

<b>LEGEND</b>	<b>M</b>	Matched Chemicals/Industries
	<b>MY</b>	Multi-year Matched Chemicals/Industries
	<b>A</b>	All Chemicals/Industries

<b>3.1</b>	<b>Introduction</b>	<b>23</b>		
<b>3.2</b>	<b>North American Releases and Transfers: The Data</b>	<b>24</b>		
Table 3-1	North American Releases and Transfers, NPRI and TRI <b>M</b> 1995	24	Table 3-7	The 50 North American Facilities with Largest Total Releases <b>M</b> 1995 <b>34</b>
Table 3-2	North American Releases and Transfers, NPRI and TRI <b>A</b> 1995	25	Figure 3-2	North American Releases, Top 50 Facilities and All Other Facilities <b>M</b> 1995 <b>35</b>
Table 3-3	North American Releases and Transfers, NPRI and TRI <b>MY</b> 94-95	26	Table 3-8	The 50 North American Facilities with Largest Total Releases and Transfers <b>M</b> 1995 <b>36</b>
Table 3-4	Update of North American Total Release and Transfer Data, NPRI and TRI <b>A</b> 1994	27	Figure 3-3	North American Releases and Transfers, Top 50 Facilities and All Other Facilities <b>M</b> 1995 <b>38</b>
<b>3.3</b>	<b>North American Releases and Transfers</b>	<b>28</b>	<b>3.5</b>	<b>Principal Chemicals Reported</b> <b>38</b>
Figure 3-1	North American Releases and Transfers <b>M</b> 1995	28	Figure 3-4	North American Top Five Chemicals for Total Releases and Transfers <b>M</b> 1995 <b>38</b>
<b>3.4</b>	<b>Geography of North American Releases and Transfers</b>	<b>30</b>	Table 3-9	The 25 Chemicals with the Largest Total Releases and Transfers in North America <b>M</b> 1995 <b>39</b>
Table 3-5	North American Releases, by State and Province <b>M</b> 1995	30	Table 3-10	The 25 Chemicals with the Largest Total Releases in North America <b>M</b> 1995 <b>40</b>
Table 3-6	North American Releases and Transfers, by State and Province <b>M</b> 1995	31	Table 3-11	The 25 Chemicals with the Largest Transfers in North America <b>M</b> 1995 <b>41</b>
Map 3-1	Largest Sources of North American Releases and Transfers: States and Provinces <b>M</b> 1995	32	Table 3-12	North America Releases and Transfers of Known or Suspected Carcinogens <b>M</b> 1995 <b>42</b>
Map 3-2	Largest Sources of North American Releases and Transfers: Facilities <b>M</b> 1995	33	Table 3-13	Top 50 North American Facilities with Total Releases of Known or Suspected Carcinogens <b>M</b> 1995 <b>44</b>
			Table 3-14	Top 50 North American Facilities with Total Releases and Transfers of Known or Suspected Carcinogens <b>M</b> 1995 <b>46</b>

### LEGEND

<b>M</b>	Matched Chemicals/Industries
<b>MY</b>	Multi-year Matched Chemicals/Industries
<b>A</b>	All Chemicals/Industries

<b>3.6</b>	<b>Reporting Industries</b>	<b>43</b>
Table 3-15	Total Releases and Transfers in North America, by Industry <b>M</b> 1995	48
Table 3-16	Release in North America, by Industry <b>M</b> 1995	49
Table 3-17	Transfers in North America, by Industry <b>M</b> 1995	50
Figure 3-5	North American Top Three Industries for Total Releases and Transfers <b>M</b> 1995	51
<b>3.7</b>	<b>Projections for Future Releases and Transfers</b>	<b>43</b>
Table 3-18	North American Projections of Total Releases and Transfers, NPRI and TRI, 1995-1997 <b>M</b> 1995	51
Figure 3-6	Industries Projecting Large Reductions in Total Releases and Transfers, 1995-1997 <b>M</b> 1995	51
Table 3-19	North American Projections of Total Releases and Transfers, NPRI and TRI, by Industry, 1995-1997 <b>M</b> 1995	52

## ■ Key Findings

- Facilities in the United States dominated releases and transfers of listed pollutants in 1995, as reported to North American Pollutant Release and Transfer Registers (PRTRs). This is true both generally and for all types of releases and transfers. However, based on the relative size of the two reporting systems (by the number of facilities that report and the number of forms they submit), Canadian releases and transfers represent a larger share of all release/transfer types, except for transfers to municipal sewage treatment plants.
- Environmental releases (to air, surface water, underground injection and land disposal at the facility) accounted for nearly three-quarters of the total amount of releases and transfers reported.
- Ten states and provinces reported total releases and transfers of more than 45 million kg each in 1995. Releases and transfers were concentrated in the southeastern United States and on both the Canadian and US sides of the Great Lakes.
- The 50 largest facilities (far less than 1 percent of all reporting facilities) generated 26 percent of total releases and transfers. In particular, they dominated injection of listed substances to underground wells, releases on-site to land and discharges to surface waters. The large facilities' waste management methods tended to concentrate on one release medium or transfer type. In most cases, one release/transfer type received more than 70 percent of the facility's reported chemicals in waste.
- The chemical industry (US SIC code 28) dominated releases, transfers and total releases and transfers. Further, 29 of the 50 facilities with the largest total releases and transfers were chemical industry facilities.
- Fifteen percent of total releases and transfers were of 45 chemicals designated as known or suspected carcinogens. Releases of these chemicals totaled 128 million kg and transfers 67 million kg.

### 3.1 Introduction

This chapter provides an overall summary of PRTR data for North America, using publicly available data collected by Canada and the United States for 1995. It analyzes the data for industries and chemicals that must be reported in both countries (a matched data set). **Chapter 4** compares the data from the two PRTRs, again using the 1995 matched data set of common chemicals and industries. In **Chapter 5**, data for 1994 and 1995 are compared for both countries, for common chemicals and industries (a multi-year matched data set).

The data for Canada are based on the NPRI data as compiled in the NPRI document *Summary Report 1995: National Pollutant Release Inventory*, Environment Canada, Hull, Quebec, November 1997. The data for the United States are based on TRI data as released to the public in *1995 Toxics Release Inventory: Public Data Release*, US Environmental Protection Agency, Washington, DC, April 1997.

To clarify the differences among data sets, this chapter begins with summary tables for the matched data set for 1995, the complete NPRI and TRI data for 1995, and the multi-year matched data set for 1994–1995 (**Tables 3-1, 3-2 and 3-3**). Letters on the left sides of all tables and figures throughout the report state which data set is in use, as explained in **Chapter 2**.

While similar, the two current North American PRTRs exhibit significant differences in the chemicals and industries they cover: The 1995 TRI required reporting list numbered 606 chemicals and chemical categories, while that for NPRI covered 176. In 1995, TRI applied only to manufacturing and

Table 3-1		North American Releases and Transfers, NPRI and TRI							
M 1995									
Data Analyzed in this Chapter and Chapter 4	North America		Canadian NPRI		US TRI		NPRI as % of	TRI as % of	
	Number		Number		Number		North American Total	North American Total	
Total Facilities	21,095		1,309		19,786		6.2	93.8	
Total Forms	64,092		4,328		59,764		6.8	93.2	
	kg	%	kg	%	kg	%			
Total Air Emissions	639,954,996	48.9	79,547,053	51.3	560,407,943	48.5	12.4	87.6	
Surface Water Discharges	75,990,103	5.8	15,419,582	9.9	60,570,521	5.2	20.3	79.7	
Underground Injection	102,720,500	7.8	9,937,227	6.4	92,783,273	8.0	9.7	90.3	
On-Site Land Releases	134,910,378	10.3	11,690,712	7.5	123,219,666	10.7	8.7	91.3	
<b>Matched Releases</b>	<b>953,725,730</b>	<b>72.8</b>	<b>116,744,327</b>	<b>75.3</b>	<b>836,981,403</b>	<b>72.4</b>	<b>12.2</b>	<b>87.8</b>	
Treatment/Destruction	117,107,768	8.9	13,148,001	8.5	103,959,767	9.0	11.2	88.8	
Sewage/POTWs	100,254,236	7.7	4,457,382	2.9	95,796,854	8.3	4.4	95.6	
Disposal/Containment	138,582,168	10.6	20,654,350	13.3	117,927,818	10.2	14.9	85.1	
<b>Matched Transfers</b>	<b>355,944,172</b>	<b>27.2</b>	<b>38,259,733</b>	<b>24.7</b>	<b>317,684,439</b>	<b>27.5</b>	<b>10.7</b>	<b>89.3</b>	
<b>Total Releases and Transfers</b>	<b>1,309,669,902</b>	<b>100.0</b>	<b>155,004,060</b>	<b>100.0</b>	<b>1,154,665,842</b>	<b>100.0</b>	<b>11.8</b>	<b>88.2</b>	

► Canada and US data only, Mexico data not collected for 1995.

federal facilities, while, with a few exceptions, NPRI encompassed facilities in any industry. Data in this chapter are limited to the chemicals and industries common to both PRTRs. Industries are defined by their US Standard Industrial Classification (SIC) code, which both countries collect.

As shown in **Chapter 4**, the matched data set—that is, data from industries and chemicals covered by both PRTRs—represents 68 percent of NPRI total releases and transfers and 84 percent of the TRI releases and transfers (not including off-site transfers to recycling, reuse, and energy recovery). Averaged over the two countries,

the matched data represent 82 percent of the North American total. When all reported amounts for transfers to recycling/reuse/recovery are included, the matched data set represents 44 percent of the North American total.

Currently, almost 25 percent of NPRI total releases and transfers must be excluded from the matched data set in this report, because they are reported by non-manufacturing industries (see **Figure 4-1**, in **Chapter 4**). As described in **Chapter 2**, TRI has expanded to cover certain additional industries, beginning with the 1998 reporting year. Had these expansion industries reported to TRI in 1995, only

14 percent of the NPRI totals would have been excluded, a substantial increase in comparability between the two databases.

### 3.2 North American Releases and Transfers: The Data

The data covered in this chapter reflect the submission of 64,092 forms by 21,095 industrial facilities. (Facilities report one chemical per form; therefore a facility that reports releases and/or transfers of 10 chemicals submits 10 forms.) These facilities reported releases and transfers of 1.3 billion kg of listed chemicals in North America

in 1995 (see **Table 3-1**). In this common database, the Canadian NPRI represents 12 percent and the US TRI 88 percent of total releases and transfers. Canadian facilities, however, account for a greater proportion of all releases and transfers than would be expected from the number of facilities and forms involved (6 percent of reporting facilities and 7 percent of submitted forms, but 12 percent of releases and 11 percent of transfers).

These results were taken from the larger pool of data that includes all industries and all chemicals that are reported to either PRTR. In the complete databases, a total of 23,709 facilities

Table 3-2		North American Releases and Transfers, NPRI and TRI							
A		1995							
	North America		Canadian NPRI		US TRI		NPRI as % of	TRI as % of	
	Number		Number		Number		North American Total	North American Total	
Total Facilities	23,709		1,758		21,951		7.4	92.6	
Total Forms	79,605		6,294		73,311		7.9	92.1	
	<b>kg</b>	<b>%*</b>	<b>kg</b>	<b>%*</b>	<b>kg</b>	<b>%*</b>	<b>%</b>	<b>%</b>	
Total Air Emissions	811,073,607	50.8	102,537,501	44.7	708,536,106	51.8	12.6	87.4	
Surface Water Discharges	96,230,607	6.0	34,409,462	15.0	61,821,145	4.5	35.8	64.2	
Underground Injection	122,652,243	7.7	16,085,482	7.0	106,566,761	7.8	13.1	86.9	
On-Site Land Releases	140,598,536	8.8	15,822,135	6.9	124,776,401	9.1	11.3	88.7	
<b>Total Releases</b>	<b>1,170,770,356</b>	<b>73.3</b>	<b>169,069,943</b>	<b>73.7</b>	<b>1,001,700,413</b>	<b>73.2</b>	<b>14.4</b>	<b>85.6</b>	
Treatment/Destruction	146,968,533	9.2	16,548,187	7.2	130,420,346	9.5	11.3	88.7	
Sewage/ POTWs	114,894,506	7.2	6,125,111	2.7	108,769,395	7.9	5.3	94.7	
Disposal/Containment	165,482,360	10.4	37,748,366	16.4	127,733,994	9.3	22.8	77.2	
<b>Total Transfers</b>	<b>427,345,399</b>	<b>26.7</b>	<b>60,421,664</b>	<b>26.3</b>	<b>366,923,735</b>	<b>26.8</b>	<b>14.1</b>	<b>85.9</b>	
<b>Subtotal Releases and Transfers</b>	<b>1,598,115,755</b>	<b>100.0</b>	<b>229,491,607</b>	<b>100.0</b>	<b>1,368,624,148</b>	<b>100.0</b>	<b>14.4</b>	<b>85.6</b>	
Recycling/Reuse/Recovery**	1,166,315,115		162,355,301		1,003,959,814		13.9	86.1	
Energy Recovery**	234,957,812		2,744,784		232,213,028		1.2	98.8	
<b>Total Releases and Transfers</b>	<b>2,999,388,682</b>		<b>394,591,692</b>		<b>2,604,796,990</b>		<b>13.2</b>	<b>86.8</b>	

\* Percentage of subtotal releases and transfers, excluding recycling/reuse/recovery and energy recovery, presented for consistency with Tables 3-1 and 3-3.

\*\* Optional reporting for NPRI, required for TRI.

➤ Canada and US data only, Mexico data not collected for 1995.

reported, submitting 79,605 forms. In this compilation of all PRTR reports, total releases and transfers amounted to just under 3.0 billion kg for 1995 (see Table 3-2). The most significant difference between the complete databases and the matched data set of common industries and chemicals is the reporting on transfers to recycling, reuse or recovery and transfers to energy recovery. Submission of data on these transfers is mandatory for TRI, but remains optional for NPRI until the 1998 reporting year. These types of

transfers accounted for 1.6 billion kg of listed chemicals, more than half of the North American total of 3.0 billion.

Chapter 4 returns to the matched data set summarized in Table 3-1, to compare NPRI and TRI reporting for the common set of chemicals and industries. Chapter 4 also discusses in more detail the effects of excluding chemicals and industries from each PRTR's data.

North American PRTR data for 1994 and 1995 are summarized in Table 3-3. For this analysis, any

chemical or industry that was not covered by both NPRI and TRI in both years must be further excluded from the matched data. Although the industrial coverage did not change from 1994 to 1995, some changes in the lists of chemical substances to be reported did occur. Thus, the 1995 releases and transfers in Table 3-3 total nearly 1.1 billion kg. Chapter 5 analyzes the matched two-year North American data.

In future years, reporting for the two PRTRs will become more similar,

increasing the proportion of data held in common. EPA is implementing an expansion of industrial coverage for TRI, effective with the 1998 reporting year. Also for 1998, reporting of transfers to recycling/reuse/recovery or to energy recovery will become mandatory for NPRI facilities.

Because facilities may at any time submit revisions to their previous reports, the NPRI and TRI databases are never static. *Taking Stock* uses the two databases as they existed at the time that

Table 3-3		North American Releases and Transfers, NPRI and TRI											
MY	94-95												
Data Analyzed in Chapter 5		North America				NPRI				TRI			
		1994	1995	Change 1994-1995		1994	1995	Change 1994-1995		1994	1995	Change 1994-1995	
		Number	Number	Number	%	Number	Number	Number	%	Number	Number	Number	%
Facilities		20,482	20,041	-441	-2.2	1,281	1,298	17	1.3	19,201	18,743	-458	-2.4
Forms		59,491	58,561	-930	-1.6	3,860	4,031	171	4.4	55,631	54,530	-1,101	-2.0
<b>Releases</b>		<b>kg</b>	<b>kg</b>	<b>kg</b>	<b>%</b>	<b>kg</b>	<b>kg</b>	<b>kg</b>	<b>%</b>	<b>kg</b>	<b>kg</b>	<b>kg</b>	<b>%</b>
Total Air Emissions		583,531,740	551,473,170	-32,058,570	-5.5	66,862,674	63,201,922	-3,660,752	-5.5	516,669,066	488,271,248	-28,397,818	-5.5
Surface Water Discharges		30,742,636	26,918,213	-3,824,423	-12.4	12,962,199	10,919,996	-2,042,203	-15.8	17,780,437	15,998,217	-1,782,220	-10.0
Underground Injection		43,721,458	55,992,452	12,270,994	28.1	872,126	3,236,927	2,364,801	271.2	42,849,332	52,755,525	9,906,193	23.1
On-Site Land Releases		136,008,323	131,360,857	-4,647,466	-3.4	10,390,568	11,573,758	1,183,190	11.4	125,617,755	119,787,099	-5,830,656	-4.6
<b>Matched Releases</b>		<b>794,168,793</b>	<b>765,885,868</b>	<b>-28,282,925</b>	<b>-3.6</b>	<b>91,252,202</b>	<b>89,073,779</b>	<b>-2,178,423</b>	<b>-2.4</b>	<b>702,916,591</b>	<b>676,812,089</b>	<b>-26,104,502</b>	<b>-3.7</b>
<b>Transfers</b>													
Treatment/Destruction		102,191,808	109,004,789	6,812,981	6.7	14,494,719	12,645,014	-1,849,705	-12.8	87,697,089	96,359,775	8,662,686	9.9
Sewage/POTWs		65,474,711	63,670,962	-1,803,749	-2.8	464,174	394,752	-69,422	-15.0	65,010,537	63,276,210	-1,734,327	-2.7
Disposal/Containment		126,068,931	133,215,054	7,146,123	5.7	11,808,310	20,486,822	8,678,512	73.5	114,260,621	112,728,232	-1,532,389	-1.3
<b>Matched Transfers</b>		<b>293,735,451</b>	<b>305,890,805</b>	<b>12,155,354</b>	<b>4.1</b>	<b>26,767,203</b>	<b>33,526,588</b>	<b>6,759,385</b>	<b>25.3</b>	<b>266,968,248</b>	<b>272,364,217</b>	<b>5,395,970</b>	<b>2.0</b>
<b>Matched Releases and Transfers</b>		<b>1,087,904,244</b>	<b>1,071,776,673</b>	<b>-16,127,571</b>	<b>-1.5</b>	<b>118,019,405</b>	<b>122,600,367</b>	<b>4,580,962</b>	<b>3.9</b>	<b>969,884,839</b>	<b>949,176,307</b>	<b>-20,708,532</b>	<b>-2.1</b>

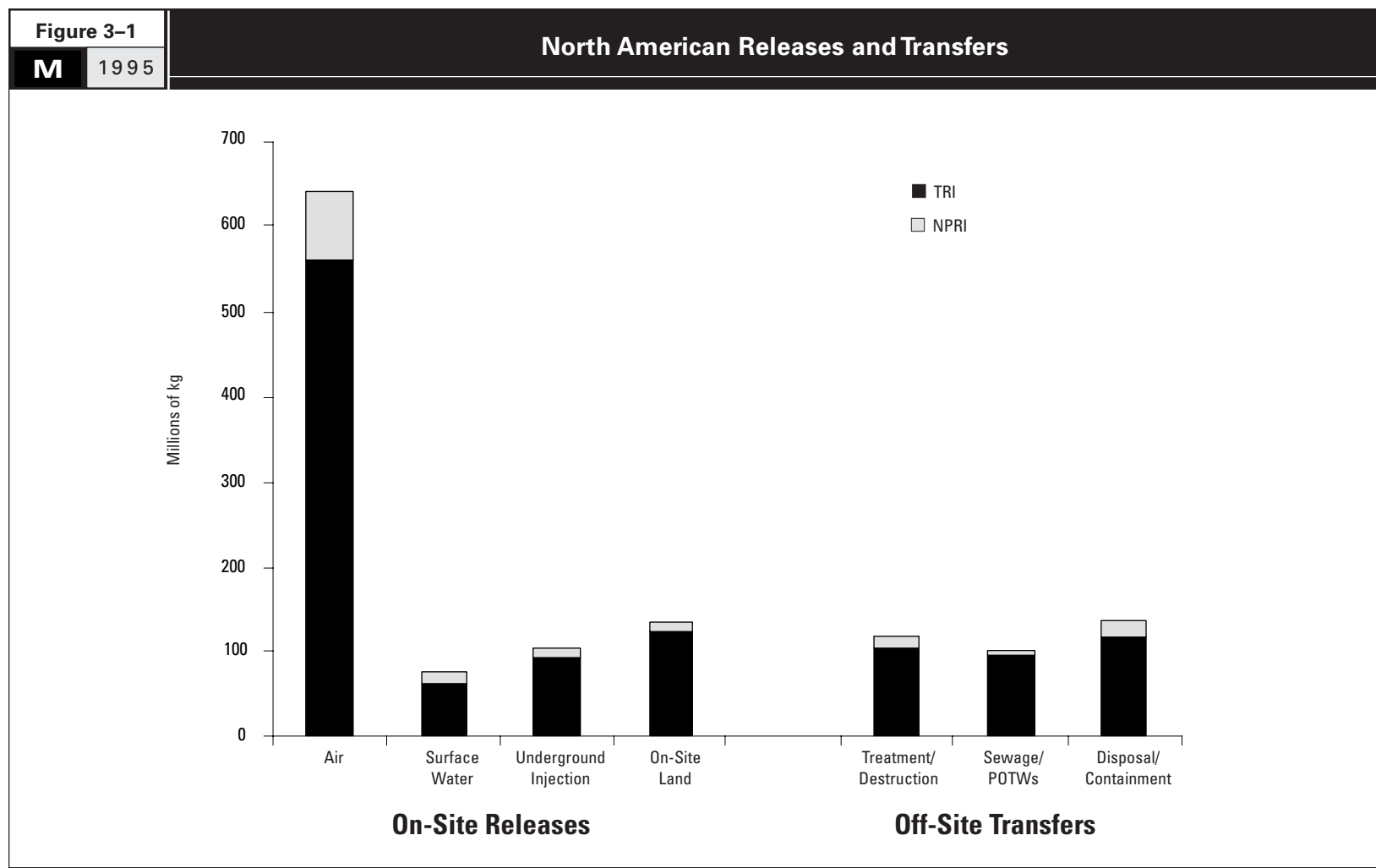
► Does not include ammonia, ammonium nitrate, ammonium sulfate, hydrochloric acid, nitric acid, nitrate compounds, sulfuric acid, and chemicals not reported to both NPRI and TRI. Canada and US data only, Mexico data not collected for 1994 and 1995.

<b>Table 3-4</b>		<b>Update of North American Total Release and Transfer Data, NPRI and TRI</b>					
<b>A</b>		<b>1994</b>					
<b>Number</b>	<b>1994 Data, Reported in <i>Taking Stock 1994</i></b>			<b>1994 Data, with Revisions Submitted since 1994 Report</b>			
	<b>North America</b>	<b>Canadian NPRI</b>	<b>US TRI</b>	<b>North America</b>	<b>Canadian NPRI</b>	<b>US TRI</b>	
	<b>Number</b>	<b>Number</b>	<b>Number</b>	<b>Number</b>	<b>Number</b>	<b>Number</b>	
Total Facilities	24,451	1,707	22,744	24,816	1,740	23,076	
Total Forms	81,260	5,928	75,332	82,224	6,004	76,220	
<b>Releases</b>	<b>kg</b>	<b>kg</b>	<b>kg</b>	<b>kg</b>	<b>kg</b>	<b>kg</b>	
Total Air Emissions	801,835,911	96,163,310	705,672,601	809,182,329	97,506,936	711,675,393	
Surface Water Discharges	85,439,465	55,469,720	29,969,745	84,683,838	55,385,747	29,298,091	
Underground Injection	172,527,104	14,264,870	158,262,234	173,837,729	13,364,870	160,472,859	
On-Site Land Releases	145,221,958	14,087,660	131,134,298	151,528,567	14,096,225	137,432,342	
<b>Total Releases</b>	<b>1,205,280,853</b>	<b>180,241,975</b>	<b>1,025,038,878</b>	<b>1,219,489,854</b>	<b>180,611,169</b>	<b>1,038,878,685</b>	
<b>Transfers</b>							
Treatment, Destruction	168,978,727	24,393,542	144,585,185	158,014,954	24,972,538	133,042,416	
Sewage/POTWs	117,521,363	2,016,222	115,505,141	116,719,343	2,082,300	114,637,043	
Disposal/Containment	174,469,897	37,869,948	136,599,949	158,088,757	23,100,584	134,988,173	
<b>Total Transfers</b>	<b>460,969,987</b>	<b>64,279,712</b>	<b>396,690,275</b>	<b>432,823,054</b>	<b>50,155,422</b>	<b>382,667,632</b>	
<b>Total Releases and Transfers</b>	<b>1,666,250,840</b>	<b>244,521,687</b>	<b>1,421,729,153</b>	<b>1,652,312,908</b>	<b>230,766,591</b>	<b>1,421,546,317</b>	

► Canada and US data only, Mexico data not collected for 1994.

Canada and the United States “locked” their data for their own annual published summaries (June 1997 for NPRI and April 1997 for TRI). Last year’s report, *Taking Stock 1994*, analyzed NPRI and TRI data as of June 1996. **Table 3-4** compares 1994 data analyzed in *Taking Stock 1994* with the current 1994 data (June 1997 update) that reflects revisions submitted since that report.

Although more facilities filed 1994 reports, the North American total for releases and transfers for that reporting year decreased by 14 million kg as a result of all revisions received. Most of the additional facilities reported to TRI, where increased releases were offset by decreases in transfers, leaving little net change. In NPRI, the revised data brought a small increase in releases but a larger decrease in transfers, reflected in the net decrease overall for North America.



### 3.3 North American Releases and Transfers

For the common North American data set (see **Table 3-1**, above), releases (to air, surface waters, on-site land and underground injection) represented 73 percent of total releases and transfers reported in 1995. Emissions to the air accounted for two-thirds of all releases and nearly one-half of total releases and transfers. On-site land releases was the next largest type of

release (10 percent of total releases and transfers), followed by underground injection (8 percent) and discharges into surface waters (6 percent). US facilities report larger releases to all media, dominating the North American data, but surface waters receive approximately twice the proportion of Canadian releases and transfers (10 percent) than is the case for the United States (5 percent). **Figure 3-1** graphically presents the distribution of releases and transfers, illustrating data from **Table 3-1**.

Facilities reported greater off-site transfers to disposal (11 percent of North American total releases and transfers) than to treatment (9 percent) or to sewage/POTWs (8 percent). Off-site transfers differed markedly, however, in the two countries: for Canada, transfers to municipal sewage treatment plants were small—3 percent of the NPRI total—and the amounts transferred to disposal (13 percent) were significantly greater than those sent to treatment (approximately 9 percent).

Transfers to sewage was the only category in which the NPRI contribution to total releases and transfers was smaller than the NPRI percentage of facilities. In contrast, in the US TRI, transfers to sewage treatment plants—although still the smallest reported transfer type—represented 8 percent of the total, and transfers to disposal (10 percent) were only somewhat greater than transfers to treatment (9 percent; see **Figure 3-1**).



## RANKING FACILITIES, PROVINCES AND STATES

Two issues raised in comments on this series of reports relate to the ranking of facilities and provinces/states and the lack of some form of production normalization of PRTR data. Underlying these two interrelated topics is the value-laden subject of how to measure environmental performance.

The CEC received comments on last year's report relating concerns that the rankings in the report were simplistic and/or misleading. Other comments received, however, supported the rankings used, and pointed out that they were consistent with practices employed by the existing national PRTR programs, such as the Toxics Release Inventory. The CEC has attempted to respond to both views by providing different presentations of ranking as a way of balancing differing approaches.

This report includes rankings of facilities based upon their total on-site releases collectively for all listed pollutants. This approach aggregates releases to different environmental media, which may have different impacts. It also aggregates chemicals with differing chemical and toxicological properties. Finally, it does not take into account any differences in the proximity of people and sensitive environments to the releases. On the other hand, it lumps only chemicals of concern—and these are just one percent of chemicals in commerce in the United States and Canada.

These rankings are done exclusively on the basis of reported quantities and are not risk-based. They present the largest sources of releases to the environment of the reported chemical from the covered facilities and provinces/states. While crude, rankings of the largest polluters in PRTR databases provide some perspective and have served to stimulate actions by industry and government to reduce pollution of substances of concern. Thus, the CEC has continued to include such rankings in this report.

None of the rankings is meant to imply that any facility is not living up to its environmental obligations under the law, nor that any province's or state's environmental program is inadequate. Such rankings instead document some of the largest sources of the listed pollutants to the environment.

Some tables include both releases and off-site transfers and rank reporting facilities and states/provinces based upon their totals. Some transfers are sent

for treatment, others for disposal. Some transfers are largely destroyed in treatment or managed at disposal sites. Other transfers result in large amounts of the substances of concern entering the environment at off-site locations (at varying distances from the facility). As a result, such rankings are not based upon what enters the environment, particularly at the site of the facility. The combination of releases and transfers instead sums the amounts of the listed pollutants being released to the environment on-site and sent off-site in wastes.

The CEC has received many suggestions of alternative measures of environmental performance for facility and state/province rankings of PRTR data. Some approaches suggested for environmental performance measurement include compilations of releases and transfers that are "normalized" to account for differences in sizes and trends in production. Issues in normalization are discussed in **Chapter 2**.

Among the many approaches to measuring environmental performance that were suggested by commenters to supplement, or substitute for, the simple summaries provided herein are:

- toxicity weighted releases,
- chemical class-based releases,
- health risks,
- health and environmental risks,
- feasibility of release reductions,
- efficiency,
- releases per unit of monetary value,
- releases per unit of production,
- changes in releases per changes in production,
- geographical area (see **Tables 3–5** and **3–6**), and
- population (see **Tables 3–5** and **3–6**).

These suggestions, along with other possible measures to rank the environmental performance of industrial facilities and governmental jurisdictions will be discussed for possible inclusion as a special feature in the next CEC North American PRTR report.

Table 3-5		North American Releases, by State and Province							
M	1995								
		1995	Land Area	Total Releases		Total Releases		Total Releases	
State/Province	Population	(km <sup>2</sup> )	(kg)	Rank	(kg)	Rank	(kg)	Rank	
Texas	18,801,380	691,031	112,793,420	1	6.0	10	163.2	21	
Louisiana	4,338,072	123,675	70,770,304	2	16.3	2	572.2	2	
Ontario	11,097,450	1,068,586	48,987,455	3	4.4	18	45.8	37	
Ohio	11,134,032	107,045	45,870,951	4	4.1	21	428.5	3	
Alabama	4,246,205	133,916	41,530,464	5	9.8	6	310.1	8	
Tennessee	5,246,723	109,153	40,403,210	6	7.7	8	370.2	5	
Illinois	11,790,379	145,934	35,130,323	7	3.0	26	240.7	14	
North Carolina	7,202,335	136,413	33,735,003	8	4.7	17	247.3	12	
Utah	1,958,313	219,889	30,718,386	9	15.7	3	139.7	23	
Florida	14,184,155	151,940	30,592,848	10	2.2	37	201.3	15	
Alberta	2,752,058	661,194	30,208,648	11	11.0	4	45.7	38	
Indiana	5,796,948	93,719	30,201,225	12	5.2	14	322.3	7	
Michigan	9,537,948	151,585	23,529,621	13	2.5	33	155.2	22	
Mississippi	2,696,183	123,515	22,344,953	14	8.3	7	180.9	17	
Pennsylvania	12,060,312	117,348	21,132,521	15	1.8	41	180.1	18	
Georgia	7,208,676	152,577	21,047,672	16	2.9	28	137.9	25	
South Carolina	3,667,000	80,583	21,007,927	17	5.7	12	260.7	9	
Quebec	7,343,240	1,540,689	20,358,536	18	2.8	32	13.2	50	
Montana	870,351	380,850	19,634,638	19	22.6	1	51.6	36	
Virginia	6,615,234	105,587	19,254,062	20	2.9	30	182.4	16	
Missouri	5,319,335	180,515	18,963,517	21	3.6	22	105.1	27	
Arizona	4,305,016	295,260	15,236,624	22	3.5	23	51.6	35	
New York	18,190,562	127,190	13,176,768	23	0.7	54	103.6	28	
Arkansas	2,484,761	137,754	12,772,193	24	5.1	15	92.7	29	
Iowa	2,843,074	145,752	12,346,541	25	4.3	19	84.7	30	
California	31,565,480	411,049	12,305,985	26	0.4	59	29.9	44	
Kentucky	3,856,877	104,659	11,907,988	27	3.1	25	113.8	26	
Wisconsin	5,122,100	145,436	10,930,967	28	2.1	38	75.2	31	
West Virginia	1,825,256	62,758	10,555,283	29	5.8	11	168.2	19	
Washington	5,447,720	176,478	9,886,090	30	1.8	39	56.0	33	
Oklahoma	3,274,870	181,186	9,608,628	31	2.9	27	53.0	34	
Oregon	3,148,855	251,419	9,003,747	32	2.9	31	35.8	42	
Kansas	2,563,618	213,098	8,348,243	33	3.3	24	39.2	39	
New Mexico	1,689,849	314,926	8,097,135	34	4.8	16	25.7	46	
Minnesota	4,614,613	218,601	7,925,993	35	1.7	43	36.3	41	
British Columbia	3,762,859	947,806	6,110,485	36	1.6	44	6.4	54	
New Jersey	7,949,506	20,168	5,208,802	37	0.7	55	258.3	10	
New Brunswick	760,187	73,440	5,077,910	38	6.7	9	69.1	32	
Wyoming	479,192	253,326	4,717,495	39	9.8	5	18.6	48	
Maryland	5,038,912	27,091	4,544,015	40	0.9	52	167.7	20	
Nebraska	1,639,213	200,350	3,895,184	41	2.4	35	19.4	47	
Puerto Rico	3,755,127	9,104	3,589,767	42	1.0	51	394.3	4	
Idaho	1,166,112	216,431	3,403,718	43	2.9	29	15.7	49	
Connecticut	3,270,740	12,997	3,260,594	44	1.0	50	250.9	11	
Maine	1,238,572	86,156	3,036,522	45	2.5	34	35.2	43	
Massachusetts	6,071,078	21,456	2,995,778	46	0.5	56	139.6	24	
Alaska	602,545	1,530,702	2,610,801	47	4.3	20	1.7	62	
Manitoba	1,136,796	649,953	2,605,811	48	2.3	36	4.0	58	
Saskatchewan	1,016,600	652,334	1,645,493	49	1.6	45	2.5	60	
Nova Scotia	937,777	55,491	1,634,705	50	1.7	42	29.5	45	
Nevada	1,533,478	286,353	1,548,687	51	1.0	49	5.4	56	
Colorado	3,747,560	269,596	1,509,326	52	0.4	57	5.6	55	
Delaware	717,041	5,294	1,277,780	53	1.8	40	241.4	13	
Rhode Island	991,701	3,139	1,142,993	54	1.2	47	364.1	6	
New Hampshire	1,148,244	24,033	902,927	55	0.8	53	37.6	40	
North Dakota	641,506	183,121	828,404	56	1.3	46	4.5	57	
South Dakota	729,500	199,731	797,729	57	1.1	48	4.0	59	
Virgin Islands	101,809	342	557,783	58	5.5	13	1,631.5	1	
Vermont	584,776	24,900	231,810	59	0.4	58	9.3	52	
Hawaii	1,179,198	16,760	155,654	60	0.1	61	9.3	53	
Newfoundland	576,637	405,721	102,264	61	0.2	60	0.3	63	
Prince Edward Island	135,606	5,659	13,020	62	0.1	62	2.3	61	
American Samoa	46,773	199	2,404	63	0.1	63	12.1	51	
District of Columbia	554,528	163	0	64	0.0	64	0.0	64	
<b>Total</b>	<b>296,312,553</b>	<b>15,443,126</b>	<b>953,725,730</b>		<b>3.2</b>		<b>61.8</b>		

► Canada and US data only, Mexico data not collected for 1995.

### 3.4 Geography of North American Releases and Transfers

#### 3.4.1 State and Provincial Data

Among US states and Canadian provinces, only Texas reported more than 100 million kg of total releases in 1995, (113 million kg, as shown in **Table 3-5**). Louisiana followed with 71 million kg, and Ontario ranked third with 49 million kg. Together, their facilities accounted for nearly one quarter of total releases reported in 1995. In 26 other provinces and states, releases totaled more than 10 million kg.

Similar results appear in **Table 3-6**, which ranks US states and Canadian provinces according to the total releases and transfers reported by facilities located within their borders. The 1,073 TRI facilities in Texas reported 151 million kg of total releases and transfers, more than any other state or province. Texas contains more reporting facilities and reported greater total releases and transfers than Louisiana and Ontario, ranked second and third, combined. In each of the top 10 states and provinces, total releases and transfers exceeded 45 million kg. Twenty-five other states and provinces reported total releases and transfers of more 10 million kg each.

**Map 3-1** illustrates the concentration of releases and transfers around the Great Lakes area in the United States and Canada and in parts of the southern United States. (**Tables 3-5** and **3-6** also provide total population and land area for each of the states and provinces.)

### 3.4.2 Facilities with the Largest Total Releases and Transfers

Some of the geographical pattern of releases and transfers can be attributed to a few facilities, as appears in **Map 3-2**, which locates facilities (two in NPRI and 35 in TRI) that reported more than 4 million kg of total releases and transfers in 1995.

**Table 3-7** lists the 50 facilities with the largest total releases. (Any evaluation of the relative health and environmental impacts of releases and transfers from these facilities must also take into account the toxicity of the chemicals released, local climatic conditions and the proximity of people and/or ecologically sensitive areas to the released waste streams.) Their reported releases amounted to 31 percent of the North American total. Seven of the 50 reported to NPRI and the remainder to TRI. For 30 of these facilities, release of one chemical to one environmental medium constituted more than 70 percent of total releases.

As illustrated in **Figure 3-2**, underground injection and on-site land releases played a much larger role for these facilities than for the rest of the reporting facilities. Together, these two media accounted for 59 percent of the top 50 facilities' releases, compared to 10 percent for all facilities. Correspondingly, air emissions were a much smaller proportion for the top 50 facilities (31 percent) than for others (83 percent).

The 50 facilities with the largest total releases and transfers reported in the combined North American data for 1995 appear in **Table 3-8**. These 50 facilities, which constitute far less than 1 percent of the total number of reporting facilities and which submitted 1 percent of all forms, nonetheless reported 26 percent of total releases and transfers. Seven are Canadian facilities, while 43 are in the United States.

Table 3-6

### North American Releases and Transfers, by State and Province

M	1995		Land Area (km <sup>2</sup> )	Number of Facilities	Total	Total	Total Releases and Transfers		Total Releases and Transfers		
	Population	Releases (kg)			Transfers (kg)	(kg) Rank	Per Capita (kg) Rank	Per km <sup>2</sup> (kg) Rank			
Texas	18,801,380	691,031	1,073	112,793,420	38,288,906	151,082,326	1	8.0	10	218.6	22
Louisiana	4,338,072	123,675	275	70,770,304	3,725,456	74,495,761	2	17.2	2	602.3	5
Ontario	11,097,450	1,068,586	718	48,987,455	25,291,348	74,278,803	3	6.7	14	69.5	33
Ohio	11,134,032	107,045	1,491	45,870,951	25,684,992	71,555,943	4	6.4	15	668.5	4
Pennsylvania	12,060,312	117,348	1,126	21,132,521	35,228,537	56,361,058	5	4.7	25	480.3	10
Alabama	4,246,205	133,916	472	41,530,464	8,331,449	49,861,913	6	11.7	4	372.3	13
Illinois	11,790,379	145,934	1,204	35,130,323	14,573,702	49,704,025	7	4.2	29	340.6	14
Tennessee	5,246,723	109,153	588	40,403,210	7,845,953	48,249,163	8	9.2	8	442.0	11
Michigan	9,537,948	151,585	806	23,529,621	24,115,735	47,645,356	9	5.0	20	314.3	16
Indiana	5,796,948	93,719	924	30,201,225	16,198,405	46,399,630	10	8.0	12	495.1	9
North Carolina	7,202,335	136,413	786	33,735,003	7,755,651	41,490,654	11	5.8	18	304.2	17
Florida	14,184,155	151,940	465	30,592,848	5,094,049	35,686,897	12	2.5	41	234.9	20
Alberta	2,752,058	661,194	88	30,208,648	1,318,330	31,526,978	13	11.5	5	47.7	42
Utah	1,958,313	219,889	132	30,718,386	627,044	31,345,431	14	16.0	3	142.6	29
Quebec	7,343,240	1,540,689	328	20,358,536	6,978,005	27,336,541	15	3.7	33	17.7	49
Virginia	6,615,234	105,587	409	19,254,062	7,883,453	27,137,515	16	4.1	31	257.0	19
South Carolina	3,667,000	80,583	460	21,007,927	5,379,419	26,387,346	17	7.2	13	327.5	15
Missouri	5,319,335	180,515	517	18,963,517	7,056,535	26,020,052	18	4.9	23	144.1	28
California	31,565,480	411,049	1,233	12,305,985	13,310,459	25,616,444	19	0.8	57	62.3	37
Mississippi	2,696,183	123,515	286	22,344,953	2,476,750	24,821,703	20	9.2	7	201.0	23
Georgia	7,208,676	152,577	637	21,047,672	3,243,470	24,291,142	21	3.4	36	159.2	25
Wisconsin	5,122,100	145,436	795	10,930,967	10,112,376	21,043,342	22	4.1	30	144.7	27
New York	18,190,562	127,190	641	13,176,768	6,904,505	20,081,273	23	1.1	54	157.9	26
Montana	870,351	380,850	25	19,634,638	24,717	19,659,355	24	22.6	1	51.6	41
Arizona	4,305,016	295,260	158	15,236,624	3,210,162	18,446,786	25	4.3	28	62.5	36
New Jersey	7,949,506	20,168	544	5,208,802	12,819,942	18,028,744	26	2.3	43	893.9	2
Iowa	2,843,074	145,752	373	12,346,541	5,372,582	17,719,124	27	6.2	17	121.6	30
Kentucky	3,856,877	104,659	381	11,907,988	5,397,554	17,305,542	28	4.5	26	165.4	24
Oregon	3,148,855	251,419	230	9,003,747	6,560,180	15,563,927	29	4.9	21	61.9	38
West Virginia	1,825,256	62,758	131	10,555,283	4,062,537	14,617,820	30	8.0	11	232.9	21
Arkansas	2,484,761	137,754	351	12,772,193	1,428,056	14,200,249	31	5.7	19	103.1	31
Kansas	2,563,618	213,098	255	8,348,243	3,988,354	12,336,596	32	4.8	24	57.9	39
Minnesota	4,614,613	218,601	461	7,925,993	3,931,715	11,857,707	33	2.6	40	54.2	40
Washington	5,447,720	176,478	255	9,886,090	1,660,589	11,546,679	34	2.1	45	65.4	34
Oklahoma	3,274,870	181,186	253	9,608,628	1,814,528	11,423,156	35	3.5	35	63.0	35
British Columbia	3,762,859	947,806	75	6,110,485	2,675,862	8,786,347	36	2.3	42	9.3	54
Massachusetts	6,071,078	21,456	457	2,995,778	5,556,172	8,551,950	37	1.4	53	398.6	12
New Mexico	1,689,849	314,926	32	8,097,135	183,312	8,280,447	38	4.9	22	26.3	47
Maryland	5,038,912	27,091	168	4,544,015	2,981,184	7,525,198	39	1.5	52	277.8	18
Puerto Rico	3,755,127	9,104	142	3,589,767	3,798,424	7,388,191	40	2.0	46	811.5	3
Connecticut	3,270,740	12,997	294	3,260,594	4,007,733	7,268,327	41	2.2	44	559.2	6
New Brunswick	760,187	73,440	21	5,077,910	1,558,783	6,636,693	42	8.7	9	90.4	32
Nebraska	1,639,213	200,350	150	3,895,184	1,984,346	5,879,531	43	3.6	34	29.3	46
Wyoming	479,192	253,326	24	4,717,495	4,237	4,721,732	44	9.9	6	18.6	48
Maine	1,238,572	86,156	83	3,036,522	810,707	3,847,229	45	3.1	37	44.7	44
Idaho	1,166,112	216,431	56	3,403,718	173,083	3,576,801	46	3.1	38	16.5	50
Manitoba	1,136,796	649,953	38	2,605,811	301,215	2,907,026	47	2.6	39	4.5	59
Delaware	717,041	5,294	69	1,277,780	1,487,622	2,765,402	48	3.9	32	522.4	8
Alaska	602,545	1,530,702	8	2,610,801	2,748	2,613,550	49	4.3	27	1.7	62
Colorado	3,747,560	269,596	159	1,509,326	856,165	2,365,491	50	0.6	58	8.8	55
Nova Scotia	937,777	55,491	22	1,634,705	107,917	1,742,622	51	1.9	47	31.4	45
Rhode Island	991,701	3,139	134	1,142,993	599,216	1,742,209	52	1.8	48	555.0	7
Saskatchewan	1,016,600	652,334	14	1,645,493	27,845	1,673,338	53	1.6	50	2.6	60
Nevada	1,533,478	286,353	32	1,548,687	28,305	1,576,992	54	1.0	55	5.5	57
New Hampshire	1,148,244	24,033	91	902,927	235,657	1,138,585	55	1.0	56	47.4	43
North Dakota	641,506	183,121	32	828,404	271,401	1,099,805	56	1.7	49	6.0	56
South Dakota	729,500	199,731	68	797,729	295,633	1,093,362	57	1.5	51	5.5	58
Virgin Islands	101,809	342	2	557,783	87,136	644,918	58	6.3	16	1,886.4	1
Vermont	584,776	24,900	32	231,810	136,335	368,145	59	0.6	59	14.8	51
Hawaii	1,179,198	16,760	14	155,654	77,259	232,913	60	0.2	60	13.9	52
Newfoundland	576,637	405,721	3	102,264	28	102,292	61	0.2	61	0.3	63
Prince Edward Island	135,606	5,659	2	13,020	400	13,420	62	0.1	62	2.4	61
American Samoa	46,773	199	1	2,404	0	2,404	63	0.1	63	12.1	53
District of Columbia	554,528	163	1	0	2	2	64	0.0	64	0.0	64
<b>Total</b>	<b>296,312,553</b>	<b>15,443,126</b>	<b>21,095</b>	<b>953,725,730</b>	<b>355,944,172</b>	<b>1,309,669,902</b>		<b>4.4</b>		<b>84.8</b>	

► Canada and US data only, Mexico data not collected for 1995.

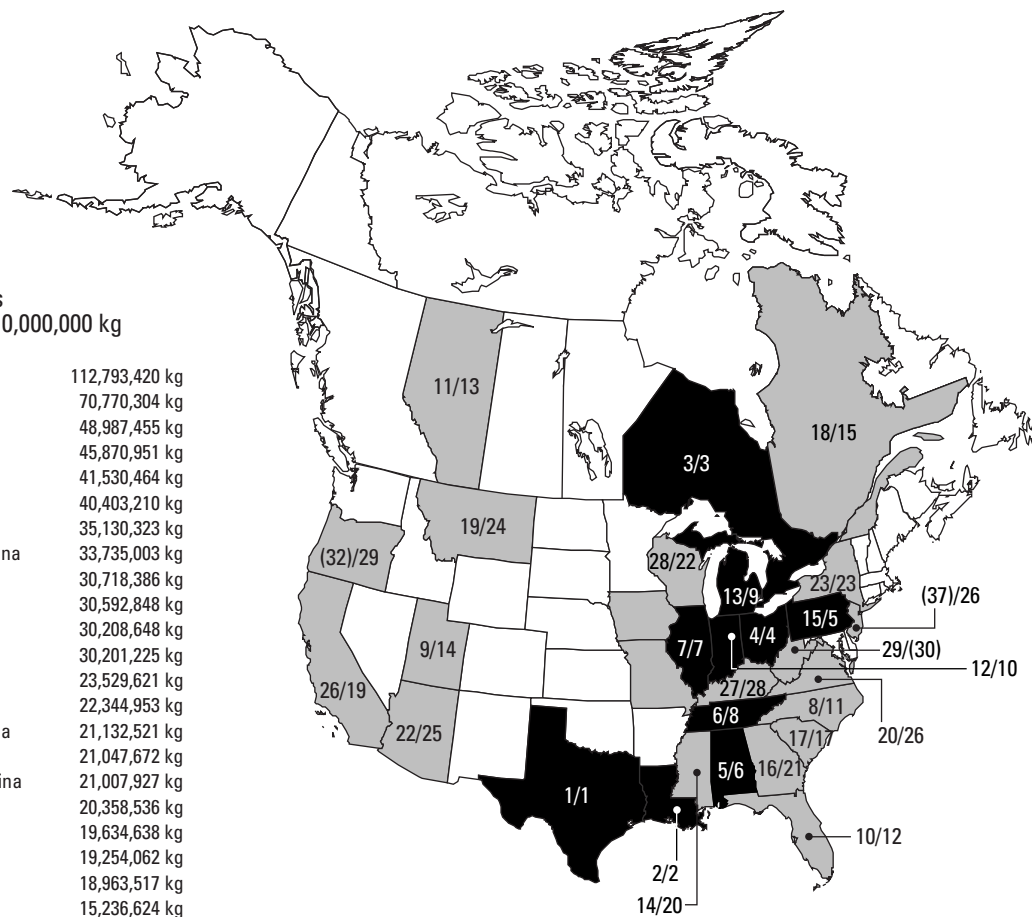
**Map 3-1**  
**M 1995**  
**Largest Sources of North American Releases and Transfers: States and Provinces (Total Releases of more than 10 million kg; Total Releases and Transfers of more than 15 million kg)**

Total Releases  
Greater than 10,000,000 kg

1	Texas	112,793,420 kg
2	Louisiana	70,770,304 kg
3	Ontario	48,987,455 kg
4	Ohio	45,870,951 kg
5	Alabama	41,530,464 kg
6	Tennessee	40,403,210 kg
7	Illinois	35,130,323 kg
8	North Carolina	33,735,003 kg
9	Utah	30,718,386 kg
10	Florida	30,592,848 kg
11	Alberta	30,208,648 kg
12	Indiana	30,201,225 kg
13	Michigan	23,529,621 kg
14	Mississippi	22,344,953 kg
15	Pennsylvania	21,132,521 kg
16	Georgia	21,047,672 kg
17	South Carolina	21,007,927 kg
18	Quebec	20,358,536 kg
19	Montana	19,634,638 kg
20	Virginia	19,254,062 kg
21	Missouri	18,963,517 kg
22	Arizona	15,236,624 kg
23	New York	13,176,768 kg
24	Arkansas	12,772,193 kg
25	Iowa	12,346,541 kg
26	California	12,305,985 kg
27	Kentucky	11,907,988 kg
28	Wisconsin	10,930,967 kg
29	West Virginia	10,555,283 kg

Total Releases and Transfers  
Greater than 15,000,000 kg

1	Texas	151,082,326 kg
2	Louisiana	74,495,761 kg
3	Ontario	74,278,803 kg
4	Ohio	71,555,943 kg
5	Pennsylvania	56,361,058 kg
6	Alabama	49,861,913 kg
7	Illinois	49,704,025 kg
8	Tennessee	48,249,163 kg
9	Michigan	47,645,356 kg
10	Indiana	46,399,630 kg
11	North Carolina	41,490,654 kg
12	Florida	35,686,897 kg
13	Alberta	31,526,978 kg
14	Utah	31,345,431 kg
15	Quebec	27,336,541 kg
16	Virginia	27,137,515 kg
17	South Carolina	26,387,346 kg
18	Missouri	26,020,052 kg
19	California	25,616,444 kg
20	Mississippi	24,821,703 kg
21	Georgia	24,291,142 kg
22	Wisconsin	21,043,342 kg
23	New York	20,081,273 kg
24	Montana	19,659,355 kg
25	Arizona	18,446,786 kg
26	New Jersey	18,028,744 kg
27	Iowa	17,719,124 kg
28	Kentucky	17,305,542 kg
29	Oregon	15,563,927 kg



**Rankings**

5/6 Rank for Total Releases/  
Rank for Total Releases and Transfers

Rankings over 29 shown in parentheses

**Total Releases and Transfers**

- 45,000,000 to 155,000,000 kg
- 15,000,000 to 45,000,000 kg
- Less than 15,000,000 kg

Map 3-2

M 1995

### Largest Sources of North American Releases and Transfers: Facilities (Total Releases and Transfers of more than 4 million kg; Total Releases of more than 4 million kg)



4/3 Rank for Total Releases and Transfers/Rank for Total Releases (if reported more than 4 million kilograms in total releases)  
Facility List: Rank for Total Releases and Transfers/Facility, City, State/Province - Amount of Total Releases and Transfers  
Rank for Total Releases (if more than 4 million kilograms) - Amount of Total Releases

Table 3-7		The 50 North American Facilities with Largest Total Releases								
M		1995								
Rank	Facility	City, State/Province	SIC Codes		Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-Site Land Releases (kg)	Total Releases (kg)
			Canada	US						
1	Magnesium Corp. of America	Rowley, UT		33	5	26,384,163	0	0	0	26,384,163
2	ASARCO Inc.	East Helena, MT		33	9	43,652	233	0	17,870,556	17,914,440
3	Courtaulds Fibers Inc.	Axis, AL		28	4	15,163,039	23,492	0	240,091	15,426,621
4	Cytec Industries Inc.	Westwego, LA		28	22	270,745	22,935	11,633,788	0	11,927,468
5	Lenzing Fibers Corp.	Lowland, TN		28	6	10,521,887	14,104	0	0	10,535,991
6	DuPont	Beaumont, TX		28	24	316,524	2,022	9,272,194	0	9,590,740
7	DuPont	Victoria, TX		28	29	164,471	708	9,338,080	4,194	9,507,453
8	ASARCO Inc.	Hayden, AZ		33	8	454,888	0	0	7,794,636	8,249,523
9	BASF Corp.	Freeport, TX		28	26	152,088	7,714,761	12,154	0	7,879,003
10	Arcadian Fertilizer L.P.	Geismar, LA		28	10	696,290	6,691,922	2	199,071	7,587,285
11	Northwestern Steel & Wire Co.	Sterling, IL		33	6	67,947	707	0	7,074,830	7,143,484
12	Elkem Metals Co.	Marietta, OH		33	6	1,956,983	273,469	0	4,858,957	7,089,410
13	Sterling Chemicals Inc.	Texas City, TX		28	36	479,409	558	6,170,968	0	6,650,935
14	General Motors Corp.	Defiance, OH		33	18	347,699	11,961	0	6,258,631	6,618,292
15	Hoechst Celanese Chemical	Pasadena, TX		28	20	456,104	0	5,715,283	0	6,171,388
16	Monsanto Co.	Cantonment, FL		28	22	84,873	486	5,954,254	0	6,039,612
17	PCS Phosphate Co. Inc.	Aurora, NC		28	6	1,610,757	2	0	4,414,671	6,025,431
18	BP Chemicals Inc.	Lima, OH		28	28	183,288	0	5,727,320	0	5,910,608
19	BP Chemicals Inc.	Port Lavaca, TX		28	17	90,938	327	5,634,195	4,106	5,729,566
20	IMC-Agrico Co.	St. James, LA		28	7	2,990,289	2,113,388	0	178,516	5,282,193
21	U.S. Steel	Gary, IN		33	29	3,177,896	14,576	0	2,038,392	5,230,864
22	Cyprus Miami Mining Corp.	Claypool, AZ		33	5	15,360	126	0	4,858,091	4,873,576
23	Sherritt Inc.	Fort Saskatchewan, AB	37	28	14	4,277,316	302,517	0	3,646	4,583,739
24	Phelps Dodge Hidalgo Inc.	Playas, NM		33	1	73,161	0	0	4,469,064	4,542,226
25	American Chrome & Chemicals	Corpus Christi, TX		28	3	41,088	1,837	0	4,263,039	4,305,964
26	Coastal Chem Inc.	Cheyenne, WY		28	13	492,449	0	3,704,308	272	4,197,029
27	Sherritt Inc.	Redwater, AB	37	28	11	2,085,465	79,883	1,655,240	111,063	3,931,751
28	IMC-Agrico Co.	Mulberry, FL		Mult.	2	249,161	0	0	3,673,469	3,922,630
29	Monsanto Co.	Alvin, TX		28	20	61,108	0	3,818,617	19,048	3,898,772
30	Bayer Corp.	New Martinsville, WV		28	29	243,410	3,589,628	0	261	3,833,298
31	Doe Run Co.	Herculaneum, MO		33	9	107,398	485	0	3,568,587	3,676,471
32	Irving Pulp and Paper	Saint John, NB	27	26	3	275,185	3,387,916	0	0	3,663,101
33	Rubicon Inc.	Geismar, LA		28	22	295,409	97	3,271,519	0	3,567,025
34	Celanese Canada Inc.	Edmonton, AB	37	28	10	339,568	0	3,156,460	1,143	3,497,171
35	Methanex Corporation	Medicine Hat, AB	37	28	6	3,351,900	0	0	1,320	3,353,220
36	Vicksburg Chemical Co.	Vicksburg, MS		28	4	53,140	3,276,172	0	0	3,329,312
37	Occidental Chemical Corp.	Castle Hayne, NC		28	2	2,653	16	0	3,310,707	3,313,376
38	Pharmacia & Upjohn Co.	Portage, MI		28	26	498,449	58,299	2,748,934	0	3,305,683
39	PCS Phosphate	White Springs, FL		28	4	235,832	304	0	2,993,197	3,229,333
40	Chino Mines Co.	Hurley, NM		33	1	16,503	0	0	3,137,437	3,153,940
41	ASARCO Inc.	Annapolis, MO		33	6	177,505	20	0	2,782,020	2,959,545
42	Kennecott Utah Copper	Magna, UT		33	13	76,488	1,839	0	2,606,259	2,684,585
43	Canadian Fertilizers Limited	Medicine Hat, AB	37	28	4	2,618,992	25,663	0	0	2,644,759
44	Eastman Kodak Co.	Rochester, NY		38	50	2,504,829	131,463	0	259	2,636,551
45	Shell Scotford Refinery	Fort Saskatchewan, AB	36	29	11	53,925	112	2,515,001	662	2,569,700
46	CF Industries, Inc.	Donaldsonville, LA		28	10	2,248,567	276,916	0	0	2,525,483
47	Weyerhaeuser Co.	Longview, WA		Mult.	16	2,283,871	219,354	0	0	2,503,225
48	Terra Nitrogen	Catoosa, OK		28	8	2,390,748	81,194	0	794	2,472,736
49	Angus Chemical Co.	Sterlington, LA		28	12	34,082	27,305	2,387,407	0	2,448,794
50	Granite City Steel	Granite City, IL		33	22	91,816	8,405	0	2,334,810	2,435,032
<b>Subtotal</b>					<b>675</b>	<b>90,809,308</b>	<b>28,355,202</b>	<b>82,715,725</b>	<b>89,071,798</b>	<b>290,952,497</b>
<b>% of Total</b>					<b>1.1</b>	<b>14.2</b>	<b>37.3</b>	<b>80.5</b>	<b>66.0</b>	<b>30.5</b>
<b>Total</b>					<b>64092</b>	<b>639,954,996</b>	<b>75,990,103</b>	<b>102,720,500</b>	<b>134,910,378</b>	<b>953,725,730</b>

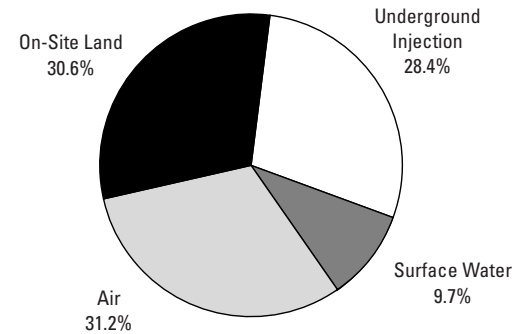
\* Chemicals accounting for more than 70% of total releases from the facility. Data on all chemicals can be found on the Internet at <http://www.rtk.net> for TRI facilities and <http://www.ec.gc.ca> for NPRI facilities.  
 > Canada and US data only, Mexico data not collected for 1995. UIJ=underground injection.

Rank	Major Chemicals Reported (Primary Media)*
1	Chlorine (air)
2	Zinc and compounds (land)
3	Carbon disulfide (air)
4	Acetonitrile, acrylic acid, ammonia (UIJ)
5	Carbon disulfide (air)
6	Nitric acid and nitrate compounds, acetonitrile (UIJ)
7	Nitric acid and nitrate compounds (UIJ)
8	Copper/zinc and compounds (land)
9	Nitric acid and nitrate compounds (water)
10	Phosphoric acid (water)
11	Zinc/manganese and compounds (land)
12	Manganese and compounds, ammonia (land, air)
13	Nitric acid and nitrate compounds, ammonia, methanol (UIJ)
14	Zinc and compounds (land)
15	Ethylene glycol (UIJ)
16	Nitric acid and nitrate compounds (UIJ)
17	Phosphoric acid (land)
18	Acetonitrile, acrylonitrile, ammonia, acrylamide (UIJ)
19	Acetonitrile, ammonia, acrylamide (UIJ)
20	Ammonia, phosphoric acid (air, water)
21	Ammonia, zinc/manganese and compounds (air, land)
22	Copper and compounds (land)
23	Ammonia, methanol (air)
24	Copper and compounds (land)
25	Chromium and compounds (land)
26	Nitric acid and nitrate compounds (UIJ)
27	Ammonia (air, UIJ)
28	Phosphoric acid (land)
29	Ammonia, acrylonitrile, methanol (UIJ)
30	Nitric acid and nitrate compounds (water)
31	Zinc and compounds (land)
32	Methanol (water)
33	Nitric acid and nitrate compounds, ammonia (UIJ, air)
34	Methanol, methyl ethyl ketone (UIJ)
35	Methanol (air)
36	Nitric acid and nitrate compounds (water)
37	Chromium and compounds (land)
38	Methanol (UIJ)
39	Phosphoric acid (land)
40	Copper and compounds (land)
41	Zinc/lead and compounds (land)
42	Copper/zinc/lead and compounds (land)
43	Ammonia (air)
44	Dichloromethane, methanol (air)
45	Ammonia (UIJ)
46	Ammonia (air)
47	Methanol, acetaldehyde (air)
48	Ammonia (air)
49	Nitric acid and nitrate compounds, formaldehyde (UIJ)
50	Zinc and compounds (land)

Figure 3-2

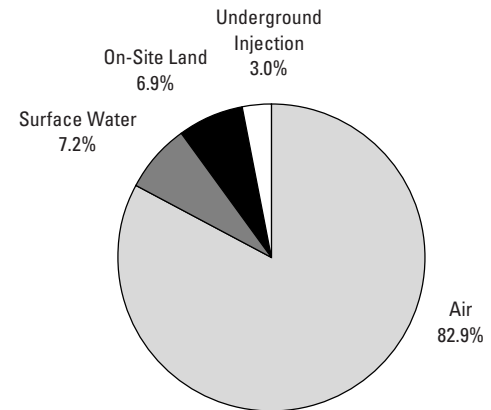
M 1995

North American Releases, Top 50 Facilities and All Other Facilities



Top 50 Facilities

Total 290,352,497 kg



All Other Facilities (21,045)

Total 662,773,233 kg

**TAKING STOCK: North American Pollutant Releases and Transfers**

Table 3-8		The 50 North American Facilities with Largest Total Releases and Transfers								
M		1995								
Rank	Facility	City, State/Province	SIC Codes		Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-Site Land Releases (kg)	Total Releases (kg)
			Canada	US						
1	Magnesium Corp. of America	Rowley, UT		33	5	26,384,163	0	0	0	26,384,163
2	ASARCO Inc.	East Helena, MT		33	9	43,652	233	0	17,870,556	17,914,440
3	Zinc Corp. of America	Monaca, PA		33	10	265,247	143	0	0	265,390
4	Courtaulds Fibers Inc.	Axis, AL		28	4	15,163,039	23,492	0	240,091	15,426,621
5	Cytec Industries Inc.	Westwego, LA		28	22	270,745	22,935	11,633,788	0	11,927,468
6	Lenzing Fibers Corp.	Lowland, TN		28	6	10,521,887	14,104	0	0	10,535,991
7	ASARCO Inc.	Hayden, AZ		33	8	454,888	0	0	7,794,636	8,249,523
8	DuPont	Victoria, TX		28	29	164,471	708	9,338,080	4,194	9,507,453
9	DuPont	Beaumont, TX		28	24	316,524	2,022	9,272,194	0	9,590,740
10	Air Products & Chemicals Inc.	Pasadena, TX		28	11	24,118	0	0	0	24,118
11	Co-Steel Lasco	Whitby, ON	29	33	6	13,986	221	0	2,397,300	2,411,507
12	BASF Corp.	Freeport, TX		28	26	152,088	7,714,761	12,154	0	7,879,003
13	Arcadian Fertilizer L.P.	Geismar, LA		28	10	696,290	6,691,922	2	199,071	7,587,285
14	Hoechst Celanese Chemical	Pasadena, TX		28	20	456,104	0	5,715,283	0	6,171,388
15	Northwestern Steel & Wire Co.	Sterling, IL		33	6	67,947	707	0	7,074,830	7,143,484
16	Elkem Metals Co.	Marietta, OH		33	6	1,956,983	273,469	0	4,858,957	7,089,410
17	Sterling Chemicals Inc.	Texas City, TX		28	36	479,409	558	6,170,968	0	6,650,935
18	General Motors Corp.	Defiance, OH		33	18	347,699	11,961	0	6,258,631	6,618,292
19	National Steel Corp.	Ecorse, MI		33	15	137,793	7,604	0	0	145,397
20	Monsanto Co.	Cantonment, FL		28	22	84,873	486	5,954,254	0	6,039,612
21	PCS Phosphate Co. Inc.	Aurora, NC		28	6	1,610,757	2	0	4,414,671	6,025,431
22	BP Chemicals Inc.	Lima, OH		28	28	183,288	0	5,727,320	0	5,910,608
23	BP Chemicals Inc.	Port Lavaca, TX		28	17	90,938	327	5,634,195	4,106	5,729,566
24	IMC-Agrico Co.	St. James, LA		28	7	2,990,289	2,113,388	0	178,516	5,282,193
25	U.S. Steel	Gary, IN		33	29	3,177,896	14,576	0	2,038,392	5,230,864
26	Nucor Steel	Crawfordsville, IN		33	7	10,173	9	0	11	10,193
27	Quantum Chemical Corp.	La Porte, TX		28	23	1,006,231	2,880	0	8	1,009,119
28	Rouge Steel Co.	Dearborn, MI		33	8	20,755	5,469	0	0	26,224
29	DuPont	Leland, NC		28	21	1,016,099	203,813	0	170,628	1,390,539
30	Cyprus Miami Mining Corp.	Claypool, AZ		33	5	15,360	126	0	4,858,091	4,873,576
31	Pharmacia & Upjohn Co.	Portage, MI		28	26	498,449	58,299	2,748,934	0	3,305,683
32	Simpson Pasadena Paper Co.	Pasadena, TX		26	8	572,444	0	0	0	572,444
33	Sherritt Inc.	Fort Saskatchewan, AB	37	28	14	4,277,316	302,517	0	3,646	4,583,739
34	Phelps Dodge Hidalgo Inc.	Playas, NM		33	1	73,161	0	0	4,469,064	4,542,226
35	Consolidated Papers Inc.	Wisconsin Rapids, WI		26	13	1,180,410	340	0	0	1,180,751
36	American Chrome & Chemicals	Corpus Christi, TX		28	3	41,088	1,837	0	4,263,039	4,305,964
37	Coastal Chem Inc.	Cheyenne, WY		28	13	492,449	0	3,704,308	272	4,197,029
38	Sherritt Inc.	Redwater, AB	37	28	11	2,085,465	79,883	1,655,240	111,063	3,931,751
39	IMC-Agrico Co.	Mulberry, FL		Mult.	2	249,161	0	0	3,673,469	3,922,630
40	Monsanto Co.	Alvin, TX		28	20	61,108	0	3,818,617	19,048	3,898,772
41	Boise Cascade Corp.	Saint Helens, OR		26	8	266,397	0	0	0	266,397
42	Bayer Corp.	New Martinsville, WV		28	29	243,410	3,589,628	0	261	3,833,298
43	Rubicon Inc.	Geismar, LA		28	22	295,409	97	3,271,519	0	3,567,025
44	Doe Run Co.	Herculaneum, MO		33	9	107,398	485	0	3,568,587	3,676,471
45	Irving Pulp and Paper	Saint John, NB	27	26	3	275,185	3,387,916	0	0	3,663,101
46	Celanese Canada Inc.	Edmonton, AB	37	28	10	339,568	0	3,156,460	1,143	3,497,171
47	Methanex Corporation	Medicine Hat, AB	37	28	6	3,351,900	0	0	1,320	3,353,220
48	Cerro Wire & Cable Co. Inc.	Hartselle, AL		33	3	14	7	0	0	20
49	Dominion Colour Corp.	Ajax, ON	37	28	6	0	0	0	0	100
50	Hercules Inc.	Hopewell, VA		28	12	358,380	0	0	0	358,380
<b>Subtotal</b>					<b>663</b>	<b>82,892,405</b>	<b>24,526,924</b>	<b>77,813,317</b>	<b>74,473,600</b>	<b>259,706,707</b>
<b>% of Total</b>					<b>1</b>	<b>13.0</b>	<b>32.3</b>	<b>75.8</b>	<b>55.2</b>	<b>27.2</b>
<b>Total</b>					<b>64,092</b>	<b>639,954,996</b>	<b>75,990,103</b>	<b>102,720,500</b>	<b>134,910,378</b>	<b>953,725,730</b>

\* Chemicals accounting for more than 70% of total releases and transfers from the facility. Data on all chemicals can be found on the Internet at <<http://www.rtk.net>> for TRI facilities and at <<http://www.ec.gc.ca>> for NPRI facilities.

► Canada and US data only, Mexico data not collected for 1995. UIJ=underground injection.



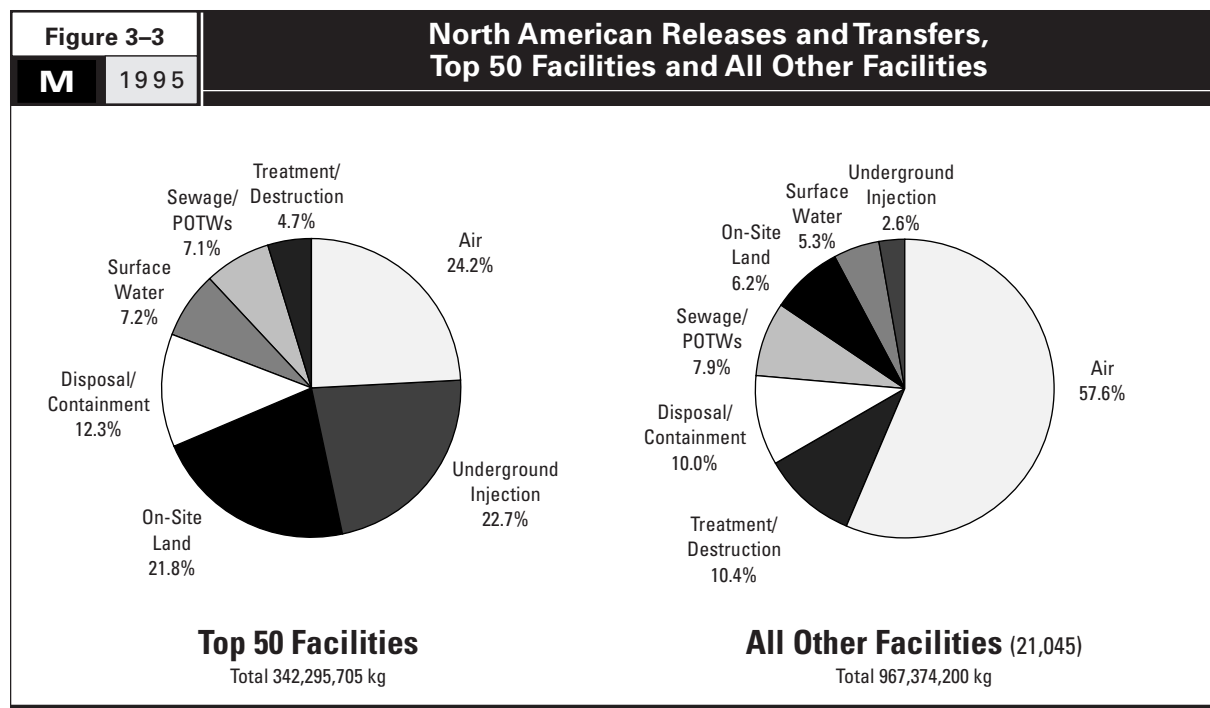
Rank	Treatment/ Destruction (kg)	Sewage/ POTWs (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	0	0	0	0	26,384,163	Chlorine (air)
2	0	180	0	180	17,914,620	Zinc and compounds (land)
3	12,172	0	15,717,212	15,729,385	15,994,775	Zinc/lead and compounds (transfers to disposal)
4	0	0	0	0	15,426,621	Carbon disulfide (air)
5	133	0	12,111	12,244	11,939,713	Acetonitrile, acrylic acid, ammonia (UIJ)
6	0	0	263,039	263,039	10,799,029	Carbon disulfide (air)
7	2,010,308	129	0	2,010,437	10,259,961	Copper/zinc and compounds (land)
8	737,706	0	0	737,706	10,245,159	Nitric acid and nitrate compounds (UIJ)
9	278,793	0	11,099	289,893	9,880,633	Nitric acid and nitrate compounds, acetonitrile (UIJ)
10	267,078	8,548,399	213	8,815,690	8,839,808	Nitric acid and nitrate compounds (transfers to sewage)
11	0	24	6,030,800	6,030,824	8,442,331	Zinc and compounds (transfers to disposal)
12	81,888	0	10,349	92,238	7,971,240	Nitric acid and nitrate compounds (water)
13	0	0	16,365	16,365	7,603,650	Phosphoric acid (water)
14	3,293	1,284,014	34,195	1,321,501	7,492,889	Ethylene glycol (UIJ)
15	311,565	0	0	311,565	7,455,049	Zinc/manganese and compounds (land)
16	0	0	23,129	23,129	7,112,539	Manganese and compounds, ammonia (land, air)
17	24,920	8,691	21,803	55,414	6,706,348	Nitric acid and nitrate compounds, ammonia, methanol (UIJ)
18	1,746	2,792	0	4,538	6,622,830	Zinc and compounds (land)
19	76,685	14,264	6,039,169	6,130,118	6,275,515	Zinc and compounds (transfers to disposal)
20	0	0	2,994	2,994	6,042,606	Nitric acid and nitrate compounds (UIJ)
21	0	0	0	0	6,025,431	Phosphoric acid (land)
22	6,807	0	630	7,438	5,918,045	Acetonitrile, acrylonitrile, ammonia, acrylamide (UIJ)
23	27,967	0	0	27,967	5,757,533	Acetonitrile, ammonia, acrylamide (UIJ)
24	0	0	0	0	5,282,193	Ammonia, phosphoric acid (air, water)
25	4,245	0	45,840	50,086	5,280,950	Ammonia, zinc/manganese and compounds (air, land)
26	1,478	0	5,203,062	5,204,540	5,214,733	Zinc and compounds (transfers to disposal)
27	4,142,622	0	0	4,142,622	5,151,741	Vinyl acetate (transfers to treatment)
28	0	0	5,071,787	5,071,787	5,098,011	Zinc and compounds (transfers to disposal)
29	3,557,400	0	31,333	3,588,733	4,979,273	Ethylene glycol (transfers to treatment)
30	0	0	0	0	4,873,576	Copper and compounds (land)
31	1,090,299	456,417	7,912	1,554,628	4,860,311	Methanol, dichloromethane (UIJ, transfers to treatment)
32	0	4,039,728	0	4,039,728	4,612,172	Methanol (transfers to sewage)
33	0	0	16,370	16,370	4,600,109	Ammonia, methanol (air)
34	0	0	0	0	4,542,226	Copper and compounds (land)
35	3,308,755	0	0	3,308,755	4,489,506	Methanol (transfers to treatment)
36	36,735	0	4,127	40,862	4,346,825	Chromium and compounds (land)
37	0	0	48	48	4,197,077	Nitric acid and nitrate compounds (UIJ)
38	0	0	0	0	3,931,751	Ammonia (air)
39	0	0	0	0	3,922,630	Phosphoric acid (land)
40	0	0	0	0	3,898,772	Ammonia, acrylonitrile, methanol (UIJ)
41	0	3,600,884	1,459	3,602,343	3,868,740	Methanol (transfers to sewage)
42	514	0	28,388	28,902	3,862,201	Nitric acid and nitrate compounds (water)
43	218,672	0	922	219,594	3,786,619	Nitric acid and nitrate compounds, ammonia (UIJ, air)
44	0	454	0	454	3,676,925	Zinc and compounds (land)
45	0	0	0	0	3,663,101	Methanol (water)
46	0	0	35,658	35,658	3,532,829	Methanol, methyl ethyl ketone (UIJ)
47	0	74,900	30	74,930	3,428,150	Methanol (air)
48	0	0	3,415,766	3,415,766	3,415,786	Copper and compounds (transfers to disposal)
49	0	3,150,000	186,100	3,336,100	3,336,200	Nitric acid and nitrate compounds (transfers to sewage)
50	0	2,974,425	0	2,974,425	3,332,805	Nitric acid and nitrate compounds, ethylene glycol (transfers to sewage)
	<b>16,201,784</b>	<b>24,155,302</b>	<b>42,231,909</b>	<b>82,588,995</b>	<b>342,295,702</b>	
	<b>13.8</b>	<b>24.1</b>	<b>30.5</b>	<b>23.2</b>	<b>26.1</b>	
	<b>117,107,768</b>	<b>100,254,236</b>	<b>138,582,168</b>	<b>355,944,172</b>	<b>1,309,669,902</b>	

While these 50 facilities reported one-quarter of total releases and transfers, they—mainly the US facilities—accounted for three-quarters of all underground injection. The top 50 facilities also reported more than one-half of on-site land releases and nearly one-third of surface water discharges. These patterns suggest that releases to these media—underground, on-site land and surface water—are more concentrated in North America than air emissions. (Overall, air emissions accounted for nearly one-half of all releases and transfers in the two countries.)

In contrast to their heavy contribution to other media, these facilities originated only 13 percent of reported releases to air. While this is still disproportionate to the number of facilities involved, these emissions represent a smaller fraction of total releases and transfers for these facilities than was found in the data for the full set of facilities. These 50 facilities also generated 23 percent of all off-site transfers, ranging from nearly 31 percent of transfers to disposal to 14 percent of transfers sent to treatment (see **Table 3–8**).

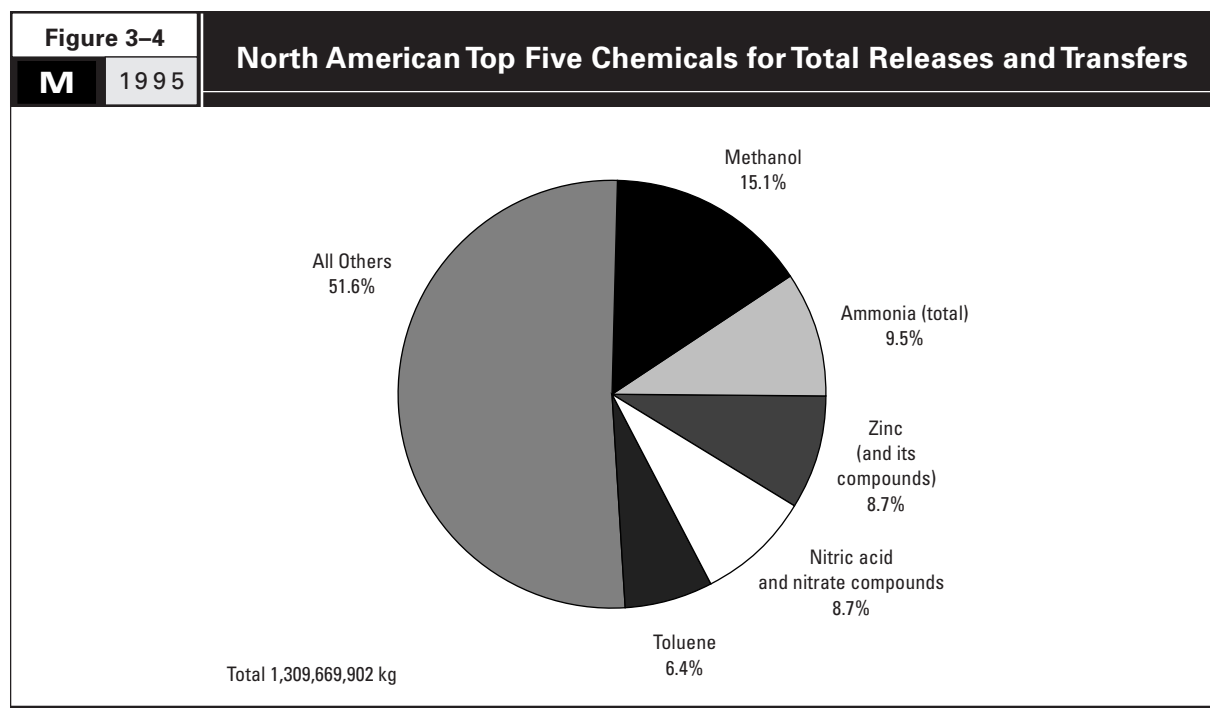
**Figure 3–3** compares the distribution of releases and transfers of the top 50 facilities with those of all other facilities that reported to NPRI and TRI. Again, although individual facilities reported large emissions to air, the 50 facilities together report a much smaller proportion of releases as air emissions than all other facilities.

Among the 50 facilities were the largest single sources of each distinct type of release and transfer. Magnesium Corp. of America, in Rowley, Utah, for example, reported only air emissions, but led all facilities for total releases and transfers. In some cases, a few facilities account for a sizable portion of the North American total for a particular



release or transfer type. Two facilities, for example—BASF in Freeport, Texas, and Arcadian Fertilizer in Geismar, Louisiana—together account for 19 percent of all reported discharges to surface water. Similarly, three facilities reported 29 percent of the underground injection; these were Cytec Industries in Westwego, Louisiana, and DuPont facilities in Victoria and Beaumont, Texas.

Moreover, releases and transfers from these facilities were to a striking extent limited to one release medium or transfer type, as in the case of Magnesium Corp. of America. For 45 of the top 50 facilities, releases to a single medium or transfers to a single management type represented more than 70 percent of the total release-and-transfer amount. As **Table 3-8** shows, most of these facilities reported large amounts for just one or a few chemicals. For six of the top 10 facilities listed, just one chemical and one method of release or transfer accounted for more than 70 percent of the facility's totals.



### 3.5 Principal Chemicals Reported

The top five chemicals for total releases and transfers represented nearly half of all releases and transfers reported in North America, as illustrated in **Figure 3-4**. **Table 3-9** shows the 25 chemicals with the largest total releases and transfers. All but one of these chemicals (phenol) also ranked in the top 25 for releases. Nineteen were among the top 25 for transfers. **Tables 3-10** and **3-11** present the top chemicals for total releases and for total transfers, respectively. (Any evaluation of the relative health and environmental impacts of these releases and transfers must also take into account the toxicity of the chemicals involved, local climatic conditions and the proximity of people and/or ecologically sensitive areas to the released waste streams.)

Table 3-9

M 1995

## The 25 Chemicals with the Largest Total Releases and Transfers in North America

CAS Number	Chemical	Forms		Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers		NPRI/TRI as % of Total			
		Number	(%)			(kg)	(%)	Forms (%)	Total Releases (%)	Total Transfers (%)	Total Releases and Transfers (%)
67-56-1	Methanol	2,614	4.1	140,929,504	57,511,085	198,440,589	15.1	8.6 / 91.4	21.3 / 78.7	3.6 / 96.4	16.2 / 83.8
—	Ammonia (total)	3,001	4.7	113,879,453	10,495,897	124,375,350	9.5	5.9 / 94.1	22.6 / 77.4	7.0 / 93.0	21.3 / 78.7
—	Zinc (and its compounds)	3,202	5.0	47,911,862	66,003,683	113,915,545	8.7	9.1 / 90.9	9.0 / 91.0	18.5 / 81.5	14.5 / 85.5
—	Nitric acid and nitrate compounds	2,530	3.9	73,960,409	39,557,469	113,517,878	8.7	4.7 / 95.3	2.7 / 97.3	10.1 / 89.9	5.3 / 94.7
108-88-3	Toluene	3,557	5.5	72,353,261	11,584,921	83,938,182	6.4	6.5 / 93.5	8.7 / 91.3	11.5 / 88.5	9.1 / 90.9
1330-20-7	Xylene (mixed isomers)	3,400	5.3	50,804,801	8,705,047	59,509,848	4.5	6.4 / 93.6	15.0 / 85.0	14.8 / 85.2	14.9 / 85.1
—	Manganese (and its compounds)	2,633	4.1	27,793,858	21,205,367	48,999,225	3.7	8.0 / 92.0	11.7 / 88.3	15.3 / 84.7	13.3 / 86.7
78-93-3	Methyl ethyl ketone	2,331	3.6	36,157,658	3,316,858	39,474,516	3.0	4.9 / 95.1	13.1 / 86.9	12.7 / 87.3	13.1 / 86.9
75-15-0	Carbon disulfide	95	0.1	38,185,683	176,322	38,362,005	2.9	5.3 / 94.7	0.0 / 100.0	4.6 / 95.4	0.1 / 99.9
—	Copper (and its compounds)	4,205	6.6	22,349,117	11,500,928	33,850,045	2.6	5.2 / 94.8	7.9 / 92.1	3.7 / 96.3	6.4 / 93.6
75-09-2	Dichloromethane	989	1.5	27,462,891	5,350,209	32,813,100	2.5	5.1 / 94.9	7.8 / 92.2	1.3 / 98.7	6.7 / 93.3
7782-50-5	Chlorine	1,433	2.2	31,250,845	319,777	31,570,622	2.4	8.0 / 92.0	4.0 / 96.0	0.0 / 100.0	4.0 / 96.0
7664-38-2	Phosphoric acid	2,913	4.5	26,226,274	3,636,946	29,863,220	2.3	6.6 / 93.4	0.5 / 99.5	12.9 / 87.1	2.0 / 98.0
107-21-1	Ethylene glycol	1,367	2.1	9,920,185	16,846,265	26,766,450	2.0	9.3 / 90.7	5.6 / 94.4	2.0 / 98.0	3.3 / 96.7
—	Chromium (and its compounds)	3,398	5.3	11,117,312	14,598,159	25,715,471	2.0	5.9 / 94.1	6.0 / 94.0	17.7 / 82.3	12.6 / 87.4
100-42-5	Styrene	1,548	2.4	19,714,825	3,982,106	23,696,931	1.8	4.3 / 95.7	3.7 / 96.3	5.8 / 94.2	4.1 / 95.9
—	Lead (and its compounds)	1,760	2.7	8,919,671	14,595,753	23,515,424	1.8	7.4 / 92.6	15.1 / 84.9	13.5 / 86.5	14.1 / 85.9
74-85-1	Ethylene	321	0.5	17,784,213	961,260	18,745,473	1.4	12.8 / 87.2	13.1 / 86.9	0.1 / 99.9	12.4 / 87.6
71-36-3	n-Butyl alcohol	1,158	1.8	13,798,234	1,890,575	15,688,809	1.2	6.6 / 93.4	9.3 / 90.7	11.5 / 88.5	9.5 / 90.5
75-05-8	Acetonitrile	87	0.1	13,167,356	2,325,055	15,492,411	1.2	2.3 / 97.7	0.6 / 99.4	0.0 / 100.0	0.5 / 99.5
79-01-6	Trichloroethylene	746	1.2	12,214,819	523,916	12,738,735	1.0	4.6 / 95.4	6.2 / 93.8	5.4 / 94.6	6.2 / 93.8
50-00-0	Formaldehyde	868	1.4	9,959,041	1,668,005	11,627,046	0.9	9.4 / 90.6	12.0 / 88.0	11.3 / 88.7	11.9 / 88.1
108-10-1	Methyl isobutyl ketone	1,041	1.6	10,471,302	997,971	11,469,273	0.9	5.4 / 94.6	6.5 / 93.5	6.7 / 93.3	6.5 / 93.5
115-07-1	Propylene	371	0.6	11,000,910	36,527	11,037,437	0.8	9.2 / 90.8	11.4 / 88.6	0.0 / 100.0	11.3 / 88.7
108-95-2	Phenol	785	1.2	6,241,997	4,020,333	10,262,330	0.8	7.3 / 92.7	6.9 / 93.1	5.8 / 94.2	6.4 / 93.6
	<b>Subtotal</b>	<b>46,353</b>	<b>72.3</b>	<b>853,575,481</b>	<b>301,810,434</b>	<b>1,155,385,915</b>	<b>88.2</b>	<b>6.6 / 93.4</b>	<b>11.8 / 88.2</b>	<b>10.7 / 89.3</b>	<b>11.5 / 88.5</b>
	<b>% of Total</b>	<b>72.3</b>		<b>89.5</b>	<b>84.8</b>	<b>88.2</b>					
	<b>Total</b>	<b>64,092</b>	<b>100.0</b>	<b>953,725,730</b>	<b>355,944,172</b>	<b>1,309,669,902</b>	<b>100.0</b>	<b>6.8 / 93.2</b>	<b>12.2 / 87.8</b>	<b>10.7 / 89.3</b>	<b>11.8 / 88.2</b>

► Canada and US data only, Mexico data not collected for 1995.

Table 3-10		The 25 Chemicals with the Largest Releases in North America									
M		1995									
CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-Site Land Releases (kg)	Total Releases (kg)	NPRI/TRI as % of Total				
							Total Air Emissions (%)	Surface Water Discharges (%)	Underground Injection (%)	On-Site Land Releases (%)	Total Releases (%)
67-56-1	Methanol	113,497,304	13,741,846	12,929,937	754,503	140,929,504	16.1 / 83.9	72.4 / 27.6	14.1 / 85.9	1.3 / 98.7	21.3 / 78.7
—	Ammonia (total)	87,303,724	7,455,972	16,904,539	2,210,090	113,879,453	18.7 / 81.3	39.2 / 60.8	37.7 / 62.3	3.2 / 96.8	22.6 / 77.4
—	Nitric acid and nitrate compounds	1,178,102	41,615,918	29,823,509	1,339,431	73,960,409	2.1 / 97.9	3.8 / 96.2	1.1 / 98.9	3.5 / 96.5	2.7 / 97.3
108-88-3	Toluene	72,125,943	33,233	154,389	31,820	72,353,261	8.7 / 91.3	27.4 / 72.6	10.9 / 89.1	6.5 / 93.5	8.7 / 91.3
1330-20-7	Xylene (mixed isomers)	50,677,634	17,978	50,408	46,122	50,804,801	14.9 / 85.1	15.0 / 85.0	21.0 / 79.0	2.7 / 97.3	15.0 / 85.0
—	Zinc (and its compounds)	3,538,255	635,977	97,928	43,630,790	47,911,862	13.2 / 86.8	15.7 / 84.3	1.4 / 98.6	8.6 / 91.4	9.0 / 91.0
75-15-0	Carbon disulfide	38,162,372	20,379	1,812	120	38,185,683	0.0 / 100.0	11.3 / 88.7	0.3 / 99.7	0.0 / 100.0	0.0 / 100.0
78-93-3	Methyl ethyl ketone	34,898,676	30,210	1,182,429	39,959	36,157,658	10.9 / 89.1	7.9 / 92.1	78.7 / 21.3	0.3 / 99.7	13.1 / 86.9
7782-50-5	Chlorine	31,038,966	167,491	33,616	6,106	31,250,845	4.0 / 96.0	13.9 / 86.1	0.0 / 100.0	0.0 / 100.0	4.0 / 96.0
—	Manganese (and its compounds)	1,650,230	549,998	1,636	25,586,710	27,793,858	3.6 / 96.4	22.6 / 77.4	0.0 / 100.0	12.0 / 88.0	11.7 / 88.3
75-09-2	Dichloromethane	26,929,890	12,849	517,159	961	27,462,891	7.9 / 92.1	0.0 / 100.0	0.0 / 100.0	2.6 / 97.4	7.8 / 92.2
7664-38-2	Phosphoric acid	581,346	9,252,921	3,429	16,385,304	26,226,274	1.5 / 98.5	0.0 / 100.0	0.0 / 100.0	0.7 / 99.3	0.5 / 99.5
—	Copper (and its compounds)	1,814,158	66,142	133,283	20,330,759	22,349,117	23.5 / 76.5	17.5 / 82.5	0.0 / 100.0	6.5 / 93.5	7.9 / 92.1
100-42-5	Styrene	19,522,982	8,267	95,303	82,388	19,714,825	3.7 / 96.3	3.6 / 96.4	0.1 / 99.9	5.9 / 94.1	3.7 / 96.3
74-85-1	Ethylene	17,770,537	12,392	0	0	17,784,213	13.1 / 86.9	0.0 / 100.0	— / —	— / —	13.1 / 86.9
71-36-3	n-Butyl alcohol	12,697,601	66,752	1,026,466	2,405	13,798,234	9.9 / 90.1	21.6 / 78.4	0.0 / 100.0	12.8 / 87.2	9.3 / 90.7
75-05-8	Acetonitrile	539,374	3,405	12,624,572	5	13,167,356	14.7 / 85.3	0.4 / 99.6	0.0 / 100.0	0.0 / 100.0	0.6 / 99.4
79-01-6	Trichloroethylene	12,211,528	735	249	1,567	12,214,819	6.2 / 93.8	8.8 / 91.2	0.0 / 100.0	0.0 / 100.0	6.2 / 93.8
—	Chromium (and its compounds)	553,571	93,216	26,464	10,436,471	11,117,312	2.4 / 97.6	25.8 / 74.2	1.0 / 99.0	5.9 / 94.1	6.0 / 94.0
115-07-1	Propylene	10,998,825	1,834	0	19	11,000,910	11.4 / 88.6	0.0 / 100.0	— / —	0.0 / 100.0	11.4 / 88.6
108-10-1	Methyl isobutyl ketone	10,369,370	23,257	71,927	5,079	10,471,302	6.5 / 93.5	0.0 / 100.0	0.0 / 100.0	37.1 / 62.9	6.5 / 93.5
50-00-0	Formaldehyde	6,070,082	468,640	3,356,709	60,872	9,959,041	13.4 / 86.6	73.2 / 26.8	1.2 / 98.8	0.3 / 99.7	12.0 / 88.0
107-21-1	Ethylene glycol	3,617,442	423,229	5,693,338	182,416	9,920,185	13.0 / 87.0	14.7 / 85.3	0.0 / 100.0	8.5 / 91.5	5.6 / 94.4
—	Lead (and its compounds)	1,426,873	47,571	454	7,439,280	8,919,671	36.8 / 63.2	38.9 / 61.1	8.8 / 91.2	10.7 / 89.3	15.1 / 84.9
75-07-0	Acetaldehyde	6,233,723	115,624	404,778	70,486	6,824,611	2.3 / 97.7	11.4 / 88.6	32.1 / 67.9	0.0 / 100.0	4.2 / 95.8
	<b>Subtotal</b>	<b>565,408,508</b>	<b>74,865,836</b>	<b>85,134,334</b>	<b>128,643,663</b>	<b>854,158,095</b>	<b>11.6 / 88.4</b>	<b>20.3 / 79.7</b>	<b>11.3 / 88.7</b>	<b>7.6 / 92.4</b>	<b>11.8 / 88.2</b>
	<b>as % of Total</b>	<b>88.4</b>	<b>98.5</b>	<b>82.9</b>	<b>95.4</b>	<b>89.6</b>					
	<b>Total</b>	<b>639,954,996</b>	<b>75,990,103</b>	<b>102,720,500</b>	<b>134,910,378</b>	<b>953,725,730</b>	<b>12.4 / 87.6</b>	<b>20.3 / 79.7</b>	<b>9.7 / 90.3</b>	<b>8.7 / 91.3</b>	<b>12.2 / 87.8</b>

► Canada and US data only, Mexico data not collected for 1995.

Table 3-11

M 1995

## The 25 Chemicals with the Largest Transfers in North America

CAS Number	Chemical	Treatment/ Destruction (kg)	Sewage/ POTWs (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	NPRI/TRI as % of Total			
						Treatment/ Destruction (%)	Sewage/ POTWs (%)	Disposal/ Containment (%)	Total Transfers (%)
—	Zinc (and its compounds)	10,726,002	276,073	55,001,608	66,003,683	28.1 / 71.9	4.7 / 95.3	16.7 / 83.3	18.5 / 81.5
67-56-1	Methanol	15,971,597	40,462,702	1,076,786	57,511,085	11.5 / 88.5	0.3 / 99.7	14.1 / 85.9	3.6 / 96.4
—	Nitric acid and nitrate compounds	6,560,983	28,316,726	4,679,760	39,557,469	1.3 / 98.7	13.2 / 86.8	3.6 / 96.4	10.1 / 89.9
—	Manganese (and its compounds)	2,867,989	185,711	18,151,666	21,205,367	16.7 / 83.3	2.0 / 98.0	15.3 / 84.7	15.3 / 84.7
107-21-1	Ethylene glycol	7,422,335	8,760,518	663,412	16,846,265	3.3 / 96.7	0.5 / 99.5	7.4 / 92.6	2.0 / 98.0
—	Chromium (and its compounds)	2,970,317	169,979	11,457,863	14,598,159	16.2 / 83.8	4.4 / 95.6	18.2 / 81.8	17.7 / 82.3
—	Lead (and its compounds)	3,901,620	29,011	10,665,122	14,595,753	12.6 / 87.4	8.8 / 91.2	13.8 / 86.2	13.5 / 86.5
108-88-3	Toluene	10,804,994	386,571	393,356	11,584,921	12.2 / 87.8	0.4 / 99.6	2.7 / 97.3	11.5 / 88.5
—	Copper (and its compounds)	1,535,355	151,773	9,813,800	11,500,928	6.7 / 93.3	2.5 / 97.5	3.2 / 96.8	3.7 / 96.3
—	Ammonia (total)	1,541,996	8,266,547	687,354	10,495,897	27.1 / 72.9	3.8 / 96.2	0.2 / 99.8	7.0 / 93.0
1330-20-7	Xylene (mixed isomers)	8,033,986	240,988	430,073	8,705,047	15.8 / 84.2	0.0 / 100.0	5.3 / 94.7	14.8 / 85.2
75-09-2	Dichloromethane	4,931,366	362,501	56,343	5,350,209	1.4 / 98.6	0.0 / 100.0	0.0 / 100.0	1.3 / 98.7
—	Nickel (and its compounds)	1,078,697	84,032	4,069,968	5,232,696	15.2 / 84.8	3.0 / 97.0	4.7 / 95.3	6.8 / 93.2
1332-21-4	Asbestos (friable)	2	341	5,112,168	5,112,511	0.0 / 100.0	0.0 / 100.0	63.6 / 36.4	63.6 / 36.4
108-05-4	Vinyl acetate	4,612,413	125,169	18,954	4,756,536	12.9 / 87.1	0.5 / 99.5	0.0 / 100.0	12.5 / 87.5
108-95-2	Phenol	1,650,182	1,779,730	590,421	4,020,333	11.5 / 88.5	1.7 / 98.3	2.2 / 97.8	5.8 / 94.2
100-42-5	Styrene	1,980,636	54,335	1,947,136	3,982,106	9.9 / 90.1	0.8 / 99.2	1.7 / 98.3	5.8 / 94.2
7664-38-2	Phosphoric acid	868,927	1,607,222	1,160,797	3,636,946	6.2 / 93.8	4.2 / 95.8	29.9 / 70.1	12.9 / 87.1
78-93-3	Methyl ethyl ketone	3,002,785	227,748	86,325	3,316,858	13.7 / 86.3	0.0 / 100.0	9.1 / 90.9	12.7 / 87.3
7429-90-5	Aluminum (fume or dust)	137,876	5,208	2,913,637	3,056,721	0.0 / 100.0	0.0 / 100.0	4.4 / 95.6	4.2 / 95.8
75-05-8	Acetonitrile	1,904,193	415,922	4,940	2,325,055	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
71-36-3	n-Butyl alcohol	858,904	807,130	224,541	1,890,575	21.6 / 78.4	0.4 / 99.6	12.4 / 87.6	11.5 / 88.5
—	Antimony (and its compounds)	403,484	51,386	1,426,403	1,881,274	0.0 / 100.0	0.2 / 99.8	0.2 / 99.8	0.2 / 99.8
7664-39-3	Hydrogen fluoride	1,109,028	174,188	459,246	1,742,462	0.5 / 99.5	0.0 / 100.0	0.0 / 100.0	0.3 / 99.7
50-00-0	Formaldehyde	465,474	1,070,329	132,202	1,668,005	33.3 / 66.7	0.9 / 99.1	17.9 / 82.1	11.3 / 88.7
	<b>Subtotal</b>	<b>95,341,141</b>	<b>94,011,840</b>	<b>131,223,881</b>	<b>320,576,861</b>	<b>12.3 / 87.7</b>	<b>4.6 / 95.4</b>	<b>15.4 / 84.6</b>	<b>11.3 / 88.7</b>
	<b>as % of Total</b>	<b>81.4</b>	<b>93.8</b>	<b>94.7</b>	<b>90.1</b>				
	<b>Total</b>	<b>117,107,768</b>	<b>100,254,236</b>	<b>138,582,168</b>	<b>355,944,172</b>	<b>11.2 / 88.8</b>	<b>4.4 / 95.6</b>	<b>14.9 / 85.1</b>	<b>10.7 / 89.3</b>

► Canada and US data only, Mexico data not collected for 1995.

Table 3-12		North American Releases and Transfers of Known or Suspected Carcinogens*					
M	1995	NPRI and TRI Total			NPRI/TRI as % of Total		
CAS Number	Chemical	Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Total Releases (%)	Total Transfers (%)	Total Releases and Transfers (%)
75-09-2	Dichloromethane	27,462,891	5,350,209	32,813,101	7.8 / 92.2	1.3 / 98.7	6.7 / 93.3
—	Chromium (and its compounds)	11,117,312	14,598,159	25,715,471	6.0 / 94.0	17.7 / 82.3	12.6 / 87.4
100-42-5	Styrene	19,714,825	3,982,106	23,696,931	3.7 / 96.3	5.8 / 94.2	4.1 / 95.9
—	Lead (and its compounds)	8,919,671	14,595,753	23,515,424	15.1 / 84.9	13.5 / 86.5	14.1 / 85.9
79-01-6	Trichloroethylene	12,214,819	523,916	12,738,735	6.2 / 93.8	5.4 / 94.6	6.2 / 93.8
50-00-0	Formaldehyde	9,959,041	1,668,005	11,627,046	12.0 / 88.0	11.3 / 88.7	11.9 / 88.1
75-07-0	Acetaldehyde	6,824,611	792,619	7,617,230	4.2 / 95.8	0.8 / 99.2	3.9 / 96.1
—	Nickel (and its compounds)	2,351,103	5,232,696	7,583,799	33.6 / 66.4	6.8 / 93.2	15.1 / 84.9
71-43-2	Benzene	6,113,271	1,066,295	7,179,566	29.3 / 70.7	12.1 / 87.9	26.8 / 73.2
108-05-4	Vinyl acetate	2,323,525	4,756,536	7,080,061	10.5 / 89.5	12.5 / 87.5	11.8 / 88.2
67-66-3	Chloroform	5,045,956	941,864	5,987,820	4.7 / 95.3	0.4 / 99.6	4.0 / 96.0
1332-21-4	Asbestos (friable)	284,554	5,112,511	5,397,066	78.5 / 21.5	63.6 / 36.4	64.4 / 35.6
127-18-4	Tetrachloroethylene	4,308,843	962,875	5,271,718	3.4 / 96.6	7.3 / 92.7	4.1 / 95.9
107-13-1	Acrylonitrile	2,951,754	527,230	3,478,983	0.6 / 99.4	6.5 / 93.5	1.5 / 98.5
79-06-1	Acrylamide	2,791,360	99,222	2,890,582	0.2 / 99.8	0.1 / 99.9	0.2 / 99.8
—	Arsenic (and its compounds)	748,947	1,254,586	2,003,533	7.1 / 92.9	1.3 / 98.7	3.5 / 96.5
117-81-7	Di(2-ethylhexyl) phthalate	355,997	1,519,501	1,875,498	16.7 / 83.3	2.7 / 97.3	5.4 / 94.6
106-99-0	1,3-Butadiene	1,546,894	106,087	1,652,980	14.4 / 85.6	56.6 / 43.4	17.1 / 82.9
107-06-2	1,2-Dichloroethane	579,279	902,467	1,481,746	1.1 / 98.9	0.0 / 100.0	0.4 / 99.6
—	Cadmium (and its compounds)	94,713	899,088	993,801	41.0 / 59.0	1.6 / 98.4	5.4 / 94.6
106-89-8	Epichlorohydrin	163,065	456,595	619,660	0.7 / 99.3	0.0 / 100.0	0.2 / 99.8
75-56-9	Propylene oxide	416,144	179,802	595,946	2.5 / 97.5	0.0 / 100.0	1.8 / 98.2
56-23-5	Carbon tetrachloride	211,333	351,948	563,281	3.7 / 96.3	3.7 / 96.3	3.7 / 96.3
75-01-4	Vinyl chloride	490,872	44,476	535,348	3.7 / 96.3	1.9 / 98.1	3.6 / 96.4
123-91-1	1,4-Dioxane	209,005	295,597	504,601	3.4 / 96.6	0.0 / 100.0	1.4 / 98.6
—	Cobalt (and its compounds)	210,408	269,655	480,063	13.8 / 86.2	2.1 / 97.9	7.2 / 92.8
75-21-8	Ethylene oxide	429,536	30,169	459,706	6.1 / 93.9	0.0 / 100.0	5.7 / 94.3
106-46-7	1,4-Dichlorobenzene	122,419	285,063	407,481	8.1 / 91.9	0.1 / 99.9	2.5 / 97.5
140-88-5	Ethyl acrylate	161,623	47,444	209,066	0.7 / 99.3	0.0 / 100.0	0.5 / 99.5
26471-62-5	Toluenediisocyanate (mixed isomers)	23,331	109,671	133,002	4.8 / 95.2	7.2 / 92.8	6.7 / 93.3
101-77-9	4,4'-Methylenedianiline	15,297	47,169	62,466	0.7 / 99.3	0.0 / 100.0	0.2 / 99.8
302-01-2	Hydrazine	5,909	13,727	19,636	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
79-46-9	2-Nitropropane	15,665	0	15,665	0.8 / 99.2	— / —	0.8 / 99.2
95-80-7	2,4-Diaminotoluene	227	13,503	13,730	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
62-56-6	Thiourea	3,790	7,686	11,476	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
96-45-7	Ethylene thiourea	238	10,181	10,420	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
584-84-9	Toluene-2,4-diisocyanate	3,840	5,645	9,484	7.8 / 92.2	1.8 / 98.2	4.2 / 95.8
64-67-5	Diethyl sulfate	3,173	2,442	5,615	0.3 / 99.7	0.0 / 100.0	0.1 / 99.9
139-13-9	Nitrotriacetic acid	1,957	2,883	4,840	32 / 68	70.6 / 29.4	55.0 / 45.0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	122	3,054	3,176	3.3 / 96.7	0.0 / 100.0	0.1 / 99.9
77-78-1	Dimethyl sulfate	2,917	1	2,919	0 / 100	0.0 / 100.0	0.0 / 100.0
91-08-7	Toluene-2,6-diisocyanate	1,380	715	2,095	0 / 100	0.0 / 100.0	0.0 / 100.0
90-94-8	Michler's ketone	715	0	715	0 / 100	— / —	0.0 / 100.0
94-59-7	Safrole	116	2	118	0 / 100	0.0 / 100.0	0.0 / 100.0
96-09-3	Styrene oxide	106	0	106	94.4 / 5.6	— / —	94.4 / 5.6
<b>Subtotal</b>		<b>128,202,553</b>	<b>67,069,156</b>	<b>195,271,709</b>	<b>8.6 / 91.4</b>	<b>14.4 / 85.6</b>	<b>10.6 / 89.4</b>
<b>% of Total for Matched Chemicals</b>		<b>13.4</b>	<b>18.8</b>	<b>14.9</b>			
<b>Total for Matched Chemicals</b>		<b>953,725,730</b>	<b>355,944,172</b>	<b>1,309,669,902</b>	<b>12.2 / 87.8</b>	<b>10.7 / 89.3</b>	<b>11.8 / 88.2</b>

\* Carcinogenic substances are those chemicals or chemical compounds listed in either the *International Agency for Research on Cancer (IARC) Monographs* or the *US National Toxicological Program (NTP) Annual Report on Carcinogens*.

► A chemical (and its compounds) category is included if the chemical or any of its compounds are designated carcinogenic. Canada and US data only, Mexico data not collected for 1995.

As shown in **Table 3-9**, four chemicals were reported in amounts totaling more than 100 million kg (total releases and transfers) each: methanol, ammonia, zinc and its compounds, and nitric acid and nitrate compounds. Canadian facilities reported high quantities of the first three chemicals (compared to their proportion of facilities, forms, and total releases and transfers). US facilities accounted for a disproportionate share of releases and transfers of nitric acid and nitrate compounds (nearly 95 percent).

These differences arise from even greater differences in the release and transfer patterns of these chemicals in the two countries, as found in **Tables 3-10** and **3-11**. For example, Canadian facilities reported 12 percent of all North American releases, in this matched data set, but they accounted for 19 percent of the air emissions of ammonia, 39 percent of its surface water discharges, and 38 percent of its underground injection. At the same time, US facilities reported 96 percent of the transfers of methanol, compared to 89 percent of all transfers.

### 3.5.1 Carcinogenic Chemicals

Of the 1.3 billion kg of total releases and transfers reported in North America in 1995, 15 percent involved chemicals designated as carcinogenic (in *International Agency for Research on Cancer Monographs* or the *US National Toxicological Program Annual Report on Carcinogens*). Facilities reported on 45 of these known or suspected carcinogenic chemicals, as shown in **Table 3-12**. Releases were 128 million kg, nearly double the 67 million kg reported as transfers.

Releases and transfers of dichloromethane, the top carcinogen reported, totaled nearly 33 million kg. More than

10 million kg each were reported for chromium (and its compounds), styrene, lead (and its compounds), trichloroethylene, and formaldehyde.

About 30 percent of the releases of these chemicals come from 50 facilities in the two countries, as shown in **Table 3-13**. (This is the same proportion as for the top 50 facilities for total releases of all chemicals, presented in **Table 3-7**.) These top 50 facilities for releases of carcinogens accounted for most of the underground injection of such chemicals (92 percent), as well as much of the on-site land disposal (75 percent). At 16 of these facilities, emissions to air of dichloromethane accounted for more than 70 percent of all releases the facility reported.

**Table 3-14** looks at the top 50 facilities for total releases and transfers of the carcinogens. They accounted for 29 percent of total reporting for these chemicals, including 36 percent of the transfers. For seven facilities, dichloromethane represented 70 percent or more of total releases and transfers. For another seven, chromium and its compounds held that position.

### 3.6 Reporting Industries

Three industries—chemicals, primary metals and paper products—accounted for two-thirds of the total releases and transfers reported in 1995, as shown in **Figure 3-5**.

The contribution of these industries to total North American releases and transfers does not arise simply from their having submitted a greater number of forms. In other words, their role in overall releases and transfer does not represent the results of “more” reporting than in other industries. Instead, as shown in **Table 3-15**, all

three industries contributed a greater proportion of total releases and transfers than would be expected from the number of forms they submitted.

Submitting 28 percent of all forms, the chemical industry reported 37 percent of total releases and transfers. The primary metals industry submitted 10 percent of all forms, but it accounted for twice that proportion of total releases and transfers (20 percent). Paper and paper products manufacturers filed 3 percent of the forms, but reported 11 percent of total releases and transfers. The paper industry averaged the highest releases and transfers per form: 65,515 kg compared to 20,434 kg for all industries. (**Chapter 8** examines in greater detail PRTR reporting by the pulp and paper products industry, including reductions in releases and transfers, regulatory and other developments, and differences within the sector between Canada and the United States.)

In the Canadian NPRI, each facility reports only the one SIC code that best represents its dominant operations. In the US TRI, however, a facility reports all SIC codes that apply to its operations. Therefore, only US facilities appear in the “multiple codes” category, which ranked fourth for total releases and transfers.

Of the top 50 facilities for total releases and transfers, 29 reported in the chemical industry, 16 in primary metals, four in paper and paper products, and one with multiple SIC codes (see **Table 3-8**, above).

The same four industry groups ranked highest for total releases and for total off-site transfers (see **Tables 3-16** and **3-17**). The chemical industry led in all types of releases and transfers except on-site releases to land and transfers to disposal, both of which were

dominated by the primary metal products industry.

### 3.7 Projections for Future Releases and Transfers

Both Canada and the United States require facilities to estimate PRTR releases and transfers for future years. Canadian facilities project total releases and total transfers, but US facilities make more detailed projections for on-site and off-site waste management. TRI includes one overall category for on-site releases and off-site disposal and another for off-site transfers to treatment. Together, these two categories—releases/off-site disposal plus off-site treatment—give projections for total releases and transfers. As **Table 3-18** shows, North American facilities overall expect to reduce their total releases and transfers by 5 percent through 1997, with Canadian facilities projecting a much greater percentage decrease (14 percent) than US facilities (4 percent).

Projected changes in releases and transfers varied markedly across industries (see **Table 3-19**). Those projecting the greatest percentage decreases also had relatively low releases and transfers in 1995. The apparel industry, projecting a 47 percent decrease through 1997, ranked 20th among 21 industry groups for total releases and transfers in 1995. Both Canadian and US apparel manufacturers have projected large net reductions, Canadian facilities at more than twice the rate projected by US facilities (75 percent and 34 percent, respectively).

Industries with the next largest projected reductions, in percentage terms, were measurement/ photographic instruments, miscellaneous manufacturing and textile mill products; these also ranked among the smaller sources of total releases and transfers in 1995.

Two industries projected increases by 1997: the relatively small tobacco products industry (6 percent) and the much larger primary metal products manufacturers (3 percent). Releases and transfers from tobacco products manufacturing ranked last among all industries in 1995, none were reported to NPRI. Primary metals producers ranked second for total releases and transfers in 1995. This industry’s projected increase arose from TRI reporting (5 percent increase), which masked projected decreases reported to NPRI (9 percent decrease). On the other hand, large increases projected by some Canadian industries (e.g., industrial machinery, food) are outweighed by smaller percentage decreases projected by their US counterparts.

**Figure 3-6** presents total releases and transfers projected for 1995–1997, from **Table 3-19**, and illustrates the contribution of industries projecting the largest absolute decreases. Chemical manufacturers in the United States and Canada have projected a reduction of nearly 32 million kg in total releases and transfers by 1997. This represents almost one-half the total net reduction across all industries. Paper products facilities projected a decrease of 14 million kg. The Canadian paper industry accounted for most (11 million kg) of this projection. (**Chapter 8** discusses the paper industry’s progress in reducing releases and transfers from 1994 to 1995.) Two other industries recorded projected decreases of more than 5 million kg by 1997: fabricated metals (6 million kg) and rubber and plastics (a little over 5 million). Together, these four industries accounted for 83 percent of the net reduction in total releases and transfers expected by 1997.

Table 3-13		Top 50 North American Facilities with Total Releases of Known or Suspected Carcinogens (sorted by total releases)									
M		1995									
Rank	Facility	City, State/Province	SIC Codes		Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-Site Land Releases (kg)	Total Releases (kg)	
			Canada	US							
1	American Chrome & Chemicals	Corpus Christi, TX		28	1	2,426	113	0	4,263,039	4,265,578	
2	Occidental Chemical Corp.	Castle Hayne, NC		28	1	2,651	16	0	3,310,707	3,313,375	
3	ASARCO Inc.	East Helena, MT		33	4	24,221	156	0	1,906,985	1,931,363	
4	Monsanto Co.	Luling, LA		28	2	8,617	0	1,815,374	0	1,823,991	
5	BP Chemicals Inc.	Lima, OH		28	10	69,732	0	1,751,583	0	1,821,315	
6	BP Chemicals Inc.	Port Lavaca, TX		28	5	14,617	0	1,383,401	32	1,398,051	
7	Eastman Kodak Co.	Rochester, NY		38	10	1,324,223	28,324	0	0	1,352,547	
8	ASARCO Inc.	Hayden, AZ		33	4	90,604	0	0	1,220,713	1,311,317	
9	Angus Chemical Co.	Sterlington, LA		28	4	10,366	1,645	1,136,741	0	1,148,752	
10	Cytec Industries Inc.	Westwego, LA		28	4	12,036	104	973,243	0	985,383	
11	ASARCO Inc.	Annapolis, MO		33	4	173,483	10	0	787,457	960,950	
12	Monsanto Co.	Alvin, TX		28	4	48,539	0	752,857	0	801,396	
13	Doe Run Co.	Herculaneum, MO		333	6	92,715	363	0	692,685	785,764	
14	Kennecott Utah Copper	Magna, UT		33	5	27,755	454	0	731,746	759,955	
15	General Electric Plastics Co.	Mount Vernon, IN		28	4	697,647	426	0	0	698,073	
16	Aquaglass Corp.	Adamsville, TN		30	1	665,652	0	0	0	665,652	
17	Cyprus Miami Mining Corp.	Claypool, AZ		33	3	7,885	0	0	609,977	617,863	
18	Northwestern Steel & Wire Co.	Sterling, IL		33	3	4,682	176	0	589,569	594,427	
19	Upjohn Mfg. Co.	Arecibo, PR		28	2	590,522	0	0	0	590,522	
20	Carpenter Co.	Verona, MS		30	2	580,417	0	0	0	580,417	
21	Glenbrook Nickel Co.	Riddle, OR		33	1	5,019	7	0	542,689	547,714	
22	Weyerhaeuser Co.	Longview, WA		Mult.	6	466,877	70,417	0	0	537,294	
23	Abbott Chemicals Inc.	Barceloneta, PR		Mult.	1	520,117	0	0	0	520,117	
24	Celanese Canada Inc.	Edmonton, AB		37 28	5	175,998	0	331,460	40	507,498	
25	Inco Limited, Copper Cliff Smelter	Copper Cliff, ON		29 33	4	498,950	0	0	0	498,950	
26	Sterling Chemicals Inc.	Texas City, TX		28	10	84,208	0	387,976	0	472,184	
27	Dow Chemical Co.	Freeport, TX		28	21	438,861	23,240	0	312	462,413	
28	Dofasco Inc.	Hamilton, ON		29 33	5	459,078	1,013	0	51	460,142	
29	General Electric Chemicals Inc.	Ottawa, IL		28	6	455,356	1,886	0	0	457,242	
30	Foamex L.P.	Corry, PA		30	2	448,334	0	0	0	448,334	
31	Heatcraft Inc.	Grenada, MS		Mult.	1	447,951	0	0	0	447,951	
32	Celanese Eng. Resins Inc.	Bishop, TX		28	4	205,624	635	240,952	0	447,211	
33	Pharmacia & Upjohn Co.	Portage, MI		28	5	373,175	227	56,689	0	430,091	
34	General Foam Corp.	West Hazelton, PA		30	3	419,152	0	0	0	419,152	
35	Novopharm Limited	Scarborough, ON		37 28	1	418,410	0	0	0	418,410	
36	Hoechst Celanese Chemical	Pasadena, TX		28	6	32,494	0	372,336	0	404,830	
37	Noranda-Fonderie Horne	Rouyn Noranda, QC		29 33	6	396,500	2,480	0	0	398,980	
38	Foamex International Inc.	Milan, TN		30	2	396,587	0	0	0	396,587	
39	Great Lakes Chemical Corp.	El Dorado, AR		28	2	11,805	0	380,172	0	391,977	
40	Elkem Metals Co.	Marietta, OH		33	4	4,149	454	0	358,730	363,332	
41	Bayer Rubber Inc.	Sarnia, ON		37 28	5	361,413	62	0	0	361,475	
42	Piper Impact Inc.	New Albany, MS		34	2	358,617	0	0	0	358,617	
43	Carpenter Co.	Russellville, KY		Mult.	3	353,610	0	0	0	353,610	
44	Carpenter Co.	Richmond, VA		Mult.	3	351,170	45	0	0	351,215	
45	Vitafoam Inc.	High Point, NC		30	3	338,776	0	0	0	338,776	
46	Co-Steel Lasco	Whitby, ON		29 33	3	1,559	39	0	333,300	334,898	
47	Kimberly-Clark Corp.	Mobile, AL		26	2	320,635	11,791	0	0	332,426	
48	Flexible Foam Products Inc.	Elkhart, IN		30	2	327,746	0	0	0	327,746	
49	Federal Paper Board Co. Inc.	Riegelwood, NC		26	4	306,122	4,036	0	16,780	326,939	
50	General Foam Corp.	Bridgeview, IL		30	3	323,982	0	0	0	323,982	
<b>Subtotal</b>					<b>204</b>	<b>13,751,068</b>	<b>148,121</b>	<b>9,582,785</b>	<b>15,364,813</b>	<b>38,846,787</b>	
<b>% of Total</b>					<b>1.2</b>	<b>14.3</b>	<b>12.3</b>	<b>91.9</b>	<b>74.6</b>	<b>30.3</b>	
<b>Total</b>					<b>16,789</b>	<b>95,949,158</b>	<b>1,200,871</b>	<b>10,428,060</b>	<b>20,587,117</b>	<b>128,202,553</b>	

\* Chemicals accounting for more than 70% of total carcinogenic releases from the facility.  
 ► Canada and US data only, Mexico data not collected for 1995. UIJ=underground injection.



Rank	Major Chemicals Reported (Primary Media)*
1	Chromium and compounds (land)
2	Chromium and compounds (land)
3	Lead and compounds (land)
4	Formaldehyde (UIJ)
5	Acrylonitrile, acrylamide (UIJ)
6	Acrylamide, acrylonitrile (UIJ)
7	Dichloromethane (air)
8	Lead and compounds (land)
9	Formaldehyde (UIJ)
10	Acrylamide (UIJ)
11	Lead and compounds (land)
12	Acrylonitrile (UIJ)
13	Lead and compounds (land)
14	Lead/arsenic and compounds (land)
15	Dichloromethane (air)
16	Styrene (air)
17	Lead and compounds (land)
18	Lead/chromium and compounds (land)
19	Dichloromethane (air)
20	Dichloromethane (air)
21	Nickel and compounds (land)
22	Acetaldehyde, chloroform (air, water)
23	Dichloromethane (air)
24	Acetaldehyde, vinyl acetate (UIJ, air)
25	Nickel and compounds (air)
26	Acrylamide, acrylonitrile (UIJ)
27	Dichloromethane, benzene, epichlorohydrin, propylene oxide, 1,3-butadiene, 1,2-dichloroethane (air)
28	Benzene (air)
29	Styrene (air)
30	Dichloromethane (air)
31	Trichloroethylene (air)
32	Formaldehyde (air)
33	Dichloromethane (air)
34	Dichloromethane (air)
35	Dichloromethane (air)
36	Vinyl acetate, ethylene oxide (UIJ)
37	Lead and compounds (air)
38	Dichloromethane (air)
39	Dichloromethane (UIJ)
40	Chromium and compounds (land)
41	1,3-butadiene, benzene (air)
42	Tetrachloroethylene (air)
43	Dichloromethane (air)
44	Dichloromethane (air)
45	Dichloromethane (air)
46	Lead and compounds (land)
47	Chloroform (air)
48	Dichloromethane (air)
49	Chloroform (air)
50	Dichloromethane (air)

**TAKING STOCK: North American Pollutant Releases and Transfers**

Table 3-14		Top 50 North American Facilities with Total Releases and Transfers of Known or Suspected Carcinogens (sorted by total releases and transfers)								
M 1995		SIC Codes		Number of Forms	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-Site Land Releases (kg)	Total Releases (kg)	
Rank	Facility	City, State/Province	Canada							US
1	American Chrome & Chemicals	Corpus Christi, TX		28	1	2,426	113	0	4,263,039	4,265,578
2	Quantum Chemical Corp.	La Porte, TX		28	6	242,183	86	0	0	242,269
3	Occidental Chemical Corp.	Castle Hayne, NC		28	1	2,651	16	0	3,310,707	3,313,375
4	ASARCO Inc.	Hayden, AZ		33	4	90,604	0	0	1,220,713	1,311,317
5	Zinc Corp. of America	Monaca, PA		33	4	5,701	10	0	0	5,711
6	CXY Chemicals	Nanaimo, BC	37	28	1	0	0	0	0	0
7	ASARCO Inc.	East Helena, MT		33	4	24,221	156	0	1,906,985	1,931,363
8	Monsanto Co.	Luling, LA		28	2	8,617	0	1,815,374	0	1,823,991
9	BP Chemicals Inc.	Lima, OH		28	10	69,732	0	1,751,583	0	1,821,315
10	Pharmacia & Upjohn Co.	Portage, MI		28	5	373,175	227	56,689	0	430,091
11	Dominion Castings Ltd.	Hamilton, ON	29	33	1	1,027	100	0	0	1,127
12	BP Chemicals Inc.	Port Lavaca, TX		28	5	14,617	0	1,383,401	32	1,398,051
13	Eastman Kodak Co.	Rochester, NY		38	10	1,324,223	28,324	0	0	1,352,547
14	Electralloy Corp.	Oil City, PA		33	2	66,435	0	0	0	66,435
15	American Steel Foundries	Alliance, OH		33	3	36,590	340	0	340	37,270
16	Angus Chemical Co.	Sterlington, LA		28	4	10,366	1,645	1,136,741	0	1,148,752
17	Allegheny Ludlum Corp.	Brackenridge, PA		33	3	19,932	1,315	0	0	21,247
18	Co-Steel Lasco	Whitby, ON	29	33	3	1,559	39	0	333,300	334,898
19	Cytec Industries Inc.	Westwego, LA		28	4	12,036	104	973,243	0	985,383
20	ASARCO Inc.	Annapolis, MO		33	4	173,483	10	0	787,457	960,950
21	Kennecott Utah Copper	Magna, UT		33	5	27,755	454	0	731,746	759,955
22	Upjohn Mfg. Co..	Arecibo, PR		28	2	590,522	0	0	0	590,522
23	Monsanto Co.	Alvin, TX		28	4	48,539	0	752,857	0	801,396
24	Avesta Sheffield Plate Inc.	New Castle, IN		33	2	0	0	0	0	0
25	Doe Run Co.	Herculaneum, MO		333	6	92,715	363	0	692,685	785,764
26	Sequentia Inc.	Grand Junction, TN		30	1	33,412	0	0	0	33,412
27	General Electric Plastics Co.	Mount Vernon, IN		28	4	697,647	426	0	0	698,073
28	Quemetco Inc.	City of Industry, CA		33	3	746	0	0	0	747
29	General Battery Corp.	Reading, PA		33	3	2,010	31	0	0	2,041
30	Aquaglass Corp.	Adamsville, TN		30	1	665,652	0	0	0	665,652
31	Bayer Rubber Inc.	Sarnia, ON	37	28	5	361,413	62	0	0	361,475
32	AT Plastics Inc.	Edmonton, AB	37	28	1	35,598	0	0	485	36,083
33	Northwestern Steel & Wire Co.	Sterling, IL		33	3	4,682	176	0	589,569	594,427
34	Quemetco Inc.	Indianapolis, IN		33	3	3,618	0	0	0	3,618
35	Cyprus Miami Mining Corp.	Claypool, AZ		33	3	7,885	0	0	609,977	617,863
36	Birmingham Steel Corp.	Jackson, MS		33	3	302	0	0	0	302
37	Carpenter Co.	Verona, MS		30	2	580,417	0	0	0	580,417
38	Armstrong World Inds. Inc.	Lancaster, PA		39	2	29,551	0	0	113	29,665
39	Slater Steels	Fort Wayne, IN		33	2	3,946	0	0	0	3,946
40	Dofasco Inc.	Hamilton, ON	29	33	5	459,078	1,013	0	51	460,142
41	Glenbrook Nickel Co.	Riddle, OR		33	1	5,019	7	0	542,689	547,714
42	Celanese Canada Inc.	Edmonton, AB	37	28	5	175,998	0	331,460	40	507,498
43	Weyerhaeuser Co.	Longview, WA		Multi.	6	466,877	70,417	0	0	537,294
44	Monsanto Co.	Springfield, MA		Multi.	5	16,110	0	0	0	16,110
45	Allegheny Ludlum Corp.	New Castle, IN		33	2	458	227	0	0	685
46	Abbott Chemicals Inc.	Barceloneta, PR		Multi.	1	520,117	0	0	0	520,117
47	Sterling Chemicals Inc.	Texas City, TX		28	10	84,208	0	387,976	0	472,184
48	Inco Limited, Copper Cliff Smelter	Copper Cliff, ON	29	33	4	498,950	0	0	0	498,950
49	Pfizer Pharmaceuticals Inc.	Barceloneta, PR		28	1	42,177	0	0	0	42,177
50	Dow Chemical Co.	Freeport, TX		28	21	438,861	23,240	0	312	462,413
<b>Subtotal</b>					<b>193</b>	<b>8,373,843</b>	<b>128,903</b>	<b>8,589,325</b>	<b>14,990,242</b>	<b>32,082,312</b>
<b>% of Total</b>					<b>1.1</b>	<b>8.7</b>	<b>10.7</b>	<b>82.4</b>	<b>72.8</b>	<b>25.0</b>
<b>Total</b>					<b>16,789</b>	<b>95,949,158</b>	<b>1,200,871</b>	<b>10,428,060</b>	<b>20,587,117</b>	<b>128,202,553</b>

\* Chemicals accounting for more than 70% of total carcinogenic releases and transfers from the facility.  
 ➤ Canada and US data only, Mexico data not collected for 1995. UIJ=underground injection.

Rank	Treatment/ Destruction (kg)	Sewage/ POTWs (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	Total Releases and Transfers (kg)	Major Chemicals Reported (Primary Media/Transfers)*
1	36,735	0	4,127	40,862	4,306,440	Chromium and compounds (land)
2	3,474,221	0	0	3,474,221	3,716,490	Vinyl acetate (air)
3	1,723	0	0	1,723	3,315,098	Chromium and compounds (land)
4	1,397,906	9	0	1,397,915	2,709,233	Lead and compounds (land, transfers to treatment)
5	762	0	2,518,890	2,519,652	2,525,363	Lead and compounds (transfers to disposal)
6	0	0	1,988,000	1,988,000	1,988,000	Asbestos (transfers to disposal)
7	0	121	0	121	1,931,484	Lead and compounds (land)
8	6,349	0	0	6,349	1,830,340	Formaldehyde (UIJ)
9	2,166	0	290	2,456	1,823,771	Acrylonitrile, acrylamide (UIJ)
10	1,090,184	163,492	1,460	1,255,136	1,685,227	Dichloromethane (transfers to treatment, air)
11	0	0	1,400,778	1,400,778	1,401,905	Chromium and compounds (transfers to disposal)
12	288	0	0	288	1,398,339	Acrylamide, acrylonitrile (UIJ)
13	12,405	0	3,227	15,632	1,368,180	Dichloromethane (air)
14	0	0	1,249,518	1,249,518	1,315,953	Chromium and compounds (transfers to disposal)
15	2,766	8,186	1,113,651	1,124,603	1,161,873	Chromium and compounds (transfers to disposal)
16	1,454	0	0	1,454	1,150,207	Formaldehyde (UIJ)
17	62,200	0	947,392	1,009,592	1,030,839	Chromium/nickel and compounds (transfers to disposal)
18	0	11	663,900	663,911	998,809	Lead and compounds (land, transfers to disposal)
19	12	0	2	14	985,397	Acrylamide (UIJ)
20	0	0	0	0	960,950	Lead and compounds (land)
21	0	0	70,726	70,726	830,680	Lead/arsenic and compounds (land)
22	195,011	16,327	0	211,338	801,859	Dichloromethane (air)
23	0	0	0	0	801,396	Acrylonitrile (UIJ)
24	801,049	0	0	801,049	801,049	Chromium and compounds (transfers to treatment)
25	0	371	0	371	786,135	Lead and compounds (land)
26	0	0	703,544	703,544	736,956	Styrene (transfers to disposal)
27	11,927	0	6,513	18,440	716,514	Dichloromethane (air)
28	0	55	701,587	701,643	702,390	Lead and compounds (transfers to disposal)
29	589,686	2	100,086	689,774	691,815	Lead and compounds (transfers to treatment)
30	0	0	0	0	665,652	Styrene (air)
31	110,500	0	168,000	278,500	639,975	1,3-butadiene, benzene (air, transfers to treatment)
32	588,390	0	0	588,390	624,473	Vinyl acetate (transfers to treatment)
33	25,850	0	0	25,850	620,278	Lead/chromium and compounds (land)
34	0	42	615,420	615,462	619,080	Lead and compounds (transfers to disposal)
35	0	0	0	0	617,863	Lead and compounds (land)
36	0	0	604,370	604,370	604,671	Lead and compounds (transfers to disposal)
37	0	0	0	0	580,417	Dichloromethane (air)
38	0	430	549,592	550,022	579,687	Di(2-ethylhexyl) phthalate (transfers to disposal)
39	567,755	1,315	0	569,070	573,016	Chromium and compounds (transfers to treatment)
40	0	388	110,080	110,468	570,610	Benzene (air)
41	0	0	0	0	547,714	Nickel and compounds (land)
42	0	0	35,041	35,041	542,539	Acetaldehyde, vinyl acetate (UIJ, air)
43	0	0	4,775	4,775	542,069	Acetaldehyde, chloroform (air, water)
44	18,845	503,851	0	522,696	538,806	Formaldehyde (transfers to sewage)
45	0	0	535,147	535,147	535,832	Nickel/chromium and compounds (transfers to disposal)
46	3,238	322	0	3,560	523,677	Dichloromethane (air)
47	6,530	115	21,384	28,029	500,214	Acrylamide, acrylonitrile (UIJ)
48	0	0	0	0	498,950	Nickel and compounds (air)
49	389,932	60,272	0	450,204	492,381	Dichloromethane (transfers to treatment)
50	27,594	0	0	27,594	490,007	Dichloromethane, benzene, epichlorohydrin, propylene oxide, 1,3-butadiene, 1,2-dichloroethane (air)
	<b>9,425,480</b>	<b>755,310</b>	<b>14,117,500</b>	<b>24,298,290</b>	<b>56,380,602</b>	
	<b>34.5</b>	<b>26.0</b>	<b>38.3</b>	<b>36.2</b>	<b>28.9</b>	
	<b>27,301,331</b>	<b>2,899,979</b>	<b>36,867,847</b>	<b>67,069,156</b>	<b>195,271,709</b>	

Table 3-15		Total Releases and Transfers in North America, by Industry									
M		1995									
US SIC Code	Industry	Forms		Total Releases (kg)	Total Transfers (kg)	Total Releases and Transfers		NPRI/TRI as % of Total			
		Number	(%)			(kg)	(%)	Forms (%)	Total Releases (%)	Total Transfers (kg)	Total Releases and Transfers (kg)
28	Chemicals	18,164	28.3	352,789,235	134,182,290	486,971,524	37.2	7.9 / 92.1	11.2 / 88.8	9.1 / 90.9	10.6 / 89.4
33	Primary Metal Industries	6,356	9.9	158,487,870	108,522,997	267,010,868	20.4	9.2 / 90.8	11.6 / 88.4	16.7 / 83.3	13.6 / 86.4
26	Paper Products	2,176	3.4	116,442,497	26,117,534	142,560,030	10.9	14.3 / 85.7	23.5 / 76.5	7.6 / 92.4	20.6 / 79.4
	Multiple Codes 20-39*	4,306	6.7	55,376,036	18,426,053	73,802,089	5.6	— / —	— / —	— / —	— / —
30	Rubber and Plastics Products	3,358	5.2	49,976,446	8,024,568	58,001,014	4.4	8.3 / 91.7	12.4 / 87.6	12.4 / 87.6	12.4 / 87.6
37	Transportation Equipment	4,070	6.4	47,833,930	8,739,820	56,573,750	4.3	7.5 / 92.5	14.6 / 85.4	11.0 / 89.0	14.1 / 85.9
34	Fabricated Metals Products	6,830	10.7	27,990,363	12,646,995	40,637,358	3.1	5.4 / 94.6	6.4 / 93.6	12.5 / 87.5	8.3 / 91.7
29	Petroleum and Coal Products	3,163	4.9	33,573,303	4,726,619	38,299,922	2.9	11.5 / 88.5	30.1 / 69.9	8.9 / 91.1	27.5 / 72.5
20	Food Products	3,283	5.1	14,737,009	10,057,813	24,794,822	1.9	3.2 / 96.8	1.8 / 98.2	4.1 / 95.9	2.7 / 97.3
36	Electronic/Electrical Equipment	2,694	4.2	9,853,655	9,835,385	19,689,040	1.5	3.4 / 96.6	2.7 / 97.3	5.7 / 94.3	4.2 / 95.8
25	Furniture and Fixtures	1,368	2.1	18,139,320	446,361	18,585,681	1.4	2.3 / 97.7	2.8 / 97.2	1.7 / 98.3	2.8 / 97.2
27	Printing and Publishing	454	0.7	14,823,145	432,587	15,255,731	1.2	8.8 / 91.2	7.6 / 92.4	39.9 / 60.1	8.5 / 91.5
24	Lumber and Wood Products	1,745	2.7	14,817,332	314,708	15,132,040	1.2	8.0 / 92.0	8.6 / 91.4	20.8 / 79.2	8.8 / 91.2
32	Stone/Clay/Glass Products	1,453	2.3	10,038,709	3,818,627	13,857,336	1.1	6.2 / 93.8	12.8 / 87.2	10.6 / 89.4	12.2 / 87.8
35	Industrial Machinery	2,480	3.9	8,699,134	2,970,849	11,669,983	0.9	2.8 / 97.2	5.6 / 94.4	4.3 / 95.7	5.3 / 94.7
22	Textile Mill Products	605	0.9	8,202,912	1,568,516	9,771,428	0.7	3.1 / 96.9	11.7 / 88.3	0.5 / 99.5	9.9 / 90.1
38	Measurement/Photographic Inst.	609	1.0	5,261,182	2,164,032	7,425,214	0.6	0.2 / 99.8	0.0 / 100.0	0.1 / 99.9	0.0 / 100.0
39	Misc. Manufacturing Industries	746	1.2	4,942,212	1,656,032	6,598,244	0.5	10.9 / 89.1	2.5 / 97.5	12.8 / 87.2	5.1 / 94.9
31	Leather Products	173	0.3	869,467	1,201,907	2,071,374	0.2	2.3 / 97.7	2.1 / 97.9	5.6 / 94.4	4.1 / 95.9
23	Apparel and Other Textile Products	40	0.1	674,527	40,021	714,548	0.1	5.0 / 95.0	33.4 / 66.6	0.0 / 100.0	31.5 / 68.5
21	Tobacco Products	19	0.0	197,446	50,458	247,903	0.0	— / —	— / —	— / —	— / —
<b>Total</b>		<b>64,092</b>	<b>100.0</b>	<b>953,725,730</b>	<b>355,944,172</b>	<b>1,309,669,902</b>	<b>100.0</b>	<b>6.8 / 93.2</b>	<b>12.2 / 87.8</b>	<b>10.7 / 89.3</b>	<b>11.8 / 88.2</b>

\* Multiple SIC codes reported only in US data.

► Canada and US data only, Mexico data not collected for 1995.

Table 3-16

M 1995

## Releases in North America, by Industry

US SIC Code	Industry	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-Site Land Releases (kg)	Total Releases (kg)	NPRI/TRI as % of Total				
							Total Air Emissions (%)	Surface Water Discharge (%)	Under- ground Injection (%)	On-Site Land Releases (%)	Total Releases (%)
28	Chemicals	187,579,068	40,934,626	95,679,440	28,514,210	352,789,235	17.3 / 82.7	3.6 / 96.4	5.0 / 95.0	1.8 / 98.2	11.2 / 88.8
33	Primary Metal Industries	58,619,854	5,368,445	82,528	94,394,510	158,487,870	10.4 / 89.6	31.1 / 68.9	0.0 / 100.0	11.2 / 88.8	11.6 / 88.4
26	Paper Products	95,262,441	19,501,395	100	1,675,197	116,442,497	16.1 / 83.9	60.9 / 39.1	0.0 / 100.0	8.4 / 91.6	23.5 / 76.5
	Multiple Codes 20-39*	43,987,844	4,316,580	820,340	6,251,273	55,376,036	— / —	— / —	— / —	— / —	— / —
30	Rubber and Plastics Products	49,623,335	140,348	0	205,184	49,976,446	12.2 / 87.8	51.0 / 49.0	— / —	25.3 / 74.7	12.4 / 87.6
37	Transportation Equipment	47,572,686	135,036	0	121,036	47,833,930	14.7 / 85.3	7.8 / 92.2	— / —	3.9 / 96.1	14.6 / 85.4
29	Petroleum and Coal Products	25,400,080	1,939,072	6,127,346	102,828	33,573,303	18.8 / 81.2	8.8 / 91.2	83.5 / 16.5	15.9 / 84.1	30.1 / 69.9
34	Fabricated Metals Products	27,468,173	166,570	309	341,784	27,990,363	6.5 / 93.5	0.1 / 99.9	0.0 / 100.0	1.0 / 99.0	6.4 / 93.6
25	Furniture and Fixtures	18,134,171	395	0	4,244	18,139,320	2.8 / 97.2	0.0 / 100.0	— / —	0.0 / 100.0	2.8 / 97.2
27	Printing and Publishing	14,807,921	12,638	0	2,086	14,823,145	7.5 / 92.5	49.4 / 50.6	— / —	0.0 / 100.0	7.6 / 92.4
24	Lumber and Wood Products	14,749,540	64,012	0	3,630	14,817,332	8.3 / 91.7	60.0 / 40.0	— / —	2.0 / 98.0	8.6 / 91.4
20	Food Products	9,834,588	2,663,093	10,435	2,228,691	14,737,009	1.7 / 98.3	1.5 / 98.5	0.0 / 100.0	2.5 / 97.5	1.8 / 98.2
32	Stone/Clay/Glass Products	9,402,933	113,478	0	519,639	10,038,709	13.0 / 87.0	53.4 / 46.6	— / —	0.0 / 100.0	12.8 / 87.2
36	Electronic/Electrical Equipment	9,490,456	179,720	2	180,322	9,853,654	2.3 / 97.7	7.3 / 92.7	0.0 / 100.0	17.9 / 82.1	2.7 / 97.3
35	Industrial Machinery	8,352,642	5,279	0	340,560	8,699,134	2.3 / 97.7	0.3 / 99.7	— / —	86.6 / 13.4	5.6 / 94.4
22	Textile Mill Products	8,086,346	113,338	0	3,128	8,202,912	11.9 / 88.1	0.0 / 100.0	— / —	0.0 / 100.0	11.7 / 88.3
38	Measurement/Photographic Inst.	4,979,162	279,405	0	2,615	5,261,182	0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0	0.0 / 100.0
39	Misc. Manufacturing Industries	4,925,148	683	0	12,600	4,942,212	2.3 / 97.7	0.0 / 100.0	— / —	47.9 / 52.1	2.5 / 97.5
31	Leather Products	811,332	51,408	0	6,727	869,467	2.3 / 97.7	0.0 / 100.0	— / —	0.0 / 100.0	2.1 / 97.9
23	Apparel and Other Textile Products	674,411	2	0	113	674,527	33.4 / 66.6	0.0 / 100.0	— / —	0.0 / 100.0	33.4 / 66.6
21	Tobacco Products	192,865	4,580	0	0	197,446	— / —	— / —	— / —	— / —	— / —
	<b>Total</b>	<b>639,954,996</b>	<b>75,990,103</b>	<b>102,720,500</b>	<b>134,910,378</b>	<b>953,725,730</b>	<b>12.4 / 87.6</b>	<b>20.3 / 79.7</b>	<b>9.7 / 90.3</b>	<b>8.7 / 91.3</b>	<b>12.2 / 87.8</b>

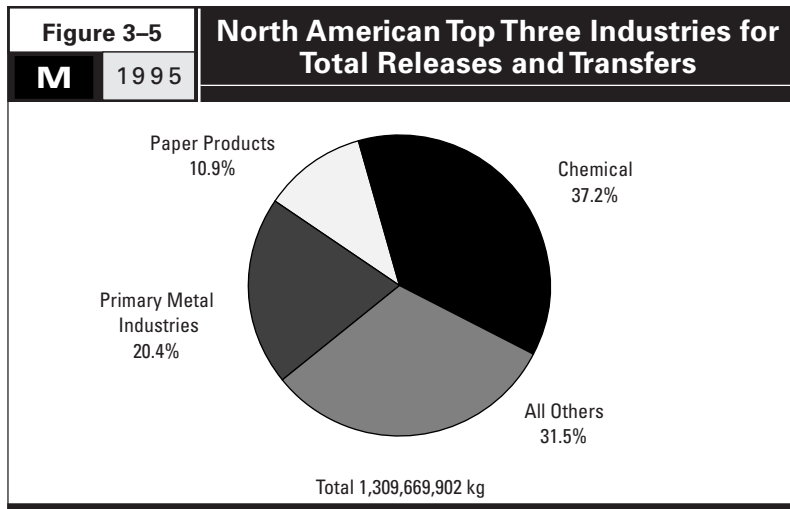
\* Multiple SIC codes reported only in US data.

► Canada and US data only, Mexico data not collected for 1995.

Table 3-17		Transfers in North America, by Industry							
M 1995									
US SIC Code	Industry	Treatment/ Destruction (kg)	Sewage/ POTWs (kg)	Disposal/ Containment (kg)	Total Transfers (kg)	NPRI/TRI as % of Total			
						Treatment/ Destruction (%)	Sewage/ POTWs (%)	Disposal/ Containment (%)	Total Transfers (%)
28	Chemicals	67,705,191	50,844,281	15,632,818	134,182,290	7.2 / 92.8	6.7 / 93.3	25.0 / 75.0	9.1 / 90.9
33	Primary Metal Industries	17,974,402	2,588,866	87,959,730	108,522,997	22.2 / 77.8	10.6 / 89.4	15.7 / 84.3	16.7 / 83.3
26	Paper Products	5,575,362	18,911,821	1,630,350	26,117,534	27.9 / 72.1	0.1 / 99.9	24.5 / 75.5	7.6 / 92.4
	Multiple Codes 20-39*	8,408,450	5,946,552	4,071,051	18,426,053	— / —	— / —	— / —	— / —
34	Fabricated Metals Products	4,837,954	1,262,363	6,546,678	12,646,995	16.0 / 84.0	1.4 / 98.6	12.0 / 88.0	12.5 / 87.5
20	Food Products	445,821	9,310,610	301,382	10,057,813	2.3 / 97.7	4.3 / 95.7	0.0 / 100.0	4.1 / 95.9
36	Electronic/Electrical Equipment	2,448,821	3,195,228	4,191,336	9,835,385	11.7 / 88.3	0.8 / 99.2	5.9 / 94.1	5.7 / 94.3
37	Transportation Equipment	2,688,891	1,272,351	4,778,578	8,739,820	23.1 / 76.9	6.2 / 93.8	5.5 / 94.5	11.0 / 89.0
30	Rubber and Plastics Products	1,965,802	735,373	5,323,393	8,024,568	29.2 / 70.8	0.2 / 99.8	7.9 / 92.1	12.4 / 87.6
29	Petroleum and Coal Products	464,704	2,490,630	1,771,285	4,726,619	3.3 / 96.7	1.9 / 98.1	20.4 / 79.6	8.9 / 91.1
32	Stone/Clay/Glass Products	920,732	315,075	2,582,821	3,818,627	14.9 / 85.1	6.3 / 93.7	9.7 / 90.3	10.6 / 89.4
35	Industrial Machinery	637,615	911,487	1,421,747	2,970,849	6.5 / 93.5	0.0 / 100.0	6.2 / 93.8	4.3 / 95.7
38	Measurement/Photographic Inst.	1,592,000	282,196	289,836	2,164,032	0.1 / 99.9	0.0 / 100.0	0.0 / 100.0	0.1 / 99.9
39	Misc. Manufacturing Industries	281,561	387,477	986,993	1,656,032	10.7 / 89.3	21.5 / 78.5	10.0 / 90.0	12.8 / 87.2
22	Textile Mill Products	259,186	1,086,881	222,449	1,568,516	3.0 / 97.0	0.0 / 100.0	0.1 / 99.9	0.5 / 99.5
31	Leather Products	5,430	564,769	631,707	1,201,907	44.2 / 55.8	11.5 / 88.5	0.0 / 100.0	5.6 / 94.4
25	Furniture and Fixtures	360,087	38,203	48,071	446,361	2.2 / 97.8	0.0 / 100.0	0.1 / 99.9	1.7 / 98.3
27	Printing and Publishing	345,042	62,724	24,821	432,587	50.1 / 49.9	0.0 / 100.0	0.0 / 100.0	39.9 / 60.1
24	Lumber and Wood Products	161,308	8,284	145,116	314,708	32.8 / 67.2	0.0 / 100.0	8.6 / 91.4	20.8 / 79.2
21	Tobacco Products	2,063	38,949	9,445	50,458	— / —	— / —	— / —	— / —
23	Apparel and Other Textile Products	27,347	116	12,559	40,021	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
	<b>Total</b>	<b>117,107,768</b>	<b>100,254,236</b>	<b>138,582,168</b>	<b>355,944,172</b>	<b>11.2 / 88.8</b>	<b>4.4 / 95.6</b>	<b>14.9 / 85.1</b>	<b>10.7 / 89.3</b>

\* Multiple SIC codes reported only in US data.

► Canada and US data only, Mexico data not collected for 1995.



**Table 3-18**  
**North American Projections of Total Releases and Transfers, NPRI and TRI**

**M** 1995

	Actual Volume 1995 (kg)	Projections for 1996 (kg)	Change 1995-1996 (%)	Projections for 1997 (kg)	Change 1995-1997 (%)
NPRI	155,004,060	139,767,641	-9.8	132,655,719	-14.4
TRI*	1,138,388,073	1,124,535,737	-1.2	1,091,755,576	-4.1
<b>Total</b>	<b>1,293,392,133</b>	<b>1,264,303,378</b>	<b>-2.2</b>	<b>1,224,411,295</b>	<b>-5.3</b>

\* Sections 8.1 plus 8.7 on TRI Form R.  
 ➤ Canada and US data only, Mexico data not collected for 1995.

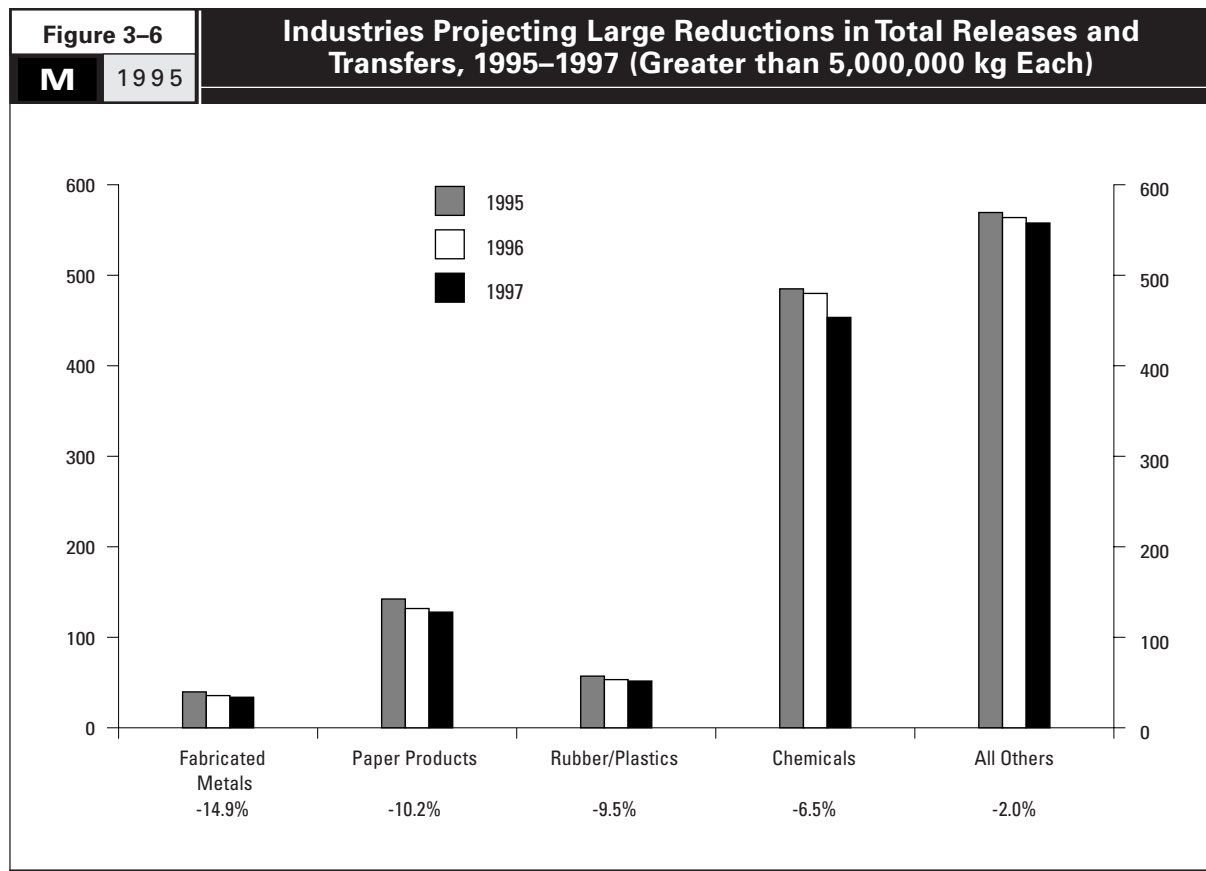


Table 3-19		North American Projections of Total Releases and Transfers, NPRI and TRI, by Industry									
M		1995									
US SIC Code	Industry	NPRI Number of Forms	NPRI Total Releases and Transfers				TRI Number of Forms	TRI Total Releases and Transfers*			
			Projections 1995 (kg)	Projections for 1996 (kg)	Projections for 1997 (kg)	Change 1995-1997 (%)		Projections 1995 (kg)	Projections for 1996 (kg)	Projections for 1997 (kg)	Change 1995-1997 (%)
28	Chemicals	1,443	51,621,155	47,511,182	44,598,850	-13.6	16,721	433,370,269	432,422,237	408,832,542	-5.7
33	Primary Metal Industries	583	36,430,425	34,671,128	33,311,792	-8.6	5,773	220,649,551	228,187,444	232,064,690	5.2
26	Paper Products	312	29,332,344	20,024,874	18,253,669	-37.8	1,864	112,968,291	111,761,217	109,561,633	-3.0
	Multiple Codes 20-39**	0	0	0	0	—	4,306	72,652,034	74,088,668	71,235,975	-1.9
30	Rubber and Plastics Products	279	7,203,374	7,027,478	6,684,718	-7.2	3,079	49,893,476	46,213,275	44,979,067	-9.8
37	Transportation Equipment	304	7,965,107	7,602,059	7,384,559	-7.3	3,766	47,840,890	44,609,872	44,549,519	-6.9
34	Fabricated Metal Products	371	3,375,124	3,943,867	3,894,455	15.4	6,459	36,290,298	31,643,398	29,865,335	-17.7
29	Petroleum and Coal Products	364	10,514,283	10,407,630	10,263,648	-2.4	2,799	28,014,976	27,892,208	27,381,755	-2.3
20	Food Products	105	670,681	942,247	927,904	38.4	3,178	23,630,014	23,190,810	23,115,685	-2.2
25	Furniture and Fixtures	31	513,169	532,493	549,093	7.0	1,337	20,469,197	19,565,068	19,454,566	-5.0
36	Electronic/Electrical Equipment	91	824,859	770,555	718,850	-12.9	2,603	18,327,488	16,685,010	16,163,353	-11.8
24	Lumber and Wood Products	139	1,332,915	1,450,642	1,506,388	13.0	1,606	13,295,147	12,558,088	12,096,057	-9.0
27	Printing and Publishing	40	1,293,131	1,266,453	1,214,898	-6.0	414	12,948,230	12,446,123	12,291,883	-5.1
32	Stone/Clay/Glass Products	90	1,691,643	1,335,711	1,107,290	-34.5	1,363	11,956,761	11,061,434	10,621,638	-11.2
35	Industrial Machinery	69	616,503	865,601	1,045,644	69.6	2,411	10,649,645	9,900,643	9,073,835	-14.8
22	Textile Mill Products	19	971,404	937,658	826,658	-14.9	586	8,819,174	7,558,791	7,164,151	-18.8
38	Measurement/Photographic Inst.	1	1,501	1,501	1,501	0.0	608	7,425,856	6,250,744	5,670,287	-23.6
39	Misc. Manufacturing Industries	81	335,954	238,562	234,802	-30.1	665	6,513,186	5,879,521	5,248,764	-19.4
31	Leather Products	4	85,488	78,000	75,000	-12.3	169	1,938,873	1,873,315	1,802,784	-7.0
23	Apparel and Other Textile Products	2	225,000	160,000	56,000	-75.1	38	486,939	500,332	320,471	-34.2
21	Tobacco Products	0	0	0	0	—	19	247,777	247,541	261,586	5.6
	<b>Total</b>	<b>4,328</b>	<b>155,004,060</b>	<b>139,767,641</b>	<b>132,655,719</b>	<b>-14.4</b>	<b>59,764</b>	<b>1,138,388,073</b>	<b>1,124,535,737</b>	<b>1,091,755,576</b>	<b>-4.1</b>

\* As reported in Sections 8.1 and 8.7 of TRI Form R.

\*\* Multiple SIC codes reported only in US data.

► Canada and US data only, Mexico data not collected for 1995.



US SIC Code	Number of Forms	Total Releases and Transfers			
		1995 (kg)	Projections for 1996 (kg)	Projections for 1997 (kg)	Change 1995-1997 (%)
28	18,164	484,991,424	479,933,419	453,431,392	-6.5
33	6,356	257,079,976	262,858,572	265,376,482	3.2
26	2,176	142,300,635	131,786,091	127,815,302	-10.2
	4,306	72,652,034	74,088,668	71,235,975	-1.9
30	3,358	57,096,850	53,240,753	51,663,785	-9.5
37	4,070	55,805,997	52,211,931	51,934,078	-6.9
34	6,830	39,665,422	35,587,265	33,759,790	-14.9
29	3,163	38,529,259	38,299,838	37,645,403	-2.3
20	3,283	24,300,695	24,133,057	24,043,589	-1.1
25	1,368	20,982,366	20,097,561	20,003,659	-4.7
36	2,694	19,152,347	17,455,565	16,882,203	-11.9
24	1,745	14,628,062	14,008,730	13,602,445	-7.0
27	454	14,241,361	13,712,576	13,506,781	-5.2
32	1,453	13,648,404	12,397,145	11,728,928	-14.1
35	2,480	11,266,148	10,766,244	10,119,479	-10.2
22	605	9,790,578	8,496,449	7,990,809	-18.4
38	609	7,427,357	6,252,245	5,671,788	-23.6
39	746	6,849,140	6,118,083	5,483,566	-19.9
31	173	2,024,361	1,951,315	1,877,784	-7.2
23	40	711,939	660,332	376,471	-47.1
21	19	247,777	247,541	261,586	5.6
	<b>64,092</b>	<b>1,293,392,133</b>	<b>1,264,303,378</b>	<b>1,224,411,295</b>	<b>-5.3</b>