359	2,320,957	12,762,520	77,916,828	396,357,972
Georgia	246,187,301	48,222,623	196,531,036	48,876,516	10,144,806	4,746,163	62,230,297	616,938,742
Guam	0	0	0	0	0	0	0	0
Hawaii	6,611	0	3,590,519	53,077	0	2,233	533,144	4,185,584
Idaho	176,378	26,900	17,160,464	600,490	165,822	281,151	15,155,543	33,566,748
Illinois	316,452,083	35,570,868	120,405,877	95,627,540	28,285,621	24,496,364	107,248,201	728,086,554
Indiana	192,429,951	86,416,362	171,880,470	245,351,295	10,914,590	11,026,374	110,151,053	828,170,095
Iowa	142,535,240	1,827,848	28,677,544	27,317,298	3,011,874	10,150,245	33,036,740	246,556,789
Kansas	210,117,169	100,585,103	35,937,066	56,985,523	2,733,483	5,423,288	26,360,461	438,142,093
Kentucky	270,427,752	70,165,040	119,641,055	52,361,408	9,429,533	11,147,552	43,766,296	576,938,636
Louisiana	725,090,414	350,796,650	816,209,604	52,384,305	15,957,047	10,003,097	183,477,795	2,153,918,912
Maine	10,123,918	11,099,536	63,525,017	3,353,816	406,981	366,806	9,462,695	98,338,769
Maryland	17,008,373	13,397,901	34,005,595	3,781,350	1,415,359	7,255,933	12,878,468	89,742,979
Massachusetts	23,084,234	5,223,661	27,615,676	29,387,616	6,680,311	10,461,917	9,741,126	112,194,541
Michigan	304,344,692	87,992,757	94,427,464	109,522,352	70,907,331	36,320,511	96,612,300	800,127,407
Minnesota	147,195,055	10,743,037	32,157,870	22,262,688	2,349,468	8,841,148	21,136,326	244,685,592
Mississippi	215,890,406	18,567,578	104,186,585	25,108,852	2,674,253	2,178,444	53,292,116	421,898,234
Missouri	177,893,875	79,482,408	72,793,495	59,989,152	27,006,551	11,964,685	59,126,923	488,257,089
Montana	50,305,985	2,513,550	8,610,407	586,363	1,559	62,202	48,511,195	110,591,261
Nebraska	18,289,870	1,499,579	6,867,436	19,004,619	434,688	1,132,693	12,743,662	59,972,547
Nevada	2,125,936	0	8,595,388	1,855,164	11,125	39,104	3,780,672	16,407,389
New Hampshire	16,867,518	1,858,325	10,301,186	12,351,423	312,436	944,007	2,476,520	45,111,415
New Jersey	56,031,604	347,873,373	125,963,690	41,733,440	30,957,035	23,687,382	19,408,308	645,654,832
New Mexico	1,509,122	33,800,000	1,868,997	1,054,680	157,340	469,286	19,990,405	58,849,834
New York	176,304,149	25,633,557	112,267,207	68,467,184	7,814,260	12,984,222	36,237,438	439,708,017
North Carolina	362,510,160	25,898,390	147,228,500	88,351,160	14,154,483	11,689,900	83,478,894	733,311,487
North Dakota	44,438	3,300	4,853,566	834,318	20,061	215,671	2,312,172	8,283,526
Ohio	329,167,620	96,800,899	155,733,167	190,012,535	40,513,765	42,263,264	152,721,169	1,007,212,419
Oklahoma	53,640,688	52,550,449	16,068,996	19,639,683	979,666	1,557,350	25,995,800	170,432,632
Oregon	33,343,531	17,268,217	61,437,014	20,382,063	1,404,094	16,476,844	23,842,013	174,153,776
Pennsylvania	392,219,178	50,287,872	149,258,161	149,691,289	17,815,663	21,877,011	115,008,743	896,157,917
Puerto Rico	24,267,097	142,187	17,004,946	13,804,916	10,661,013	8,446,328	8,200,030	82,526,517
Rhode Island	13,987,327	226,963	7,123,050	14,710,524	858,003	891,635	2,203,317	40,000,819
South Carolina	303,352,841	78,185,193	112,054,076	97,338,156	7,886,714	10,814,955	56,205,773	665,837,708
South Dakota	30,204,647	1,050,000	1,894,335	508,822	185,424	1,411,791	5,101,582	40,356,601
Tennessee	164,053,491	49,580,975	106,752,628	49,461,184	6,244,944	12,365,334	106,047,967	494,506,523
Texas	965,065,180	836,485,137	1,375,842,159	178,196,574	72,829,686	79,465,740	273,328,764	3,781,213,240
Utah	9,803,457	25,620,841	317,147,921	7,763,733	106,125	4,686,207	80,758,371	445,886,655
Vermont	457,075	6,200	1,026,694	2,453,609	13,332	264,620	451,988	4,673,518
Virgin Islands	711,124	0	10,248,528	96,920	4,834	377,449	1,506,138	12,944,993
Virginia	178,353,110	29,707,489	317,770,559	23,042,524	7,097,789	19,350,747	56,322,865	631,645,083
Washington	80,436,589	18,590,204	90,430,822	11,732,574	884,619	2,504,576	27,405,507	231,984,891
West Virginia	121,297,058	10,237,138	146,675,430	30,312,857	9,237,060	5,804,792	28,809,290	352,373,625
Wisconsin	53,677,399	14,787,808	112,924,941	56,504,531	22,299,121	16,294,697	39,640,292	316,128,789
Wyoming	1,770,771	62,350	4,934,435	317,475	3,573	2,797	9,676,690	16,768,091
Total	7,842,595,142	2,761,739,445	7,139,861,921	2,230,297,511	510,267,931	516,662,017	2,414,916,746	23,416,340,713

Note: Data from current year (Column B), Section 8 of Form R for 1996.



Table 2-19. Actual and Projected Quantities of TRI Chemicals in Waste, by State, 1995-1998

State	Year	On-site Waste Management			Off-site Waste Management			Releases Quantity Released On- and Off-site	Total Production- related Waste
		Recycled On-site	Energy Recovery On-site	Treated On-site	Recycled Off-site	Energy Recovery Off-site	Treated Off-site		
Alabama	95	219,467,972	29,584,924	351,827,816	35,519,367	30,484,802	5,610,686	104,116,292	776,611,859
	96	247,765,725	35,866,493	316,900,305	35,529,473	25,359,373	7,922,475	95,182,733	764,526,577
	97	265,839,978	38,913,149	336,579,788	36,855,806	27,433,244	8,012,760	88,209,844	801,844,569
	98	280,513,089	42,296,780	330,281,488	37,148,385	28,519,583	9,121,436	86,963,696	814,844,457
Alaska	95	29,470	1,211,000	2,395,209	2,034	3	12	6,833,331	10,471,059
	96	25,842	457,400	2,761,278	235,363	5,869	943	6,908,058	10,394,753
	97	27,500	457,400	3,652,132	189,500	3	901	4,781,550	9,108,986
	98	27,500	457,400	6,192,132	29,500	3	942	1,652,765	8,360,242
American Samoa	95	0	0	0	0	0	0	5,500	5,500
	96	0	0	0	0	0	0	10,500	10,500
	97	0	0	0	0	0	0	8,800	8,800
	98	0	0	0	0	0	0	5,500	5,500
Arizona	95	484,880,620	450,436	7,926,180	51,066,569	876,773	10,509,493	35,410,045	591,120,116
	96	629,813,584	695,864	7,501,763	79,178,016	781,997	11,197,887	47,930,882	777,099,993
	97	665,023,628	727,854	7,563,850	54,952,082	835,715	6,022,147	45,930,204	781,055,480
	98	664,537,289	778,605	8,002,943	53,147,186	904,696	6,282,829	44,396,829	778,050,377
Arkansas	95	200,836,918	35,286,643	131,623,494	50,668,477	6,569,340	6,298,787	35,443,104	466,726,763
	96	202,786,365	33,421,106	113,334,864	41,400,704	7,246,845	3,522,772	33,544,838	435,257,494
	97	211,072,328	27,158,942	113,391,126	39,347,670	6,938,893	2,122,669	32,080,324	432,111,952
	98	143,688,683	28,716,478	114,560,701	37,521,322	7,044,809	973,191	31,553,572	364,058,756
California	95	43,406,401	16,731,524	165,981,733	67,824,469	23,834,775	16,162,797	44,146,211	378,087,910
	96	48,933,381	18,173,050	1,102,173,175	69,551,505	22,064,027	15,705,219	49,809,089	1,326,409,446
	97	45,648,039	15,905,475	1,099,888,806	69,551,988	22,280,848	19,265,330	44,377,837	1,316,918,323
	98	44,137,360	12,320,213	1,099,316,151	71,741,859	23,572,492	16,123,456	40,864,117	1,308,075,648
Colorado	95	14,154,013	9,200,000	7,463,134	21,483,549	3,534,014	1,570,209	4,225,300	61,630,219
	96	18,998,219	8,287,872	8,234,284	18,399,440	4,139,362	1,752,199	5,164,556	64,975,932
	97	22,156,172	8,727,500	7,535,477	15,898,758	5,882,450	1,981,226	5,110,928	67,292,511
	98	29,364,283	8,733,500	8,888,156	16,178,257	5,598,648	2,025,868	5,068,277	75,856,989
Connecticut	95	101,132,184	4,684,785	36,684,424	25,794,257	2,382,702	7,924,633	10,268,190	188,871,175
	96	91,847,249	4,467,216	36,458,784	24,608,796	2,207,815	7,282,528	8,426,865	175,299,253
	97	92,249,043	3,605,295	36,154,545	25,072,622	2,434,043	6,862,368	7,421,396	173,799,312
	98	94,260,961	3,741,001	35,225,624	26,218,588	2,464,214	6,832,799	6,518,819	175,262,006
Delaware	95	28,988,464	332,836	55,612,821	17,201,009	2,251,577	4,015,714	4,486,670	112,889,091
	96	29,782,121	219,184	50,920,120	10,044,253	1,170,244	5,768,778	3,638,053	101,542,753
	97	32,227,122	170,000	50,693,906	10,851,548	1,232,515	4,725,462	3,341,249	103,241,802
	98	34,616,402	190,000	54,911,008	10,734,632	1,309,352	3,577,840	3,359,720	108,698,954
District of Columbia	95	0	0	580	13,000	0	301	22,000	35,881
	96	0	0	1,695	12,000	0	181	9,295	23,171
	97	0	0	1,520	12,000	0	201	19,495	33,216
	98	0	0	1,495	9,700	0	201	19,476	30,872
Florida	95	136,096,589	18,443,697	113,882,754	13,290,886	1,438,594	8,866,851	74,653,934	366,673,305
	96	133,882,239	19,362,992	131,946,077	18,166,359	2,320,957	12,762,520	77,916,828	396,357,972
	97	143,109,672	18,625,150	135,374,285	16,617,122	2,398,726	12,758,671	77,142,881	406,026,507
	98	143,473,003	17,204,108	136,340,610	16,739,484	2,870,588	12,631,760	77,631,977	406,891,530
Georgia	95	255,463,864	55,200,432	246,467,698	44,738,315	7,969,702	5,092,309	59,554,126	674,486,446
	96	246,187,301	48,222,623	196,531,036	48,876,516	10,144,806	4,746,163	62,230,297	616,938,742
	97	269,514,510	50,459,174	209,916,458	42,543,250	9,300,970	4,156,106	61,831,074	647,721,542
	98	269,584,391	51,068,639	217,170,277	43,011,731	9,303,497	4,060,073	60,792,761	654,991,369



Table 2-19. Actual and Projected Quantities of TRI Chemicals in Waste, by State, 1995-1998, Continued

State	Year	On-site Waste Management			Off-site Waste Management			Releases	Total Production- related Waste
		Recycled On-site	Energy Recovery On-site	Treated On-site	Recycled Off-site	Energy Recovery Off-site	Treated Off-site	Quantity Released On- and Off-site	
Guam	95	0	0	0	0	0	0	200	200
	96	0	0	0	0	0	0	0	0
	97	0	0	0	0	0	0	0	0
	98	0	0	0	0	0	0	0	0
Hawaii	95	5,002	0	4,020,323	31,298	0	8,311	526,687	4,591,621
	96	6,611	0	3,590,519	53,077	0	2,233	533,144	4,185,584
	97	13,095	0	3,606,960	45,007	0	1,178	535,935	4,202,175
	98	13,179	0	3,606,985	45,008	0	4,708	532,035	4,201,915
Idaho	95	79,381	26,600	14,629,446	618,240	99,082	245,680	14,798,404	30,496,833
	96	176,378	26,900	17,160,464	600,490	165,822	281,151	15,155,543	33,566,748
	97	161,435	29,000	16,910,920	646,129	167,680	274,423	14,508,212	32,697,799
	98	170,150	31,800	17,079,193	684,253	168,866	284,371	14,716,367	33,135,000
Illinois	95	212,160,290	17,217,921	119,001,986	97,063,564	31,010,926	27,943,182	107,722,726	612,120,595
	96	316,452,083	35,570,868	120,405,877	95,627,540	28,285,621	24,496,364	107,248,201	728,086,554
	97	365,174,196	34,827,012	118,359,358	83,400,865	26,898,516	28,733,922	100,591,924	757,985,793
	98	368,688,995	34,827,591	126,067,801	83,529,541	27,036,157	27,956,922	98,915,603	767,022,610
Indiana	95	200,488,445	54,698,263	117,571,011	207,532,211	11,051,214	10,412,799	105,415,248	707,169,191
	96	192,429,951	86,416,362	171,880,470	245,351,295	10,914,590	11,026,374	110,151,053	828,170,095
	97	183,320,682	75,565,928	177,124,609	227,296,934	9,909,867	10,670,196	111,944,696	795,832,912
	98	165,364,498	76,696,673	180,974,406	226,613,953	9,766,935	14,302,686	109,032,068	782,751,219
Iowa	95	210,191,023	1,621,517	30,919,395	38,742,753	4,165,128	9,055,841	35,712,940	330,408,597
	96	142,535,240	1,827,848	28,677,544	27,317,298	3,011,874	10,150,245	33,036,740	246,556,789
	97	151,040,397	1,778,000	28,347,408	27,502,327	2,455,100	10,975,548	32,110,920	254,209,700
	98	152,166,830	1,778,000	28,403,356	27,328,529	2,262,442	11,539,317	30,810,925	254,289,399
Kansas	95	344,076,586	163,803,089	42,974,398	41,443,936	1,522,106	3,124,467	28,106,985	625,051,567
	96	210,117,169	100,585,103	35,937,066	56,985,523	2,733,483	5,423,288	26,360,461	438,142,093
	97	172,350,660	76,742,580	30,221,018	59,536,773	2,443,634	7,771,993	23,377,047	372,443,705
	98	130,834,841	79,783,680	42,269,210	63,914,555	2,404,577	8,465,313	24,403,887	352,076,063
Kentucky	95	249,733,864	53,171,189	94,901,838	50,599,860	7,685,528	12,492,084	45,939,840	514,524,203
	96	270,427,752	70,165,040	119,641,055	52,361,408	9,429,533	11,147,552	43,766,296	576,938,636
	97	280,179,863	70,259,565	108,193,839	60,132,880	8,217,190	12,405,717	39,919,136	579,308,190
	98	286,183,857	70,358,282	113,795,016	64,331,077	8,310,170	12,563,385	39,140,643	594,682,430
Louisiana	95	687,755,914	319,488,010	804,299,854	54,288,026	14,500,229	9,022,999	176,659,049	2,066,014,081
	96	725,090,414	350,796,650	816,209,604	52,384,305	15,957,047	10,003,097	183,477,795	2,153,918,912
	97	737,080,787	361,838,512	827,982,234	53,850,411	14,853,540	8,817,621	186,135,189	2,190,558,294
	98	736,202,605	398,550,769	830,290,259	53,940,241	14,568,140	7,142,907	167,978,196	2,208,673,117
Maine	95	9,926,951	11,337,913	72,254,423	2,489,316	486,675	685,277	11,003,221	108,183,776
	96	10,123,918	11,099,536	63,525,017	3,353,816	406,981	366,806	9,462,695	98,338,769
	97	10,310,687	11,664,226	65,236,039	3,400,112	403,221	640,308	9,551,394	101,205,987
	98	10,329,245	12,348,916	65,264,854	3,063,439	399,141	624,412	9,174,264	101,204,271
Maryland	95	14,108,909	13,968,772	30,015,914	6,561,633	1,661,599	5,130,867	13,976,556	85,424,250
	96	17,008,373	13,397,901	34,005,595	3,781,350	1,415,359	7,255,933	12,878,468	89,742,979
	97	19,599,216	14,019,001	34,636,540	3,989,785	1,372,780	5,528,871	13,063,884	92,210,077
	98	19,645,929	15,054,300	34,143,833	4,250,046	1,357,848	5,706,355	13,025,830	93,184,141
Massachusetts	95	24,143,263	8,340,614	25,053,928	27,017,638	8,181,825	11,503,493	8,817,706	113,058,467
	96	23,084,234	5,223,661	27,615,676	29,387,616	6,680,311	10,461,917	9,741,126	112,194,541
	97	21,307,702	5,545,174	27,805,276	26,791,088	6,180,813	10,055,167	8,782,190	106,467,410
	98	22,937,559	5,771,934	28,149,120	30,860,708	6,273,419	10,048,620	8,494,412	112,535,772



Table 2-19. Actual and Projected Quantities of TRI Chemicals in Waste, by State, 1995-1998, Continued

State	Year	On-site Waste Management			Off-site Waste Management			Releases	Total Production-related Waste
		Recycled On-site	Energy Recovery On-site	Treated On-site	Recycled Off-site	Energy Recovery Off-site	Treated Off-site	Quantity Released On- and Off-site	
Michigan	95	171,481,860	108,318,595	130,519,722	102,772,789	62,603,906	29,318,219	119,802,545	724,817,636
	96	304,344,692	87,992,757	94,427,464	109,522,352	70,907,331	36,320,511	96,612,300	800,127,407
	97	565,436,601	114,442,661	94,085,470	109,601,210	69,064,689	31,401,602	97,065,310	1,081,097,543
	98	651,921,845	117,989,684	91,173,912	108,741,152	68,262,599	31,555,340	91,054,210	1,160,698,742
Minnesota	95	150,902,425	24,194,538	28,875,750	21,118,170	2,751,381	8,322,922	22,365,059	258,530,245
	96	147,195,055	10,743,037	32,157,870	22,262,688	2,349,468	8,841,148	21,136,326	244,685,592
	97	156,855,777	10,885,174	31,522,009	20,412,696	2,253,113	9,090,046	20,645,985	251,664,800
	98	161,883,046	10,880,474	31,293,355	20,818,524	2,226,141	9,441,414	19,807,222	256,350,176
Mississippi	95	239,115,840	7,757,942	106,747,614	37,127,185	2,777,089	2,432,071	54,206,478	450,164,219
	96	215,890,406	18,567,578	104,186,585	25,108,852	2,674,253	2,178,444	53,292,116	421,898,234
	97	226,639,557	20,691,427	108,327,208	23,209,638	2,836,492	1,568,971	49,076,321	432,349,614
	98	216,853,163	20,985,879	108,919,572	22,929,577	2,670,025	1,325,728	41,414,278	415,098,222
Missouri	95	184,142,307	88,370,962	74,705,094	55,862,604	27,875,621	13,319,301	56,781,935	501,057,824
	96	177,893,875	79,482,408	72,793,495	59,989,152	27,006,551	11,964,685	59,126,923	488,257,089
	97	201,206,404	71,722,272	70,229,707	58,267,849	11,061,520	12,147,169	56,719,180	481,354,101
	98	211,701,625	71,635,972	71,706,835	61,833,606	11,513,724	12,678,478	54,676,333	495,746,573
Montana	95	48,846,536	17,305,350	9,178,710	114,088	14,948	36,092	43,840,102	119,335,826
	96	50,305,985	2,513,550	8,610,407	586,363	1,559	62,202	48,511,195	110,591,261
	97	38,430,146	2,489,150	8,952,428	297,221	1,558	71,488	46,967,394	97,209,385
	98	38,437,346	2,489,150	8,952,428	293,221	1,558	60,488	46,930,768	97,164,959
Nebraska	95	10,330,640	1,879,530	6,249,946	32,929,648	558,633	1,059,237	13,935,727	66,943,361
	96	18,289,870	1,499,579	6,867,436	19,004,619	434,688	1,132,693	12,743,662	59,972,547
	97	5,042,941	578,696	6,983,096	17,011,375	472,245	1,179,778	12,043,822	43,311,953
	98	1,904,024	578,865	7,188,406	17,691,735	556,553	1,178,319	9,296,086	38,393,988
Nevada	95	2,452,241	0	6,840,500	2,306,858	6,236	18,688	3,784,296	15,408,819
	96	2,125,936	0	8,595,388	1,855,164	11,125	39,104	3,780,672	16,407,389
	97	2,353,184	0	15,916,020	1,892,704	9,960	16,746	3,947,732	24,136,346
	98	2,352,897	0	15,917,420	1,867,911	9,980	17,040	3,898,565	24,063,813
New Hampshire	95	17,604,327	1,684,385	10,847,794	11,284,316	238,437	786,989	2,465,137	44,911,385
	96	16,867,518	1,858,325	10,301,186	12,351,423	312,436	944,007	2,476,520	45,111,415
	97	18,342,433	1,956,218	10,305,178	12,605,887	296,039	989,791	2,321,997	46,817,543
	98	18,354,043	1,956,218	10,203,683	12,860,395	311,414	1,015,885	2,188,666	46,890,304
New Jersey	95	44,699,570	188,618,111	146,846,720	42,592,246	30,986,427	23,310,572	17,322,281	494,375,927
	96	56,031,604	347,873,373	125,963,690	41,733,440	30,957,035	23,687,382	19,408,308	645,654,832
	97	57,982,745	344,050,005	117,760,336	38,359,097	27,793,209	21,600,707	16,991,634	624,537,733
	98	55,510,470	344,220,825	116,072,654	38,808,550	25,616,113	22,870,995	16,462,234	619,561,841
New Mexico	95	2,049,130	48,000,000	2,299,637	872,727	304,703	343,712	18,337,965	72,207,874
	96	1,509,122	33,800,000	1,868,997	1,054,684	157,340	469,286	19,990,405	58,849,834
	97	1,508,912	33,800,000	3,730,657	1,471,458	182,115	628,687	20,621,028	61,942,857
	98	1,508,537	33,800,000	3,997,653	1,793,467	205,079	764,682	19,864,437	61,933,855
New York	95	180,309,512	23,320,957	108,416,905	77,097,766	9,384,258	13,169,349	39,728,489	451,427,236
	96	176,304,149	25,633,557	112,267,207	68,467,184	7,814,260	12,984,222	36,237,438	439,708,017
	97	176,510,089	26,229,328	116,633,402	73,332,942	7,323,634	13,133,349	32,395,595	445,558,339
	98	176,721,572	26,728,870	118,001,093	77,786,623	6,738,126	12,772,370	30,624,974	449,373,628
North Carolina	95	462,392,427	35,657,780	146,439,231	102,388,950	10,640,119	14,041,845	87,004,373	858,564,725
	96	362,510,160	25,898,390	147,228,500	88,351,160	14,154,483	11,689,900	83,478,894	733,311,487
	97	413,059,086	26,391,309	151,062,521	84,274,099	14,546,636	11,395,311	82,450,349	783,179,311
	98	443,635,515	28,712,851	151,308,433	89,256,876	15,108,257	8,342,756	80,770,323	817,135,011



Table 2-19. Actual and Projected Quantities of TRI Chemicals in Waste, by State, 1995-1998, Continued

State	Year	On-site Waste Management			Off-site Waste Management			Releases	Total Production- related Waste
		Recycled On-site	Energy Recovery On-site	Treated On-site	Recycled Off-site	Energy Recovery Off-site	Treated Off-site	Quantity Released On- and Off-site	
North Dakota	95	53,707	4,200	3,854,548	967,698	9,714	653,466	2,831,733	8,375,066
	96	44,438	3,300	4,853,566	834,318	20,061	215,671	2,312,172	8,283,526
	97	44,517	3,300	11,227,119	848,350	23,802	218,779	3,065,688	15,431,555
	98	44,637	3,000	11,204,954	848,350	20,852	193,931	2,615,643	14,931,367
Ohio	95	357,113,023	89,144,781	175,401,791	180,011,637	28,347,722	33,116,606	149,163,113	1,012,298,673
	96	329,167,620	96,800,899	155,733,167	190,012,535	40,513,765	42,263,264	152,721,169	1,007,212,419
	97	336,531,518	101,028,491	150,406,553	194,198,149	30,141,071	45,567,711	148,202,400	1,006,075,893
	98	339,102,230	106,879,906	160,611,187	187,131,700	26,956,354	42,493,050	143,384,871	1,006,559,298
Oklahoma	95	51,815,273	95,421,680	12,566,124	19,984,131	2,843,786	1,204,530	27,387,172	211,222,696
	96	53,640,688	52,550,449	16,068,996	19,639,683	979,666	1,557,350	25,995,800	170,432,632
	97	54,335,262	58,000,431	16,024,278	20,041,948	1,355,395	1,435,419	23,692,194	174,884,927
	98	50,883,583	58,000,431	16,197,036	20,473,869	1,038,192	1,418,806	21,471,873	169,483,790
Oregon	95	35,903,722	17,090,728	56,027,077	21,528,149	1,162,022	13,818,469	23,669,447	169,199,614
	96	33,343,531	17,268,217	61,437,014	20,382,063	1,404,094	16,476,844	23,842,013	174,153,776
	97	35,152,544	17,519,770	63,164,157	17,999,932	1,154,249	16,677,938	25,041,678	176,710,268
	98	35,228,389	17,625,970	65,581,916	18,937,523	1,246,212	16,708,936	25,379,313	180,708,259
Pennsylvania	95	417,121,400	51,207,089	166,187,096	135,594,906	15,900,996	21,770,185	100,693,535	908,475,207
	96	392,219,178	50,287,872	149,258,161	149,691,289	17,815,663	21,877,011	115,008,743	896,157,917
	97	338,423,564	51,046,927	151,042,133	145,782,479	17,935,600	22,868,314	112,997,798	840,096,815
	98	333,688,503	54,610,513	155,176,996	149,545,374	18,041,048	22,198,894	113,026,197	846,287,525
Puerto Rico	95	30,330,473	531,226	13,861,336	11,706,122	9,927,345	8,169,262	9,632,280	84,158,044
	96	24,267,097	142,187	17,004,946	13,804,916	10,661,013	8,446,328	8,200,030	82,526,517
	97	24,157,885	9,000	21,752,120	11,420,426	10,238,274	7,522,959	8,132,473	83,233,137
	98	15,213,992	0	26,945,030	12,247,295	11,230,304	8,111,173	7,278,531	81,026,325
Rhode Island	95	17,344,535	237,930	7,434,547	13,829,904	868,305	1,100,845	2,946,818	43,762,884
	96	13,987,327	226,963	7,123,050	14,710,524	858,003	891,635	2,203,317	40,000,819
	97	11,592,386	225,225	7,231,809	16,028,822	550,062	731,423	1,789,702	38,149,429
	98	11,750,519	269,500	7,770,670	17,033,082	559,092	407,035	1,821,933	39,611,831
South Carolina	95	279,881,113	49,028,680	113,792,493	108,538,907	11,807,750	11,916,160	55,955,740	630,920,843
	96	303,352,841	78,185,193	112,054,076	97,338,156	7,886,714	10,814,955	56,205,773	665,837,708
	97	321,445,881	78,193,006	113,689,226	99,867,231	6,539,274	11,085,513	56,094,653	686,914,784
	98	372,257,633	78,038,558	113,302,629	104,633,162	6,908,421	10,916,292	52,389,985	738,446,680
South Dakota	95	36,980,289	1,065,000	1,147,835	370,122	167,753	555,298	7,542,847	47,829,144
	96	30,204,647	1,050,000	1,894,335	508,822	185,424	1,411,791	5,101,582	40,356,601
	97	34,318,935	1,118,000	2,435,346	500,822	187,274	1,061,350	6,209,886	45,831,613
	98	34,344,535	1,216,000	2,451,939	525,438	195,726	1,072,875	6,341,423	46,147,936
Tennessee	95	139,305,627	58,224,173	131,821,169	56,246,392	6,045,762	11,184,985	108,943,716	511,771,824
	96	164,053,491	49,580,975	106,752,628	49,461,184	6,244,944	12,365,334	106,047,967	494,506,523
	97	183,315,566	50,202,122	109,044,718	51,130,494	5,179,581	11,193,284	105,854,007	515,919,772
	98	189,358,652	56,101,194	109,897,408	49,062,074	4,932,286	10,389,382	100,115,163	519,856,159
Texas	95	851,351,242	802,343,769	1,756,510,238	147,314,196	131,170,022	96,486,725	285,373,579	4,070,549,771
	96	965,065,180	836,485,137	1,375,842,159	178,196,574	72,829,686	79,465,740	273,328,764	3,781,213,240
	97	1,722,593,864	911,615,423	1,356,528,683	163,538,778	68,835,844	75,152,754	268,416,810	4,566,682,156
	98	1,023,433,433	838,470,021	1,505,544,277	166,800,583	66,294,108	74,566,747	259,410,360	3,934,519,529
Utah	95	13,692,011	4,418,581	309,942,774	3,224,718	85,923	763,467	76,593,979	408,721,453
	96	9,803,457	25,620,841	317,147,921	7,763,733	106,125	4,686,207	80,758,371	445,886,655
	97	8,766,613	21,620,300	316,408,567	5,473,299	123,301	8,770,604	83,040,797	444,203,481
	98	8,731,227	21,637,457	316,429,929	5,344,669	134,435	8,848,085	70,136,456	431,262,258



Table 2-19. Actual and Projected Quantities of TRI Chemicals in Waste, by State, 1995-1998, Continued

State	Year	On-site Waste Management			Off-site Waste Management			Releases Quantity Released On- and Off-site	Total Production- related Waste
		Recycled On-site	Energy Recovery On-site	Treated On-site	Recycled Off-site	Energy Recovery Off-site	Treated Off-site		
Vermont	95	1,073,467	12,000	741,603	1,760,132	45,611	329,343	571,414	4,533,570
	96	457,075	6,200	1,026,694	2,453,609	13,332	264,620	451,988	4,673,518
	97	459,765	3,000	1,054,094	1,869,600	400	166,307	439,805	3,992,971
	98	470,080	0	1,074,149	716,100	0	98,689	459,896	2,818,914
Virgin Islands	95	766,194	0	10,014,402	117,182	51,700	192,110	1,460,160	12,601,748
	96	711,124	0	10,248,528	96,920	4,834	377,449	1,506,138	12,944,993
	97	711,124	0	10,248,528	96,920	4,834	377,449	1,641,691	13,080,546
	98	711,124	0	10,248,528	96,920	4,834	377,449	1,641,691	13,080,546
Virginia	95	152,431,389	40,127,426	342,447,586	26,936,757	7,609,951	18,440,473	54,244,301	642,237,883
	96	178,353,110	29,707,489	317,770,559	23,042,524	7,097,789	19,350,747	56,322,865	631,645,083
	97	181,014,830	30,492,814	317,760,882	19,824,123	7,908,276	18,535,397	55,614,506	631,150,828
	98	263,122,649	30,995,661	353,116,201	18,236,779	8,744,718	18,528,448	54,287,103	747,031,559
Washington	95	79,400,362	12,310,080	83,876,405	13,450,710	652,856	2,205,532	27,652,784	219,548,729
	96	80,436,589	18,590,204	90,430,822	11,732,574	884,619	2,504,576	27,405,507	231,984,891
	97	73,706,411	19,064,399	89,455,332	7,962,906	893,166	6,534,488	25,967,859	223,584,561
	98	76,901,535	19,451,420	90,750,947	6,621,422	870,927	8,179,156	25,504,038	228,279,445
West Virginia	95	121,278,361	11,819,776	156,343,554	34,736,094	30,508,269	6,742,802	33,584,598	395,013,454
	96	121,297,058	10,237,138	146,675,430	30,312,857	9,237,060	5,804,792	28,809,290	352,373,625
	97	125,430,748	9,369,471	148,879,489	26,042,129	8,492,090	5,288,322	26,497,725	349,999,974
	98	133,413,272	8,578,814	157,596,505	26,306,802	9,096,259	5,394,764	25,080,642	365,467,058
Wisconsin	95	60,306,238	11,313,067	113,768,447	55,286,633	18,806,052	13,139,030	39,346,821	311,966,288
	96	53,677,399	14,787,808	112,924,941	56,504,531	22,299,121	16,294,697	39,640,292	316,128,789
	97	53,426,685	15,102,560	109,203,571	57,098,530	22,560,602	15,832,900	37,775,440	311,000,288
	98	50,982,071	15,026,503	106,343,709	60,565,947	23,026,657	15,987,984	37,178,309	309,111,180
Wyoming	95	1,855,743	118,190	4,068,157	68,369	1,830	1,793	11,030,850	17,144,932
	96	1,770,771	62,350	4,934,435	317,475	3,573	2,797	9,676,690	16,768,091
	97	1,847,551	64,447	6,114,515	438,654	3,573	87,331	9,540,231	18,096,302
	98	1,874,181	64,447	5,248,515	519,000	3,573	2,301	9,580,553	17,292,570
Total	95	7,599,457,107	2,604,326,691	6,713,283,164	2,172,130,513	573,861,721	503,626,870	2,426,043,539	22,592,729,605
	96	7,842,595,142	2,761,739,445	7,139,861,921	2,230,297,511	510,267,931	516,662,017	2,414,916,746	23,416,340,713
	97	9,058,050,236	2,834,933,863	7,176,355,246	2,139,384,425	469,607,626	514,114,672	2,352,037,799	24,544,483,867
	98	8,519,036,977	2,827,656,852	7,431,162,587	2,171,369,720	466,659,144	508,186,883	2,249,143,815	24,173,215,978

Note: Data from Section 8 of Form R for 1996. 95 is prior year, 96 is current year, 97 and 98 are projected years.

Chemical-Specific Waste Management Data

Table 2-20 presents the top 20 TRI chemicals for total production-related waste, led by methanol (2.29 billion pounds). Four other chemicals were reported in quantities of more than 1 billion pounds: toluene (1.82 billion pounds), copper (1.35 billion pounds), sulfuric acid (1.22 billion pounds), and ethylene (1.22 billion pounds).

Waste management of the top five chemicals varied. For methanol, this consisted primarily of on-site treatment (41.5% of its total production-related waste), and more methanol was treated

on-site than any other TRI chemical in 1996 (950.7 million pounds). On-site recycling accounted for more than half the management of the next three chemicals: toluene (968.3 million pounds, or 53.3%), copper (737.2 million pounds, or 54.5%), and sulfuric acid (798.6 million pounds, or 65.4%). These were the leading chemicals for on-site recycling. About equal shares of ethylene, ranked fifth overall, were burned on-site for energy recovery and treated on-site (40.3% and 39.8%, respectively). Propylene, however, ranking sixth overall, was the chemical with the largest on-site energy recovery (567.6 million pounds, compared to 490.6 million pounds for ethylene).



Table 2-20. Top 20 Chemicals with the Largest Total Production-related Waste, 1996

CAS Number	Chemical	On-site Waste Management			Off-site Waste Management			Releases Quantity Released On- and Off-site	Total Production-related Waste
		Recycled On-site	Energy Recovery On-site	Treated On-site	Recycled Off-site	Energy Recovery Off-site	Treated Off-site		
67-56-1	Methanol	537,583,324	331,508,259	950,729,426	17,596,160	91,920,468	115,676,226	245,467,067	2,290,480,930
108-88-3	Toluene	968,269,305	187,671,839	395,302,542	26,647,879	93,076,963	19,431,352	125,826,351	1,816,226,231
7440-50-8	Copper	737,221,219	123,097	41,621,864	547,960,360	45,526	6,663,640	20,249,615	1,353,885,321
7664-93-9	Sulfuric acid	798,641,136	3,600	389,473,985	6,021,651	6,722	4,306,466	22,069,485	1,220,523,045
74-85-1	Ethylene	194,529,481	490,573,955	483,574,781	13,317	13,028,334	2,112,396	32,662,262	1,216,494,526
115-07-1	Propylene	60,407,279	567,598,551	302,585,973	13	215,250	278,482	26,440,895	957,526,443
7664-41-7	Ammonia	337,049,680	38,613,184	342,109,457	8,898,654	66,067	16,369,151	193,035,326	936,141,519
7647-01-0	Hydrochloric acid	73,213,533	120,000	684,523,200	3,701,000	11,200	6,024,057	66,271,877	833,864,867
—	Lead compounds	396,430,669	0	1,350,570	317,306,000	66,447	7,827,663	29,787,645	752,768,994
107-21-1	Ethylene glycol	378,289,176	6,653,981	57,466,450	115,505,157	16,998,309	22,366,793	18,306,032	615,585,898
—	Zinc compounds	84,991,928	102,429	3,458,463	235,539,067	319,843	29,509,406	209,342,225	563,263,361
1330-20-7	Xylene (mixed isomer)	110,754,065	146,026,399	81,266,575	45,207,020	81,139,488	9,077,257	87,947,647	561,418,451
110-54-3	n-Hexane	226,946,357	27,541,392	183,924,283	10,713,933	10,361,400	8,225,491	71,903,265	539,616,121
7664-38-2	Phosphoric acid	310,993,398	8,300	117,388,358	8,585,442	71,813	4,285,837	62,229,276	503,562,424
—	Copper compounds	189,656,521	59	5,817,034	202,204,906	19,489	1,643,531	57,165,332	456,506,872
7782-50-5	Chlorine	82,275,726	4,000	259,753,478	751,497	14,348	1,279,178	67,322,428	411,400,655
—	Nitrate compounds	103,734,553	0	27,468,515	4,700,612	98,981	61,901,864	169,285,536	367,190,061
78-93-3	Methyl ethyl ketone	61,050,421	92,654,090	68,944,661	20,448,105	41,818,751	5,660,666	60,360,784	350,937,478
—	Glycol ethers	195,662,187	43,392,075	27,509,395	3,304,996	17,139,212	11,860,515	42,287,893	341,156,273
7697-37-2	Nitric acid	24,081,964	165,558	269,641,370	2,378,483	330	15,672,065	21,715,136	333,654,906
	Subtotal	5,871,781,922	1,932,760,768	4,693,910,380	1,577,484,252	366,418,941	350,172,036	1,629,676,077	16,422,204,376
	Total	7,842,595,142	2,761,739,445	7,139,861,921	2,230,297,511	510,267,931	516,662,017	2,414,916,746	23,416,340,713

Note: Data from current year (Column B), Section 8 of Form R for 1996.

More than half of total production-related waste for all but three of the top 20 chemicals was managed on-site. The exceptions were zinc compounds (11th overall), copper compounds (15th), and nitrate compounds (17th). These substances were primarily recycled off-site (235.5 million pounds of zinc compounds and 202.2 million pounds of copper compounds) and/or released on- and off-site to the environment (209.3 million pounds of zinc compounds and 169.3 million pounds of nitrate compounds).

The leading chemical for off-site recycling was copper, with 548.0 million pounds. Toluene led for off-site energy recovery, with 93.1 million pounds. As with on-site treatment, methanol was the top chemical sent for off-site treatment, with 115.7 million pounds. Methanol also led all TRI chemicals in on- and off-site releases, with 245.5 million pounds. Zinc compounds were second (209.3 million pounds), and ammonia was third (193.0 million pounds).

Chemical-Specific Data Table

Table 2-21 presents on- and off-site releases, on-site waste management, and transfers off-site for further waste management for all reported TRI chemicals for 1996. Pesticides are denoted with an asterisk (*) next to the chemical name.



Table 2-21A. TRI On-site and Off-site Releases, by Chemical, 1996

CAS Number	Chemical	On-site Releases								Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
		Air			On-site Land Releases						
		Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Total On-site Releases Pounds		
71751-41-2	* Abamectin	0	0	10	0	0	0	0	10	0	10
30560-19-1	* Acephate	255	1,250	0	0	0	0	0	1,505	1,400	2,905
75-07-0	Acetaldehyde	1,637,438	10,938,582	198,485	468,662	0	121	16,679	13,259,967	2,463	13,262,430
60-35-5	Acetamide	5	14	2	1,169,000	0	0	0	1,169,021	0	1,169,021
75-05-8	Acetonitrile	601,735	421,386	11,900	22,826,712	0	11	37	23,861,781	548,193	24,409,974
98-86-2	Acetophenone	149,441	29,865	734	474,202	0	0	2,738	656,980	15,950	672,930
62476-59-9	* Acifluorfen, sodium salt	219	7	7	0	0	0	5	238	0	238
107-02-8	* Acrolein	928	81,348	550	100,360	0	0	0	183,186	0	183,186
79-06-1	Acrylamide	2,751	8,949	3,653	5,748,154	0	149,156	0	5,912,663	301,575	6,214,238
79-10-7	Acrylic acid	193,012	231,271	3,171	5,168,000	0	0	67	5,595,521	51,375	5,646,896
107-13-1	Acrylonitrile	291,729	1,003,720	590	3,595,236	0	5	297	4,891,577	6,639	4,898,216
15972-60-8	* Alachlor	2,100	240	330	0	0	0	0	2,670	4,100	6,770
116-06-3	* Aldicarb	151	1,205	0	0	0	0	5	1,361	0	1,361
28057-48-9	d-trans-Allethrin	0	0	0	0	0	0	0	0	0	0
107-18-6	Allyl alcohol	43,237	15,383	4,962	374,263	0	0	0	437,845	134,595	572,440
107-11-9	Allylamine	0	0	0	0	0	0	0	0	0	0
107-05-1	Allyl chloride	56,007	24,141	9	0	0	0	0	80,157	0	80,157
7429-90-5	Aluminum (fume or dust)	285,959	1,397,308	48,989	0	0	54,398	3,818,509	5,605,163	7,747,964	13,353,127
1344-28-1	Aluminum oxide (fibrous forms)	74,648	32,743	505	0	0	20	357,630	465,546	9,452,079	9,917,625
20859-73-8	* Aluminum phosphide	0	0	0	0	0	0	0	0	0	0
834-12-8	* Ametryn	2,835	486	59	0	0	0	0	3,380	0	3,380
60-09-3	4-Aminoazobenzene	0	0	0	203	0	0	0	203	0	203
92-67-1	4-Aminobiphenyl	0	0	0	2	0	0	0	2	0	2
33089-61-1	* Amitraz	0	0	0	0	0	0	0	0	0	0
7664-41-7	* Ammonia	35,870,521	118,910,062	8,267,591	24,180,232	225,985	444,378	3,159,106	191,057,875	1,917,792	192,975,667
62-53-3	Aniline	111,741	133,351	16,217	835,298	0	210	571	1,097,388	21,071	1,118,459
90-04-0	o-Anisidine	1,443	74	28	0	0	0	0	1,545	1	1,546
104-94-9	p-Anisidine	0	0	0	0	0	0	0	0	0	0
120-12-7	Anthracene	23,583	40,617	122	0	0	272	389	64,983	51,041	116,024
7440-36-0	Antimony	2,905	7,962	5,388	0	0	6,086	3,394	25,735	217,968	243,703
—	Antimony compounds	32,345	70,385	34,886	13,908	0	101,859	1,872,669	2,126,052	4,201,352	6,327,404
7440-38-2	Arsenic	32,882	6,590	421	0	0	2,181	96,577	138,651	47,420	186,071
—	Arsenic compounds	75,960	39,486	4,047	61,280	0	13,910	1,737,118	1,931,801	1,196,069	3,127,870
1332-21-4	Asbestos (friable)	1,398	1,362	2	0	0	26,010	453,549	482,321	3,316,112	3,798,433
1912-24-9	Atrazine	5,067	21,944	1,326	1	0	0	614,353	642,691	188,963	831,654
7440-39-3	Barium	9,579	33,400	2,482	0	0	0	306,932	352,393	574,589	926,982
—	Barium compounds	84,002	215,467	89,385	750	0	66,678	1,466,707	1,922,989	4,127,184	6,050,173
22781-23-3	* Bendiocarb	0	0	0	0	0	0	0	0	0	0
1861-40-1	* Benfluralin	1,200	2,208	0	0	0	0	0	3,408	0	3,408
17804-35-2	* Benomyl	0	0	0	0	0	0	0	0	0	0
98-87-3	Benzal chloride	1,158	8	0	0	0	0	0	1,166	0	1,166
71-43-2	Benzene	3,365,712	4,753,759	27,376	312,016	750	28,841	47,316	8,535,770	65,750	8,601,520
98-07-7	Benzoic trichloride	7,925	66	16	0	0	0	0	8,007	0	8,007
98-88-4	Benzoyl chloride	16,874	1,829	0	0	0	0	0	18,703	2,370	21,073
94-36-0	Benzoyl peroxide	325	1,694	10	0	0	0	1,655	3,684	6,352	10,036
100-44-7	Benzyl chloride	13,695	5,697	324	660	0	0	173	20,549	4,824	25,373
7440-41-7	Beryllium	9	850	31	0	0	28,000	3,240	32,130	1,590	33,720
—	Beryllium compounds	30	365	1	0	0	0	16,188	16,584	1,440	18,024
82657-04-3	* Bifenthrin	6	1	0	0	0	0	0	7	0	7
92-52-4	Biphenyl	409,862	237,574	9,779	31,558	0	15	29,257	718,045	34,962	753,007
111-91-1	Bis(2-chloroethoxy)methane	1,320	11	0	6,688	0	542	0	8,561	0	8,561
111-44-4	Bis(2-chloroethyl) ether	799	2,119	6	0	0	0	0	2,924	16	2,940
542-88-1	Bis(chloromethyl) ether	0	0	0	0	0	0	0	0	0	0
108-60-1	Bis(2-chloro-1-methylethyl) ether	520	4,100	44	0	0	0	3	4,667	0	4,667
56-35-9	* Bis(tributyltin) oxide	5	5	21	0	0	0	55	86	4,537	4,623

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.

*Pesticide



Table 2-21B. TRI Other On-site Waste Management and Transfers Off-site for Further Waste Management, by Chemical, 1996

Chemical	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Total On-site Waste Management Pounds	Transfers					Total Off-site Waste Management Pounds	Total Production-related Waste Pounds
					Transfers to Recycling Pounds	to Energy Recovery Pounds	Transfers to Treatment Pounds	to POTWs Pounds	Other Transfers Pounds		
Abamectin	0	0	31	31	0	0	78	0	0	78	114
Acephate	30	0	176,000	176,030	0	0	15,820	250	0	16,070	185,345
Acetaldehyde	178,600	12,168,237	21,603,608	33,950,445	43	144,723	311,747	346,698	0	803,211	47,988,233
Acetamide	0	98,900	1	98,901	0	0	411	0	0	411	1,269,087
Acetonitrile	22,263,727	24,163,715	12,010,669	58,438,111	1,736,000	6,436,847	3,730,563	911,800	0	12,815,210	96,460,892
Acetophenone	900	36,395,314	1,013,493	37,409,707	7,255	243,525	9,811	51,510	0	312,101	38,393,585
Acifluorfen, sodium salt	0	0	90	90	0	0	0	674	0	674	1,002
Acrolein	0	3,641,691	6,126,756	9,768,447	0	27,729	39	0	0	27,768	9,971,496
Acrylamide	307	90,400	137,990	228,697	4	22,780	27,346	65,280	0	115,410	6,525,693
Acrylic acid	4,427,743	27,444,611	27,724,878	59,597,232	96,828	3,738,960	1,107,155	19,688	0	4,962,631	70,187,482
Acrylonitrile	12,680,622	3,485,381	10,463,883	26,629,886	517	317,693	1,013,860	88,141	0	1,420,211	32,917,197
Alachlor	0	0	28,000	28,000	0	0	148,600	0	0	148,600	183,400
Aldicarb	0	0	505	505	0	0	32,588	0	0	32,588	34,215
d-trans-Allethrin	0	0	0	0	0	0	0	0	0	0	0
Allyl alcohol	120,525	822,495	1,313,506	2,256,526	0	653,065	107,040	211,324	0	971,429	3,678,780
Allylamine	0	0	2	2	0	2	0	0	0	2	4
Allyl chloride	260,000	2,300,000	504,432	3,064,432	0	360	487,384	11	0	487,755	3,640,974
Aluminum (fume or dust)	15,382,373	0	18,105,328	33,487,701	22,941,895	88,524	152,126	12,754	0	23,195,299	68,452,437
Aluminum oxide (fibrous forms)	175,000	0	3,900	178,900	16,417	22,333	36,314	1,328	0	76,392	1,883,324
Aluminum phosphide	0	0	0	0	0	0	0	0	0	0	0
Ametryn	0	0	33,000	33,000	0	0	19,620	0	0	19,620	54,961
4-Aminoazobenzene	0	0	0	0	0	0	99	0	0	99	302
4-Aminobiphenyl	0	0	91,000	91,000	0	0	103	0	0	103	91,105
Amitraz	0	0	0	0	0	0	0	0	0	0	0
Ammonia	337,049,680	38,613,184	342,109,457	717,772,321	8,590,971	83,430	2,373,153	14,637,033	61,588	25,746,175	936,141,519
Aniline	8,838,234	6,189,043	3,641,917	18,669,194	0	314,762	381,821	1,113,702	0	1,810,285	21,595,574
o-Anisidine	0	1,465	3,992	5,457	0	0	0	6,251	0	6,251	13,254
p-Anisidine	0	0	0	0	0	0	0	0	0	0	0
Anthracene	214,266	112,111	1,257,051	1,583,428	9,722	210,273	4,782	345	0	225,122	1,916,943
Antimony	3,549,028	109,302	1,220,051	4,878,381	2,939,941	33,085	155,173	22,558	2	3,150,759	8,273,867
Antimony compounds	6,138,043	0	94,818	6,232,861	2,874,865	63,927	747,146	94,398	0	3,780,336	15,280,785
Arsenic	1,191,541	0	70,004	1,261,545	751,303	0	95,712	303	0	847,318	2,276,319
Arsenic compounds	4,931,812	0	92,028	5,023,840	368,156	326	1,718,792	229	0	2,087,503	9,549,085
Asbestos (friable)	142,589	0	519,822	662,411	0	0	75	752	0	827	4,348,203
Atrazine	59	0	365,171	365,230	0	0	252,344	73	0	252,417	1,340,928
Barium	58,305	220,321	75,212	353,838	92,646	3,253	167,142	1,629	0	264,670	1,496,638
Barium compounds	37,172,801	200	6,877,708	44,050,709	2,771,996	224,870	1,592,618	392,151	2,941	4,984,576	54,816,803
Bendiocarb	0	0	0	0	0	0	0	0	0	0	0
Benfluralin	74,000	0	2,500	76,500	0	0	39,250	0	0	39,250	118,253
Benomyl	0	0	340,000	340,000	0	0	6,000	0	0	6,000	346,000
Benzal chloride	0	0	110,000	110,000	0	780,000	180	5	0	780,185	891,348
Benzene	61,704,353	15,645,404	64,991,646	142,341,403	531,327	2,196,809	1,491,143	214,698	6	4,433,983	156,110,718
Benzoic trichloride	0	0	150,000	150,000	0	12,000	44	5	0	12,049	170,025
Benzoyl chloride	0	0	1,998,467	1,998,467	0	138	630,473	6	0	630,617	2,650,142
Benzoyl peroxide	11,580	0	36,266	47,846	6,000	3,760	6,842	38,772	0	55,374	113,431
Benzyl chloride	19,000	20,600	258,415	298,015	0	559,486	1,608	1,581	0	562,675	882,915
Beryllium	38,389	0	921	39,310	93,078	0	3,257	0	0	96,335	166,725
Beryllium compounds	0	0	0	0	18,050	0	1,309	1	0	19,360	36,966
Bifenthrin	0	0	0	0	0	0	48	0	0	48	55
Biphenyl	161,010	1,094,809	3,058,232	4,314,051	527,079	243,039	513,754	404,785	0	1,688,657	6,793,939
Bis(2-chloroethoxy)methane	0	0	0	0	0	0	0	0	0	0	8,561
Bis(2-chloroethyl) ether	0	573,000	960,300	1,533,300	180,000	407,512	34,692	2,382	0	624,586	2,160,836
Bis(chloromethyl) ether	0	0	6,500	6,500	0	0	0	0	0	0	6,500
Bis(2-chloro-1-methylethyl) ether	13,000,000	0	8,934,000	21,934,000	0	0	0	0	0	0	21,938,700
Bis(tributyltin) oxide	0	0	339	339	55,471	0	0	0	0	55,471	60,426

Note: Other On-site Waste Management from Section 8 and Transfers Off-site for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without valid waste management codes. Production-related Waste from Section 8 of Form R (total excludes remedial and catastrophic quantities).



Table 2-21A. TRI On-site and Off-site Releases, by Chemical, 1996, Continued

CAS Number	Chemical	On-site Releases								Off-site Releases Transfers	Total On- and Off-site Releases
		Air			On-site Land Releases						
		Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Total On-site Releases Pounds	Off-site to Disposal Pounds	
10294-34-5	Boron trichloride	1	36	0	0	0	0	0	37	0	37
7637-07-2	Boron trifluoride	10,975	12,456	0	0	0	0	0	23,431	0	23,431
314-40-9*	Bromacil	6	0	30,740	0	0	0	0	30,746	0	30,746
7726-95-6*	Bromine	39,175	38,525	10	7	0	245,117	6	322,840	245,117	567,957
35691-65-7*	1-Bromo-1-(bromomethyl)-1,3-propanedicarbonitrile	0	0	0	0	0	0	0	0	0	0
353-59-3	Bromochlorodifluoromethane (Halon 1211)	4,688	0	0	0	0	0	0	4,688	0	4,688
74-83-9*	Bromomethane	414,088	1,885,755	7	303	0	0	6	2,300,159	0	2,300,159
52-51-7*	2-Bromo-2-nitropropane-1,3-diol	0	0	0	0	0	0	0	0	0	0
75-63-8	Bromotrifluoromethane (Halon 1301)	12,153	14,000	0	0	0	0	0	26,153	0	26,153
1689-84-5*	Bromoxynil	5	10	0	0	0	0	0	15	1,388	1,403
1689-99-2*	Bromoxynil octanoate	270	251	0	0	0	0	0	521	16,605	17,126
357-57-3	Brucine	0	0	0	0	0	0	0	0	0	0
106-99-0	1,3-Butadiene	1,429,487	1,296,809	11,001	1,000	0	110	153	2,738,560	4,790	2,743,350
141-32-2	Butyl acrylate	105,689	108,649	712	0	0	0	2,165	217,215	50,540	267,755
71-36-3	n-Butyl alcohol	4,906,789	17,938,341	61,936	2,452,006	0	617	5,517	25,365,206	304,582	25,669,788
78-92-2	sec-Butyl alcohol	320,953	929,317	6,920	120,169	0	0	490	1,377,849	18,769	1,396,618
75-65-0	tert-Butyl alcohol	494,612	272,590	30,430	1,007,213	0	0	758	1,805,603	42,468	1,848,071
106-88-7	1,2-Butylene oxide	5,499	7,198	45	0	0	0	0	12,742	12	12,754
123-72-8	Butyraldehyde	128,227	155,403	441	43,344	0	0	46	327,461	37	327,498
7440-43-9	Cadmium	1,926	2,849	1,010	0	0	4,561	46,859	57,205	39,864	97,069
—	Cadmium compounds	5,964	33,925	3,614	82	0	53,618	448,409	545,612	898,688	1,444,300
156-62-7	Calcium cyanamide	1	1	0	0	0	0	0	2	0	2
133-06-2*	Captan	519	12,106	5	5	0	0	0	12,635	2,191	14,826
63-25-2*	Carbaryl	1,270	11,662	54	0	0	2,685	0	15,671	2,848	18,519
1563-66-2*	Carbofuran	2,315	274	1	0	0	0	0	2,590	0	2,590
75-15-0	Carbon disulfide	3,212,583	69,569,637	66,555	3,788	0	0	270	72,852,833	19,097	72,871,930
56-23-5	Carbon tetrachloride	140,533	210,317	215	44,515	0	0	0	395,580	9,245	404,825
463-58-1	Carbonyl sulfide	610,328	19,241,733	0	0	0	0	0	19,852,061	0	19,852,061
5234-68-4*	Carboxin	8	0	0	0	0	0	0	8	384	392
120-80-9	Catechol	2,480	2,826	24,475	0	0	38	2,184	32,003	239	32,242
57-74-9	Chlordane	660	0	95	0	0	0	0	755	0	755
115-28-6	Chlorendic acid	0	43	0	0	0	0	0	43	0	43
90982-32-4*	Chlorimuron ethyl	0	1	0	0	0	0	0	1	0	1
7782-50-5*	Chlorine	1,119,170	65,308,331	465,787	74,196	0	0	312,638	67,280,122	21,045	67,301,167
10049-04-4*	Chlorine dioxide	20,395	1,189,230	0	0	0	0	0	1,209,625	0	1,209,625
79-11-8	Chloroacetic acid	5,620	812	2	0	0	0	250	6,684	255	6,939
4080-31-3*	1-(3-Chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride	6	54	15	0	0	0	607	682	4,582	5,264
106-47-8	p-Chloroaniline	97	47	407	0	0	0	5	556	0	556
108-90-7	Chlorobenzene	775,735	402,361	2,086	68,701	0	0	5	1,248,888	106,844	1,355,732
75-68-3	1-Chloro-1,1-difluoroethane (HCFC-142b)	677,293	5,566,588	2,858	0	0	0	0	6,246,739	2,450	6,249,189
75-45-6	Chlorodifluoromethane (HCFC-22)	4,388,043	5,388,543	2,538	0	0	0	1	9,779,125	54,200	9,833,325
75-00-3	Chloroethane	1,130,568	1,422,692	285	92	0	0	0	2,553,637	0	2,553,637
67-66-3	Chloroform	3,086,308	6,235,110	340,396	45,387	0	25,156	7,553	9,739,910	38,868	9,778,778
74-87-3	Chloromethane	772,463	3,685,312	803	99,705	0	0	80	4,558,363	392	4,558,755
107-30-2	Chloromethyl methyl ether	199	2,642	7	0	0	0	0	2,848	70	2,918
563-47-3	3-Chloro-2-methyl-1-propene	331	22,676	0	0	0	0	0	23,007	0	23,007
—	Chlorophenols	1,851	2,924	13	113,554	0	0	0	118,342	2,290	120,632
76-06-2*	Chloropicrin	5,269	6,504	0	0	0	0	0	11,773	216	11,989
126-99-8	Chloroprene	112,905	913,190	5	120,000	0	8,640	0	1,154,740	8,640	1,163,380

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.

*Pesticide



Table 2-21B. TRI Other On-site Waste Management and Transfers Off-site for Further Waste Management, by Chemical, 1996, Continued

Chemical	Energy Recycled On-site Pounds	Recovery On-site Pounds	Treated On-site Pounds	Total On-site Waste Management Pounds	Transfers				Other Off-site Transfers Pounds	Total Off-site Waste Management Pounds	Total Production-related Waste Pounds
					Transfers to Recycling Pounds	to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds			
Boron trichloride	6,000	0	6,500	12,500	0	0	0	0	0	0	12,537
Boron trifluoride	11	0	382,165	382,176	0	0	1,169	5	0	1,174	406,841
Bromacil	0	0	18,062	18,062	0	0	29,048	0	0	29,048	77,856
Bromine	4,662,000	0	14,057,885	18,719,885	0	0	158,170	2,674,844	0	2,833,014	21,877,588
1-Bromo-1-(bromomethyl)-1,3-propanedicarbonitrile	0	0	29,000	29,000	0	0	7,104	0	0	7,104	36,104
Bromochlorodifluoromethane (Halon 1211)	674,672	0	0	674,672	0	0	0	0	0	0	679,371
Bromomethane	39,200	207,750	454,397	701,347	0	190	0	0	0	190	3,001,785
2-Bromo-2-nitropropane-1,3-diol	0	0	0	0	0	0	0	0	0	0	0
Bromotrifluoromethane (Halon 1301)	343,951	0	0	343,951	0	0	0	0	0	0	367,704
Bromoxynil	0	0	0	0	0	0	8	0	0	8	1,546
Bromoxynil octanoate	0	0	0	0	0	0	1,448	0	0	1,448	18,174
Brucine	0	0	0	0	0	0	0	0	0	0	0
1,3-Butadiene	5,953,022	37,128,076	61,528,326	104,609,424	7,241,635	3,409	92,020	670	0	7,337,734	120,423,280
Butyl acrylate	93,695	1,902,440	3,155,076	5,151,211	90,081	308,058	59,934	112,122	0	570,195	5,979,902
n-Butyl alcohol	7,330,808	22,248,666	39,477,166	69,056,640	2,929,058	7,807,862	1,222,863	1,862,777	11,000	13,833,560	109,092,615
sec-Butyl alcohol	472,175	20,272,772	2,060,170	22,805,117	143,765	3,500,087	86,670	56,350	0	3,786,872	27,617,067
tert-Butyl alcohol	437,181	53,474,091	2,117,278	56,028,550	12,084	8,386,360	184,233	1,151,656	0	9,734,333	68,708,742
1,2-Butylene oxide	0	46,792	350,376	397,168	0	263,538	20,558	0	0	284,096	690,769
Butyraldehyde	0	2,757,675	1,905,739	4,663,414	3,405	26,894	22,351	258,800	0	311,450	5,333,341
Cadmium	504,123	0	67,708	571,831	395,287	0	34,693	570	1	430,551	1,078,869
Cadmium compounds	7,831,833	0	68,747	7,900,580	710,242	1,613	192,918	2,577	0	907,350	10,221,593
Calcium cyanamide	0	0	0	0	0	0	0	0	0	0	1
Captan	4,079	0	9,500	13,579	0	0	2,081	0	0	2,081	28,694
Carbaryl	46,121	458,932	437,614	942,667	0	0	67,982	5	0	67,987	984,715
Carbofuran	0	0	3	3	0	0	60,346	0	0	60,346	62,223
Carbon disulfide	19,122,418	6,776,413	23,478,038	49,376,869	395	297,411	24,954	292,225	0	614,985	123,183,876
Carbon tetrachloride	2,073,632	1,050,017	41,816,616	44,940,265	128,727	26,337	1,600,815	480	0	1,756,359	45,991,160
Carbonyl sulfide	0	1,805,617	14,041,155	15,846,772	0	0	5,900	0	0	5,900	35,818,382
Carboxin	2,604	0	0	2,604	0	0	390	2	0	392	3,388
Catechol	0	10,927,849	3,729,029	14,656,878	0	32,112	19,160	34,644	0	85,916	14,752,655
Chlordane	0	0	4,150	4,150	0	0	1	83	0	84	4,989
Chlorendic acid	0	0	0	0	0	0	553	0	0	553	596
Chlorimuron ethyl	0	0	0	0	0	0	36,604	0	0	36,604	36,605
Chlorine	82,275,726	4,000	259,753,478	342,033,204	751,987	10,348	1,011,185	567,079	0	2,340,599	411,400,655
Chlorine dioxide	2,242,600	0	50,907,468	53,150,068	0	0	0	16,000	0	16,000	54,522,783
Chloroacetic acid	42,416	0	1,636,910	1,679,326	0	0	251	1,250	0	1,501	1,686,206
1-(3-Chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride	9,900	0	1,080	10,980	0	0	6,357	36	0	6,393	22,655
p-Chloroaniline	0	0	411	411	0	455	5,400	3,826	0	9,681	11,459
Chlorobenzene	5,742,719	2,870,143	11,527,191	20,140,053	1,605,990	589,367	2,803,074	8,139	21,747	5,028,317	26,343,646
1-Chloro-1,1-difluoroethane (HCFC-142b)	13,140	0	154,810	167,950	14,000	21	42,716	0	0	56,737	6,495,601
Chlorodifluoromethane (HCFC-22)	4,647,033	0	556,776	5,203,809	232,795	721	275,716	5	0	509,237	15,401,656
Chloroethane	3,909,753	12,244,253	28,988,635	45,142,641	155,710	39,841	490,834	762	1,926	689,073	48,384,121
Chloroform	6,039,162	8,887,218	13,453,310	28,379,690	668,897	189,452	1,860,389	329,533	0	3,048,271	41,656,082
Chloromethane	2,999,190	4,492,933	12,991,668	20,483,791	0	6,223	253,067	9,758	0	269,048	25,480,331
Chloromethyl methyl ether	0	0	8,220	8,220	0	0	0	0	0	0	11,137
3-Chloro-2-methyl-1-propene	0	0	345,271	345,271	0	0	52,209	103	0	52,312	420,590
Chlorophenols	2,486,786	0	207,215	2,694,001	0	670	8,698	0	0	9,368	2,822,844
Chloropicrin	29,902	0	365	30,267	0	64	370	0	0	434	42,513
Chloroprene	0	944,336	7,250,217	8,194,553	281,520	14,010	252,891	16,109	0	564,530	9,912,418

Note: On-site Waste Management from Section and Transfers Off-site for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without valid waste management codes. **Production-related Waste** from Section 8 of Form R (total excludes remedial and catastrophic quantities).



Table 2-21A. TRI On-site and Off-site Releases, by Chemical, 1996, Continued

CAS Number	Chemical	On-site Releases								Off-site Releases	Total On- and Off-site Releases
		Air			On-site Land Releases						
		Fugitive or Nonpoint Air Emissions	Stack or Point Air Emissions	Surface Water Discharges	Underground Injection Class I Wells	Underground Injection Class II-V Wells	RCRA Subtitle C Landfills	Other On-site Land Releases	Total On-site Releases	Off-site to Disposal	
Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds		
354-25-6	1-Chloro-1,1,2,2-tetrafluoroethane (HCFC-124a)	4,677	591,789	65	0	0	0	0	596,531	0	596,531
2837-89-0	2-Chloro-1,1,1,2-tetrafluoroethane (HCFC-124)	238,752	665,722	961	0	0	0	0	905,435	0	905,435
1897-45-6*	Chlorothalonil	12,307	3,423	22	0	0	0	1,670	17,422	253,395	270,817
75-88-7	2-Chloro-1,1,1-trifluoroethane (HCFC-133a)	250	33,963	0	0	0	0	0	34,213	0	34,213
75-72-9	Chlorotrifluoromethane (CFC-13)	1,750	7,600	250	0	0	0	0	9,600	0	9,600
5598-13-0*	Chlorpyrifos methyl	505	1,505	0	0	3,653	0	0	5,663	0	5,663
64902-72-3*	Chlorsulfuron	0	1	0	0	0	0	0	1	0	1
7440-47-3	Chromium	353,248	135,244	574,092	9	0	332,175	433,176	1,827,944	4,985,681	6,813,625
—	Chromium compounds	168,943	237,261	137,319	37,422	0	864,202	25,270,469	26,715,616	11,759,262	38,474,878
569-64-2	C.I. Basic Green 4	0	5	0	0	0	0	0	5	0	5
989-38-8	C.I. Basic Red 1	0	0	0	0	0	0	0	0	668	668
28407-37-6	C.I. Direct Blue 218	0	0	6	0	0	0	0	6	1,400	1,406
2832-40-8	C.I. Disperse Yellow 3	392	60	28	0	0	0	0	480	594	1,074
81-88-9	C.I. Food Red 15	0	0	0	0	0	0	0	0	0	0
7440-48-4	Cobalt	19,372	13,129	4,330	0	0	9,683	57,053	103,567	139,708	243,275
—	Cobalt compounds	3,994	26,931	27,960	15,917	0	29,357	191,277	295,436	559,381	854,817
7440-50-8*	Copper	4,316,839	707,505	46,778	41,027	5	406,184	2,946,824	8,465,162	14,493,597	22,958,759
—	Copper compounds	1,198,319	666,754	62,013	298,693	14,683	968,892	47,098,824	50,308,178	6,935,031	57,243,209
8001-58-9*	Creosote	382,479	555,535	9,114	0	0	460	250	947,838	7,333,126	8,280,964
120-71-8	p-Cresidine	1,665	1,800	0	0	0	0	0	3,465	0	3,465
108-39-4*	m-Cresol	20,830	20,394	1,633	520,000	0	0	0	562,857	1,473	564,330
95-48-7	o-Cresol	1,998	6,293	845	440,000	0	0	0	449,136	4,257	453,393
106-44-5	p-Cresol	24,607	17,189	825	262,500	0	361	0	305,482	13,462	318,944
1319-77-3	Cresol (mixed isomers)	284,120	1,398,346	10,114	711,056	0	52	1,917	2,405,605	20,245	2,425,850
4170-30-3	Crotonaldehyde	41,397	16,256	1,600	61,900	0	0	0	121,153	0	121,153
98-82-8	Cumene	565,522	1,008,756	1,042	3,267	0	3	6,847	1,585,437	5,006	1,590,443
80-15-9	Cumene hydroperoxide	35,755	11,241	26	180,169	0	0	6,300	233,491	11,147	244,638
135-20-6	Cupferron	0	0	0	0	0	0	0	0	0	0
21725-46-2*	Cyanazine	290	1,625	421	0	0	0	0	2,336	2,695	5,031
—	Cyanide compounds	125,836	723,335	107,054	3,477,384	0	2,049	74,052	4,509,710	95,181	4,604,891
1134-23-2*	Cycloate	0	49	1	2	0	0	0	52	28	80
110-82-7	Cyclohexane	2,964,377	3,851,714	23,595	314,855	0	12	5,540	7,160,093	107,106	7,267,199
108-93-0	Cyclohexanol	66,799	133,202	122	3,630,080	0	0	74	3,830,277	3,221	3,833,498
68359-37-5*	Cyfluthrin	8	18	0	0	0	0	350	376	0	376
94-75-7*	2,4-D (acetic acid)	2,218	3,771	832	0	0	250	5	7,076	6,017	13,093
533-74-4*	Dazomet	318	330	197	0	0	0	0	845	4,900	5,745
53404-60-7*	Dazomet, sodium salt	0	0	0	0	0	0	0	0	250	250
94-82-6*	2,4-DB	470	250	0	0	0	0	0	720	0	720
1929-73-3*	2,4-D butoxyethyl ester	262	401	0	0	0	0	0	663	0	663
1163-19-5	Decabromodiphenyl oxide	13,728	31,880	3,675	0	0	13,000	187,838	250,121	620,047	870,168
13684-56-5*	Desmedipham	15	0	0	0	0	0	0	15	0	15
1928-43-4*	2,4-D 2-Ethylhexyl ester	2,160	1,065	5	0	0	0	0	3,230	2,077	5,307
101-80-4	4,4'-Diaminodiphenyl ether	9	7	182	0	0	0	0	198	53	251
95-80-7	2,4-Diaminotoluene	211	1,364	0	0	0	0	0	1,575	0	1,575
25376-45-8	Diaminotoluene (mixed isomers)	10,404	6,845	590	7,600	0	0	10	25,449	23,286	48,735
333-41-5*	Diazinon	286	15,301	21	0	0	0	0	15,608	1,000	16,608
132-64-9	Dibenzofuran	22,012	17,242	62	0	0	0	265	39,581	28,986	68,567
106-93-4	1,2-Dibromoethane	6,503	2,207	7	24	0	0	1	8,742	0	8,742
124-73-2	Dibromotetrafluoroethane (Halon 2402)	5	5	0	0	0	0	0	10	0	10
84-74-2	Dibutyl phthalate	10,300	74,826	452	180,000	0	7	306	265,891	25,217	291,108

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.

*Pesticide



Table 2-21B. TRI Other On-site Waste Management and Transfers Off-site for Further Waste Management, by Chemical, 1996, Continued

Chemical	Energy Recycled On-site Pounds	Recovery On-site Pounds	Treated On-site Pounds	Total On-site Waste Management Pounds	Transfers				Other Off-site Transfers Pounds	Total Off-site Waste Management Pounds	Total Production-related Waste Pounds
					Transfers to Recycling Pounds	to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds			
1-Chloro-1,1,2,2-tetrafluoroethane (HCFC-124a)	0	0	33,195	33,195	0	0	0	0	0	0	629,214
2-Chloro-1,1,1,2-tetrafluoroethane (HCFC-124)	184,882	0	183,025	367,907	226,600	0	0	0	0	226,600	1,539,206
Chloroethanol	5,208	0	25,902	31,110	148	0	274,590	1,459	0	276,197	568,381
2-Chloro-1,1,1-trifluoroethane (HCFC-133a)	0	0	0	0	0	0	16,571	5	0	16,576	50,869
Chlorotrifluoromethane (CFC-13)	0	0	0	0	0	0	0	0	0	0	9,500
Chlorpyrifos methyl	2,692	0	0	2,692	0	0	5,500	0	0	5,500	17,969
Chlorosulfuron	0	0	0	0	0	0	9,807	0	0	9,807	9,808
Chromium	30,287,624	34,195	317,369	30,639,188	82,655,975	1,109	643,205	49,915	5,441	83,355,645	124,633,699
Chromium compounds	25,668,394	27,254	5,417,810	31,113,458	31,270,685	55,259	3,327,978	247,125	0	34,901,047	105,639,489
C.I. Basic Green 4	0	0	100	100	0	0	11,499	0	0	11,499	609
C.I. Basic Red 1	0	0	0	0	0	40	248	15	0	303	971
C.I. Direct Blue 218	0	0	639	639	0	0	0	79	0	79	2,119
C.I. Disperse Yellow 3	0	0	0	0	0	0	0	5,891	0	5,891	6,960
C.I. Food Red 15	0	0	0	0	0	0	0	5	0	5	0
Cobalt	3,778,210	0	147,007	3,925,217	6,699,148	0	21,256	6,533	47,000	6,773,937	11,312,611
Cobalt compounds	215,762	0	1,107,761	1,323,523	1,940,354	2,020	105,173	7,433	0	2,054,980	4,221,216
Copper	737,221,219	123,097	41,621,864	778,966,180	539,187,912	63,810	1,224,559	370,317	1,004	540,847,602	1,353,885,321
Copper compounds	189,656,521	59	5,817,034	195,473,614	194,626,529	19,948	1,884,588	156,261	17,159	196,704,485	456,506,872
Creosote	48,219,156	5,500	19,634,028	67,858,684	0	35,675	258,443	15,411	10,500	320,029	72,500,095
p-Cresidine	0	0	0	0	0	0	1,600	38,697	0	40,297	44,162
m-Cresol	2,104,414	789,240	229,581	3,123,235	820,576	38,925	24,217	3,261	0	886,979	4,578,595
o-Cresol	97,068	299,260	196,840	593,168	8	53,235	12,421	41,234	0	106,898	1,152,884
p-Cresol	90,880	430,589	468,502	989,971	500,574	115,535	20,308	388,390	0	1,024,807	2,335,909
Cresol (mixed isomers)	502,345	4,573,476	14,730,070	19,805,891	388,055	558,963	274,727	61,307	0	1,283,052	23,349,769
Crotonaldehyde	0	22,600	571,700	594,300	0	0	0	0	0	0	715,173
Cumene	16,061,751	9,440,085	38,743,335	64,245,171	153,825	1,191,125	88,661	29,547	0	1,463,158	67,186,433
Cumene hydroperoxide	0	0	543,481	543,481	0	12	1,937	175,887	0	177,836	1,016,533
Cupferron	0	679	0	679	0	0	90	0	0	90	769
Cyanazine	0	0	39,000	39,000	0	5	22,355	62	0	22,422	68,859
Cyanide compounds	588,476	120,114	10,946,174	11,654,764	31,823	22	404,941	236,134	0	672,920	16,757,529
Cycloate	0	0	0	0	0	0	1,006	0	0	1,006	1,086
Cyclohexane	61,438,279	8,021,506	33,944,668	103,404,453	507,862	2,657,437	1,800,730	8,400	6,909	4,981,338	116,046,627
Cyclohexanol	0	1,405,718	208,684	1,614,402	0	67,115	123,556	11,111	0	201,782	5,686,289
Cyfluthrin	0	0	1,110	1,110	0	0	1,223	10	0	1,233	2,729
2,4-D (acetic acid)	78,758	0	25,360	104,118	0	0	31,635	263	0	31,898	138,148
Dazomet	0	3	15,261	15,264	0	0	2,700	83	0	2,783	24,409
Dazomet, sodium salt	0	0	130	130	0	0	13,948	15	0	13,963	14,232
2,4-DB	0	0	0	0	0	0	792	0	0	792	826
2,4-D butoxyethyl ester	0	0	0	0	0	0	3,256	0	0	3,256	3,619
Decabromodiphenyl oxide	902,477	0	48,973	951,450	117,679	4,881	53,022	265,560	0	441,142	2,260,569
Desmedipham	0	0	0	0	0	0	492	0	0	492	507
2,4-D 2-Ethylhexyl ester	4,701	0	0	4,701	0	0	23,721	5	0	23,726	24,245
4,4'-Diaminodiphenyl ether	0	0	140	140	0	0	9,975	5	0	9,980	10,360
2,4-Diaminotoluene	0	0	66,836	66,836	0	0	279	0	0	279	68,690
Diaminotoluene (mixed isomers)	0	4,731,680	442,162	5,173,842	0	2,712,895	219,120	95,849	0	3,027,864	9,117,854
Diazinon	42,605	0	107,961	150,566	0	3,900	8,478	0	0	12,378	178,501
Dibenzofuran	183,852	190	491,323	675,365	4,601	500	132	500	0	5,733	738,244
1,2-Dibromoethane	0	0	11,202	11,202	0	3,301	27,431	0	0	30,732	50,530
Dibromotetrafluoroethane (Halon 2402)	96,000	0	0	96,000	0	0	0	0	0	0	96,010
Dibutyl phthalate	46,139	333,566	121,193	500,898	13,360	139,274	108,022	6,323	0	266,979	1,057,185

Note: On-site Waste Management from Section and Transfers Off-site for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without valid waste management codes. Production-related Waste from Section 8 of Form R (total excludes remedial and catastrophic quantities).



Table 2-21A. TRI On-site and Off-site Releases, by Chemical, 1996, Continued

CAS Number	Chemical	On-site Releases								Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
		Air			On-site Land Releases						
		Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Total On-site Releases Pounds		
1918-00-9 *	Dicamba	365	694	132	59,200	0	0	0	60,391	0	60,391
99-30-9 *	Dichloran	2	8	0	0	0	0	0	10	0	10
95-50-1	1,2-Dichlorobenzene	186,171	101,181	5,324	4,900	0	382	2	297,960	17,759	315,719
541-73-1	1,3-Dichlorobenzene	1,743	3,375	897	0	0	0	0	6,015	0	6,015
106-46-7 *	1,4-Dichlorobenzene	93,651	142,851	1,881	2,000	0	0	480	240,863	0	240,863
25321-22-6	Dichlorobenzene (mixed isomers)	239	13,808	0	0	0	0	0	14,047	10	14,057
91-94-1	3,3'-Dichlorobenzidine	1	1	0	0	0	0	0	2	5,550	5,552
612-83-9	3,3'-Dichlorobenzidine dihydrochloride	0	5	0	0	0	0	0	5	0	5
64969-34-2	3,3'-Dichlorobenzidine sulfate	0	0	0	0	0	0	0	0	0	0
75-27-4	Dichlorobromomethane	0	2,400	0	0	0	0	110	2,510	0	2,510
764-41-0	1,4-Dichloro-2-butene	50	3,060	0	3,400	0	0	0	6,510	0	6,510
110-57-6	trans-1,4-Dichloro-2-butene	137	0	0	0	0	0	0	137	0	137
1649-08-7	1,2-Dichloro-1,1-difluoroethane (HCFC-132b)	760	170	20	0	0	0	0	950	89	1,039
75-71-8	Dichlorodifluoromethane (CFC-12)	1,095,303	228,933	80	0	0	0	6,070	1,330,386	460	1,330,846
107-06-2	1,2-Dichloroethane	434,047	610,525	1,848	5,126	0	25,000	250	1,076,796	91,249	1,168,045
540-59-0	1,2-Dichloroethylene	3,075	5,119	37	0	0	0	0	8,231	0	8,231
1717-00-6	1,1-Dichloro-1-fluoroethane (HCFC-141b)	5,337,013	3,841,152	508	0	0	0	5,835	9,184,508	217,899	9,402,407
75-43-4	Dichlorofluoromethane (HCFC-21)	14,725	130,560	0	0	0	0	0	145,285	10,676	155,961
75-09-2	Dichloromethane	21,519,922	31,900,543	10,060	749,507	0	15	4,942	54,184,989	116,409	54,301,398
507-55-1	1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	29,000	0	0	0	0	0	0	29,000	0	29,000
422-56-0	3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	24,000	0	0	0	0	0	0	24,000	0	24,000
120-83-2	2,4-Dichlorophenol	2,705	412	53	15,390	0	0	0	18,560	0	18,560
78-87-5	1,2-Dichloropropane	224,371	290,057	1,855	0	0	0	150	516,433	5,330	521,763
10061-02-6	trans-1,3-Dichloropropene	810	30	0	0	0	0	0	840	0	840
78-88-6	2,3-Dichloropropene	510	540	19,900	0	0	0	0	20,950	0	20,950
542-75-6 *	1,3-Dichloropropylene	8,686	761	1,270	0	0	0	0	10,717	0	10,717
76-14-2	Dichlorotetrafluoroethane (CFC-114)	699,501	146,953	4,936	0	0	0	0	851,390	2	851,392
34077-87-7	Dichlorotrifluoroethane	750	250	0	0	0	0	0	1,000	0	1,000
354-23-4	1,2-Dichloro-1,1,2-trifluoroethane (HCFC-123a)	66,400	2,600	250	0	0	0	0	69,250	0	69,250
306-83-2	2,2-Dichloro-1,1,1-trifluoroethane (HCFC-123)	193,631	35,500	250	0	0	0	4	229,385	0	229,385
62-73-7 *	Dichlorvos	5	250	5	0	0	0	0	260	1,228	1,488
115-32-2 *	Dicofol	460	0	0	0	0	0	0	460	250	710
77-73-6	Dicyclopentadiene	226,020	69,826	16,953	0	0	3	0	312,802	37,220	350,022
111-42-2	Diethanolamine	331,728	144,835	165,714	16,211	0	390	41,780	700,658	82,106	782,764
117-81-7	Di-(2-ethylhexyl) phthalate	80,785	383,644	274	0	0	264	70,047	535,014	1,762,843	2,297,857
64-67-5	Diethyl sulfate	3,024	184	0	0	0	0	0	3,208	47	3,255
35367-38-5 *	Diflubenzuron	0	0	0	0	0	0	0	0	0	0
101-90-6	Diglycidyl resorcinol ether	255	255	0	0	0	0	0	510	0	510
94-58-6	Dihydrosafrole	533	300	0	0	0	0	0	833	0	833
—	Diisocyanates	523,201	281,078	261	0	0	29	33,199	837,768	1,357,637	2,195,405
55290-64-7 *	Dimethipin	0	0	0	0	0	0	0	0	0	0
60-51-5 *	Dimethoate	225	260	10	0	0	0	0	495	0	495
119-90-4	3,3'-Dimethoxybenzidine	0	0	0	0	0	0	0	0	0	0
20325-40-0	3,3'-Dimethoxybenzidine dihydrochloride	2	8	0	0	0	0	0	10	0	10

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.
*Pesticide



Table 2-21B. TRI Other On-site Waste Management and Transfers Off-site for Further Waste Management, by Chemical, 1996, Continued

Chemical	Energy Recycled On-site Pounds	Recovery On-site Pounds	Treated On-site Pounds	Total On-site Waste Management Pounds	Transfers					Total Off-site Waste Management Pounds	Total Production-related Waste Pounds
					to Recycling Pounds	to Energy Recovery Pounds	to Treatment Pounds	to POTWs Pounds	Other Off-site Transfers Pounds		
Dicamba	895	0	95	990	0	0	375	5	0	380	61,139
Dichloran	0	0	55	55	0	0	0	250	0	250	95
1,2-Dichlorobenzene	6,431,032	612,089	318,912	7,362,033	2,890,994	587,976	2,685,125	4,368	0	6,168,463	13,824,617
1,3-Dichlorobenzene	1,793	0	9	1,802	884	0	1,489	796	0	3,169	11,002
1,4-Dichlorobenzene	4,249,806	354,424	130,406	4,734,636	0	12,038	509,105	79	0	521,222	5,496,709
Dichlorobenzene (mixed isomers)	0	595,086	260,043	855,129	0	13,115	20,133	0	0	33,248	902,613
3,3'-Dichlorobenzidine	0	0	6,000	6,000	0	0	46,000	250	0	46,250	57,400
3,3'-Dichlorobenzidine dihydrochloride	0	0	10,114	10,114	0	0	100,000	14	0	100,014	110,115
3,3'-Dichlorobenzidine sulfate	0	0	600	600	0	0	6,730	0	0	6,730	7,300
Dichlorobromomethane	0	0	0	0	0	0	0	0	0	0	2,500
1,4-Dichloro-2-butene	1,800,000	0	3,000,000	4,800,000	0	0	320,000	0	0	320,000	5,126,510
trans-1,4-Dichloro-2-butene	0	0	0	0	0	0	0	0	0	0	137
1,2-Dichloro-1,1-difluoroethane (HCFC-132b)	0	0	96,000	96,000	0	0	37,000	0	0	37,000	134,000
Dichlorodifluoromethane (CFC-12)	540,671	0	17,016	557,687	423,063	82	43,566	1	0	466,712	2,140,917
1,2-Dichloroethane	47,818,476	49,048,528	48,491,110	145,358,114	16,957,172	1,085,108	926,243	6,369	0	18,974,892	165,469,049
1,2-Dichloroethylene	620,000	1,560,000	1,828,252	4,008,252	3,109	0	8,701	0	0	11,810	4,051,845
1,1-Dichloro-1-fluoroethane (HCFC-141b)	389,753	0	2,069,813	2,459,566	232,507	279,804	1,101,604	2,904	0	1,616,819	13,501,000
Dichlorofluoromethane (HCFC-21)	0	0	0	0	0	0	201	0	0	201	152,760
Dichloromethane	112,064,937	5,598,974	23,207,510	140,871,421	11,799,944	3,005,556	11,903,667	640,294	1,815,884	29,165,345	223,690,940
1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	4,841	0	0	4,841	2,400	0	1,430	0	0	3,830	37,671
3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	3,960	0	0	3,960	1,900	0	1,170	0	0	3,070	31,030
2,4-Dichlorophenol	1,240	3	420,660	421,903	0	0	0	0	0	0	440,459
1,2-Dichloropropane	37,213,000	22,560,000	5,117,425	64,890,425	0	0	142	1,513	0	1,655	65,413,342
trans-1,3-Dichloropropene	49,000	12,000,000	0	12,049,000	0	0	285	0	0	285	12,050,130
2,3-Dichloropropene	3,800,000	2,600,000	484,000	6,884,000	0	0	360,000	0	0	360,000	7,265,396
1,3-Dichloropropylene	3,036,700	14,000,000	573,241	17,609,941	0	4,724	53,855	0	0	58,579	17,678,872
Dichlorotetrafluoroethane (CFC-114)	100,880	0	1,631,367	1,732,247	200,686	0	16,154	0	0	216,840	2,808,241
Dichlorotrifluoroethane	0	0	716,409	716,409	0	0	0	0	0	0	717,377
1,2-Dichloro-1,1,2-trifluoroethane (HCFC-123a)	0	0	0	0	0	0	0	0	0	0	69,500
2,2-Dichloro-1,1,1-trifluoroethane (HCFC-123)	253,000	0	4,916	257,916	0	0	5,963	5	0	5,968	473,144
Dichlorvos	0	0	10	10	0	104	395	0	0	499	1,805
Dicofol	19	0	0	19	0	0	250	0	0	250	329
Dicyclopentadiene	457,892	1,890,677	724,443	3,073,012	189,076	2,314,192	159,097	262	0	2,662,627	6,007,500
Diethanolamine	14,024	56,991	2,093,114	2,164,129	92,356	215,991	356,576	1,540,734	0	2,205,657	5,162,230
Di-(2-ethylhexyl) phthalate	3,346,141	354,639	290,002	3,990,782	3,876,237	274,610	225,525	21,084	0	4,397,456	10,972,505
Diethyl sulfate	0	0	4,621	4,621	3,293,130	0	1,511	4,288	0	3,298,929	3,306,606
Diflubenzuron	0	0	0	0	0	0	0	0	0	0	0
Diglycidyl resorcinol ether	0	0	0	0	0	500	0	0	0	500	1,015
Dihydrosafrole	0	0	0	0	0	0	0	167	0	167	562
Disocyanates	849,302	91,890	558,301	1,499,493	389,249	445,322	1,395,847	13,847	0	2,244,265	5,838,560
Dimethipin	0	0	0	0	0	0	0	0	0	0	0
Dimethoate	180	0	0	180	0	0	3,091	0	0	3,091	2,737
3,3'-Dimethoxybenzidine	0	0	0	0	0	0	0	0	0	0	0
3,3'-Dimethoxybenzidine dihydrochloride	0	0	100	100	0	0	0	5	0	5	110

Note: On-site Waste Management from Section and Transfers Off-site for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without valid waste management codes. Production-related Waste from Section 8 of Form R (total excludes remedial and catastrophic quantities).



Table 2-21A. TRI On-site and Off-site Releases, by Chemical, 1996, Continued

CAS Number	Chemical	On-site Releases								Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
		Air			On-site Land Releases							
		Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Total On-site Releases Pounds			
124-40-3	Dimethylamine	112,970	353,142	38,367	2,850	0	0	4,730	512,059	35,305	547,364	
2300-66-5*	Dimethylamine dicamba	580	5	0	0	0	5	0	590	255	845	
121-69-7	N,N-Dimethylaniline	17,736	48,557	128	0	0	0	0	66,421	0	66,421	
119-93-7	3,3'-Dimethylbenzidine	3	3	25	0	0	0	0	31	229	260	
612-82-8	3,3'-Dimethylbenzidine dihydrochloride	0	0	0	0	0	0	0	0	0	0	
2524-03-0	Dimethyl chlorothiophosphate	5	5	0	0	0	0	0	10	0	10	
68-12-2	N,N-Dimethylformamide	368,967	1,282,686	43,956	1,220,000	0	1,350	278	2,917,237	184,053	3,101,290	
57-14-7	1,1-Dimethyl hydrazine	259	43	0	0	0	0	1	303	425	728	
105-67-9*	2,4-Dimethylphenol	16,838	40,836	100	140,000	0	0	0	197,774	821	198,595	
576-26-1	2,6-Dimethylphenol	1,853	652	37	35,000	0	0	0	37,542	0	37,542	
131-11-3	Dimethyl phthalate	52,537	101,917	551	1,000	0	4	4	156,013	3,615	159,628	
77-78-1	Dimethyl sulfate	4,977	819	0	0	0	0	0	5,796	0	5,796	
99-65-0	m-Dinitrobenzene	13	408	83,436	0	0	310	0	84,167	0	84,167	
528-29-0	o-Dinitrobenzene	2	52	1,067	0	0	40	0	1,161	0	1,161	
100-25-4	p-Dinitrobenzene	1	14	29	0	0	11	0	55	0	55	
88-85-7	Dinitrobutyl phenol	717	5	3,800	0	0	0	0	4,522	13,500	18,022	
534-52-1	4,6-Dinitro-o-cresol	5	95	0	0	0	0	0	100	27,820	27,920	
51-28-5	2,4-Dinitrophenol	151	31	65,869	0	0	0	0	66,051	2	66,053	
121-14-2	2,4-Dinitrotoluene	1,888	3	349	0	0	0	0	2,240	0	2,240	
606-20-2	2,6-Dinitrotoluene	471	1	94	0	0	0	0	566	0	566	
25321-14-6	Dinitrotoluene (mixed isomers)	1,540	13,275	586	33,000	0	0	0	48,401	121	48,522	
39300-45-3*	Diinocap	0	0	0	0	0	0	0	0	0	0	
123-91-1	1,4-Dioxane	41,019	78,937	226,998	0	0	0	5,409	352,363	479,388	831,751	
122-39-4*	Diphenylamine	29,018	17,759	205	15,532	0	0	0	62,514	11,382	73,896	
2164-07-0*	Dipotassium endothall	39	4	0	0	0	0	0	43	0	43	
138-93-2*	Disodium cyanodithioimidocarbonate	0	0	0	0	0	0	0	0	0	0	
330-54-1*	Diuron	271	1,501	13	0	0	0	0	1,785	1,500	3,285	
2439-10-3*	Dodine	5	5	0	0	0	0	0	10	0	10	
120-36-5*	2,4-DP	257	255	0	0	0	5	0	517	39	556	
2702-72-9*	2,4-D sodium salt	0	0	0	0	0	0	0	0	0	0	
106-89-8	Epichlorohydrin	246,061	84,963	20,735	0	0	1	2,204	353,964	4,137	358,101	
13194-48-4*	Ethoprop	250	616	0	0	0	0	108,933	109,799	250	110,049	
110-80-5	2-Ethoxyethanol	66,539	125,923	6	0	0	0	0	192,468	250	192,718	
140-88-5	Ethyl acrylate	88,053	98,738	199	0	0	0	516	187,506	32,734	220,240	
100-41-4	Ethylbenzene	2,487,776	6,902,212	7,080	335,677	255	534	61,293	9,794,827	95,603	9,890,430	
541-41-3	Ethyl chloroformate	4,295	446	5	0	0	0	5	4,751	0	4,751	
759-94-4*	Ethyl dipropylthiocarbamate	6,706	619	2	29	0	0	0	7,356	590	7,946	
74-85-1*	Ethylene	16,159,552	19,627,812	25,228	0	0	7,800	280	35,820,672	10,845	35,831,517	
—	Ethylenebisdithiocarbamic acid, salts and esters	1,062	59	0	0	0	0	0	1,121	3,100	4,221	
107-21-1	Ethylene glycol	2,787,138	3,232,634	1,842,307	7,698,571	913	55,341	374,635	15,991,539	2,576,966	18,568,505	
151-56-4	Ethyleneimine	0	2	0	0	0	0	0	2	0	2	
75-21-8*	Ethylene oxide	436,537	352,902	4,474	22,200	0	0	551	816,664	1,048	817,712	
96-45-7	Ethylene thiourea	5	263	0	0	0	0	0	268	4,071	4,339	
75-34-3	Ethylidene dichloride	7,786	14,164	11	0	0	0	0	21,961	0	21,961	
52-85-7	Famphur	0	0	0	0	0	0	0	0	0	0	
60168-88-9*	Fenarimol	0	0	0	0	0	0	0	0	0	0	
13356-08-6*	Fenbutatin oxide	5	250	0	745	0	0	0	1,000	0	1,000	
39515-41-8*	Fenpropathrin	0	0	0	0	0	0	0	0	0	0	
55-38-9*	Fenthion	0	0	0	0	0	0	0	0	1	1	
51630-58-1*	Fenvalerate	1	0	0	0	0	0	0	1	0	1	
69806-50-4	Fluazifop butyl	0	0	0	0	0	0	0	0	0	0	
2164-17-2*	Fluometuron	270	717	0	0	0	0	0	987	2,505	3,492	
7782-41-4	Fluorine	0	25,460	43,100	0	0	0	0	68,560	0	68,560	

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.

*Pesticide



Table 2-21B. TRI Other On-site Waste Management and Transfers Off-site for Further Waste Management, by Chemical, 1996, Continued

Chemical	Total On-site Waste				Transfers				Other Off-site Transfers	Total Off-site Waste Management	Total Production-related Waste
	Energy Recycled On-site Pounds	Recovery On-site Pounds	Treated On-site Pounds	Management Pounds	Transfers to Recycling Pounds	to Energy Recovery Pounds	Transfers to Treatment Pounds	to POTWs Pounds			
Dimethylamine	494,604	8,000	2,626,306	3,128,910	0	1,633	134,626	179,127	0	315,386	3,987,348
Dimethylamine dicamba	11,863	0	0	11,863	0	0	0	0	0	0	13,044
N,N-Dimethylaniline	48,000	0	6,895	54,895	0	1,087,965	80,649	95,542	0	1,264,156	1,382,346
3,3'-Dimethylbenzidine	0	0	2,287	2,287	0	0	0	0	0	0	2,547
3,3'-Dimethylbenzidine dihydrochloride	0	0	0	0	0	0	0	0	0	0	0
Dimethyl chlorothiophosphate	0	0	0	0	0	0	0	0	0	0	10
N,N-Dimethylformamide	5,447,326	9,632,409	12,108,837	27,188,572	280,627	3,872,987	752,773	4,009,179	0	8,915,566	38,750,948
1,1-Dimethyl hydrazine	0	9,215	4,237	13,452	0	7,001	8,806	0	0	15,807	22,980
2,4-Dimethylphenol	33,354	1,836,216	562,773	2,432,343	58,775	90,569	23,610	5,675	0	178,629	2,808,945
2,6-Dimethylphenol	4,100	263,030	8,200	275,330	0	14,755	2,831	0	0	17,586	330,416
Dimethyl phthalate	0	225,020	360,632	585,652	0	84,755	16,715	53,702	0	155,172	866,200
Dimethyl sulfate	100,000	0	76,354	176,354	77,756	0	0	5	0	77,761	259,207
m-Dinitrobenzene	0	0	750,922	750,922	0	0	77	0	0	77	835,166
o-Dinitrobenzene	0	0	468,906	468,906	0	0	10	0	0	10	470,077
p-Dinitrobenzene	0	0	29,076	29,076	0	0	3	0	0	3	29,134
Dinitrobutyl phenol	0	267,404	7,701	275,105	0	0	340	0	0	340	293,447
4,6-Dinitro-o-cresol	0	716,801	29,000	745,801	0	0	8,390	626	0	9,016	762,305
2,4-Dinitrophenol	0	319,777	1,207,434	1,527,211	0	1	0	0	0	1	1,593,115
2,4-Dinitrotoluene	0	51,527	35,270	86,797	840	0	0	0	0	840	103,418
2,6-Dinitrotoluene	0	1,711	23,500	25,211	0	0	26	0	0	26	25,803
Dinitrotoluene (mixed isomers)	0	0	221,517	221,517	0	0	11,385	83,000	0	94,385	821,262
Dinocap	0	0	0	0	0	0	0	0	0	0	0
1,4-Dioxane	5,592,026	3,126,659	1,074,367	9,793,052	846	1,371,301	22,070	160,497	0	1,554,714	12,186,086
Diphenylamine	1,200,000	2,190,000	38,849	3,428,849	25,237	421,527	231,730	7,683	0	686,177	4,188,562
Dipotassium endothall	0	0	0	0	0	0	250	0	0	250	55
Disodium cyanodithioimido-carbonate	0	0	0	0	0	0	0	0	0	0	0
Diuron	0	0	0	0	0	0	1,385	250	0	1,635	7,636
Dodine	0	0	0	0	0	0	500	0	0	500	368
2,4-DP	4,256	0	0	4,256	0	0	253	0	0	253	4,822
2,4-D sodium salt	0	0	3,956	3,956	0	0	0	0	0	0	3,956
Epichlorohydrin	20,158,532	5,863,590	2,992,084	29,014,206	2	75,430	1,443,664	11,471	0	1,530,567	30,901,434
Ethoprop	3	0	0	3	0	0	1,105	0	0	1,105	110,256
2-Ethoxyethanol	6,210	480,076	662,210	1,148,496	22,801	163,808	82,677	78,269	0	347,555	1,617,777
Ethyl acrylate	284,024	7,177,162	16,524,991	23,986,177	45,497	792,458	329,056	24,090	0	1,191,101	25,394,505
Ethylbenzene	33,064,962	31,512,229	60,433,909	125,011,100	5,339,992	8,905,167	1,685,706	76,581	0	16,007,446	154,127,108
Ethyl chloroformate	0	0	11,600	11,600	0	0	0	0	0	0	16,271
Ethyl dipropylthiocarbamate	0	0	0	0	0	0	9,610	5	0	9,615	19,099
Ethylene	194,529,481	490,573,955	483,574,781	1,168,678,217	13,317	13,028,335	1,112,185	261	0	14,154,098	1,216,494,526
Ethylenebisdithiocarbamic acid, salts and esters	0	0	0	0	0	5	14,780	882	0	15,667	24,984
Ethylene glycol	378,289,176	6,653,981	57,466,450	442,409,607	110,548,356	17,019,781	6,086,887	16,587,111	44,588	150,286,723	615,585,898
Ethyleneimine	0	0	22,000	22,000	0	0	0	0	0	0	22,002
Ethylene oxide	114,788	28,135	13,246,872	13,389,795	6,664	0	963	117,227	0	124,854	14,316,592
Ethylene thiourea	0	0	0	0	2,735	0	2,815	1	0	5,551	9,645
Ethylidene dichloride	1,300,000	140,773	2,410,240	3,851,013	0	0	18,514	0	0	18,514	3,891,561
Famphur	0	0	0	0	0	0	4,416	5	0	4,421	12,242
Fenarimol	0	0	0	0	0	0	0	0	0	0	0
Fenbutatin oxide	0	0	0	0	0	0	0	0	0	0	1,000
Fenpropathrin	0	0	0	0	0	0	0	0	0	0	0
Fenthion	7	0	8	15	0	0	3,271	0	0	3,271	3,287
Fenvalerate	0	0	0	0	0	0	3,994	0	0	3,994	3,995
Fluazifop butyl	0	0	0	0	0	0	0	0	0	0	0
Fluometuron	0	0	0	0	0	5	14,035	235	0	14,275	18,576
Fluorine	0	0	3,005	3,005	0	0	0	0	0	0	71,327

Note: On-site Waste Management from Section and Transfers Off-site for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without valid waste management codes. Production-related Waste from Section 8 of Form R (total excludes remedial and catastrophic quantities).



Table 2-21A. TRI On-site and Off-site Releases, by Chemical, 1996, Continued

CAS Number	Chemical	On-site Releases								Off-site Releases	Total On- and Off-site Releases
		Air			On-site Land Releases						
		Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Total On-site Releases Pounds	Off-site to Disposal Pounds	
51-21-8	Fluorouracil	0	0	0	0	0	250	0	250	250	500
69409-94-5*	Fluvalinate	0	0	0	0	0	0	0	0	0	0
133-07-3*	Folpet	252	51	0	0	0	0	0	303	2,444	2,747
72178-02-0	Fomesafen	255	250	0	0	0	0	0	505	2,501	3,006
50-00-0*	Formaldehyde	1,779,994	9,639,206	320,003	9,403,275	0	755	113,651	21,256,884	329,509	21,586,393
64-18-6	Formic acid	216,458	1,897,322	84,133	11,001,260	0	5	3,005	13,202,183	103,871	13,306,054
76-13-1	Freon 113	992,423	409,756	786	0	0	0	0	1,402,965	1,147	1,404,112
—	Glycol ethers	8,347,921	31,823,871	143,511	99,208	0	1,000	57,625	40,473,136	653,180	41,126,316
76-44-8*	Heptachlor	198	0	5	0	0	0	0	203	0	203
118-74-1	Hexachlorobenzene	115	105	274	717	0	0	0	1,211	23,449	24,660
87-68-3	Hexachloro-1,3-butadiene	1,374	1,007	256	952	0	0	0	3,589	310	3,899
77-47-4	Hexachlorocyclopentadiene	7,451	515	0	250	0	0	0	8,216	1,000	9,216
67-72-1	Hexachloroethane	2,122	759	32	2,024	0	0	0	4,937	471	5,408
110-54-3	n-Hexane	22,361,785	49,482,089	218,217	101,579	0	547	23,365	72,187,582	291,798	72,479,380
51235-04-2*	Hexazinone	17	283	3,075	0	0	0	0	3,375	250	3,625
67485-29-4*	Hydramethylnon	5	5	0	0	0	0	0	10	0	10
302-01-2	Hydrazine	7,797	2,646	23	0	0	0	250	10,716	18,549	29,265
10034-93-2	Hydrazine sulfate	0	0	0	350,000	0	0	0	350,000	0	350,000
7647-01-0*	Hydrochloric acid	1,934,070	63,180,765	4,985	260,005	0	0	23,148	65,402,973	236,994	65,639,967
74-90-8	Hydrogen cyanide	74,893	2,311,807	105	528,513	0	3	0	2,915,321	1,164	2,916,485
7664-39-3	Hydrogen fluoride	3,508,122	8,955,387	10,691	0	2,620	0	36,834	12,513,654	553,050	13,066,704
123-31-9	Hydroquinone	13,974	14,039	2,652	290,000	0	0	0	320,665	2,628	323,293
55406-53-6*	3-Iodo-2-propynyl butyl-carbamate	3,375	255	15	0	0	0	292	3,937	6,505	10,442
13463-40-6	Iron pentacarbonyl	1,280	99	0	0	0	0	0	1,379	0	1,379
78-84-2	Isobutyraldehyde	106,793	88,280	1,791	2,374	0	0	1	199,239	1,000	200,239
25311-71-1*	Isopfenphos	1,505	670	0	0	0	1,536	0	3,711	0	3,711
67-63-0*	Isopropyl alcohol (manufacturing)	289,954	770,538	0	0	0	0	0	1,060,492	8,296	1,068,788
80-05-7	4,4'-Isopropylidenediphenol	112,706	71,321	4,803	25,000	0	250,130	1,257	465,217	320,605	785,822
77501-63-4*	Lactofen	1,256	206	0	0	0	0	0	1,462	250	1,712
7439-92-1	Lead	192,275	425,787	12,233	0	0	124,959	3,286,129	4,041,383	1,743,638	5,785,021
—	Lead compounds	434,594	752,764	50,186	794	0	1,657,584	9,910,784	12,806,706	21,476,996	34,283,702
58-89-9*	Lindane	255	255	5	0	0	0	250	765	276	1,041
330-55-2*	Linuron	10	5	5	0	0	0	0	20	250	270
554-13-2	Lithium carbonate	3,703	11,475	260	210	0	4,000	8,540	28,188	160,793	188,981
121-75-5*	Malathion	821	1,784	10	0	0	0	0	2,615	0	2,615
108-31-6	Maleic anhydride	65,216	500,783	15	10	0	1,000	0	567,024	10,666	577,690
109-77-3	Malononitrile	0	250	0	475,997	0	0	0	476,247	0	476,247
12427-38-2*	Maneb	0	0	0	0	0	0	0	0	250	250
7439-96-5	Manganese**	6,751,776	384,254	117,375	1	7	44,526	9,995,845	17,293,784	13,905,393	31,199,177
—	Manganese compounds	806,259	1,020,847	1,901,227	14,880	2,808	4,583,105	35,566,390	43,895,516	26,664,625	70,560,141
93-65-2	Mecoprop	520	1,170	0	0	0	250	5	1,945	3,896	5,841
149-30-4	2-Mercaptobenzothiazole	604	9,668	30	52,000	0	0	0	62,302	205,531	267,833
7439-97-6	Mercury	10,144	4,037	468	0	0	6	531	15,186	4,272	19,458
—	Mercury compounds	2,011	905	73	9	0	0	0	2,998	21,612	24,610
150-50-5	Merphos	200	0	0	0	0	0	0	200	0	200
126-98-7	Methacrylonitrile	943	2	0	206,110	0	0	0	207,055	0	207,055
137-42-8*	Metham sodium	2,107	1,342	4	0	0	0	2	3,455	15,937	19,392
67-56-1	Methanol	27,987,712	178,370,259	7,353,977	23,801,105	499,383	10,041	1,921,624	239,944,101	1,411,828	241,355,929
94-74-6*	Methoxone	271	761	250	0	0	250	0	1,532	4,778	6,310
72-43-5*	Methoxychlor	10	15	0	0	0	0	0	25	0	25
109-86-4	2-Methoxyethanol	115,723	749,517	11,672	0	0	0	0	876,912	489	877,401
96-33-3	Methyl acrylate	70,888	116,348	8,145	147	0	0	162	195,690	32,136	227,826
1634-04-4	Methyl tert-butyl ether	952,626	2,170,463	103,615	176,424	750	0	26,568	3,430,446	243,220	3,673,666

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.

*Pesticide

** One facility reported 6,211,171 pounds of fugitive air emissions of manganese in error for 1996; the correct amount is 750 pounds. Fugitive air emissions for manganese should be 541,355 pounds.



Table 2-21B. TRI Other On-site Waste Management and Transfers Off-site for Further Waste Management, by Chemical, 1996, Continued

Chemical	Total On-site Waste Management				Transfers					Total Off-site Waste Management	Total Production-related Waste
	Energy Recycled On-site	Recovery On-site	Treated On-site	Management	Transfers to Recycling	to Energy Recovery	Transfers to Treatment	Transfers to POTWs	Other Off-site Transfers		
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds		
Fluorouracil	930	0	0	930	0	0	0	0	0	0	930
Fluvalinate	0	0	0	0	0	0	0	0	0	0	0
Folpet	0	0	1,501	1,501	0	0	234	0	0	234	4,248
Fomesafen	0	0	0	0	0	0	5	0	0	5	4,801
Formaldehyde	87,248,040	8,433,075	71,530,408	167,211,523	40,083	212,122	701,402	1,888,772	0	2,842,379	191,563,245
Formic acid	883,880	6,705,732	158,130,642	165,720,254	988	2,216,791	177,878	2,899,291	0	5,294,948	184,631,875
Freon 113	692,774	74,113	219,059,366	219,826,253	114,875	53,651	1,074,322	255	0	1,243,103	222,533,621
Glycol ethers	195,662,187	43,392,075	27,509,395	266,563,657	3,320,310	14,836,166	2,299,832	11,095,899	2,530	31,554,737	341,156,273
Heptachlor	0	0	2,206	2,206	0	0	16,073	32	0	16,105	18,514
Hexachlorobenzene	7,100	240,000	2,132,566	2,379,666	1	2,215	42,146	0	0	44,362	2,448,643
Hexachloro-1,3-butadiene	0	66,000	6,107,496	6,173,496	0	0	277,522	2	0	277,524	6,455,792
Hexachlorocyclopentadiene	0	0	246,437	246,437	0	800	55,082	1,580	0	57,462	312,981
Hexachloroethane	0	939,000	4,600,732	5,539,732	0	71,034	120,921	0	0	191,955	5,736,137
n-Hexane	226,946,357	27,541,392	183,924,283	438,412,032	10,711,026	15,066,284	3,265,794	92,888	0	29,135,992	539,616,121
Hexazinone	0	0	4,091	4,091	0	0	213,513	250	0	213,763	220,925
Hydramethylnon	0	0	0	0	0	0	0	5	0	5	5
Hydrazine	0	300	338,596	338,896	1	65	1,961	3,733	0	5,760	373,612
Hydrazine sulfate	0	0	0	0	0	0	0	0	0	0	350,000
Hydrochloric acid	73,213,533	120,000	684,523,200	757,856,733	3,106,585	11,450	3,357,319	2,025,449	59,564	8,560,367	833,864,867
Hydrogen cyanide	73,467	33,847,854	27,343,220	61,264,541	0	250	3,316	1,380	0	4,946	64,188,841
Hydrogen fluoride	113,956,854	0	102,386,943	216,343,797	300,265	6,692	2,063,848	336,467	0	2,707,272	232,944,508
Hydroquinone	962	1,298,419	388,600	1,687,981	0	47,951	99,588	32,930	0	180,469	2,189,143
3-Iodo-2-propynyl butyl-carbamate	6,193	0	340	6,533	76,936	1,183	3,665	13,342	0	95,126	112,013
Iron pentacarbonyl	0	0	0	0	0	0	0	0	0	0	1,379
Isobutyraldehyde	5,109	2,316,637	555,954	2,877,700	4,110	492,237	50,743	73,213	0	620,303	3,738,528
Isofenphos	9,948	0	0	9,948	0	0	2,162	0	0	2,162	17,526
Isopropyl alcohol (manufacturing)	125,634	3,274,940	146,031	3,546,605	10,631	430,297	23,421	142,613	36,060	643,022	4,936,742
4,4'-Isopropylidenediphenol	102,400	8,712,328	998,531	9,813,259	1,620	75,268	57,588	19,576	0	154,052	10,791,340
Lactofen	13	0	0	13	0	0	4,040	0	0	4,040	5,408
Lead	209,065,669	89,267	2,403,298	211,558,234	36,000,051	5,320	2,016,537	19,579	189,780	38,231,267	255,641,888
Lead compounds	396,430,669	0	1,350,570	397,781,239	283,323,678	68,985	12,061,469	27,932	538,834	296,020,898	752,768,994
Lindane	371	0	0	371	0	0	1,388	0	0	1,388	2,031
Linuron	0	0	0	0	0	0	250	0	0	250	234
Lithium carbonate	35,836	0	0	35,836	0	0	4,450	10	0	4,460	220,432
Malathion	104	0	0	104	0	0	1,957	0	0	1,957	4,634
Maleic anhydride	6,847	3,333,330	36,712,857	40,053,034	7,307	98,199	1,311,988	3,017	0	1,420,511	42,033,547
Malononitrile	0	0	21	21	0	0	0	0	0	0	432,995
Maneb	0	0	0	0	0	0	1,108	0	0	1,108	1,322
Manganese	32,636,249	0	371,283	33,007,532	90,014,975	36,070	1,314,531	72,506	40,863	91,478,945	133,772,704
Manganese compounds	134,562,338	21,216	899,859	135,483,413	52,316,073	223,482	6,349,936	323,137	20,000	59,232,628	263,481,976
Mecoprop	1,972	0	990	2,962	0	0	2,747	5	0	2,752	10,648
2-Mercaptobenzothiazole	5,630	0	144,750	150,380	19,118	800,000	12,313	929	0	832,360	1,245,056
Mercury	803,882	0	4,114	807,996	23,748	0	6,586	5	0	30,339	860,054
Mercury compounds	46,348	0	1	46,349	2,000	500	7,855	10	0	10,365	79,595
Merphos	0	0	0	0	0	0	0	0	0	0	200
Methacrylonitrile	0	0	503	503	0	0	0	0	0	0	583,083
Metham sodium	35,780	0	121	35,901	0	557	5,938	1	0	6,496	61,733
Methanol	537,583,324	331,508,259	950,729,426	1,819,821,009	17,478,098	90,419,383	37,230,842	81,631,668	13	226,760,004	2,290,480,930
Methoxone	8,591	0	45	8,636	0	0	1,191	5	0	1,196	16,012
Methoxychlor	0	0	0	0	0	0	1,250	0	0	1,250	818
2-Methoxyethanol	1,704,300	146,744	2,181,353	4,032,397	11,084	1,304,325	97,388	741,640	0	2,154,437	7,042,511
Methyl acrylate	1,010,001	908,315	1,479,300	3,397,616	10,018	313,548	79,773	15,322	0	418,661	4,042,978
Methyl tert-butyl ether	1,693,888	807,055	2,525,427	5,026,370	283,774	1,853,551	604,850	253,430	0	2,995,605	12,689,501

Note: On-site Waste Management from Section and Transfers Off-site for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without valid waste management codes. Production-related Waste from Section 8 of Form R (total excludes remedial and catastrophic quantities).



Table 2-21A. TRI On-site and Off-site Releases, by Chemical, 1996, Continued

CAS Number	Chemical	On-site Releases								Off-site Transfers	Total On- and Off-site Releases
		Air			On-site Land Releases						
		Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Total On-site Releases Pounds	Off-site to Disposal Pounds	
79-22-1	Methyl chlorocarbonate	2,350	87	5	0	0	0	5	2,447	0	2,447
101-14-4	4,4'-Methylenebis(2-chloro-aniline)	251	255	0	0	0	0	750	1,256	5	1,261
101-61-1	4,4'-Methylenebis(N,N-dimethyl) benzeneamine	0	1	0	0	0	0	0	1	0	1
74-95-3	Methylene bromide	85,043	14,249	0	0	0	0	0	99,292	0	99,292
101-77-9	4,4'-Methylenedianiline	8,227	1,535	23	41,120	0	0	0	50,905	19,591	70,496
78-93-3	Methyl ethyl ketone	20,641,669	38,426,835	74,989	432,767	5	36,301	103,297	59,715,863	247,023	59,962,886
60-34-4	Methyl hydrazine	250	250	0	0	0	0	0	500	0	500
74-88-4	Methyl iodide	20,141	45,084	0	23,500	0	0	0	88,725	3,300	92,025
108-10-1	Methyl isobutyl ketone	4,570,658	14,312,039	22,569	162,000	0	3	4,855	19,072,124	35,672	19,107,796
624-83-9	Methyl isocyanate	1,116	373	0	0	0	0	0	1,489	0	1,489
556-61-6 *	Methyl isothiocyanate	41	41	0	0	0	0	0	82	0	82
75-86-5	2-Methylacetonitrile	3,141	1,004	0	0	0	0	0	4,145	0	4,145
80-62-6	Methyl methacrylate	507,244	1,332,648	2,551	160,000	0	0	1,072	2,003,515	107,184	2,110,699
924-42-5	N-Methylolacrylamide	1,375	1,739	1,170	0	0	0	32	4,316	776	5,092
298-00-0 *	Methyl parathion	716	312	0	0	0	0	0	1,028	360	1,388
109-06-8	2-Methylpyridine	68,705	3,719	0	65,062	0	0	0	137,486	504	137,990
872-50-4	N-Methyl-2-pyrrolidone	1,579,639	1,510,899	52,339	2,905,944	1,760	40,336	26,613	6,117,530	550,926	6,668,456
21087-64-9 *	Metribuzin	2	1,010	5	0	0	0	0	1,017	0	1,017
7786-34-7	Mevinphos	0	0	0	0	0	0	0	0	0	0
2212-67-1 *	Molinate	315	271	1	0	0	0	0	587	4,405	4,992
1313-27-5	Molybdenum trioxide	159,992	36,366	28,004	209,900	0	38,627	33,026	505,915	628,643	1,134,558
76-15-3	Monochloropentafluoroethane (CFC-115)	67,620	3,105	2,155	0	0	0	0	72,880	1	72,881
505-60-2	Mustard gas	0	0	0	0	0	0	0	0	0	0
88671-89-0 *	Myclobutanil	0	0	0	0	0	0	0	0	0	0
142-59-6 *	Nabam	0	0	0	0	0	0	0	0	0	0
300-76-5 *	Naled	0	50	0	0	0	0	0	50	0	50
91-20-3 *	Naphthalene	1,281,814	1,576,524	11,737	285,877	0	23,379	278,134	3,457,465	576,597	4,034,062
134-32-7	alpha-Naphthylamine	0	0	0	0	0	0	0	0	0	0
7440-02-0	Nickel	256,602	125,211	28,163	4,225	0	54,458	206,208	674,867	3,480,910	4,155,777
—	Nickel compounds	78,907	246,069	60,646	86,028	250	101,549	3,597,373	4,170,822	4,757,894	8,928,716
—	Nicotine and salts	25,720	418,225	881	0	0	0	0	444,826	426,142	870,968
1929-82-4 *	Nitrapyrin	0	1	0	0	0	0	0	1	0	1
—	Nitrate compounds	12,981	334,102	117,714,518	39,398,312	250	3,415	3,710,521	161,174,099	2,590,615	163,764,714
7697-37-2	Nitric acid	628,830	2,453,528	221,434	17,483,972	0	64,756	111,735	20,964,255	1,477,976	22,442,231
139-13-9	Nitrioltriacetic acid	10	0	78	1,500	0	0	0	1,588	0	1,588
100-01-6	p-Nitroaniline	10,100	1,660	50	0	0	0	0	11,810	0	11,810
99-59-2	5-Nitro-o-anisidine	5	5	0	0	0	0	0	10	0	10
98-95-3	Nitrobenzene	23,351	15,888	951	193,527	0	45	1	233,763	3,825	237,588
55-63-0	Nitroglycerin	1,439	21,027	18,508	0	0	3	3,778	44,755	3,610	48,365
88-75-5	2-Nitrophenol	5	28	51	0	0	0	0	84	90	174
100-02-7 *	4-Nitrophenol	890	45	0	0	0	0	0	935	0	935
79-46-9	2-Nitropropane	19,226	15,062	2,790	0	0	0	0	37,078	0	37,078
86-30-6	N-Nitrosodiphenylamine	10	0	0	0	0	0	0	10	0	10
156-10-5	p-Nitrosodiphenylamine	24	0	0	0	0	0	0	24	420	444
59-89-2	N-Nitrosomorpholine	0	0	0	0	0	0	0	0	0	0
99-55-8	5-Nitro-o-toluidine	0	10	0	0	0	0	0	10	30	40
27314-13-2 *	Norflurazon	0	8	0	0	0	0	0	8	40,000	40,008
19044-88-3 *	Oryzalin	0	5	0	0	0	0	0	5	0	5
301-12-2 *	Oxydemeton methyl	0	0	0	0	0	0	0	0	0	0
19666-30-9 *	Oxydiazon	10	431	0	0	0	0	0	441	0	441
42874-03-3 *	Oxyfluorfen	0	0	0	0	0	0	0	0	0	0
10028-15-6	Ozone	39,814	661,906	0	0	0	0	0	701,720	0	701,720
123-63-7	Paraldehyde	12	23	0	0	0	0	0	35	0	35

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.

*Pesticide



Table 2-21B. TRI Other On-site Waste Management and Transfers Off-site for Further Waste Management, by Chemical, 1996, Continued

Chemical	Energy Recycled On-site Pounds	Recovery On-site Pounds	Treated On-site Pounds	Total On-site Waste Management Pounds	Transfers				Other Off-site Transfers Pounds	Total Off-site Waste Management Pounds	Total Production-related Waste Pounds
					Transfers to Recycling Pounds	to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds			
Methyl chlorocarbonate	0	0	4,110	4,110	0	0	0	0	0	0	6,580
4,4'-Methylenebis(2-chloro-aniline)	0	0	0	0	0	2,494	11,299	5	0	13,798	13,633
4,4'-Methylenebis(N,N-dimethyl) benzeneamine	0	0	0	0	0	0	0	0	0	0	1
Methylene bromide	1,211,800	0	270	1,212,070	0	0	0	0	0	0	1,311,362
4,4'-Methylenedianiline	2,900	52,414	83,357	138,671	0	2,235	55,191	2,023	0	59,449	263,947
Methyl ethyl ketone	61,050,421	92,654,090	68,944,661	222,649,172	20,101,826	37,076,309	4,887,309	598,327	70,490	62,734,261	350,937,478
Methyl hydrazine	0	0	44	44	0	0	5	0	0	5	429
Methyl iodide	0	1,900	341	2,241	0	0	27	0	0	27	94,229
Methyl isobutyl ketone	52,337,198	20,171,448	13,243,777	85,752,423	12,107,396	17,968,462	1,233,056	299,154	2,013	31,610,081	139,241,590
Methyl isocyanate	0	0	91,617	91,617	0	0	3,007	0	0	3,007	96,100
Methyl isothiocyanate	0	0	0	0	0	73	340	0	0	413	495
2-Methylacetonitrile	0	0	19,305	19,305	0	0	0	0	0	0	23,456
Methyl methacrylate	4,567,223	2,367,486	4,635,442	11,570,151	58,074	1,328,264	211,404	229,373	0	1,827,115	15,528,946
N-Methylolacrylamide	449	0	14,403	14,852	0	45,763	314	4,435	0	50,512	69,237
Methyl parathion	10	0	0	10	0	0	2,120	0	0	2,120	2,920
2-Methylpyridine	95,000	50,000	52,000	197,000	0	2,873	538	23,000	0	26,411	359,466
N-Methyl-2-pyrrolidone	1,034,445	373,437	4,842,383	6,250,265	6,671,779	2,295,296	1,684,956	1,124,740	0	11,776,771	24,986,689
Metribuzin	0	0	38,864	38,864	0	0	13,213	0	0	13,213	53,094
Mevinphos	0	0	0	0	0	0	0	0	0	0	0
Molinate	0	0	0	0	0	21	1,256	0	0	1,277	6,039
Molybdenum trioxide	6,529,490	0	31,277	6,560,767	2,736,322	3,276	360,880	63,951	0	3,164,429	11,204,989
Monochloropentafluoroethane (CFC-115)	110,000	0	68,635	178,635	0	0	14,262	0	0	14,262	265,778
Mustard gas	0	0	0	0	0	0	0	0	0	0	0
Myclobutanil	0	0	0	0	0	0	0	0	0	0	0
Nabam	0	0	0	0	0	0	0	0	0	0	0
Naled	0	0	500	500	0	0	3,176	5	0	3,181	3,700
Naphthalene	12,512,289	5,184,798	142,338,479	160,035,566	248,539	3,380,659	797,683	23,965	2,800	4,453,646	168,190,422
alpha-Naphthylamine	0	0	0	0	0	0	0	0	0	0	0
Nickel	34,302,930	16,476	996,941	35,316,347	73,839,083	70,582	2,060,315	86,328	3,650	76,059,958	116,797,060
Nickel compounds	8,360,348	37,998	2,719,330	11,117,676	25,082,239	1,379	864,624	93,795	8,651	26,050,688	60,211,166
Nicotine and salts	8,896	0	846,164	855,060	158,695	0	50,591	247,957	0	457,243	2,120,254
Nitrapyrin	0	0	0	0	0	550	130	0	0	680	681
Nitrate compounds	103,734,553	0	27,468,515	131,203,068	5,537,321	98,981	5,266,009	59,945,210	0	70,847,521	367,190,061
Nitric acid	24,081,964	165,558	269,641,370	293,888,892	2,610,233	346	11,575,491	3,851,407	25,118	18,062,595	333,654,906
Nitrilotriacetic acid	0	0	1,017,756	1,017,756	0	0	0	18,000	0	18,000	1,037,344
p-Nitroaniline	0	0	460	460	0	0	89,720	15,850	0	105,570	118,970
5-Nitro-o-anisidine	0	0	0	0	0	0	0	5	0	5	5
Nitrobenzene	3,552,450	1,781,334	1,146,945	6,480,729	0	20,703	599,215	116	0	620,034	7,336,665
Nitroglycerin	18,000	0	315,442	333,442	0	36,584	15,809	217	0	52,610	424,506
2-Nitrophenol	0	53,000	75,000	128,000	0	0	20,900	47	0	20,947	149,179
4-Nitrophenol	0	12,990	60,000	72,990	0	1	476,030	169	0	476,200	549,931
2-Nitropropane	0	0	58,297	58,297	0	50	12,467	0	0	12,517	107,890
N-Nitrosodiphenylamine	0	0	47,762	47,762	0	230,000	120,000	0	0	350,000	397,772
p-Nitrosodiphenylamine	0	9,400	0	9,400	0	17,000	180	0	0	17,180	27,024
N-Nitrosomorpholine	0	0	0	0	0	0	23,600	0	0	23,600	24,000
5-Nitro-o-toluidine	0	0	0	0	0	0	0	0	0	0	40
Norflurazon	0	0	0	0	0	0	1,041	0	0	1,041	41,008
Oryzalin	0	0	0	0	0	0	51,800	0	0	51,800	52,003
Oxydemeton methyl	0	0	0	0	0	0	0	0	0	0	0
Oxydiazon	13,404	0	2,600	16,004	0	0	250	0	0	250	16,705
Oxyfluorfen	0	0	0	0	0	0	13,126	7,053	0	20,179	20,181
Ozone	0	0	2,221,877	2,221,877	0	0	0	0	0	0	2,908,498
Paraldehyde	0	48,566	230,000	278,566	0	5	0	0	0	5	278,606

Note: On-site Waste Management from Section and Transfers Off-site for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without valid waste management codes. Production-related Waste from Section 8 of Form R (total excludes remedial and catastrophic quantities).



Table 2-21A. TRI On-site and Off-site Releases, by Chemical, 1996, Continued

CAS Number	Chemical	On-site Releases								Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
		Air			On-site Land Releases						
		Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Class I Wells Pounds	Underground Injection Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Total On-site Releases Pounds		
1910-42-5*	Paraquat dichloride	500	500	0	0	0	0	0	1,000	5	1,005
56-38-2*	Parathion	0	0	0	0	0	0	0	0	0	0
1114-71-2*	Pebulate	250	250	0	0	0	0	500	500	0	1,000
40487-42-1*	Pendimethalin	1,470	760	22	0	0	750	140	3,142	0	3,142
76-01-7	Pentachloroethane	1,427	225	22	0	0	0	0	1,674	0	1,674
87-86-5*	Pentachlorophenol	8,164	4,977	8,236	0	0	2,750	250	24,377	196,075	220,452
79-21-0*	Peracetic acid	960	10,595	5	0	0	0	812	12,372	0	12,372
594-42-3	Perchloromethyl mercaptan	12	552	0	0	0	0	0	564	0	564
52645-53-1*	Permethrin	981	514	0	0	0	0	0	1,495	1,250	2,745
85-01-8	Phenanthrene	14,517	113,917	103	0	0	1,855	4,461	134,853	89,038	223,891
108-95-2*	Phenol	2,456,348	7,096,154	72,555	2,045,370	0	12,998	146,061	11,829,486	1,016,261	12,845,747
26002-80-2*	Phenothrin	0	0	0	0	0	0	0	0	0	0
95-54-5	1,2-Phenylenediamine	22	494	3,000	0	0	26,940	0	30,456	8	30,464
108-45-2	1,3-Phenylenediamine	327	2,342	128,739	0	0	37,508	0	168,916	633	169,549
106-50-3	p-Phenylenediamine	3,416	564	409	0	0	1,308	0	5,697	0	5,697
90-43-7*	2-Phenylphenol	55	4,052	1	0	0	0	250	4,358	1,789	6,147
57-41-0	Phenytoin	0	0	0	0	0	0	0	0	12,800	12,800
75-44-5	Phosgene	6,635	9,648	0	5	0	0	0	16,288	0	16,288
7803-51-2	Phosphine	11,941	8,440	0	0	0	643	0	21,024	0	21,024
7664-38-2*	Phosphoric acid	196,086	851,959	28,367,233	9,716	0	43,325	31,417,396	60,885,715	2,331,930	63,217,645
7723-14-0	Phosphorus (yellow or white)	24,359	1,577	255	0	0	0	2,057,524	2,083,715	19,839	2,103,554
85-44-9	Phthalic anhydride	59,978	367,260	174	0	0	0	0	427,412	103,707	531,119
1918-02-1*	Picloram	521	1	0	0	0	0	0	522	0	522
88-89-1	Picric acid	0	0	0	94,031	0	0	0	94,031	0	94,031
51-03-6*	Piperonyl butoxide	206	307	14	0	0	0	0	527	0	527
—	Polybrominated biphenyls	0	250	0	0	0	0	0	250	375	625
—	Polychlorinated alkanes	1,775	1,012	8,372	0	0	0	687	11,846	89,133	100,979
1336-36-3	Polychlorinated biphenyls (PCBs)	5	250	0	0	0	9,205	0	9,460	51,086	60,546
—	Polycyclic aromatic compounds	121,107	521,753	8,079	0	0	0	14,439	665,378	1,248,088	1,913,466
7758-01-2	Potassium bromate	5	0	0	0	0	0	0	5	0	5
128-03-0*	Potassium dimethyldithio-carbamate	73	107	0	0	0	0	0	180	0	180
137-41-7*	Potassium N-methyldithio-carbamate	0	0	0	0	0	0	0	0	0	0
41198-08-7*	Profenofos	0	0	0	0	0	0	0	0	0	0
7287-19-6*	Prometryn	1,015	283	27	0	0	0	0	1,325	500	1,825
23950-58-5*	Pronamide	5	250	0	0	0	0	0	255	0	255
1918-16-7*	Propachlor	0	250	0	0	0	0	0	250	1,200	1,450
1120-71-4	Propane sultone	0	0	0	0	0	0	0	0	0	0
709-98-8*	Propanil	500	2,877	250	0	0	0	0	3,627	0	3,627
2312-35-8*	Propargite	5	255	0	0	0	0	0	260	0	260
107-19-7	Propargyl alcohol	1,799	6,964	0	285,166	0	0	0	293,929	576	294,505
31218-83-4*	Propetamphos	5	5	0	0	0	250	0	260	1,000	1,260
60207-90-1*	Propiconazole	5	5	0	0	0	0	0	10	1,332	1,342
123-38-6	Propionaldehyde	76,050	94,958	32,077	74,613	0	0	0	277,698	62	277,760
114-26-1*	Propoxur	0	0	0	0	0	0	0	0	0	0
115-07-1	Propylene	10,546,131	15,859,826	7,133	0	0	750	1,708	26,415,548	2,181	26,417,729
75-55-8	Propyleneimine	366	36	0	0	0	0	0	402	0	402
75-56-9*	Propylene oxide	226,160	354,701	45,393	12,141	0	0	335	638,730	39,230	677,960
110-86-1	Pyridine	47,611	43,568	908	428,000	0	1	0	520,088	775	520,863
91-22-5	Quinoline	12,053	10,921	20	32,000	0	0	466	55,460	5,072	60,532
106-51-4	Quinone	3,801	3,304	500	0	0	0	0	7,605	0	7,605
82-68-8*	Quintozene	1,550	1,061	0	0	0	836	0	3,447	0	3,447
76578-14-8*	Quizalofop-ethyl	1	0	0	0	0	0	0	1	0	1
10453-86-8*	Resmethrin	1	0	0	0	0	0	0	1	0	1

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.

*Pesticide



Table 2-21B. TRI Other On-site Waste Management and Transfers Off-site for Further Waste Management, by Chemical, 1996, Continued

Chemical	Total On-site Waste Management				Transfers				Other Off-site Transfers		Total Production-related Waste
	Recycled On-site	Recovery On-site	Treated On-site	Management	Transfers to Recycling	to Energy Recovery	Transfers to Treatment	Transfers to POTWs	Off-site Transfers	Waste Management	
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	
Paraquat dichloride	23	0	0	23	0	0	250	32	0	282	326
Parathion	0	0	0	0	0	0	0	0	0	0	0
Pebutate	0	0	0	0	0	0	250	0	0	250	820
Pendimethalin	600	0	150,000	150,600	0	0	5,108	0	0	5,108	160,138
Pentachloroethane	4,150,000	390,000	6,531,742	11,071,742	0	12,300	208,004	0	0	220,304	11,293,709
Pentachlorophenol	1,232,965	11,754	22,743	1,267,462	2,971	8,875	67,358	611	0	79,815	1,551,847
Peracetic acid	0	0	4,160	4,160	0	0	7,300	2,664	0	9,964	26,290
Perchloromethyl mercaptan	0	0	98,690	98,690	0	0	10	0	0	10	99,246
Permethrin	0	0	177	177	0	0	2,660	0	0	2,660	3,921
Phenanthrene	445,644	611,002	746,789	1,803,435	1,495	192,495	122,964	42	0	316,996	2,471,952
Phenol	40,787,213	27,483,437	25,790,593	94,061,243	120,652	3,787,203	3,556,740	3,280,289	0	10,744,884	117,406,441
Phenothrin	0	0	0	0	0	0	0	0	0	0	0
1,2-Phenylenediamine	0	0	136,000	136,000	0	0	930	15	0	945	167,409
1,3-Phenylenediamine	1,200	0	1,162,215	1,163,415	0	1,091	144,552	3,157	0	148,800	1,481,506
p-Phenylenediamine	0	0	303,611	303,611	0	0	22,030	5,850	0	27,880	339,489
2-Phenylphenol	0	92	705,215	705,307	0	0	250	24,662	0	24,912	732,897
Phenytol	0	0	0	0	0	0	250	0	0	250	13,050
Phosgene	0	200	17,249,349	17,249,549	0	0	2,270	0	0	2,270	17,268,049
Phosphine	0	0	350,643	350,643	0	0	0	0	0	0	371,022
Phosphoric acid	310,993,398	8,300	117,388,358	428,390,056	7,460,279	72,379	1,835,400	2,745,535	750	12,114,343	503,562,424
Phosphorus (yellow or white)	300	0	610,526	610,826	110,484	0	21,916	272	0	132,672	2,864,362
Phthalic anhydride	90,881	2,098,212	12,577,144	14,766,237	475	4,814,622	241,672	149,891	0	5,206,660	20,539,607
Picloram	0	0	26,464	26,464	0	0	0	0	0	0	26,986
Picric acid	0	136,931	1,779,450	1,916,381	0	0	21,015	0	0	21,015	2,031,427
Piperonyl butoxide	0	0	9	9	0	0	4,989	0	0	4,989	5,655
Polybrominated biphenyls	0	0	0	0	4,219	0	0	0	0	4,219	4,724
Polychlorinated alkanes	17,136	69,000	228,286	314,422	271,378	230,140	287,210	74,867	0	863,595	1,316,176
Polychlorinated biphenyls (PCBs)	0	0	0	0	59,972	250	243,194	0	0	303,416	52,237
Polycyclic aromatic compounds	1,202,404	16,190,102	2,909,759	20,302,265	8,743,647	73,385	4,641	624	0	8,822,297	31,063,793
Potassium bromate	0	0	0	0	0	0	0	0	0	0	8
Potassium dimethyldithio-carbamate	0	0	0	0	40,000	0	765	147,911	0	188,676	188,756
Potassium N-methyldithio-carbamate	0	0	0	0	0	0	43	0	0	43	43
Profenofos	0	0	0	0	0	0	0	0	0	0	0
Prometryn	0	0	827	827	0	5	56,565	12	0	56,582	60,636
Pronamide	8,800	0	0	8,800	0	0	500	0	0	500	9,670
Propachlor	0	0	0	0	0	0	8,450	15	0	8,465	9,900
Propane sultone	0	0	4	4	0	0	0	0	0	0	4
Propanil	0	0	0	0	0	0	1,744	0	0	1,744	4,481
Propargite	0	0	0	0	0	3,808	11,970	105	0	15,883	15,893
Propargyl alcohol	5	211,930	333,937	545,872	0	289,545	11,256	24,937	0	325,738	1,166,171
Propetamphos	0	0	0	0	0	0	0	0	0	0	1,032
Propiconazole	0	0	0	0	0	0	0	0	0	0	3,055
Propionaldehyde	0	255,989	4,446,808	4,702,797	0	18,135	9	320,765	0	338,909	5,319,755
Propoxur	0	0	0	0	0	0	0	0	0	0	0
Propylene	60,407,279	567,598,551	302,585,973	930,591,803	0	215,250	272,632	6,315	250	494,447	957,526,443
Propyleneimine	0	0	1,734	1,734	0	0	0	0	0	0	2,136
Propylene oxide	3,780,004	18,451,509	13,284,599	35,516,112	255	250,033	1,871	206,725	0	458,884	36,848,356
Pyridine	7,426,653	1,278,558	886,200	9,591,411	31,550	260,552	252,608	355,442	0	900,152	11,009,790
Quinoline	15,881	34,652	91,001	141,534	2,180	34,429	17,015	255	0	53,879	255,277
Quinone	0	230,508	366,115	596,623	0	0	50,513	0	0	50,513	654,741
Quintozene	884	0	0	884	0	221,410	398,894	4	0	620,308	624,210
Quizalofop-ethyl	0	0	0	0	0	0	0	0	0	0	1
Resmethrin	0	0	0	0	0	0	600	0	0	600	601

Note: On-site Waste Management from Section and Transfers Off-site for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without valid waste management codes. Production-related Waste from Section 8 of Form R (total excludes remedial and catastrophic quantities).



Table 2-21A. TRI On-site and Off-site Releases, by Chemical, 1996, Continued

CAS Number	Chemical	On-site Releases								Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
		Air			On-site Land Releases						
		Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Class I Wells Pounds	Underground Injection Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Total On-site Releases Pounds		
81-07-2	Saccharin (manufacturing)	210	33	0	0	0	0	0	243	1,200	1,443
94-59-7	Safrole	500	5	0	0	0	0	0	505	0	505
7782-49-2	Selenium	5	40	97	0	0	0	29	171	784	955
—	Selenium compounds	1,986	45,278	2,404	3,100	0	0	211,237	264,005	61,491	325,496
74051-80-2*	Sethoxydim	0	0	0	0	0	0	0	0	0	0
7440-22-4*	Silver	6,261	1,947	149	0	0	0	6,306	14,663	21,736	36,399
—	Silver compounds	3,016	13,375	8,147	370	0	0	45,693	70,601	10,132	80,733
122-34-9*	Simazine	1,007	3,584	93	0	0	0	0	4,684	54,457	59,141
26628-22-8	Sodium azide	1,110	20,203	268	0	0	111	5	21,697	133,449	155,146
1982-69-0*	Sodium dicamba	5	750	0	0	0	0	0	755	0	755
128-04-1*	Sodium dimethyldithio- carbamate	1,453	1,381	10	0	0	0	0	2,844	121,595	124,439
7632-00-0	Sodium nitrite	75,141	210,769	1,302,379	727,000	0	0	63,654	2,378,943	504,474	2,883,417
100-42-5	Styrene	10,917,192	31,011,969	12,864	228,317	0	90,680	176,010	42,437,032	3,251,349	45,688,381
96-09-3	Styrene oxide	7	24	0	0	0	0	0	31	0	31
7664-93-9*	Sulfuric acid	738,366	18,951,993	1,281	15,000	0	0	52,709	19,759,349	1,380,947	21,140,296
2699-79-8*	Sulfuryl fluoride	15,000	347,000	0	0	0	0	0	362,000	0	362,000
35400-43-2	Sulprofos	0	0	0	0	0	0	0	0	0	0
34014-18-1*	Tebuthiuron	0	5	0	0	0	0	0	5	0	5
3383-96-8*	Temephos	0	0	0	0	0	0	0	0	0	0
5902-51-2*	Terbacil	0	0	3,835	0	0	0	0	3,835	0	3,835
630-20-6	1,1,1,2-Tetrachloroethane	3,960	2,506	30	0	0	0	1	6,497	19	6,516
79-34-5	1,1,2,2-Tetrachloroethane	12,638	2,850	130	0	0	0	0	15,618	7	15,625
127-18-4	Tetrachloroethylene	3,095,666	4,765,504	1,311	13,436	0	26,000	4,442	7,906,359	22,071	7,928,430
961-11-5*	Tetrachlorvinphos	110	255	5	0	0	0	0	370	2,030	2,400
64-75-5	Tetracycline hydrochloride	5	250	0	0	0	0	0	255	0	255
7696-12-0*	Tetramethrin	0	0	0	0	0	0	0	0	0	0
—	Thallium compounds	0	0	0	0	0	0	0	0	0	0
148-79-8*	Thiabendazole	230	4,600	0	0	0	0	0	4,830	0	4,830
28249-77-6*	Thiobencarb	530	281	0	0	0	0	0	811	4,930	5,741
59669-26-0*	Thiodicarb	488	1,021	0	0	0	250	16,032	17,791	250	18,041
23564-06-9	Thiophanate ethyl	0	0	0	0	0	0	0	0	0	0
23564-05-8*	Thiophanate-methyl	75	422	0	0	0	0	0	497	1,167	1,664
62-56-6	Thiourea	1,093	119	339	5,000	0	0	250	6,801	2,590	9,391
137-26-8*	Thiram	1,674	1,960	40	0	0	0	2,000	5,674	94,436	100,110
1314-20-1	Thorium dioxide	0	1	0	0	0	0	0	1	0	1
7550-45-0	Titanium tetrachloride	21,080	9,771	0	0	0	0	0	30,851	34,013	64,864
108-88-3	Toluene	41,711,487	83,670,741	68,697	325,920	3,355	143,008	414,152	126,337,360	1,022,535	127,359,895
584-84-9	Toluene-2,4-diisocyanate	3,247	4,086	0	0	0	0	192	7,525	3,586	11,111
91-08-7	Toluene-2,6-diisocyanate	6,262	7,404	0	0	0	0	48	13,714	897	14,611
26471-62-5	Toluenediisocyanate q(mixed isomers)	22,122	23,191	0	0	0	0	353	45,666	33,029	78,695
95-53-4	o-Toluidine	8,997	8,584	260	17,450	0	0	10	35,301	1,401	36,702
43121-43-3*	Triadimefon	0	0	0	0	0	0	0	0	0	0
2303-17-5*	Triallate	250	339	0	0	0	0	0	589	16,509	17,098
101200-48-0*	Tribenuron methyl	0	1	0	0	0	0	0	1	0	1
2155-70-6*	Tributyltin methacrylate	10	10	5	0	0	0	0	25	0	25
78-48-8* S,S,S-Tributyltrithiophosphate		1,325	473	2	0	0	0	8	1,808	0	1,808
52-68-6*	Trichlorfon	0	0	0	0	0	0	0	0	0	0
76-02-8	Trichloroacetyl chloride	0	1	0	0	0	0	0	1	0	1
120-82-1	1,2,4-Trichlorobenzene	32,283	124,980	433	750	0	0	0	158,446	4,487	162,933
71-55-6	1,1,1-Trichloroethane	4,339,326	4,428,210	844	1,354	0	4,505	21,798	8,796,037	34,031	8,830,068
79-00-5	1,1,2-Trichloroethane	33,142	305,908	516	0	0	0	16	339,582	85	339,667
79-01-6	Trichloroethylene	10,665,331	10,606,835	541	1,291	0	5,550	17,590	21,297,138	76,327	21,373,465
75-69-4	Trichlorofluoromethane (CFC-11)	552,444	140,307	961	0	0	0	5,575	699,287	180	699,467

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.

*Pesticide



Table 2-21B. TRI Other On-site Waste Management and Transfers Off-site for Further Waste Management, by Chemical, 1996, Continued

Chemical	Energy Recycled On-site Pounds	Recovery On-site Pounds	Treated On-site Pounds	Total On-site Waste Management Pounds	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds	Other Off-site Transfers Pounds	Total Off-site Waste Management Pounds	Total Production-related Waste Pounds
Saccharin (manufacturing)	0	0	12,000	12,000	0	0	0	12	0	12	13,512
Safrole	0	0	4	4	0	0	0	134	0	134	234
Selenium	0	0	29	29	0	755	12,119	405	0	13,279	14,099
Selenium compounds	601,563	0	0	601,563	133,241	4,700	32,979	21	8,464	179,405	1,100,414
Sethoxydim	0	0	0	0	0	0	0	0	0	0	0
Silver	541,588	0	26,366	567,954	1,647,173	0	3,481	388	7	1,651,049	1,391,508
Silver compounds	638,500	0	3,967,716	4,606,216	1,408,111	0	32,081	2,260	250	1,442,702	5,976,018
Simazine	0	0	32,000	32,000	0	0	250	5	0	255	89,271
Sodium azide	91,031	0	78,892	169,923	1,603,236	0	2,216,294	709	0	3,820,239	4,152,824
Sodium dicamba	0	0	0	0	0	0	0	750	0	750	528
Sodium dimethyldithio-carbamate	200	0	400,906	401,106	1,780,555	0	372,577	157,075	0	2,310,207	2,832,939
Sodium nitrite	213,726	0	6,975,746	7,189,472	32,816	1	578,847	2,932,827	17,002	3,561,493	13,695,779
Styrene	19,962,598	21,544,063	15,021,756	56,528,417	1,154,843	7,704,571	2,798,362	264,473	900	11,923,149	113,542,563
Styrene oxide	0	35,337	0	35,337	0	861	0	0	0	861	36,230
Sulfuric acid	798,641,136	3,600	389,473,985	1,188,118,721	6,025,376	75	4,216,967	1,898,308	45	12,140,771	1,220,523,045
Sulfuryl fluoride	0	0	0	0	0	0	0	0	0	0	362,000
Sulprofos	0	0	0	0	0	0	0	0	0	0	0
Tebuthiuron	1	0	1,000	1,001	0	0	937	0	0	937	2,002
Temephos	0	0	0	0	0	0	0	0	0	0	0
Terbacil	0	0	2,983	2,983	0	0	7,547	0	0	7,547	14,365
1,1,1,2-Tetrachloroethane	2,500,000	0	2,836,903	5,336,903	0	140,000	237,704	0	0	377,704	5,721,626
1,1,1,2,2-Tetrachloroethane	4,808,000	924,000	11,024,249	16,756,249	2,380,211	0	248,014	90	0	2,628,315	19,400,145
Tetrachloroethylene	46,710,867	2,647,705	20,674,831	70,033,403	5,822,463	530,548	1,440,050	1,847	0	7,794,908	85,970,037
Tetrachlorvinphos	615	0	1,020	1,635	0	44,900	3,885	0	0	48,785	52,662
Tetracycline hydrochloride	0	0	0	0	0	0	500	250	0	750	450
Tetramethrin	0	0	0	0	0	0	0	0	0	0	0
Thallium compounds	0	0	0	0	0	0	5	0	0	5	10
Thiabendazole	0	0	5,700	5,700	0	0	1,126	140	0	1,266	11,766
Thiobencarb	380	0	0	380	0	0	0	0	0	0	5,444
Thiodicarb	57,100	0	41,632	98,732	0	0	38,921	5	0	38,926	136,033
Thiophanate ethyl	0	0	0	0	0	0	0	0	0	0	0
Thiophanate-methyl	9,400	0	0	9,400	0	0	5,613	0	0	5,613	16,646
Thiourea	4,665	0	664	5,329	0	0	11,073	254	0	11,327	31,767
Thiram	20,051	0	40	20,091	45,604	256	45,866	566	0	92,292	170,352
Thorium dioxide	22,000	0	0	22,000	0	0	0	2,200	0	2,200	24,200
Titanium tetrachloride	0	0	26,706,771	26,706,771	136,039	1	166,720	0	0	302,760	27,074,252
Toluene	968,269,305	187,671,839	395,302,542	1,551,243,686	22,885,031	79,191,567	22,051,736	599,828	60,979	124,789,141	1,816,226,231
Toluene-2,4-diisocyanate	547	0	1,107	1,654	2,656	24,143	12,689	0	0	39,488	46,410
Toluene-2,6-diisocyanate	137	0	150	287	7,081	3,065	11,151	0	0	21,297	42,840
Toluenediisocyanate (mixed isomers)	12,100	16,337,483	5,054,902	21,404,485	1,500	35,005	550,367	0	300	587,172	22,020,829
o-Toluidine	58	231,376	144,487	375,921	0	79,475	74,198	22,698	0	176,371	619,345
Triadimefon	0	0	0	0	0	0	0	0	0	0	0
Triallate	1,107	0	11,000	12,107	0	0	110,176	0	0	110,176	140,290
Tribenuron methyl	0	0	0	0	0	0	17,387	0	0	17,387	17,388
Tributyltin methacrylate	0	0	160	160	0	208	23,114	0	0	23,322	23,516
S,S,S-Tributyltrithiophosphate	0	0	33,373	33,373	0	0	116	0	0	116	35,097
Trichlorfon	0	0	0	0	0	0	0	0	0	0	0
Trichloroacetyl chloride	0	0	0	0	0	0	0	0	0	0	1
1,2,4-Trichlorobenzene	1,250,136	44,674	598,429	1,893,239	4,335	68,544	229,460	21,618	0	323,957	2,374,399
1,1,1-Trichloroethane	39,529,212	860,823	1,184,611	41,574,646	1,441,519	338,734	1,023,362	10,318	0	2,813,933	52,924,903
1,1,2-Trichloroethane	23,529,000	16,834,508	20,388,250	60,751,758	13,086,925	305,329	2,823,046	745	0	16,216,045	77,283,995
Trichloroethylene	118,520,604	2,050,829	5,358,265	125,929,698	6,669,733	761,582	1,606,178	86,392	0	9,123,885	156,902,484
Trichlorofluoromethane (CFC-11)	168,213	0	5,000	173,213	125,002	184,710	100,804	5	78,622	489,143	1,335,587

Note: On-site Waste Management from Section and Transfers Off-site for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without valid waste management codes. Production-related Waste from Section 8 of Form R (total excludes remedial and catastrophic quantities).



Table 2-21A. TRI On-site and Off-site Releases, by Chemical, 1996, Continued

CAS Number	Chemical	On-site Releases								Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
		Air		Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds		
		Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds		Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds			
88-06-2	2,4,6-Trichlorophenol	136	155	28	0	0	0	0	319	0	319
96-18-4	1,2,3-Trichloropropane	8,068	695	0	0	0	0	0	8,763	0	8,763
57213-69-1*	Triclopyr triethylammonium salt	0	6	0	0	0	0	0	6	0	6
121-44-8	Triethylamine	387,504	1,144,303	21,648	287,951	0	0	19,011	1,860,417	21,534	1,881,951
1582-09-8*	Trifluralin	11,153	4,453	87	0	0	310	0	16,003	51,678	67,681
26644-46-2*	Triforine	0	0	0	0	0	0	0	0	0	0
95-63-6	1,2,4-Trimethylbenzene	2,752,443	4,667,587	9,570	2,697	0	5	29,942	7,462,244	135,485	7,597,729
639-58-7	Triphenyltin chloride	0	0	0	0	0	0	0	0	0	0
76-87-9*	Triphenyltin hydroxide	5	5	0	0	0	0	0	10	250	260
51-79-6	Urethane	496	12,042	0	0	0	0	0	12,538	3,675	16,213
7440-62-2	Vanadium (fume or dust)	452	1,249	4	0	0	0	16	1,721	38,641	40,362
50471-44-8*	Vinclozolin	0	0	0	0	0	0	0	0	0	0
108-05-4	Vinyl acetate	829,617	3,010,281	2,393	300,768	0	0	2,834	4,145,893	27,065	4,172,958
593-60-2	Vinyl bromide	240	5,600	0	0	0	0	0	5,840	0	5,840
75-01-4	Vinyl chloride	272,926	746,882	356	333	0	0	1	1,020,498	19,614	1,040,112
75-35-4	Vinylidene chloride	82,672	94,525	216	0	0	0	1	177,414	33	177,447
108-38-3	m-Xylene	450,550	525,195	635	45,239	0	250	93,127	1,114,996	3,275	1,118,271
95-47-6	o-Xylene	680,963	550,970	2,503	4,760	0	5	88,871	1,328,072	4,611	1,332,683
106-42-3	p-Xylene	839,254	1,997,026	477	1,010	0	5	88,799	2,926,571	1,114	2,927,685
1330-20-7*	Xylene (mixed isomers)	20,296,828	62,388,723	39,902	130,351	2,620	10,465	48,486	82,917,375	499,478	83,416,853
87-62-7	2,6-Xylidine	0	53	0	0	0	0	0	53	0	53
7440-66-6*	Zinc (fume or dust)	633,707	1,001,365	12,062	0	0	21,721	6,778,165	8,447,020	2,477,827	10,924,847
—	Zinc compounds	2,327,688	3,506,502	1,065,164	129,498	0	14,985,107	79,857,092	101,871,051	105,122,823	206,993,874
12122-67-7	Zineb	0	0	0	0	0	0	0	0	0	0
—	Mixtures and other trade name products	17,641	14,424	1,030	0	0	0	27,618	60,713	16,780	77,493
—	Trade secrets	500	255	0	0	0	0	0	755	0	755
≥	Total	355,271,752	1,096,818,210	173,288,209	203,572,710	756,399	26,454,969	282,608,237	2,138,770,486	294,736,096	2,433,506,582

Note: On-site Releases from Section 5 and Off-site Releases from Section 6 (off-site transfers to disposal) of Form R.

*Pesticide



Table 2-21B. TRI Other On-site Waste Management and Transfers Off-site for Further Waste Management, by Chemical, 1996, Continued

Chemical	Energy Recycled	Recovery	Treated	Total On-site Waste Management	Transfers to Recycling	Transfers to Energy Recovery	Transfers to Treatment	Transfers to POTWs	Other Off-site Transfers	Total Off-site Waste Management	Total Production-related Waste
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
2,4,6-Trichlorophenol	0	0	1,020,923	1,020,923	0	0	0	0	0	0	1,021,242
1,2,3-Trichloropropane	6,100,000	690,000	1,050,000	7,840,000	0	0	9,000,006	0	0	9,000,006	16,848,666
Triclopyr triethylammonium salt	0	0	8	8	0	0	82	0	0	82	96
Triethylamine	227,485	262,294	2,439,524	2,929,303	484,476	404,756	476,847	270,296	0	1,636,375	6,624,992
Trifluralin	71,149	0	13,000	84,149	0	0	111,790	5	0	111,795	286,572
Triforine	0	0	0	0	0	0	0	0	0	0	0
1,2,4-Trimethylbenzene	11,081,130	5,247,136	153,658,796	169,987,062	1,052,594	3,371,314	281,757	331,065	0	5,036,730	182,627,439
Triphenyltin chloride	0	0	1,400	1,400	0	0	0	0	0	0	1,400
Triphenyltin hydroxide	0	0	51,328	51,328	0	0	255	0	0	255	52,013
Urethane	0	0	0	0	0	0	175	0	0	175	15,642
Vanadium (fume or dust)	233,249	282	2,205	235,736	3,236	0	1,705	200	0	5,141	279,958
Vincllozolin	0	0	0	0	0	0	0	0	0	0	0
Vinyl acetate	651,835	13,459,144	19,970,650	34,081,629	47,199	11,097,329	1,949,118	144,887	0	13,238,533	52,673,663
Vinyl bromide	0	0	39	39	0	0	0	0	0	0	5,839
Vinyl chloride	144,257,010	34,902,139	34,549,160	213,708,309	108,475	17,000	57,390	734	0	183,599	214,928,242
Vinylidene chloride	1,540,000	81,000	5,944,435	7,565,435	26	45,180	36,107	90	0	81,403	7,919,564
m-Xylene	1,413,683	130,969	159,029,986	160,574,638	44,221	56,722	101,754	7,046	8,100	217,843	161,921,893
o-Xylene	90,138	14,825,694	96,322,096	111,237,928	192,724	781,724	509,146	424,692	0	1,908,286	114,697,510
p-Xylene	195,330	521,427	73,929,099	74,645,856	4,462	21,639	115,168	2,325	0	143,594	77,696,140
Xylene (mixed isomers)	110,754,065	146,026,399	81,266,575	338,047,039	43,676,875	68,512,589	7,986,520	487,905	8,590	120,672,479	561,418,451
2,6-Xylidine	0	36,684	0	36,684	0	0	0	0	0	0	36,737
Zinc (fume or dust)	25,204,044	0	2,192,517	27,396,561	63,284,353	48,635	7,925,233	18,590	47,444	71,324,255	110,397,651
Zinc compounds	84,991,928	102,429	3,458,463	88,552,820	235,687,595	323,618	35,124,148	410,791	23,997	271,570,149	563,263,361
Zineb	0	0	0	0	0	0	0	0	0	0	0
Mixtures and other trade name products	0	0	34,000	34,000	538,881	1,000	0	11,900	2,618	554,399	685,593
Trade secrets	0	0	0	0	0	0	750	2,379	0	3,129	2,630
Total	7,842,595,142	2,761,739,445	7,139,861,921	17,744,196,508	2,150,593,994	477,056,570	290,096,828	235,813,508	3,306,380	3,156,867,280	23,416,340,713

Note: On-site Waste Management from Section and **Transfers Off-site for Further Waste Management** from Section 6 (excluding off-site transfers to disposal) of Form R. **Other Off-site Transfers** are transfers reported without valid waste management codes. **Production-related Waste** from Section 8 of Form R (total excludes remedial and catastrophic quantities).



Chapter 2 — 1996 TRI Releases and Transfers

ERRATA

Some copies of the *1996 Toxics Release Inventory: Public Data Release* contain incomplete data in Table 2-8 on page 31. The complete data appear in Table 2-8, on the other side of this errata sheet.

1996 Toxics Release Inventory: Public Data Release

Table 2-8. TRI Off-site Transfers for Further Waste Management by State, 1996

State	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTW's Pounds	Other Off-site Transfers Pounds	Total Off-site Transfers Excluding Transfers to Disposal Pounds
Alabama	33,675,464	10,487,499	7,163,468	516,571	750	51,843,752
Alaska	235,463	6,325	137	0	0	241,925
American Samoa	0	0	0	0	0	0
Arizona	79,468,186	784,295	9,259,081	1,951,033	0	91,462,595
Arkansas	44,916,893	6,677,636	6,119,839	122,428	250	57,837,046
California	61,488,314	8,602,952	5,054,720	13,086,610	16,705	88,249,301
Colorado	18,194,235	4,033,682	1,230,695	795,799	5	24,254,416
Connecticut	24,122,459	2,226,821	6,085,697	1,304,464	250	33,739,691
Delaware	10,054,130	1,169,726	1,299,302	4,515,982	0	17,039,140
District of Columbia	12,151	0	5	180	0	12,336
Florida	17,546,126	2,201,015	7,115,310	5,617,773	0	32,480,224
Georgia	43,272,325	9,828,150	6,065,284	2,873,071	19,456	62,058,286
Guam	0	0	0	15,000	0	15,000
Hawaii	53,075	0	4,557	0	0	57,632
Idaho	600,108	154,988	89,400	274,987	0	1,119,483
Illinois	92,791,384	29,994,071	13,946,004	10,650,115	170,140	147,551,714
Indiana	227,040,410	11,888,870	7,427,771	3,313,075	7,896	249,678,022
Iowa	26,694,400	3,079,716	3,072,917	7,613,435	0	40,460,468
Kansas	56,635,370	2,745,539	4,395,674	1,081,427	0	64,858,010
Kentucky	50,702,619	9,357,605	8,070,093	1,515,709	45,591	69,691,617
Louisiana	52,355,796	15,998,779	9,371,461	52,168	0	77,778,204
Maine	4,949,244	379,964	308,126	181,137	0	5,818,471
Maryland	3,870,056	1,340,824	3,465,720	3,837,977	0	12,514,577
Massachusetts	28,308,038	6,713,380	4,766,282	5,334,593	17,752	45,140,045
Michigan	100,909,367	69,413,222	23,506,076	14,143,038	250	207,971,953
Minnesota	21,696,873	2,196,764	1,014,387	8,095,891	8,636	33,012,551
Mississippi	21,598,058	2,654,505	2,122,333	628,934	8,632	27,012,462
Missouri	58,339,188	23,850,564	9,826,440	6,394,678	7,890	98,418,760
Montana	579,043	26,048	42,733	4,168	0	651,992
Nebraska	26,709,177	446,647	216,005	618,762	250	27,990,841
Nevada	1,635,380	9,679	18,434	21,514	0	1,685,007
New Hampshire	12,146,978	224,756	754,064	201,695	0	13,327,493
New Jersey	33,315,528	30,358,462	8,331,546	18,766,215	83,937	90,855,688
New Mexico	1,055,552	157,296	194,084	270,890	250	1,678,072
New York	64,139,124	7,747,898	6,825,645	6,792,564	1,971,363	87,476,594
North Carolina	79,313,339	14,071,452	8,705,633	3,077,616	0	105,168,040
North Dakota	802,146	19,711	15,583	198,048	0	1,035,488
Ohio	186,144,474	40,468,374	20,701,110	16,401,171	24,544	263,739,673
Oklahoma	19,065,778	967,015	1,149,182	456,827	0	21,638,802
Oregon	20,516,944	1,313,460	6,024,151	10,719,550	13	38,574,118
Pennsylvania	138,842,336	17,612,095	16,632,816	8,461,731	132,237	181,681,215
Puerto Rico	13,509,670	10,621,929	5,210,764	2,179,129	44,588	31,566,080
Rhode Island	7,619,534	838,404	369,333	386,775	0	9,214,046
South Carolina	96,310,411	6,142,486	6,654,915	4,282,130	18,150	113,408,092
South Dakota	435,739	193,405	78,484	1,294,101	0	2,001,729
Tennessee	46,687,393	6,290,202	10,324,918	5,665,208	0	68,967,721
Texas	193,240,622	74,366,119	33,729,621	36,475,413	174,466	337,986,241
Utah	5,028,082	80,661	4,351,475	422,249	538,256	10,420,723
Vermont	2,454,769	18,950	252,374	3,025	0	2,729,118
Virgin Islands	96,920	4,834	377,449	0	0	479,203
Virginia	22,724,864	6,931,822	1,762,214	16,876,073	1,000	48,295,973
Washington	12,695,274	871,255	896,850	1,693,122	0	16,156,501
West Virginia	30,508,467	8,961,334	3,422,220	2,414,351	10,500	45,316,872
Wisconsin	55,169,040	22,521,811	12,270,738	4,214,840	2,623	94,179,052
Wyoming	317,678	3,573	3,708	266	0	325,225
Total	2,150,593,994	477,056,570	290,096,828	235,813,508	3,306,380	3,156,867,280

Note: Data from Section 6 of Form R excluding off-site transfers to disposal. Other Off-site Transfers are transfers reported without a valid waste management code.