Chapter 3: On-site Releases

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Key Findings

- In 1997, North American facilities released 847.8 million kg of listed substances as reported to TRI and NPRI. These on-site releases represent the total for all chemicals and industries covered by the matched data set.
- Total releases declined nine percent from 1995 to 1997. NPRI facilities reported a 13 percent reduction. In TRI, the decrease was eight percent.
- For both NPRI and TRI, air emissions decreased. NPRI facilities reported a six percent decrease and TRI facilities a 17 percent decrease in air emissions from 1995 to 1997. Increases were reported by NPRI facilities in underground injection (18 percent) and by TRI facilities in surface water discharges (27 percent) and on-site land releases (eight percent). All other types of releases declined.
- Canadian facilities accounted for seven percent of the facilities and reporting forms in the 1997 matched data, but contributed closer to 10 percent of the on-site releases, including 12 percent of North American emissions to air. With 93 percent of the North American facilities and forms, the US TRI facilities reported nearly 91 percent of the on-site releases.
- More than one-quarter of all North American releases in the matched data set originated in four states and provinces: Texas, Louisiana, Utah and Ontario.
- Both Texas and Ontario facilities reported a decrease in on-site releases from 1995 to 1997 (21 percent for Texas and 13 percent for Ontario). However, Louisiana and Utah facilities reported increases (four percent for Louisiana and 23 percent for Utah).
- Fifty facilities with the largest releases in North America reported one-third (34 percent) of total releases in 1997, although they represented just 0.2 percent of all facilities in the matched data set.
- Industries reporting the largest releases were the same in NPRI and in TRI, but did not appear in the same order. The primary metals industry reported the largest NPRI releases, followed by chemical manufacturing and paper products. In TRI, chemical manufacturing ranked first for total releases, followed by primary metals and paper products.
- Two chemical groups of special concern did not share in the overall reduction of releases from 1995 to 1997. NPRI releases decreased less than one percent both for substances designated as known or suspected carcinogens and for metals. Although TRI facilities reported a three percent decrease in releases of designated carcinogens, their releases of metals rose by 18 percent.
- Of the three industries contributing the largest releases in NPRI and TRI, two—chemical manufacturing and paper products—reported decreases from 1995 to 1997. In both countries, releases reported by the primary metals industry increased.

3.1 Introduction

This chapter examines reporting of on-site releases of PRTR-listed substances in North America. These releases—to air, water, land, or underground injection wells—occur at the facility. As explained in **Chapter 2**, this chapter analyzes data for industries and chemicals that must be reported in both the US and Canada (the matched data set). Mexican data are not available for the 1997 reporting year.

The data for on-site releases for 1997 are presented first: those for the combined North American data followed by separate sections devoted to NPRI and TRI reporting for 1997 in the matched data set. Then there is a section on the changes in on-site releases from 1995 to 1997, again looking at the combined North American data followed by NPRI and TRI separately.

Each part first presents geographic data for the states and provinces; then data on the 50 facilities with the largest reported amounts; data by chemical for substances with the largest amounts, for designated carcinogens, and for metals; and finally data by industry sector.

Table 3–1
M 1997

North American On-site Releases, NPRI and TRI, 1997

	North America		Canadian NPRI*		US TRI		NPRI as % of North American Total	TRI as % of North American Total
	Number		Number		Number			
Total Facilities	20,555		1,430		19,125		7.0	93.0
Total Forms	62,851		4,599		58,252		7.3	92.7
On-site Releases	**kg**	**%**	**kg**	**%**	**kg**	**%**		
Total Air Emissions	512,213,962	60.4	62,838,622	78.1	449,375,340	58.6	12.3	87.7
Surface Water Discharges	98,842,863	11.7	4,224,169	5.3	94,618,694	12.3	4.3	95.7
Underground Injection	78,847,314	9.3	4,197,660	5.2	74,649,654	9.7	5.3	94.7
On-site Land Releases	157,720,611	18.6	9,062,108	11.3	148,658,503	19.4	5.7	94.3
Total Releases	**847,751,115**	**100.0**	**80,448,924**	**100.0**	**767,302,191**	**100.0**	**9.5**	**90.5**

* The sum of individual release types for NPRI will not equal total releases because total releases of less than 1 tonne may be reported as total releases only.
➤ Canada and US data only. Mexico data not collected for 1997.

3.2 1997 On-site Releases

In 1997, 20,555 North American facilities in industries covered by both the Canadian NPRI and the US TRI filed 62,851 reports on the substances that are common to both PRTRs (**Table 3–1**).

The 1,430 facilities reporting to Canada's NPRI and the 4,599 forms they submitted represented seven percent of the North American totals in the matched data set. The 19,125 US TRI facilities and their 58,252 forms accounted for 93 percent of these totals.

3.2.1 North American Releases

Overview

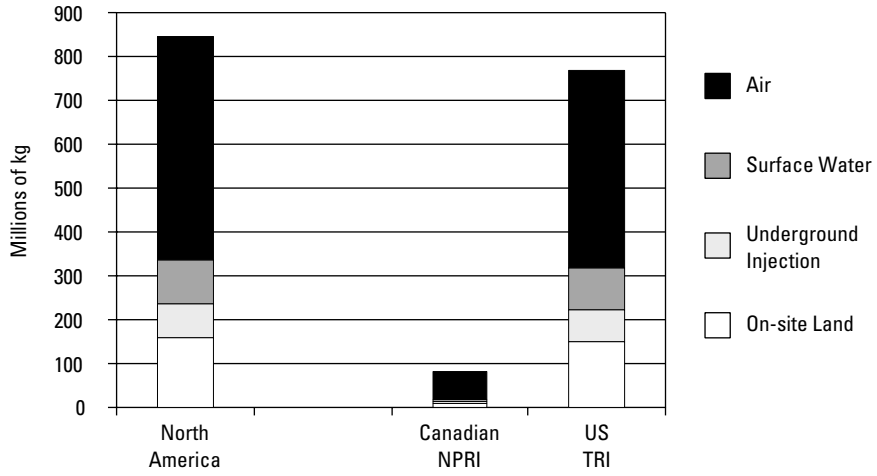
On-site releases in North America totaled 847.8 million kg in 1997 for the matched data set. Most of the North American reporting occurs in the United States, with its larger industrial base. NPRI facilities reported 80.4 million kg or 9.5 percent of the North American releases, while TRI facilities reported 767.3 million kg or 90.5 percent of the total. With seven percent of the facilities and forms, NPRI reporting thus contributed a somewhat larger portion of North American releases than might be expected (**Table 3–1**).

North American facilities reported releasing 512.2 million kg of listed substances to air in 1997. This amounted to 60 percent of North American releases. Discharges to surface water totaled 98.8 million kg, 12 percent of the total. Facilities also injected 78.8 million kg of listed substances in the matched data set into underground wells, which represented nine percent of all releases. On-site land disposal, the second-largest release type, totaled 157.7 million kg or 19 percent of the total (**Figures 3–1** and **3–2**).

Canadian facilities reported 12 percent of North American air emissions, but six percent or less of the other release types. US facilities reported 96 percent of the surface water discharges, 95 percent of the underground injection, and 94 percent of the on-site land releases.

Figure 3–1
M 1997

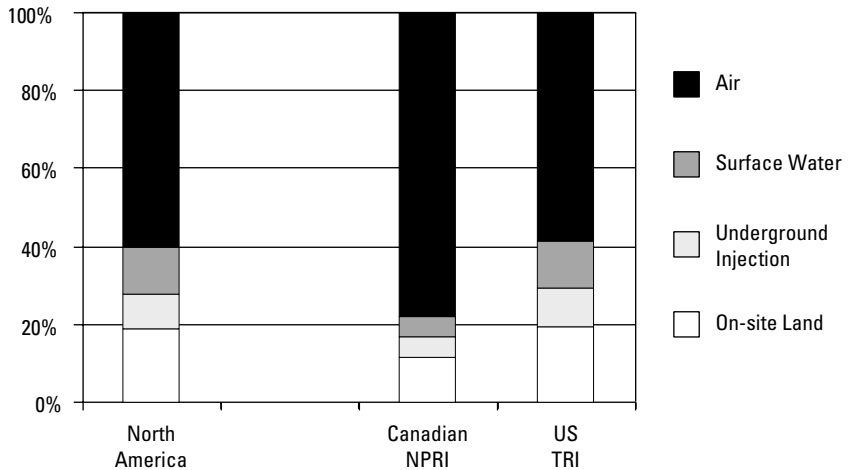
North American On-site Releases by Type, NPRI and TRI, 1997



➤ Canada and US data only. Mexico data not collected for 1997.

Figure 3–2
M 1997

Distribution of North American On-site Releases, NPRI and TRI, 1997



➤ Canada and US data only. Mexico data not collected for 1997.

Releases by State and Province

More than one-quarter of all North American releases in the matched data set originated in four states and provinces: Texas, Louisiana, Utah and Ontario. Texas reported the largest releases, with 83.9 million kg. Texas facilities reported the largest amounts of air emissions (38.7 million kg) and underground injection (27.1 million kg—**Table 3–2** and **Maps 3–1** through **3–5**).

Louisiana ranked second among states and provinces for total releases, with 63.2 million kg. Surface water discharges in Louisiana totaled 20.9 million kg, more than in any other state or province. Facilities in Louisiana also reported 18.8 million kg released to underground injection, second only to Texas.

Facilities in Utah reported 41.8 million kg of releases, the third-largest total, and those in Ontario reported 40.0 million kg, the fourth-largest total. Utah and Ontario did not lead in any release category, but on-site releases to land totaled 12.0 million kg in Utah, the third-largest amount among states and provinces. Ontario's air emissions totaled 36.0 million kg, second behind Texas. The largest on-site land releases were reported in Montana (17.1 million kg), although this state ranked 19th for total releases.

Four states and provinces had releases of less than 500,000 kg. They were Newfoundland, Prince Edward Island, Vermont and Hawaii. Facilities in the District of Columbia reported no releases.

Table 3–2

M 1997

North American On-site Releases, by Province and State, 1997

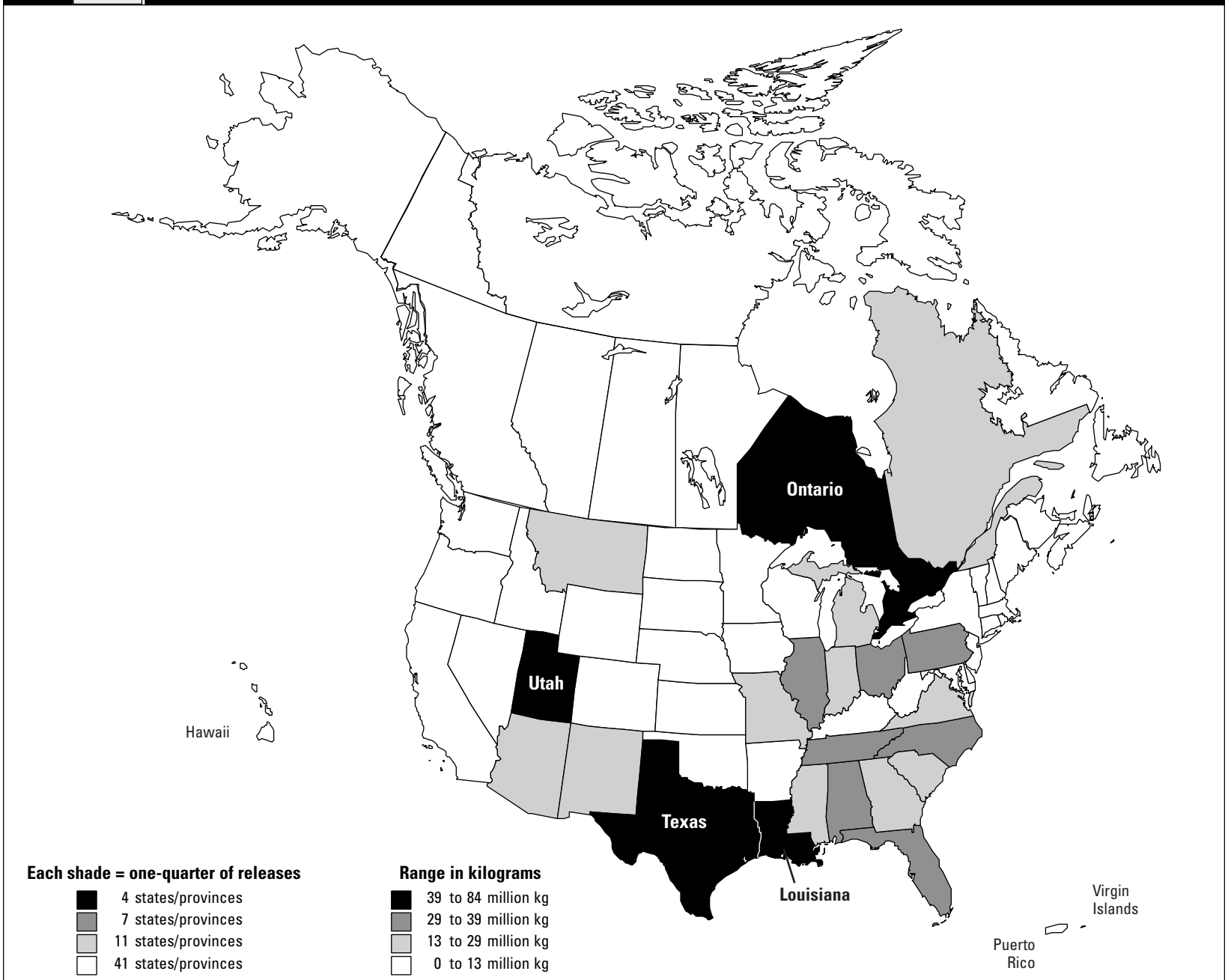
Province/State	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
Texas	38,699,081	9,086,284	27,113,580	8,984,055	83,883,000
Louisiana	20,218,057	20,906,839	18,788,650	3,310,832	63,224,378
Utah	29,292,846	551,154	0	11,991,001	41,835,001
Ontario	36,049,425	1,149,543	0	2,682,311	39,955,770
Ohio	18,397,663	2,519,375	4,146,794	11,928,550	36,992,382
Tennessee	29,475,027	433,000	3,857,299	2,112,648	35,877,974
Pennsylvania	15,581,050	17,384,468	0	748,188	33,713,706
Florida	9,799,141	3,691,701	9,816,593	8,706,340	32,013,775
Illinois	17,846,951	2,158,283	1,520	11,138,116	31,144,870
Alabama	24,083,443	1,814,015	4	4,302,073	30,199,535
North Carolina	17,855,348	2,834,574	13,197	8,332,258	29,035,377
Indiana	19,026,535	884,957	87,618	7,812,085	27,811,195
Mississippi	13,104,815	5,277,258	3,851,531	2,519,643	24,753,247
Missouri	12,486,375	1,255,584	0	9,037,762	22,779,721
Georgia	16,090,372	3,074,232	0	1,209,219	20,373,823
Michigan	16,610,760	163,603	2,151,240	1,074,965	20,000,568
South Carolina	17,660,101	1,078,794	0	611,086	19,349,981
Virginia	17,163,630	1,657,917	0	526,512	19,348,059
Montana	1,560,643	38,172	0	17,100,808	18,699,623
Quebec	10,042,745	1,195,907	0	3,384,956	14,649,326
Arizona	3,657,642	19	2	9,778,878	13,436,541
New Mexico	919,208	3,648	0	12,364,744	13,287,600
Kentucky	10,746,890	254,436	0	1,241,926	12,243,252
Alberta	6,535,005	422,063	4,195,518	825,838	11,987,370
Wisconsin	10,144,520	1,297,358	2	513,695	11,955,575
New York	9,265,335	1,901,094	113	540,875	11,707,417
Arkansas	7,448,214	727,009	656,793	1,395,928	10,227,944
Oregon	6,508,451	1,915,261	0	1,253,309	9,677,021
California	6,743,559	1,855,386	13,217	309,372	8,921,534
Washington	7,685,887	947,713	0	102,277	8,735,877
West Virginia	4,885,110	2,957,563	0	22,647	7,865,320
Iowa	5,808,061	1,117,395	0	904,592	7,830,048
Kansas	6,125,545	249,930	425,762	427,013	7,228,250
Idaho	1,073,907	508,103	0	4,647,354	6,229,364
Oklahoma	4,772,487	293,724	750,444	251,223	6,067,878
New Jersey	3,406,353	2,091,688	0	524,913	6,022,954
British Columbia	5,099,159	281,346	0	70,769	5,459,128
Minnesota	5,238,940	66,321	0	65,957	5,371,218
Maryland	2,399,558	884,574	0	1,162,227	4,446,359
Wyoming	562,694	176	2,975,170	27,637	3,565,677
Manitoba	1,584,802	34,570	0	1,774,178	3,397,552
Maine	2,398,587	420,723	0	127,781	2,947,091
Puerto Rico	2,893,226	476	0	600	2,894,302
New Brunswick	1,467,892	878,778	0	8,254	2,357,036
Connecticut	2,004,136	292,732	0	17,516	2,314,384
Nebraska	1,891,807	219,271	0	29,920	2,140,998
Massachusetts	2,048,545	21,932	0	8,731	2,079,208
Nevada	586,225	0	0	1,235,152	1,821,377
South Dakota	526,009	816,327	0	1,060	1,343,396
Colorado	874,450	410,834	0	46,067	1,331,351
Nova Scotia	710,039	45,264	0	308,191	1,063,517
Delaware	780,983	94,961	0	135,131	1,011,075
New Hampshire	859,600	39,392	0	71,547	970,539
Saskatchewan	921,011	20,722	2,142	55	946,849
Rhode Island	702,832	952	0	1,964	705,748
Alaska	398,450	141,154	122	766	540,492
Virgin Islands	536,198	671	0	666	537,535
North Dakota	315,176	193,895	0	776	509,847
Newfoundland	409,896	1,054	0	1,356	412,606
Prince Edward Island	18,648	194,922	0	6,200	219,770
Vermont	91,314	83,508	0	118	174,940
Hawaii	123,603	258	3	0	123,864
District of Columbia	0	0	0	0	0
Total	**512,213,962**	**98,842,863**	**78,847,314**	**157,720,611**	**847,751,115**

➤ Canada and US data only. Mexico data not collected for 1997.

Map 3–1

M 1997

North American On-site Releases, 1997: States and Provinces

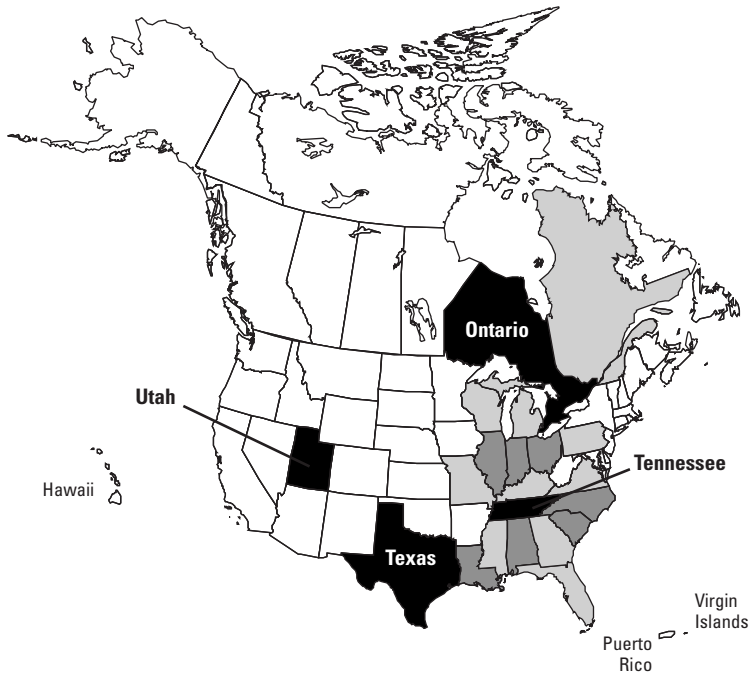


➤ Canada and US data only. Mexico data not collected for 1997.

Map 3–2

M 1997

North American On-site Releases to Air, 1997: States and Provinces



Each shade = one-quarter of releases

4	states/provinces
7	states/provinces
10	states/provinces
42	states/provinces

Range in kilograms

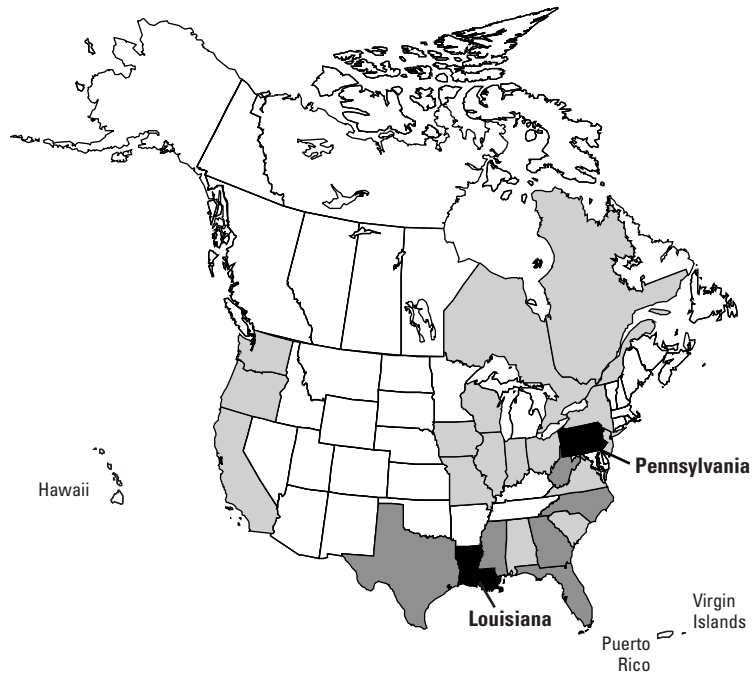
29.0 to 39.0	million kg
17.5 to 29.0	million kg
9.5 to 17.5	million kg
0 to 9.5	million kg

➤ Canada and US data only. Mexico data not collected for 1997.

Map 3–3

M 1997

North American On-site Releases to Surface Waters, 1997: States and Provinces



Each shade = one-quarter of releases

2	states/provinces
6	states/provinces
16	states/provinces
39	states/provinces

Range in kilograms

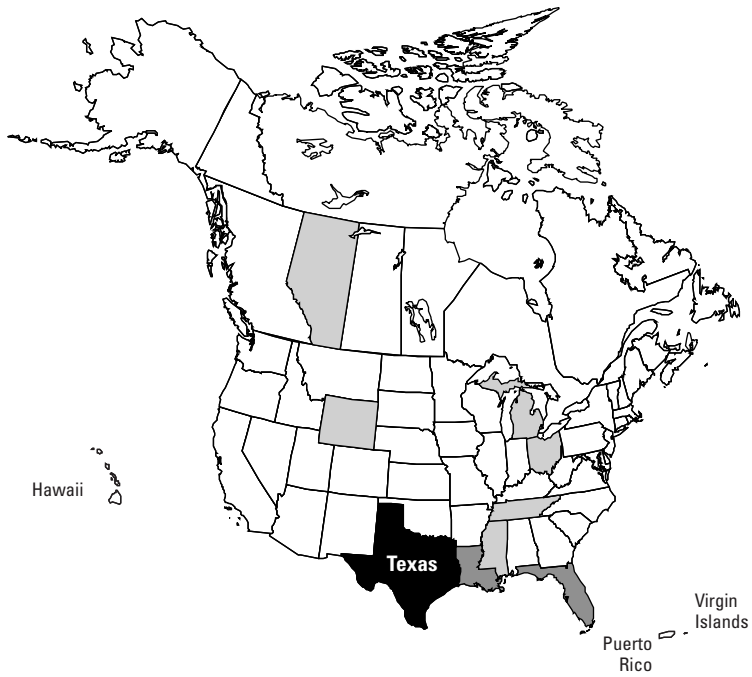
15.0 to 21.0	million kg
2.7 to 15.0	million kg
0.8847 to 2.7	million kg
0 to 0.8847	million kg

➤ Canada and US data only. Mexico data not collected for 1997.

Map 3–4

M 1997

North American On-site Releases to Underground Injection, 1997: States and Provinces



Each shade = one-quarter of releases

1	state/province
2	states/provinces
6	states/provinces
54	states/provinces

Range in kilograms

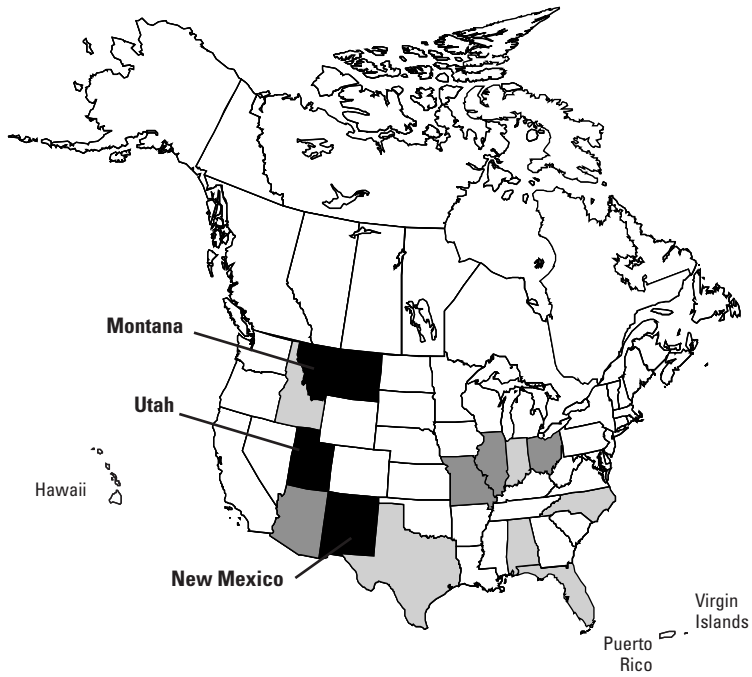
20 to 28	million kg
9 to 20	million kg
1 to 9	million kg
0 to 1	million kg

➤ Canada and US data only. Mexico data not collected for 1997.

Map 3–5

M 1997

North American On-site Releases to Land, 1997: States and Provinces



Each shade = one-quarter of releases

3	states/provinces
4	states/provinces
6	states/provinces
50	states/provinces

Range in kilograms

11.99 to 18.00	million kg
9.00 to 11.99	million kg
4.00 to 9.00	million kg
0 to 4.00	million kg

➤ Canada and US data only. Mexico data not collected for 1997.

Top Facilities

The 50 North American facilities with the largest releases in the matched data set reported 285.3 million kg of releases in 1997. Although they represented just 0.2 percent of the reporting facilities, these facilities contributed 34 percent of total North American releases (**Table 3–3** and **Figure 3–3**).

These 50 facilities reported the majority of North American underground injection (62.9 million kg or 80 percent of the North American total) and on-site land releases (113.1 million kg or 72 percent of the total). However, they reported less than half the surface water discharges (43.5 million kg or 44 percent) and a much smaller portion of the air emissions (65.8 million kg or 13 percent).

Thus, for the top facilities, air emissions were markedly smaller, and on-site land releases and underground injection larger, than for other facilities as a whole. Air emissions constituted 23 percent of the top 50 facilities' releases, while on-site land releases represented 40 percent and underground injection 22 percent. For other facilities, air emissions were 79 percent of the total, on-site land releases eight percent, and underground injection three percent (**Figure 3–4**).

Table 3–3

M 1997

The 50 North American Facilities with the Largest Total Releases, 1997

Rank	Facility	City, State/Province	SIC Codes Canada	SIC Codes US	Number of Forms
1	Magnesium Corp. of America, Renco Group Inc.	Rowley, UT		33	6
2	ASARCO Inc.	East Helena, MT		33	10
3	PCS Nitrogen Fertilizer L.P., Potash Corp. of Saskatchewan	Geismar, LA		28	12
4	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM		33	13
5	Armco Inc. (Route 8 S.)	Butler, PA		33	14
6	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT		33	14
7	Solutia Inc.	Gonzalez, FL		28	18
8	DuPont	Victoria, TX		28	29
9	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ		33	13
10	Lenzing Fibers Corp.	Lowland, TN		28	5
11	Cytec Ind. Inc., Fortier Plant	Westwego, LA		28	24
12	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN		33	33
13	Courtaulds Fibers Inc., Courtaulds Finance U.S. Inc.	Axis, AL		28	4
14	Northwestern Steel & Wire Co.	Sterling, IL		33	6
15	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX		28	2
16	BASF Corp.	Freeport, TX		28	26
17	GM Powertrain Defiance, General Motors Corp.	Defiance, OH		33	20
18	Elkem Metals Co.	Marietta, OH		33	6
19	ASARCO Inc., Glover Plant	Annapolis, MO		33	7
20	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	7
21	BP Chemicals Inc., BP America Inc.	Lima, OH		28	27
22	BP Chemicals Inc., Green Lake, BP America Inc.	Port Lavaca, TX		28	17
23	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC		28	1
24	DuPont	Pass Christian, MS		28	11
25	PCS Phosphate Co. Inc., Potash Corp. of Saskatchewan	Aurora, NC		28	6
26	Doe Run Co., Renco Group Inc.	Herculaneum, MO		33	9
27	Celanese Canada Inc.	Edmonton, AB	37	28	11
28	Vicksburg Chemical Co.	Vicksburg, MS		28	3
29	DuPont	New Johnsonville, TN		28	11
30	Rubicon Inc.	Geismar, LA		28	24
31	Monsanto Co.	Luling, LA		28	14
32	FMC Corp.	Pocatello, ID		28	12
33	Mulberry Phosphates Inc., Mulberry Corp.	Mulberry, FL		28	4
34	Eastman Kodak Co., Kodak Park	Rochester, NY		38	46
35	Coastal Chem Inc., Coastal Corp.	Cheyenne, WY		28	12
36	Angus Chemical Co.	Sterlington, LA		28	11
37	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ		33	13
38	Sterling Chemicals Inc.	Texas City, TX		28	34
39	DuPont	Beaumont, TX		28	22
40	Granite City Steel, National Steel Corp.	Granite City, IL		33	22
41	PCS Phosphate Co. Inc., Potash Corp. of Saskatchewan	White Springs, FL		28	4
42	Tennessee Eastman Div., Eastman Chemical Co.	Kingsport, TN		28	63
43	IMC-Agrico Co., IMC Global Inc.	Saint James, LA		28	6
44	Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur, QC	29	33	5
45	USS Fairfield Works, USX Corp.	Fairfield, AL		33	15
46	International Paper Co.	Hampton, SC		30	10
47	Exxon Co. USA, Baton Rouge Refinery, Exxon Corp.	Baton Rouge, LA		29	32
48	Westvaco Corp., Bleached Board Div.	Covington, VA		26	16
49	Kerr-McGee Chemical LLC, Kerr-McGee Corp.	Hamilton, MS		Mult.	5
50	Nova Chemicals (Canada) Ltd., St. Clair Site	Corunna, ON	37	28	7
	Subtotal				**742**
	% of Total				**1.2**
	Total				**62,851**

➤ Canada and US data only. Mexico data not collected for 1997

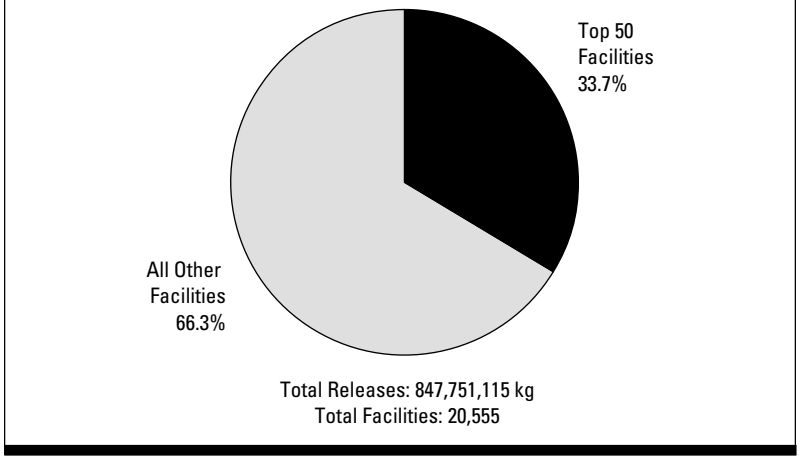
Rank	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	28,270,233	0	0	0	28,270,233	Chlorine (air)
2	47,346	2,280	0	17,100,454	17,150,080	Zinc and compounds (land)
3	48,716	13,487,112	0	291,886	13,827,714	Phosphoric acid (water)
4	288,368	3,644	0	12,053,733	12,345,745	Zinc/Copper and compounds (land)
5	98,510	11,793,413	0	0	11,891,923	Nitric acid and nitrate compounds (water)
6	109,489	4,441	0	10,908,661	11,022,591	Copper/Zinc/Lead and compounds (land)
7	103,557	826	9,712,998	0	9,817,381	Nitric acid and nitrate compounds (UIJ)
8	176,213	791	8,861,812	5,445	9,044,261	Nitric acid and nitrate compounds (UIJ)
9	92,972	0	0	8,503,492	8,596,464	Copper and compounds (land)
10	7,619,166	2,879	0	142,766	7,764,811	Carbon disulfide (air)
11	71,934	3,167	7,594,695	0	7,669,796	Acetonitrile, Acrylic acid, Acrylamide (UIJ)
12	777,508	13,242	0	6,463,719	7,254,469	Zinc and compounds (land)
13	6,848,254	9,265	0	175,510	7,033,029	Carbon disulfide (air)
14	60,613	7,982	0	6,716,100	6,784,695	Zinc/Manganese and compounds (land)
15	2,131	703	0	6,575,964	6,578,798	Chromium and compounds (land)
16	143,873	6,353,578	5,407	0	6,502,858	Nitric acid and nitrate compounds (water)
17	333,612	18,744	0	5,620,881	5,973,237	Zinc and compounds (land)
18	174,841	205,442	0	4,752,382	5,132,665	Manganese and compounds (land)
19	28,690	10	0	4,892,495	4,921,195	Zinc/Lead and compounds (land)
20	4,259,786	0	0	649,000	4,908,786	Sulfuric acid (air)
21	142,400	0	4,146,788	0	4,289,188	Acetonitrile, Acrylamide, Cyanide compounds (UIJ)
22	54,412	306	4,198,418	3,985	4,257,121	Acetonitrile, Acrylamide, Acrylonitrile (UIJ)
23	2,843	14	0	4,126,984	4,129,841	Chromium and compounds (land)
24	282,458	0	3,809,524	0	4,091,982	Manganese and compounds (UIJ)
25	163,429	0	0	3,805,895	3,969,324	Phosphoric acid (land)
26	119,063	183	0	3,839,901	3,959,147	Zinc and compounds (land)
27	294,315	0	3,542,000	593	3,836,908	Methanol, Methyl ethyl ketone (UIJ)
28	34,454	3,668,877	0	0	3,703,331	Nitric acid and nitrate compounds (water)
29	33,946	32,986	3,516,553	57	3,583,542	Manganese and compounds (UIJ)
30	144,879	79	3,274,650	0	3,419,608	Nitric acid and nitrate compounds, Methanol (UIJ)
31	38,598	90,123	3,277,869	0	3,406,590	Formaldehyde (UIJ)
32	13,048	338	0	3,362,448	3,375,834	Zinc and compounds, Phosphorus (land)
33	12,939	3,170,390	0	0	3,183,329	Phosphoric acid (water)
34	2,750,339	288,950	0	18,603	3,057,892	Dichloromethane, Hydrochloric acid, Methanol (air)
35	11,497	0	2,975,170	109	2,986,776	Nitric acid and nitrate compounds (UIJ)
36	59,908	96,610	2,800,966	0	2,957,484	Nitric acid and nitrate compounds, Formaldehyde (UIJ)
37	2,046,411	0	0	842,723	2,889,134	Copper and compounds (air)
38	367,117	2,312	2,502,904	0	2,872,333	Acetonitrile, Acrylamide, Nitric acid and nitrate compounds, tert-Butyl alcohol (UIJ)
39	119,905	315	2,672,011	0	2,792,231	Nitric acid and nitrate compounds (UIJ)
40	100,722	6,116	0	2,668,366	2,775,204	Zinc and compounds (land)
41	54,427	0	0	2,630,385	2,684,812	Phosphoric acid (land)
42	2,375,308	53,946	0	235,359	2,664,613	Hydrochloric acid, Methanol, Sulfuric acid, Toluene, Xylene, Hydrogen fluoride, Bromomethane, Ethylene glycol, Ethylene (air)
43	74,646	2,242,020	0	165,209	2,481,875	Phosphoric acid (water)
44	48,835	550	0	2,300,405	2,349,790	Zinc and compounds (land)
45	149,742	794	0	2,139,993	2,290,529	Zinc and compounds (land)
46	2,264,625	31	0	0	2,264,656	Methanol, Phenol (air)
47	371,814	1,859,247	0	1	2,231,062	Nitric acid and nitrate compounds (water)
48	2,102,416	35,531	0	52,444	2,190,391	Methanol, Hydrochloric acid (air)
49	4,946	6,145	0	2,066,666	2,077,757	Manganese and compounds (land)
50	2,045,900	480	0	0	2,046,380	Cyclohexane (air)
	65,841,154	**43,463,862**	**62,891,765**	**113,112,614**	**285,309,395**	
	12.9	**44.0**	**79.8**	**71.7**	**33.7**	
	512,213,962	**98,842,863**	**78,847,314**	**157,720,611**	**847,751,115**	

* Chemicals accounting for more than 70% of total releases from the facility.

➤ UIJ=underground injection

Figure 3–3 M 1997

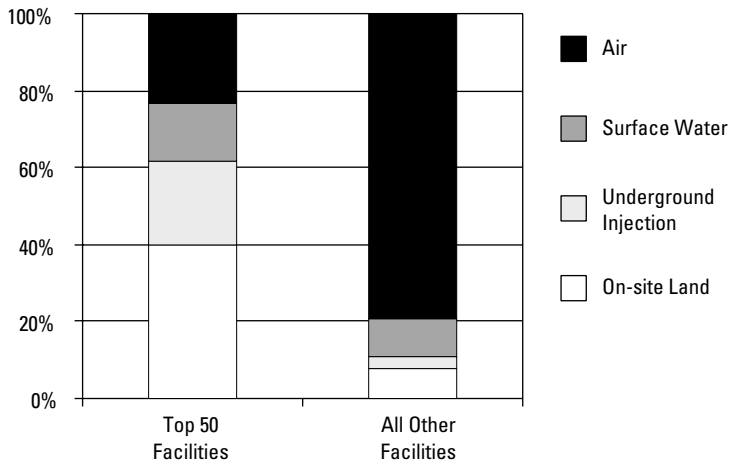
North American Releases, Top 50 Facilities and All Others, 1997



➤ Canada and US data only. Mexico data not collected for 1997.

Figure 3–4 M 1997

Distribution of North American Releases, Top 50 Facilities and All Others, 1997



➤ Canada and US data only. Mexico data not collected for 1997.

Releases by Chemical

There are 165 substances on both the TRI and NPRI lists. These are the substances in the matched data set. However, just 25 of these substances represented 89 percent of the total on-site releases in North America. Of the 165 substances, 48 are known or suspected carcinogens and 15 are metals with their compounds. These groups of substances are considered in more detail in this section.

Top Chemicals

North American facilities reported releasing more methanol—118.4 million kg—than any other chemical in the matched data set. Most releases of methanol, a volatile chemical, occurred as emissions to air—103.3 million kg in 1997. Releases of nitric acid and nitrate compounds, which ranked second after methanol, totaled 100.4 million kg. Most releases of nitric acid and nitrate compounds were surface water discharges, which totaled 70.1 million kg. Facilities also injected 27.3 million kg of nitric acid and nitrate compounds into underground wells. Zinc and its compounds ranked third for total releases, with 65.1 million kg, including 59.9 million kg of on-site land releases (**Table 3–4**).

The large surface water discharges of nitric acid and nitrate compounds and the large on-site land releases of zinc and its compounds significantly influenced the distribution of releases of the top 25 chemicals, compared to

[continued on page 50]

Table 3–4

M 1997

The 25 Chemicals with the Largest Releases in North America, 1997

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	103,309,718	4,307,908	10,320,650	441,758	118,386,601	15.0/ 85.0	26.8/ 73.2	22.5/ 77.5	1.6/ 98.4	16.1/ 83.9
—	Nitric acid and nitrate compounds	1,485,737	70,092,845	27,274,131	1,551,218	100,405,925	6.9/ 93.1	3.4/ 96.6	2.0/ 98.0	2.6/ 97.4	3.1/ 96.9
—	Zinc (and its compounds)	4,375,920	599,874	167,413	59,909,894	65,061,318	17.8/ 82.2	9.6/ 90.4	0.2/ 99.8	8.3/ 91.7	8.9/ 91.1
108-88-3	Toluene	57,178,994	19,940	254,014	336,874	57,797,513	10.7/ 89.3	30.2/ 69.8	8.3/ 91.7	0.5/ 99.5	10.6/ 89.4
1330-20-7	Xylene (mixed isomers)	39,882,720	19,179	73,134	37,564	40,022,182	16.0/ 84.0	14.1/ 85.9	18.5/ 81.5	7.7/ 92.3	16.0/ 84.0
—	Manganese (and its compounds)	1,111,400	2,207,366	6,536,436	28,832,410	38,696,839	4.6/ 95.4	10.6/ 89.4	0.0/100.0	5.6/ 94.4	4.9/ 95.1
7664-38-2	Phosphoric acid	832,953	19,749,343	6,012	13,708,634	34,298,617	1.9/ 98.1	0.1/ 99.9	0.0/100.0	0.0/100.0	0.1/ 99.9
7782-50-5	Chlorine	30,097,364	126,794	27,480	33,455	30,288,037	3.0/ 97.0	10.0/ 90.0	0.0/100.0	0.0/100.0	3.0/ 97.0
78-93-3	Methyl ethyl ketone	27,963,245	18,830	1,160,021	72,532	29,222,187	15.0/ 85.0	0.0/100.0	81.0/ 19.0	0.4/ 99.6	17.6/ 82.4
7647-01-0	Hydrochloric acid	27,562,613	0	0	0	27,562,613	5.1/ 94.9	—/ —	—/ —	—/ —	5.1/ 94.9
75-09-2	Dichloromethane	23,559,964	4,347	239,467	5,119	23,809,687	9.8/ 90.2	1.7/ 98.3	0.0/100.0	1.0/ 99.0	9.7/ 90.3
75-15-0	Carbon disulfide	23,138,230	12,992	234,723	2	23,387,547	0.1/ 99.9	0.0/100.0	0.0/100.0	0.0/100.0	0.1/ 99.9
—	Copper (and its compounds)	3,288,255	73,552	133,659	18,341,134	21,840,400	12.8/ 87.2	11.1/ 88.9	0.0/100.0	1.2/ 98.8	3.0/ 97.0
100-42-5	Styrene	20,784,435	19,930	91,848	225,402	21,127,342	3.9/ 96.1	0.0/100.0	0.1/ 99.9	0.2/ 99.8	3.9/ 96.1
74-85-1	Ethylene	15,682,265	422	1,194	52	15,684,983	12.7/ 87.3	0.5/ 99.5	0.0/100.0	3.8/ 96.2	12.7/ 87.3
—	Chromium (and its compounds)	471,955	63,146	513,398	14,208,243	15,262,424	8.4/ 91.6	20.6/ 79.4	0.0/100.0	5.1/ 94.9	5.1/ 94.9
7664-93-9	Sulfuric acid	13,941,694	0	0	0	13,941,694	32.0/ 68.0	—/ —	—/ —	—/ —	32.0/ 68.0
71-36-3	n-Butyl alcohol	10,875,063	36,162	1,415,908	15,668	12,347,082	11.0/ 89.0	0.0/100.0	0.0/100.0	0.2/ 99.8	9.7/ 90.3
50-00-0	Formaldehyde	6,786,773	317,389	4,552,904	51,377	11,712,702	23.0/ 77.0	64.7/ 35.3	1.3/ 98.7	0.0/100.0	15.6/ 84.4
—	Lead (and its compounds)	1,130,933	28,090	119,761	8,785,379	10,069,524	48.3/ 51.7	19.1/ 80.9	0.0/100.0	7.9/ 92.1	12.4/ 87.6
75-05-8	Acetonitrile	415,089	3,384	8,569,053	28	8,987,554	2.7/ 97.3	0.0/100.0	0.0/100.0	0.0/100.0	0.1/ 99.9
79-01-6	Trichloroethylene	8,616,177	251	447	1,802	8,619,908	8.1/ 91.9	0.0/100.0	0.0/100.0	0.0/100.0	8.1/ 91.9
115-07-1	Propylene	8,347,776	2,357	1,194	304	8,351,831	11.6/ 88.4	0.0/100.0	0.0/100.0	0.0/100.0	11.6/ 88.4
108-10-1	Methyl isobutyl ketone	7,938,745	8,681	39,183	1,882	7,990,948	9.1/ 90.9	0.0/100.0	0.0/100.0	1.5/ 98.5	9.1/ 90.9
7664-39-3	Hydrogen fluoride	7,349,802	14,262	0	6,823	7,370,891	23.5/ 76.5	0.0/100.0	—/ —	0.0/100.0	23.4/ 76.6
	Subtotal	**446,127,820**	**97,727,044**	**61,732,030**	**146,567,554**	**752,246,349**	**11.9/ 88.1**	**4.2/ 95.8**	**6.3/ 93.7**	**5.6/ 94.4**	**9.2/ 90.8**
	% of Total	**87.1**	**98.9**	**78.3**	**92.9**	**88.7**					
	Total	**512,213,962**	**98,842,863**	**78,847,314**	**157,720,611**	**847,751,115**	**12.3/ 87.7**	**4.3/ 95.7**	**5.3/ 94.7**	**5.7/ 94.3**	**9.5/ 90.5**

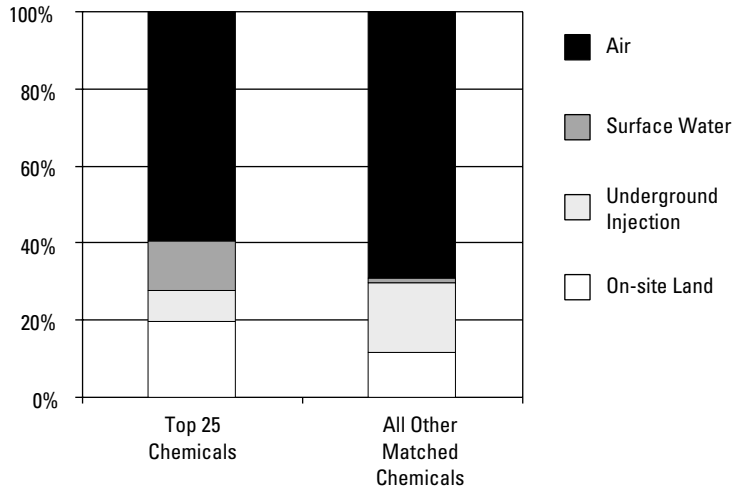
➤ Canada and US data only. Mexico data not collected for 1997.

other chemicals in the matched data set. Thirteen percent of total releases of the top 25 chemicals consisted of surface water discharges, while on-site land disposal represented 20 percent. For all other matched chemicals, surface waters received one percent of total releases and on-site land disposal received 12 percent (**Figure 3–5**).

(**Appendix C** presents information on potential health effects of substances with the largest releases and transfers as reported to the North American PRTRs, from the US Agency for Toxic Substances and Disease Registry, US EPA's Office of Pollution Prevention and Toxics and the New Jersey Department of Health and Senior Services. **Appendix C** also describes uses of these substances.)

Figure 3–5
M 1997

Distribution of North American Releases, Top 25 Chemicals and All Others, 1997



➤ Canada and US data only. Mexico data not collected for 1997.

Carcinogens

In 1997, North American facilities reported releasing 128.0 million kg of substances designated as known or suspected carcinogens by the International Agency for Research on Cancer (IARC) <http://www.iarc.fr/> or by the US National Toxicological Program (NTP) <http://ntp-server.niehs.nih.gov/> (**Table 3–5**). Fifteen percent of all releases in 1997 consisted of designated carcinogens.

Dichloromethane was released in the largest amount—23.8 million kg including 23.6 million kg emitted to air. Styrene ranked second among carcinogens for releases with 21.1 million kg including 20.8 million kg of air emissions. Ranking third, chromium and its compounds had releases of 15.3 million kg, and this included 14.2 million kg of on-site land releases.

Carcinogenic substances were more likely to be released to air and less likely to be released to surface waters than other matched chemicals. Sixty-seven percent of releases of the designated carcinogens were emitted to air, compared to 59 percent for other matched chemicals. Less than one percent of the releases of carcinogenic substances were discharged to surface waters, compared to 14 percent for other matched chemicals (**Figure 3–6**).

The six designated carcinogens with the largest releases were also among the top 25 chemicals for total releases: dichloromethane, styrene, chromium (and its compounds), formaldehyde, lead (and its compounds) and trichloroethylene (see **Table 3–4**).

The 50 North American facilities with the largest releases of carcinogenic substances accounted for 38 percent of such releases, with 48.1 million kg (**Figure 3–7** and **Table 3–6**). These facilities reported 87 percent (10.1 million kg) of the underground injection and 81 percent (23.6 million kg) of the on-site land releases of these substances.

Table 3–5

M 1997

Releases in North America of Known or Suspected Carcinogens†, 1997

CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
75-09-2	Dichloromethane	23,559,964	4,347	239,467	5,119	23,809,687
100-42-5	Styrene	20,784,435	19,930	91,848	225,402	21,127,342
—	Chromium (and its compounds)	471,955	63,146	513,398	14,208,243	15,262,424
50-00-0	Formaldehyde	6,786,773	317,389	4,552,904	51,377	11,712,702
—	Lead (and its compounds)	1,130,933	28,090	119,761	8,785,379	10,069,524
79-01-6	Trichloroethylene	8,616,177	251	447	1,802	8,619,908
75-07-0	Acetaldehyde	5,967,068	104,368	206,516	53,572	6,331,624
71-43-2	Benzene	5,393,705	5,811	199,817	28,519	5,628,282
67-66-3	Chloroform	3,473,336	78,045	12,224	3,335	3,567,931
79-06-1	Acrylamide	8,166	2,881	3,208,173	138,569	3,357,989
127-18-4	Tetrachloroethylene	3,095,999	942	6,856	2,308	3,106,968
—	Nickel (and its compounds)	639,094	76,988	64,436	2,132,622	2,915,533
—	Arsenic (and its compounds)	237,381	3,399	34,544	2,615,079	2,891,228
107-13-1	Acrylonitrile	560,549	553	1,828,525	374	2,391,280
108-05-4	Vinyl acetate	1,650,099	1,211	194,114	1,082	1,846,566
106-99-0	1,3-Butadiene	1,334,885	1,185	454	133	1,336,918
75-01-4	Vinyl chloride	460,670	247	168	0	461,285
—	Cadmium (and its compounds)	65,249	1,939	24	389,886	457,198
107-06-2	1,2-Dichloroethane	434,015	854	2,062	1,331	438,272
75-21-8	Ethylene oxide	417,452	1,647	6,869	446	426,859
—	Cobalt (and its compounds)	38,314	18,330	20,255	300,841	377,928
98-95-3	Nitrobenzene	29,168	135	289,369	3	318,675
1332-21-4	Asbestos (friable)	3,289	1	0	286,359	289,649
75-56-9	Propylene oxide	259,541	10,413	5,306	402	275,662
56-23-5	Carbon tetrachloride	162,386	142	14,947	61	177,616
123-91-1	1,4-Dioxane	65,366	91,712	0	2,090	159,168
117-81-7	Di(2-ethylhexyl) phthalate	126,086	262	0	32,239	159,113
106-89-8	Epichlorohydrin	142,514	4,219	0	4,312	151,049
106-46-7	1,4-Dichlorobenzene	126,942	783	907	889	129,621
140-88-5	Ethyl acrylate	83,005	71	0	233	83,370
26471-62-5	Toluenediisocyanate (mixed isomers)	23,641	115	0	164	24,551
79-46-9	2-Nitropropane	10,761	1,265	0	0	12,026
101-77-9	4,4'-Methylenedianiline	4,185	39	6,826	0	11,050
139-13-9	Nitrilotriacetic acid	2,623	3,390	1,088	0	7,346
302-01-2	Hydrazine	5,063	5	0	113	5,181
64-67-5	Diethyl sulfate	3,365	0	0	0	3,365
62-56-6	Thiourea	465	158	2,268	113	3,004
584-84-9	Toluene-2,4-diisocyanate	2,952	2	0	0	2,964
77-78-1	Dimethyl sulfate	2,052	0	0	0	2,052
121-14-2	2,4-Dinitrotoluene	817	857	0	0	1,674
91-08-7	Toluene-2,6-diisocyanate	1,271	0	0	0	1,271
101-14-4	4,4'-Methylenebis(2-chloroaniline)	1,028	0	0	0	1,034
95-80-7	2,4-Diaminotoluene	888	0	0	0	888
96-09-3	Styrene oxide	5	0	0	0	302
94-59-7	Safrole	229	0	0	0	229
606-20-2	2,6-Dinitrotoluene	199	11	0	0	210
90-94-8	Michler's ketone	182	0	0	0	182
96-45-7	Ethylene thiourea	130	0	0	0	130
	Subtotal	**86,184,372**	**845,133**	**11,623,573**	**29,272,397**	**127,958,830**
	% of Total	**16.8**	**0.9**	**14.7**	**18.6**	**15.1**
	Total for All Matched Chemicals	**512,213,962**	**98,842,863**	**78,847,314**	**157,720,611**	**847,751,115**

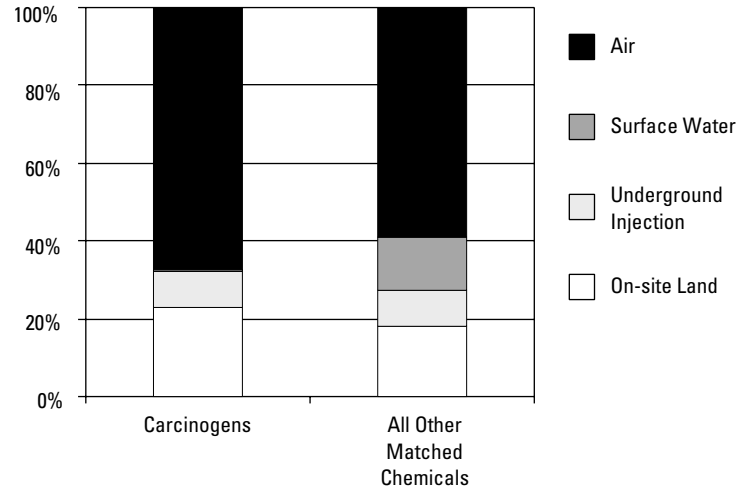
† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

➤ Canada and US data only. Mexico data not collected for 1997.

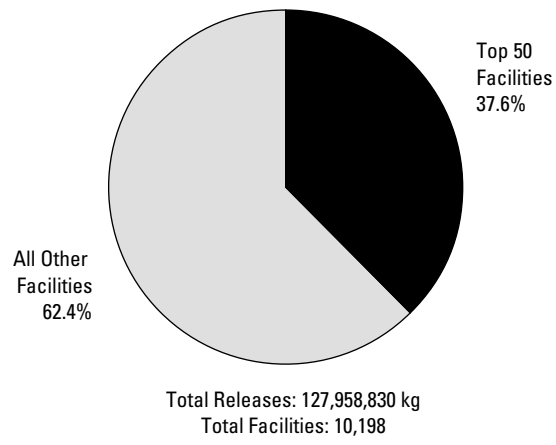
NPRI/TRI as % of Total				
Total Air Emissions (%)	Surface Water Discharges (%)	Underground Injection (%)	On-site Land Releases (%)	Total Releases (%)
9.8 / 90.2	1.7 / 98.3	0.0 / 100.0	1.0 / 99.0	9.7 / 90.3
3.9 / 96.1	0.0 / 100.0	0.1 / 99.9	0.2 / 99.8	3.9 / 96.1
8.4 / 91.6	20.6 / 79.4	0.0 / 100.0	5.1 / 94.9	5.1 / 94.9
23.0 / 77.0	64.7 / 35.3	1.3 / 98.7	0.0 / 100.0	15.6 / 84.4
48.3 / 51.7	19.1 / 80.9	0.0 / 100.0	7.9 / 92.1	12.4 / 87.6
8.1 / 91.9	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	8.1 / 91.9
3.8 / 96.2	3.5 / 96.5	18.4 / 81.6	0.0 / 100.0	4.2 / 95.8
26.7 / 73.3	12.7 / 87.3	17.6 / 82.4	2.3 / 97.7	26.3 / 73.7
6.2 / 93.8	7.0 / 93.0	0.0 / 100.0	0.0 / 100.0	6.2 / 93.8
4.0 / 96.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
1.7 / 98.3	3.0 / 97.0	0.0 / 100.0	0.3 / 99.7	1.7 / 98.3
46.1 / 53.9	31.1 / 68.9	0.0 / 100.0	2.0 / 98.0	12.5 / 87.5
61.8 / 38.2	45.2 / 54.8	0.0 / 100.0	0.0 / 100.0	5.2 / 94.8
0.9 / 99.1	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.3 / 99.7
8.7 / 91.3	0.0 / 100.0	72.1 / 27.9	9.2 / 90.8	15.3 / 84.7
7.9 / 92.1	2.4 / 97.6	0.0 / 100.0	0.0 / 100.0	7.9 / 92.1
9.5 / 90.5	85.0 / 15.0	0.0 / 100.0	— / —	9.5 / 90.5
61.2 / 38.8	42.8 / 57.2	0.0 / 100.0	0.1 / 99.9	9.0 / 91.0
4.2 / 95.8	3.2 / 96.8	0.0 / 100.0	99.1 / 0.9	4.5 / 95.5
3.8 / 96.2	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	3.8 / 96.2
21.4 / 78.6	9.0 / 91.0	0.0 / 100.0	3.5 / 96.5	5.5 / 94.5
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
0.0 / 100.0	0.0 / 100.0	— / —	18.5 / 81.5	18.3 / 81.7
5.0 / 95.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	4.7 / 95.3
0.2 / 99.8	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.2 / 99.8
2.0 / 98.0	2.9 / 97.1	— / —	0.0 / 100.0	2.5 / 97.5
15.3 / 84.7	0.0 / 100.0	— / —	0.1 / 99.9	12.5 / 87.5
0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0	0.0 / 100.0
6.3 / 93.7	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	6.2 / 93.8
0.1 / 99.9	0.0 / 100.0	— / —	0.0 / 100.0	0.2 / 99.8
0.6 / 99.4	0.0 / 100.0	— / —	0.0 / 100.0	3.2 / 96.8
0.0 / 100.0	0.0 / 100.0	— / —	— / —	0.0 / 100.0
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0
100.0 / 0.0	0.0 / 100.0	0.0 / 100.0	— / —	39.0 / 61.0
0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0	0.0 / 100.0
0.0 / 100.0	— / —	— / —	— / —	0.0 / 100.0
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
0.0 / 100.0	0.0 / 100.0	— / —	— / —	0.3 / 99.7
0.5 / 99.5	— / —	— / —	— / —	0.5 / 99.5
0.0 / 100.0	95.2 / 4.8	— / —	— / —	48.7 / 51.3
0.0 / 100.0	— / —	— / —	— / —	0.0 / 100.0
0.0 / 100.0	— / —	— / —	— / —	0.6 / 99.4
0.0 / 100.0	— / —	— / —	— / —	0.0 / 100.0
0.0 / 100.0	— / —	— / —	— / —	98.3 / 1.7
0.0 / 100.0	— / —	— / —	— / —	0.0 / 100.0
0.0 / 100.0	0.0 / 100.0	— / —	— / —	0.0 / 100.0
0.0 / 100.0	— / —	— / —	— / —	0.0 / 100.0
0.0 / 100.0	— / —	— / —	— / —	0.0 / 100.0
10.2 / 89.8	**31.4 / 68.6**	**2.4 / 97.6**	**5.2 / 94.8**	**8.5 / 91.5**
12.3 / 87.7	**4.3 / 95.7**	**5.3 / 94.7**	**5.7 / 94.3**	**9.5 / 90.5**

Figure 3–6
M 1997
Distribution of North American Releases, Known or Suspected Carcinogens† and All Others, 1997



† 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) is included if the chemical or any of its compounds is designated carcinogenic. ➤ Canada and US data only. Mexico data not collected for 1997.

Figure 3–7
M 1997
North American Releases of Known or Suspected Carcinogens†, Top 50 Facilities and All Others, 1997



† 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) is included if the chemical or any of its compounds is designated carcinogenic. ➤ Canada and US data only. Mexico data not collected for 1997.

Table 3–6

M 1997

The 50 North American Facilities with the Largest Total Releases of Known or Suspected Carcinogens†, 1997

Rank	Facility	City, State/Province	SIC Codes Canada	SIC Codes US	Number of Forms
1	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX		28	1
2	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC		28	1
3	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT		33	5
4	Monsanto Co.	Luling, LA		28	2
5	ASARCO Inc.	East Helena, MT		33	4
6	BP Chemicals Inc., Green Lake, BP America Inc.	Port Lavaca, TX		28	5
7	ASARCO Inc., Glover Plant	Annapolis, MO		33	4
8	Angus Chemical Co.	Sterlington, LA		28	4
9	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR		33	1
10	Aquaglass Corp., Masco Corp.	Adamsville, TN		30	1
11	Solutia Inc., Chocolate Bayou	Alvin, TX		28	3
12	Eastman Kodak Co., Kodak Park	Rochester, NY		38	9
13	BP Chemicals Inc., BP America Inc.	Lima, OH		28	10
14	Cytec Ind. Inc., Fortier Plant	Westwego, LA		28	5
15	Foamex L.P., Div. of Kihi	Corry, PA		30	2
16	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	4
17	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM		33	6
18	Borden Chemicals & Plastics LP	Geismar, LA		28	7
19	Carpenter Co., Tupelo Div.	Verona, MS		30	2
20	Abbott Health Prods. Inc., Abbott Labs.	Barceloneta, PR		28	1
21	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ		33	7
22	Northwestern Steel & Wire Co.	Sterling, IL		33	2
23	Boeing Co.	Wichita, KS		Mult.	6
24	Doe Run Co., Renco Group Inc.	Herculaneum, MO		33	5
25	Carpenter Co.	Russellville, KY		Mult.	5
26	Sterling Chemicals Inc.	Texas City, TX		28	9
27	Foamex Intl Inc.	Milan, TN		30	2
28	FMC Corp.	Pocatello, ID		28	4
29	GE Co.	Ottawa, IL		28	4
30	Vitafoam Inc., British Vita PLC	Tupelo, MS		30	3
31	Carpenter Co.	Richmond, VA		Mult.	3
32	Carpenter Co.	Elkhart, IN		Mult.	3
33	Aqua Glass Performance Plant, Masco Corp.	McEwen, TN		30	1
34	Pharmacia & Upjohn Caribe Inc., Pharmacia & Upjohn Inc.	Arecibo, PR		28	2
35	GE Plastics Co., GE Co.	Mount Vernon, IN		28	4
36	Foamex L.P., Foamex Intl. Inc.	Morristown, TN		30	2
37	Celanese Canada Inc.	Edmonton, AB	37	28	6
38	General Foam Corp., PMC Inc.	West Hazelton, PA		30	3
39	U.S. Vanadium Corp., Strategic Minerals Corp.	Hot Springs, AR		33	1
40	Elkem Metals Co.	Marietta, OH		33	4
41	DuPont	Pass Christian, MS		28	4
42	Nu-Foam Prods. Inc., Ohio Decorative Prods. Inc.	Chattanooga, TN		30	2
43	Tomkins Ind. Inc., Lasco Bathware Div.	Three Rivers, MI		30	1
44	Flexible Foam Prods., Ohio Decorative Prods. Inc.	Elkhart, IN		30	2
45	Tomkins Ind. Inc., Lasco Bathware Div.	Cordele, GA		30	1
46	Cleveland Laminating Corp.	Cleveland, OH		26	1
47	Weyerhaeuser Co.	Longview, WA		Mult.	5
48	Kimberly-Clark Corp.	Mobile, AL		26	2
49	3V Inc.	Georgetown, SC		28	4
50	Dofasco Inc.	Hamilton, ON	29	33	5
	Subtotal				**180**
	% of Total				**1.1**
	Total for All Matched Carcinogens				**17,017**

† 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) is included if the chemical or any of its compounds is designated carcinogenic.

➤ Canada and US data only. Mexico data not collected for 1997.

Rank	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	2,018	113	0	6,575,964	6,578,095	Chromium and compounds (land)
2	2,843	14	0	4,126,984	4,129,841	Chromium and compounds (land)
3	27,487	452	0	4,073,128	4,101,067	Lead/Arsenic and compounds (land)
4	15,601	0	3,221,043	0	3,236,644	Formaldehyde (UIJ)
5	23,355	1,262	0	1,739,278	1,763,895	Lead and compounds (land)
6	20,563	0	1,690,118	656	1,711,337	Acrylamide, Acrylonitrile (UIJ)
7	21,141	5	0	1,582,218	1,603,364	Lead and compounds (land)
8	12,481	1,956	1,126,995	0	1,141,432	Formaldehyde (UIJ)
9	34,921	7	0	1,062,717	1,097,645	Nickel and compounds (land)
10	1,057,867	0	0	0	1,057,867	Styrene (air)
11	13,064	0	1,025,986	0	1,039,050	Acrylonitrile (UIJ)
12	980,987	25,565	0	6,803	1,013,355	Dichloromethane (air)
13	27,171	0	965,267	0	992,438	Acrylamide (UIJ)
14	4,009	235	979,139	0	983,383	Acrylamide (UIJ)
15	903,448	0	0	0	903,448	Dichloromethane (air)
16	248,650	0	0	649,000	897,650	Chromium and compounds (land)
17	13,177	267	0	833,526	846,970	Lead/Arsenic/Chromium and compounds (land)
18	815,549	187	9	0	815,745	Benzene (air)
19	704,215	0	0	0	704,215	Dichloromethane (air)
20	689,524	0	0	0	689,524	Dichloromethane (air)
21	8,074	0	0	672,109	680,183	Lead/Chromium and compounds (land)
22	4,921	345	0	593,651	598,917	Chromium/Lead and compounds (land)
23	595,943	452	0	0	596,395	Tetrachloroethylene (air)
24	99,783	98	0	494,901	594,782	Lead and compounds (land)
25	571,776	0	0	0	571,776	Dichloromethane (air)
26	67,453	0	481,566	0	549,019	Acrylamide (UIJ)
27	521,285	0	0	0	521,285	Dichloromethane (air)
28	2,924	0	0	477,785	480,709	Chromium/Cadmium and compounds (land)
29	446,033	117	0	115	446,265	Styrene, Acrylonitrile (air)
30	425,644	0	0	0	425,644	Dichloromethane (air)
31	414,129	0	0	0	414,129	Dichloromethane (air)
32	408,975	0	0	0	408,975	Dichloromethane (air)
33	404,393	0	0	0	404,393	Styrene (air)
34	396,123	0	0	0	396,123	Dichloromethane (air)
35	392,178	270	0	0	392,448	Dichloromethane (air)
36	392,006	0	0	0	392,006	Dichloromethane (air)
37	151,422	0	227,000	0	378,422	Vinyl acetate, Acetaldehyde (UIJ)
38	377,050	0	0	0	377,050	Dichloromethane (air)
39	0	88	0	365,306	365,394	Nickel and compounds (land)
40	27,223	5,442	0	326,985	359,650	Chromium and compounds (land)
41	0	0	358,277	0	358,277	Chromium and compounds (UIJ)
42	354,187	0	0	0	354,187	Dichloromethane (air)
43	352,562	0	0	0	352,562	Styrene (air)
44	350,198	0	0	0	350,198	Dichloromethane (air)
45	347,116	0	0	0	347,116	Styrene (air)
46	346,032	0	0	0	346,032	Dichloromethane (air)
47	320,666	19,157	0	0	339,823	Acetaldehyde (air)
48	316,100	11,792	0	0	327,892	Chloroform (air)
49	319,397	0	0	0	319,397	Dichloromethane (air)
50	315,968	446	0	82	316,496	Benzene (air)
	14,347,632	**68,270**	**10,075,400**	**23,581,208**	**48,072,510**	
	16.6	**8.1**	**86.7**	**80.6**	**37.6**	
	86,184,372	**845,133**	**11,623,573**	**29,272,397**	**127,958,830**	

* Chemicals accounting for more than 70% of total releases of carcinogens from the facility.

➤ UIJ=underground injection

Metals

Releases of the 15 metals and metal compounds reportable to both NPRI and TRI totaled 161.0 million kg in North America in 1997, 19 percent of total releases. The great majority (137.8 million kg) was released to on-site land disposal (**Table 3–7**). On-site land releases of metals and their compounds accounted for 16 percent of all releases of all substances in the matched data set. Thus, the pattern of releases for metals contrasted sharply with the pattern of releases for non-metal substances in the matched data set. On-site land releases amounted to 86 percent of all metals releases but only three percent of releases of all other matched chemicals (**Figure 3–8**).

Zinc and its compounds ranked first for total releases, followed by manganese and copper and their compounds. Of the 65.1 million kg of releases of zinc and zinc compounds, 59.9 million kg were released on-site to land.

On-site land releases constituted more than 60 percent of the releases of 13 of the 15 metals. The exceptions were mercury and vanadium; 62 percent (6,596 kg) of the releases of mercury and its compounds and 79 percent of the releases of vanadium (217,869 kg) were emitted to air. (Mercury is used in making chlorine gas and caustic soda and in thermometers, batteries, mercury lamps, and other products. Mercury salts are used in ointments. Mercury is also a catalyst for production of vinyl chloride monomer, urethane foam, and anthraquinone. Vanadium compounds are a constituent of a specialty steel used principally in automobile parts. Vanadium is also used in rubber, plastics and ceramics production.)

The 50 facilities with the largest releases of metals and metal compounds reported the overwhelming majority—84 percent—of such releases in 1997. They reported 135.8 million kg of releases of metals, including 122.3 million kg released on-site to land. They also reported 7.3 million kg of underground injection of these substances (96 percent of that total—see **Figure 3–9** and **Table 3–8**).

Table 3–7
M 1997

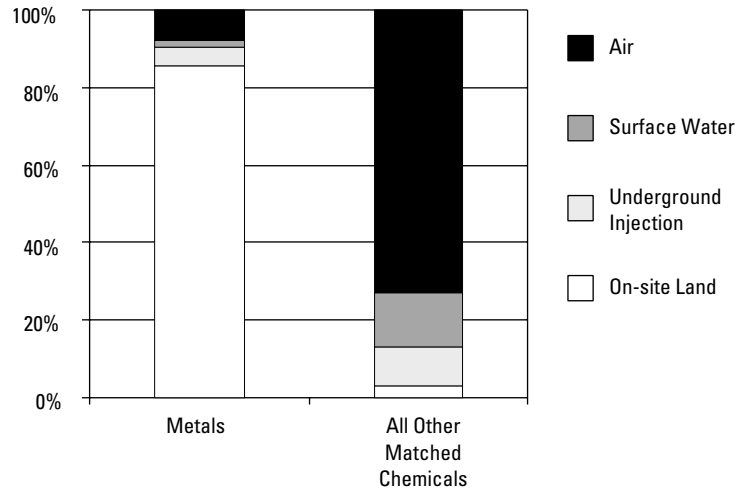
Releases in North America of Metals and Their Compounds, 1997

CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
—	Zinc (and its compounds)	4,375,920	599,874	167,413	59,909,894	65,061,318
—	Manganese (and its compounds)	1,111,400	2,207,366	6,536,436	28,832,410	38,696,839
—	Copper (and its compounds)	3,288,255	73,552	133,659	18,341,134	21,840,400
—	Chromium (and its compounds)	471,955	63,146	513,398	14,208,243	15,262,424
—	Lead (and its compounds)	1,130,933	28,090	119,761	8,785,379	10,069,524
—	Nickel (and its compounds)	639,094	76,988	64,436	2,132,622	2,915,533
—	Arsenic (and its compounds)	237,381	3,399	34,544	2,615,079	2,891,228
7429-90-5	Aluminum (fume or dust)	783,402	19,548	0	1,473,752	2,278,190
—	Antimony (and its compounds)	47,966	19,511	5,538	565,945	639,540
—	Cadmium (and its compounds)	65,249	1,939	24	389,886	457,198
—	Cobalt (and its compounds)	38,314	18,330	20,255	300,841	377,928
7440-62-2	Vanadium (fume or dust)	217,869	484	0	56,156	274,610
—	Selenium (and its compounds)	42,338	5,091	1,546	144,258	193,895
—	Silver (and its compounds)	8,310	3,005	71	18,641	30,027
—	Mercury (and its compounds)	6,596	192	19	3,758	10,571
	Subtotal	**12,464,982**	**3,120,515**	**7,597,100**	**137,777,998**	**160,999,225**
	% of Total	**2.4**	**3.2**	**9.6**	**87.4**	**19.0**
	Total for All Matched Chemicals	**512,213,962**	**98,842,863**	**78,847,314**	**157,720,611**	**847,751,115**

➤ Canada and US data only. Mexico data not collected for 1997.

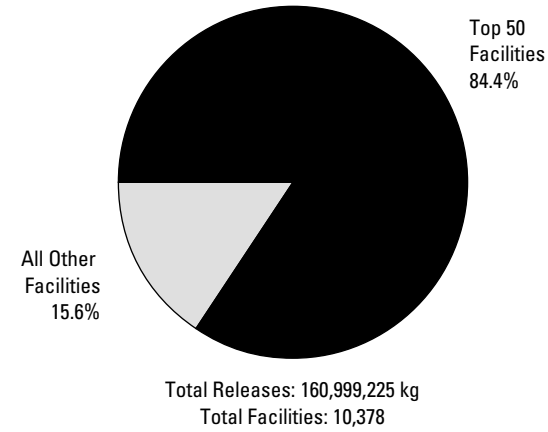
NPRI/TRI as % of Total				
Total Air Emissions (%)	Surface Water Discharges (%)	Underground Injection (%)	On-site Land Releases (%)	Total Releases (%)
17.8 / 82.2	9.6 / 90.4	0.2 / 99.8	8.3 / 91.7	8.9 / 91.1
4.6 / 95.4	10.6 / 89.4	0.0 / 100.0	5.6 / 94.4	4.9 / 95.1
12.8 / 87.2	11.1 / 88.9	0.0 / 100.0	1.2 / 98.8	3.0 / 97.0
8.4 / 91.6	20.6 / 79.4	0.0 / 100.0	5.1 / 94.9	5.1 / 94.9
48.3 / 51.7	19.1 / 80.9	0.0 / 100.0	7.9 / 92.1	12.4 / 87.6
46.1 / 53.9	31.1 / 68.9	0.0 / 100.0	2.0 / 98.0	12.5 / 87.5
61.8 / 38.2	45.2 / 54.8	0.0 / 100.0	0.0 / 100.0	5.2 / 94.8
8.0 / 92.0	1.7 / 98.3	— / —	31.9 / 68.1	23.5 / 76.5
12.1 / 87.9	3.1 / 96.9	0.0 / 100.0	0.1 / 99.9	1.1 / 98.9
61.2 / 38.8	42.8 / 57.2	0.0 / 100.0	0.1 / 99.9	9.0 / 91.0
21.4 / 78.6	9.0 / 91.0	0.0 / 100.0	3.5 / 96.5	5.5 / 94.5
97.4 / 2.6	33.7 / 66.3	— / —	5.1 / 94.9	78.4 / 21.6
10.9 / 89.1	78.4 / 21.6	0.0 / 100.0	0.0 / 100.0	4.8 / 95.2
15.1 / 84.9	5.7 / 94.3	0.0 / 100.0	0.3 / 99.7	4.9 / 95.1
0.8 / 99.2	1.0 / 99.0	0.0 / 100.0	4.9 / 95.1	2.3 / 97.7
21.0 / 79.0	**11.2 / 88.8**	**0.0 / 100.0**	**6.4 / 93.6**	**7.3 / 92.7**
12.3 / 87.7	**4.3 / 95.7**	**5.3 / 94.7**	**5.7 / 94.3**	**9.5 / 90.5**

Figure 3–8 M 1997
Distribution of North American Releases, Metals and Their Compounds and All Others, 1997



➤ Canada and US data only. Mexico data not collected for 1997.

Figure 3–9 M 1997
North American Releases of Metals and Their Compounds, Top 50 Facilities and All Others, 1997



➤ Canada and US data only. Mexico data not collected for 1997.

Table 3–8
M 1997

The 50 North American Facilities with the Largest Total Releases of Metals and Their Compounds, 1997

Rank	Facility	City, State/Province	SIC Codes Canada	SIC Codes US	Number of Forms
1	ASARCO Inc.	East Helena, MT		33	9
2	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM		33	10
3	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT		33	8
4	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ		33	11
5	Northwestern Steel & Wire Co.	Sterling, IL		33	4
6	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN		33	11
7	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX		28	1
8	GM Powertrain Defiance, General Motors Corp.	Defiance, OH		33	6
9	Elkem Metals Co.	Marietta, OH		33	5
10	ASARCO Inc., Glover Plant	Annapolis, MO		33	7
11	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC		28	1
12	Doe Run Co., Renco Group Inc.	Herculaneum, MO		33	8
13	DuPont	Pass Christian, MS		28	6
14	DuPont	New Johnsonville, TN		28	5
15	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ		33	11
16	Granite City Steel, National Steel Corp.	Granite City, IL		33	6
17	Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur, QC	29	33	5
18	FMC Corp.	Pocatello, ID		28	9
19	USS Fairfield Works, USX Corp.	Fairfield, AL		33	8
20	Kerr-McGee Chemical LLC, Kerr-McGee Corp.	Hamilton, MS		Mult.	3
21	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33	5
22	Chemetals Inc., Comilog	New Johnsonville, TN		28	1
23	Louisiana Pigment Co. L.P.	Westlake, LA		28	1
24	Co-Steel Lasco	Whitby, ON	29	33	6
25	Kerr-McGee Chemical LLC	Henderson, NV		28	2
26	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR		33	1
27	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	6
28	Springs Chemical, Grace Complex, Springs Ind. Inc.	Lancaster, SC		22	7
29	P4 Production L.L.C.	Soda Springs, ID		Mult.	4
30	Austeel Lemont Co. Inc.	Lemont, IL		33	5
31	Imco Recycling Inc.	Morgantown, KY		33	4
32	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33	6
33	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33	5
34	Millennium Inorganic Chemicals, Millennium Chemicals Inc.	Baltimore, MD		28	2
35	General Motors Corp., GMPTG Saginaw Metal Casting	Saginaw, MI		33	6
36	Bethlehem Steel Corp.	Sparrows Point, MD		33	6
37	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33	11
38	American Steel Foundries, Amsted Ind. Inc.	Granite City, IL		33	5
39	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	6
40	Griffin Wheel Co., Amsted Ind. Inc.	Keokuk, IA		33	2
41	GE Co., Silicone Prods.	Waterford, NY		28	2
42	Geneva Steel	Vineyard, UT		33	8
43	LTV Steel Co. Inc.	East Chicago, IN		33	4
44	Griffin Wheel Co., Columbus Plant, Amsted Ind. Inc.	Groveport, OH		33	2
45	Ispat Sidbec Inc., Sidbec-Feruni, Ispat Mexicana	Contrecoeur, QC	29	33	5
46	Georgia-Pacific Corp.	Ashdown, AR		26	3
47	U.S. Vanadium Corp., Strategic Minerals Corp.	Hot Springs, AR		33	1
48	Griffin Wheel Co., Amsted Ind. Inc.	Bessemer, AL		33	2
49	Griffin Wheel Co., Amsted Ind. Inc.	Kansas City, KS		33	2
50	Great Southern Paper Co., Georgia-Pacific Corp.	Cedar Springs, GA		26	5
	Subtotal				**259**
	% of Total				**1.2**
	Total for All Matched Metals				**21,727**

➤ Canada and US data only. Mexico data not collected for 1997.

Rank	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	40,338	2,280	0	17,100,454	17,143,072	Zinc and compounds (land)
2	133,922	3,644	0	12,048,532	12,186,098	Zinc/Copper and compounds (land)
3	71,865	4,215	0	10,900,498	10,976,578	Copper/Zinc/Lead and compounds (land)
4	18,596	0	0	8,503,492	8,522,088	Copper and compounds (land)
5	55,261	1,179	0	6,716,100	6,772,540	Zinc/Manganese and compounds (land)
6	140,596	7,755	0	6,450,341	6,598,692	Zinc and compounds (land)
7	2,018	113	0	6,575,964	6,578,095	Chromium and compounds (land)
8	33,575	2,175	0	5,564,083	5,599,833	Zinc and compounds (land)
9	174,615	205,442	0	4,752,382	5,132,439	Manganese and compounds (land)
10	28,690	10	0	4,892,495	4,921,195	Zinc/Lead and compounds (land)
11	2,843	14	0	4,126,984	4,129,841	Chromium and compounds (land)
12	118,721	183	0	3,839,901	3,958,805	Zinc and compounds (land)
13	0	0	3,809,524	0	3,809,524	Manganese and compounds (UIJ)
14	0	0	3,516,553	0	3,516,553	Manganese and compounds (UIJ)
15	2,046,411	0	0	842,723	2,889,134	Copper and compounds (air)
16	22,216	5,704	0	2,667,815	2,695,735	Zinc and compounds (land)
17	48,835	550	0	2,300,405	2,349,790	Zinc and compounds (land)
18	4,674	338	0	2,167,628	2,172,640	Zinc/Chromium and compounds (land)
19	6,353	794	0	2,133,209	2,140,356	Zinc and compounds (land)
20	4,354	6,145	0	2,066,666	2,077,165	Manganese and compounds (land)
21	22,322	152	0	1,730,140	1,752,614	Zinc and compounds (land)
22	15,556	583	0	1,523,810	1,539,949	Manganese and compounds (land)
23	9	122	0	1,405,896	1,406,027	Manganese and compounds (land)
24	14,253	362	0	1,245,254	1,259,869	Zinc and compounds (land)
25	6,077	0	0	1,152,381	1,158,458	Manganese and compounds (land)
26	34,921	7	0	1,062,717	1,097,645	Nickel and compounds (land)
27	365,986	0	0	649,000	1,014,986	Chromium and compounds (land), Nickel and compounds (air)
28	969,901	0	0	0	969,901	Zinc and compounds (air)
29	35,863	226	0	905,652	941,741	Zinc and compounds (land)
30	12,521	226	0	766,139	778,886	Zinc and compounds (land)
31	14,163	0	0	739,864	754,027	Aluminum (land)
32	12,053	47	0	717,505	729,605	Zinc/Manganese and compounds (land)
33	706,574	3,780	0	0	710,354	Zinc/Lead and compounds (air)
34	0	68,027	0	603,175	671,202	Manganese and compounds (land)
35	15,320	0	0	561,405	576,725	Zinc/Manganese and compounds (land)
36	7,758	19,570	0	471,883	499,211	Manganese and compounds (land)
37	482,280	15,840	0	0	498,120	Lead/Copper/Zinc and compounds (air)
38	24,617	0	0	459,411	484,028	Chromium and compounds, Aluminum (land)
39	18,012	2,682	0	442,030	462,724	Manganese and compounds (land)
40	8,164	0	0	446,893	455,057	Manganese and compounds (land)
41	454	6,984	0	444,671	452,109	Copper and compounds (land)
42	1,169	771	0	437,700	439,640	Manganese/Zinc and compounds (land)
43	6,508	1,383	0	425,397	433,288	Manganese and compounds (land)
44	8,164	0	0	423,423	431,587	Manganese and compounds (land)
45	0	0	0	402,950	402,950	Zinc/Lead and compounds (land)
46	2,998	88,436	0	290,395	381,829	Manganese and compounds (land)
47	0	88	0	365,306	365,394	Nickel and compounds (land)
48	3,583	0	0	355,157	358,740	Manganese and compounds (land)
49	3,583	0	0	321,290	324,873	Manganese and compounds (land)
50	33,760	19,464	0	266,811	320,035	Zinc/Manganese and compounds (land)
	5,780,452	**469,291**	**7,326,077**	**122,265,927**	**135,841,747**	
	46.4	**15.0**	**96.4**	**88.7**	**84.4**	
	12,464,982	**3,120,515**	**7,597,100**	**137,777,998**	**160,999,225**	

* Chemicals accounting for more than 70% of total releases of metals from the facility.

➤ UIJ=underground injection

Releases by Industry

In 1997, the chemical manufacturing industry reported 272.9 million kg of on-site releases of substances in the matched data set, 32 percent of the North American total and the largest amount reported by any industry (**Table 3–9** and **Figure 3–10**). This included the largest air emissions (113.7 million kg), nearly half the surface water discharges (47.2 million kg) and almost all of the underground injection (78.1 million kg).

The primary metals industry ranked second for total releases in 1997 with 190.0 million kg. This included more than two-thirds of all on-site land releases, or 109.7 million kg. As noted in the previous section, metals and metal compounds in industrial waste are typically released on-site to land (or transferred off-site to land disposal, as discussed in **Chapter 4**). **Chapter 7** examines the primary metals industry in greater depth.

Pulp and paper production accounted for the third-largest total releases in 1997. The paper products industry reported releases of 112.3 million kg, including air emissions of 97.3 million kg. (A special chapter in *Taking Stock 1995* examined the pulp and paper industry and its PRTR reporting and identified influences that have contributed to large reductions in releases for this sector since 1995.)

Together, the top three industries reported 68 percent of all on-site releases in North America in 1997.

Table 3–9

M 1997

Releases in North America by Industry, 1997

Rank	US SIC Code	Industry	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
1	28	Chemicals	113,693,205	47,151,749	78,122,963	33,873,604	272,904,779
2	33	Primary Metals	58,115,488	21,996,486	170,771	109,735,033	190,032,817
3	26	Paper Products	97,305,455	9,241,146	13,197	5,775,791	112,338,644
4	30	Rubber and Plastics Products	44,638,371	6,346	0	402,885	45,055,140
5	37	Transportation Equipment	42,317,214	110,814	0	263,853	42,699,007
6		Multiple Codes 20–39*	33,568,587	4,991,863	231	3,573,169	42,133,850
7	29	Petroleum and Coal Products	21,436,142	5,257,182	538,853	784,473	28,019,407
8	34	Fabricated Metals Products	21,721,052	637,815	3	387,233	22,761,249
9	24	Lumber and Wood Products	13,046,929	17,776	0	21,308	13,087,552
10	27	Printing and Publishing	12,187,084	4,249	0	113	12,191,946
11	32	Stone/Clay/Glass Products	10,493,573	24,676	0	1,530,176	12,050,633
12	20	Food Products	2,935,202	7,719,766	2	872,630	11,527,600
13	25	Furniture and Fixtures	11,371,130	17	0	5,515	11,377,301
14	22	Textile Mill Products	7,570,432	154,069	0	92,657	7,817,258
15	36	Electronic/Electrical Equipment	5,684,149	846,004	1,292	185,533	6,720,557
16	35	Industrial Machinery	6,409,666	3,757	0	104,668	6,518,894
17	38	Measurement/Photographic Instruments	4,033,302	587,910	0	55,644	4,676,856
18	39	Misc. Manufacturing Industries	4,389,928	1,027	2	40,961	4,434,996
19	21	Tobacco Products	585,081	77,587	0	0	662,668
20	31	Leather Products	474,005	10,039	0	4,484	488,528
21	23	Apparel and Other Textile Products	237,967	2,585	0	10,881	251,433
		Total for All Matched Industries	**512,213,962**	**98,842,863**	**78,847,314**	**157,720,611**	**847,751,115**

* Multiple SIC codes reported only in US data.

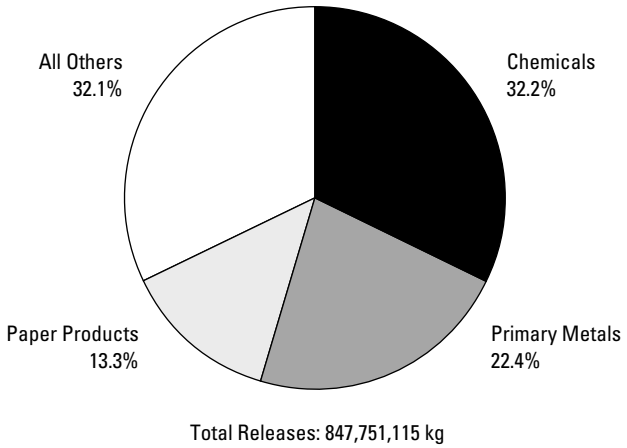
➤ Canada and US data only. Mexico data not collected for 1997.

NPRI/TRI as % of Total				
Total Air Emissions (%)	Surface Water Discharges (%)	Underground Injection (%)	On-site Land Releases (%)	Total Releases (%)
11.6 / 88.4	1.8 / 98.2	5.3 / 94.7	0.2 / 99.8	6.7 / 93.3
16.8 / 83.2	3.1 / 96.9	0.0 / 100.0	7.8 / 92.2	10.0 / 90.0
15.3 / 84.7	20.4 / 79.6	0.0 / 100.0	4.6 / 95.4	15.2 / 84.8
13.2 / 86.8	8.0 / 92.0	— / —	8.3 / 91.7	13.2 / 86.8
14.5 / 85.5	0.4 / 99.6	— / —	2.4 / 97.6	14.4 / 85.6
0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0	0.0 / 100.0
19.6 / 80.4	7.1 / 92.9	13.2 / 86.8	2.1 / 97.9	16.7 / 83.3
9.3 / 90.7	0.1 / 99.9	0.0 / 100.0	0.4 / 99.6	9.0 / 91.0
16.9 / 83.1	82.0 / 18.0	— / —	0.0 / 100.0	17.0 / 83.0
13.2 / 86.8	86.9 / 13.1	— / —	0.0 / 100.0	13.2 / 86.8
8.2 / 91.8	19.4 / 80.6	— / —	0.4 / 99.6	7.2 / 92.8
2.2 / 97.8	5.4 / 94.6	0.0 / 100.0	2.8 / 97.2	4.4 / 95.6
6.9 / 93.1	0.0 / 100.0	— / —	0.0 / 100.0	6.9 / 93.1
3.7 / 96.3	0.0 / 100.0	— / —	0.0 / 100.0	3.6 / 96.4
1.3 / 98.7	0.3 / 99.7	0.0 / 100.0	2.4 / 97.6	1.2 / 98.8
4.2 / 95.8	0.5 / 99.5	— / —	0.0 / 100.0	4.1 / 95.9
0.0 / 100.0	0.0 / 100.0	— / —	0.0 / 100.0	0.0 / 100.0
12.2 / 87.8	38.9 / 61.1	0.0 / 100.0	81.2 / 18.8	12.9 / 87.1
0.0 / 100.0	0.0 / 100.0	— / —	— / —	0.0 / 100.0
5.0 / 95.0	0.0 / 100.0	— / —	0.0 / 100.0	4.8 / 95.2
0.1 / 99.9	0.0 / 100.0	— / —	0.0 / 100.0	0.1 / 99.9
12.3 / 87.7	**4.3 / 95.7**	**5.3 / 94.7**	**5.7 / 94.3**	**9.5 / 90.5**

Figure 3–10

M 1997

North American Top Three Industries for Total Releases, 1997



➤ Canada and US data only. Mexico data not collected for 1997.

3.2.2 NPRI and TRI Releases

This section compares reporting of on-site releases by Canadian and US facilities for 1997. It notes significant similarities and differences between the two PRTRs for the matched data set.

Overview

In the matched data set, a total of 1,430 facilities submitted NPRI reports in 1997, while 19,125 facilities reported to TRI. NPRI submissions totaled 4,599 forms; the TRI total was 58,252 (**Table 3–10**).

Emissions to air were the largest release type in both Canada (62.8 million kg) and the United States (449.4 million kg). On-site land disposal received the second-largest amounts of releases in both PRTRs: 9.1 million kg in NPRI and 148.7 million kg in TRI. NPRI facilities reported releasing 4.2 million kg each to surface waters and to underground injection. In TRI, surface water discharges totaled 94.6 million kg and underground injection totaled 74.6 million kg.

The percentage distribution of releases differed substantially between NPRI and TRI. In NPRI, air emissions represented 78 percent of all on-site releases, a much higher proportion than TRI's 59 percent. Surface water discharges were more than twice the percentage of total releases in TRI (12 percent) compared to NPRI (five percent). Similarly, underground injection amounted to nearly 10 percent of TRI releases and five percent of NPRI releases. The differential was only slightly less for on-site land releases, which amounted to 19 percent of TRI releases and 11 percent of those in NPRI (**Figure 3–11**).

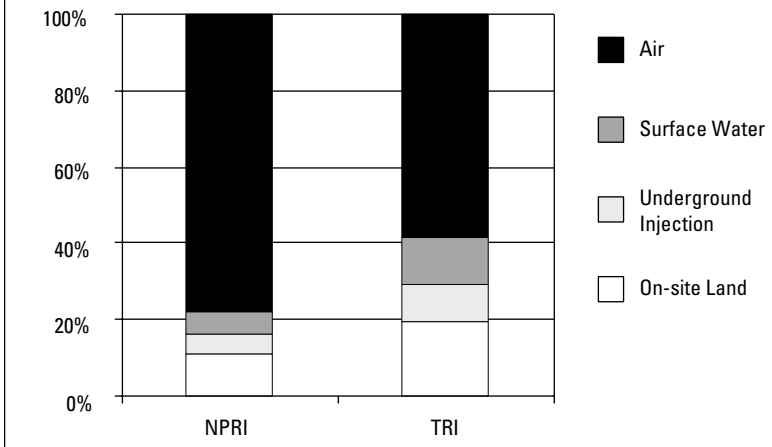
Table 3–10
M 1997

On-site Releases, NPRI and TRI, 1997

	NPRI		TRI	
	Number		Number	
Total Facilities	1,430		19,125	
Total Forms	4,599		58,252	
	kg	**%**	**kg**	**%**
Total Air Emissions	62,838,622	78.1	449,375,340	58.6
Surface Water Discharges	4,224,169	5.3	94,618,694	12.3
Underground Injection	4,197,660	5.2	74,649,654	9.7
On-site Land Releases	9,062,108	11.3	148,658,503	19.4
Matched Releases	**80,448,924**	**100.0**	**767,302,191**	**100.0**

Figure 3–11
M 1997

Distribution of On-site Releases, NPRI and TRI, 1997



Top Facilities

In NPRI, the 50 facilities with the largest releases represented 3.5 percent of all NPRI facilities (in the 1997 matched data set). In TRI, the 50 facilities with the largest releases represented just 0.3 percent of all TRI facilities because of the much larger number of reporting facilities.

The 50 NPRI facilities with the largest releases in 1997 reported 54 percent—43.6 million kg—of NPRI's on-site releases. In TRI, the 50 facilities with the largest releases reported 37 percent—279.9 million kg—of the total (**Tables 3–11** and **3–12** and **Figure 3–12**).

In NPRI, the 50 facilities with the largest releases reported air emissions of 29.6 million kg, 47 percent of all NPRI air emissions. In TRI, 65.1 million kg of air emissions by the facilities with the largest releases amounted to just 15 percent of the TRI total. In both countries, the top 50 facilities for releases reported approximately half the surface water discharges. These were 2.1 million kg in NPRI (50 percent of all NPRI surface water discharges) and 43.6 million kg in TRI (46 percent).

Facilities with the largest releases also reported the majority of underground injection and on-site land releases in both countries. However, NPRI facilities reported larger percentages of NPRI's total in these categories than was the case in TRI. The 50 NPRI facilities reported 4.1 million kg of underground injection (98 percent of NPRI's total) and 7.8 million kg of on-site land releases (86 percent). The 50 TRI facilities reported 60.9 million kg of underground injection (82 percent of TRI's total) and 110.3 million kg of on-site land releases (74 percent).

Releases reported by the two groups of facilities thus showed conspicuous differences. Surface water discharges, underground injection and on-site land releases by the TRI facilities with the largest releases amounted to more than twice the proportion of such releases for the NPRI facilities with the largest amounts. Conversely, air emissions for the NPRI facilities with the largest amounts of on-site releases were almost three times those of TRI facilities with the largest amounts (68 percent versus 23 percent—**Figure 3–13**).

Table 3–11

M 1997

The 50 NPRI Facilities with the Largest Total On-site Releases, 1997

Rank	Facility	City, State/Province	SIC Codes Canada	SIC Codes US	Number of Forms
1	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	7
2	Celanese Canada Inc.	Edmonton, AB	37	28	11
3	Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur, QC	29	33	5
4	Nova Chemicals (Canada) Ltd., St. Clair Site	Corunna, ON	37	28	7
5	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33	7
6	Bayer Inc., Bayer AG	Sarnia, ON	37	28	17
7	General Motors of Canada Ltd., Oshawa Car Assembly Plant	Oshawa, ON	32	37	13
8	Co-Steel Lasco	Whitby, ON	29	33	6
9	Irving Pulp & Paper, Ltd / Irving Tissue Company	Saint John, NB	27	26	4
10	Daishowa-Marubeni International, Peace River Pulp Div.	Peace River, AB	27	26	10
11	Agrium Products Inc., Redwater Fertilizer Operations	Redwater, AB	37	28	15
12	Avenor Inc., Thunder Bay Operations	Thunder Bay, ON	27	26	8
13	Canadian General-Tower Ltd., Vinyl Manufacturer	Cambridge, ON	16	30	8
14	Graphic Packaging Canada, Toronto Facility, ACX Technologies	Mississauga, ON	28	27	2
15	Methanex Corporation	Medicine Hat, AB	37	28	3
16	Agrium, Fort Saskatchewan Nitrogen Operations	Fort Saskatchewan, AB	37	28	4
17	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29	23
18	Morbern Incorporated	Cornwall, ON	16	30	3
19	Maple Roll Leaf Co., Illinois Tool Works Canada Inc.	Windsor, ON	37	28	10
20	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33	6
21	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33	6
22	Sunworthy Wallcoverings, Borden Co. Ltd.	Brampton, ON	27	26	2
23	International Wallcoverings Ltd.	Brampton, ON	27	26	4
24	St. Anne-Nackawic Pulp Company Ltd.	Nackawic, NB	27	26	4
25	Avenor Inc., Dryden Mill	Dryden, ON	27	26	7
26	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	16
27	Paintplas Inc.	Ajax, ON	32	30	10
28	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33	11
29	Weyerhaeuser Saskatchewan Ltd., Prince Albert Pulp & Paper	Prince Albert, SK	27	26	5
30	Ford Motor Company, Oakville Assembly Plant	Oakville, ON	32	37	11
31	Papiers Domtar - Centre d'affaires Windsor	Windsor, QC	27	26	6
32	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33	12
33	Alcan Smelters and Chemicals Ltd.	Kitimat, BC	29	33	4
34	Witco Canada Inc., West Hill Plant	Scarborough, ON	36	29	2
35	Union Carbide Canada Inc., Prentiss Ethylene Glycol Plant	Lacombe County, AB	37	28	6
36	MB Paper Ltd., Powell River Division	Powell River, BC	27	26	4
37	Fletcher Challenge Canada, Elk Falls Mill	Campbell River, BC	27	26	4
38	Dofasco Inc.	Hamilton, ON	29	33	18
39	Cartons St-Laurent Inc.	LaTuque, QC	27	26	8
40	Standard Products (Canada) Limited, Rubber Plant #1	Stratford, ON	15	30	3
41	Canfor Pulp & Paper Mills, Canadian Forest Products Ltd.	Prince George, BC	27	26	4
42	Skeena Cellulose Inc., Skeena Pulp Operations	Skeena, BC	27	26	4
43	Ispat Sidbec Inc., Sidbec-Feruni, Ispat Mexicana	Contrecoeur, QC	29	33	5
44	Avenor Inc., Gold River Operations	Gold River, BC	27	26	6
45	Les Produits forestiers Donohue Inc, usine de pâte kraft	St-Félicien, QC	27	26	6
46	Imperial Oil, Sarnia Chemical Plant	Sarnia, ON	37	28	18
47	General Motors of Canada Ltd., Oshawa Truck Assembly Centre	Oshawa, ON	32	37	14
48	Société canadienne de métaux Reynolds, Reynolds Metals Co.	Baie-Comeau, QC	29	33	6
49	Kimberly-Clark Corporation	Terrace Bay, ON	27	26	4
50	Pétromont, Société en commandite	Varennes, QC	37	28	10
	Subtotal				**389**
	% of Total				**8.5**
	Total				**4,599**

Rank	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	4,259,786	0	0	649,000	4,908,786	Sulfuric acid (air)
2	294,315	0	3,542,000	593	3,836,908	Methanol, Methyl ethyl ketone (UIJ)
3	48,835	550	0	2,300,405	2,349,790	Zinc and compounds (land)
4	2,045,900	480	0	0	2,046,380	Cyclohexane (air)
5	22,992	165	0	1,759,790	1,782,947	Zinc and compounds (land)
6	1,397,853	22,937	0	0	1,421,799	Cyclohexane, Chloromethane (air)
7	1,299,755	0	0	0	1,299,855	Xylene, Toluene (air)
8	14,253	362	0	1,245,254	1,259,869	Zinc and compounds (land)
9	246,211	824,078	0	0	1,070,289	Methanol (water)
10	845,060	15,550	0	96,347	956,957	Methanol (air)
11	205,010	160,160	570,160	0	935,330	Nitric acid and nitrate compounds (UIJ, water)
12	874,078	724	0	0	874,802	Methanol (air)
13	817,865	0	0	0	817,865	Methyl ethyl ketone (air)
14	797,000	0	0	0	797,000	Methanol (air)
15	790,620	0	0	80	790,700	Methanol (air)
16	761,100	0	900	0	762,000	Methanol (air)
17	474,924	280,405	0	4,784	760,113	Nitric acid and nitrate compounds (water), Methanol, Vanadium, Methyl isobutyl ketone, Methyl ethyl ketone (air)
18	757,500	0	0	0	757,500	Methyl ethyl ketone (air)
19	750,109	0	0	0	750,109	Methyl ethyl ketone, Methanol, Toluene (air)
20	740,792	3,780	0	0	744,572	Zinc/Lead and compounds (air)
21	12,053	47	0	717,505	729,605	Zinc/Manganese and compounds (land)
22	707,900	0	0	0	707,900	Methyl ethyl ketone, Toluene (air)
23	669,500	0	0	0	669,500	Methyl ethyl ketone, Toluene (air)
24	588,500	11,130	0	6,870	606,500	Chlorine dioxide, Methanol, Chlorine (air)
25	597,481	1,610	0	2,001	601,092	Methanol (air)
26	103,757	31,645	0	442,030	577,432	Manganese and compounds (land)
27	552,000	0	0	0	552,000	Xylene, Toluene, Methyl isobutyl ketone (air)
28	24,567	524,450	0	0	549,017	Nitric acid and nitrate compounds (water)
29	521,402	20,700	0	0	542,102	Methanol, Chlorine (air)
30	531,275	0	0	0	531,275	Xylene, 1,2,4-Trimethylbenzene, n-Butyl alcohol (air)
31	470,060	56,100	0	0	527,484	Methanol (air)
32	499,280	15,840	0	0	515,120	Lead/Copper/Zinc and compounds (air)
33	485,800	0	0	0	485,800	Hydrogen fluoride (air)
34	474,000	0	0	0	474,000	Methanol (air)
35	444,335	0	0	0	444,335	Ethylene glycol, Ethylene (air)
36	443,000	0	0	0	443,270	Methanol (air)
37	442,050	0	0	0	442,050	Methanol (air)
38	424,762	6,176	0	125	431,063	Benzene (air)
39	391,679	39,052	0	0	430,731	Methanol (air)
40	427,400	0	0	0	427,400	Xylene (air)
41	418,400	0	0	0	418,400	Methanol (air)
42	412,600	0	0	0	412,600	Methanol, Chlorine (air)
43	0	0	0	402,950	402,950	Zinc/Lead and compounds (land)
44	401,100	0	0	0	401,100	Methanol (air)
45	196,200	74,800	0	127,400	398,400	Manganese and compounds (land, water), Methanol (air)
46	391,146	2,259	0	0	393,911	Hydrochloric acid, Ethylene, Benzene (air)
47	391,423	0	0	0	391,461	Xylene, n-Butyl alcohol (air)
48	388,581	0	0	0	388,581	Hydrogen fluoride (air)
49	387,820	90	0	0	387,910	Methanol (air)
50	386,842	34	0	0	386,876	Propylene, Ethylene (air)
	29,628,871	**2,093,124**	**4,113,060**	**7,755,134**	**43,593,436**	
	47.2	**49.6**	**98.0**	**85.6**	**54.2**	
	62,838,622	**4,224,169**	**4,197,660**	**9,062,108**	**80,448,924**	

* Chemicals accounting for more than 70% of total releases from the facility.

➤ UIJ = underground injection

Table 3–12

M 1997

The 50 TRI Facilities with the Largest Total On-site Releases, 1997

Rank	Facility	City, State	US SIC Code	Number of Forms
1	Magnesium Corp. of America, Renco Group Inc.	Rowley, UT	33	6
2	ASARCO Inc.	East Helena, MT	33	10
3	PCS Nitrogen Fertilizer L.P., Potash Corp. of Saskatchewan	Geismar, LA	28	12
4	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33	13
5	Armco Inc. (Route 8 S.)	Butler, PA	33	14
6	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	14
7	Solutia Inc.	Gonzalez, FL	28	18
8	DuPont	Victoria, TX	28	29
9	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33	13
10	Lenzing Fibers Corp.	Lowland, TN	28	5
11	Cytec Ind. Inc., Fortier Plant	Westwego, LA	28	24
12	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN	33	33
13	Courtaulds Fibers Inc., Courtaulds Finance U.S. Inc.	Axis, AL	28	4
14	Northwestern Steel & Wire Co.	Sterling, IL	33	6
15	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28	2
16	BASF Corp.	Freeport, TX	28	26
17	GM Powertrain Defiance, General Motors Corp.	Defiance, OH	33	20
18	Elkem Metals Co.	Marietta, OH	33	6
19	ASARCO Inc., Glover Plant	Annapolis, MO	33	7
20	BP Chemicals Inc., BP America Inc.	Lima, OH	28	27
21	BP Chemicals Inc., Green Lake, BP America Inc.	Port Lavaca, TX	28	17
22	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	1
23	DuPont	Pass Christian, MS	28	11
24	PCS Phosphate Co. Inc., Potash Corp. of Saskatchewan	Aurora, NC	28	6
25	Doe Run Co., Renco Group Inc.	Herculaneum, MO	33	9
26	Vicksburg Chemical Co.	Vicksburg, MS	28	3
27	DuPont	New Johnsonville, TN	28	11
28	Rubicon Inc.	Geismar, LA	28	24
29	Monsanto Co.	Luling, LA	28	14
30	FMC Corp.	Pocatello, ID	28	12
31	Mulberry Phosphates Inc., Mulberry Corp.	Mulberry, FL	28	4
32	Eastman Kodak Co., Kodak Park	Rochester, NY	38	46
33	Coastal Chem Inc., Coastal Corp.	Cheyenne, WY	28	12
34	Angus Chemical Co.	Sterlington, LA	28	11
35	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33	13
36	Sterling Chemicals Inc.	Texas City, TX	28	34
37	DuPont	Beaumont, TX	28	22
38	Granite City Steel, National Steel Corp.	Granite City, IL	33	22
39	PCS Phosphate Co. Inc., Potash Corp. of Saskatchewan	White Springs, FL	28	4
40	Tennessee Eastman Div., Eastman Chemical Co.	Kingsport, TN	28	63
41	IMC-Agrico Co., IMC Global Inc.	Saint James, LA	28	6
42	USS Fairfield Works, USX Corp.	Fairfield, AL	33	15
43	International Paper Co.	Hampton, SC	30	10
44	Exxon Co. USA, Baton Rouge Refinery, Exxon Corp.	Baton Rouge, LA	29	32
45	Westvaco Corp., Bleached Board Div.	Covington, VA	26	16
46	Kerr-McGee Chemical LLC, Kerr-McGee Corp.	Hamilton, MS	Mult.	5
47	Weyerhaeuser Co.	Longview, WA	Mult.	18
48	Dow Chemical Co.	Freeport, TX	28	68
49	International Paper Co., Mansfield Mill	Mansfield, LA	26	10
50	Hoechst-Celanese Chemical, Clear Lake Plant, Hoechst Corp.	Pasadena, TX	28	20
	Subtotal			**828**
	% of Total			**1.4**
	Total			**58,252**

Rank	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	28,270,233	0	0	0	28,270,233	Chlorine (air)
2	47,346	2,280	0	17,100,454	17,150,080	Zinc and compounds (land)
3	48,716	13,487,112	0	291,886	13,827,714	Phosphoric acid (water)
4	288,368	3,644	0	12,053,733	12,345,745	Zinc/Copper and compounds (land)
5	98,510	11,793,413	0	0	11,891,923	Nitric acid and nitrate compounds (water)
6	109,489	4,441	0	10,908,661	11,022,591	Copper/Zinc/Lead and compounds (land)
7	103,557	826	9,712,998	0	9,817,381	Nitric acid and nitrate compounds (UIJ)
8	176,213	791	8,861,812	5,445	9,044,261	Nitric acid and nitrate compounds (UIJ)
9	92,972	0	0	8,503,492	8,596,464	Copper and compounds (land)
10	7,619,166	2,879	0	142,766	7,764,811	Carbon disulfide (air)
11	71,934	3,167	7,594,695	0	7,669,796	Acetonitrile, Acrylic acid, Acrylamide (UIJ)
12	777,508	13,242	0	6,463,719	7,254,469	Zinc and compounds (land)
13	6,848,254	9,265	0	175,510	7,033,029	Carbon disulfide (air)
14	60,613	7,982	0	6,716,100	6,784,695	Zinc/Manganese and compounds (land)
15	2,131	703	0	6,575,964	6,578,798	Chromium and compounds (land)
16	143,873	6,353,578	5,407	0	6,502,858	Nitric acid and nitrate compounds (water)
17	333,612	18,744	0	5,620,881	5,973,237	Zinc and compounds (land)
18	174,841	205,442	0	4,752,382	5,132,665	Manganese and compounds (land)
19	28,690	10	0	4,892,495	4,921,195	Zinc/Lead and compounds (land)
20	142,400	0	4,146,788	0	4,289,188	Acetonitrile, Acrylamide, Cyanide compounds (UIJ)
21	54,412	306	4,198,418	3,985	4,257,121	Acetonitrile, Acrylamide, Acrylonitrile (UIJ)
22	2,843	14	0	4,126,984	4,129,841	Chromium and compounds (land)
23	282,458	0	3,809,524	0	4,091,982	Manganese and compounds (UIJ)
24	163,429	0	0	3,805,895	3,969,324	Phosphoric acid (land)
25	119,063	183	0	3,839,901	3,959,147	Zinc and compounds (land)
26	34,454	3,668,877	0	0	3,703,331	Nitric acid and nitrate compounds (water)
27	33,946	32,986	3,516,553	57	3,583,542	Manganese and compounds (UIJ)
28	144,879	79	3,274,650	0	3,419,608	Nitric acid and nitrate compounds, Methanol (UIJ)
29	38,598	90,123	3,277,869	0	3,406,590	Formaldehyde (UIJ)
30	13,048	338	0	3,362,448	3,375,834	Zinc and compounds, Phosphorus (land)
31	12,939	3,170,390	0	0	3,183,329	Phosphoric acid (water)
32	2,750,339	288,950	0	18,603	3,057,892	Dichloromethane, Hydrochloric acid, Methanol (air)
33	11,497	0	2,975,170	109	2,986,776	Nitric acid and nitrate compounds (UIJ)
34	59,908	96,610	2,800,966	0	2,957,484	Nitric acid and nitrate compounds, Formaldehyde (UIJ)
35	2,046,411	0	0	842,723	2,889,134	Copper and compounds (air)
36	367,117	2,312	2,502,904	0	2,872,333	Acetonitrile, Acrylamide, Nitric acid and nitrate compounds, tert-Butyl alcohol (UIJ)
37	119,905	315	2,672,011	0	2,792,231	Nitric acid and nitrate compounds (UIJ)
38	100,722	6,116	0	2,668,366	2,775,204	Zinc and compounds (land)
39	54,427	0	0	2,630,385	2,684,812	Phosphoric acid (land)
40	2,375,308	53,946	0	235,359	2,664,613	Hydrochloric acid, Methanol, Sulfuric acid, Toluene, Xylene, Hydrogen fluoride, Bromomethane, Ethylene glycol, Ethylene (air)
41	74,646	2,242,020	0	165,209	2,481,875	Phosphoric acid (water)
42	149,742	794	0	2,139,993	2,290,529	Zinc and compounds (land)
43	2,264,625	31	0	0	2,264,656	Methanol, Phenol (air)
44	371,814	1,859,247	0	1	2,231,062	Nitric acid and nitrate compounds (water)
45	2,102,416	35,531	0	52,444	2,190,391	Methanol, Hydrochloric acid (air)
46	4,946	6,145	0	2,066,666	2,077,757	Manganese and compounds (land)
47	1,851,284	117,389	0	0	1,968,673	Methanol, Acetaldehyde (air)
48	1,884,177	64,115	0	14,283	1,962,575	Hydrochloric acid, Ethylene, Propylene, Chlorine (air)
49	1,754,569	1,790	0	156,121	1,912,480	Methanol (air)
50	386,059	0	1,517,577	0	1,903,636	Ethylene glycol (UIJ)
	65,068,407	**43,646,126**	**60,867,342**	**110,333,020**	**279,914,895**	
	14.5	**46.1**	**81.5**	**74.2**	**36.5**	
	449,375,340	**94,618,694**	**74,649,654**	**148,658,503**	**767,302,191**	

* Chemicals accounting for more than 70% of total releases from the facility.

➤ UIJ = underground injection

Figure 3–12
M 1997

NPRI and TRI Total On-site Releases, Top 50 Facilities and All Others, 1997

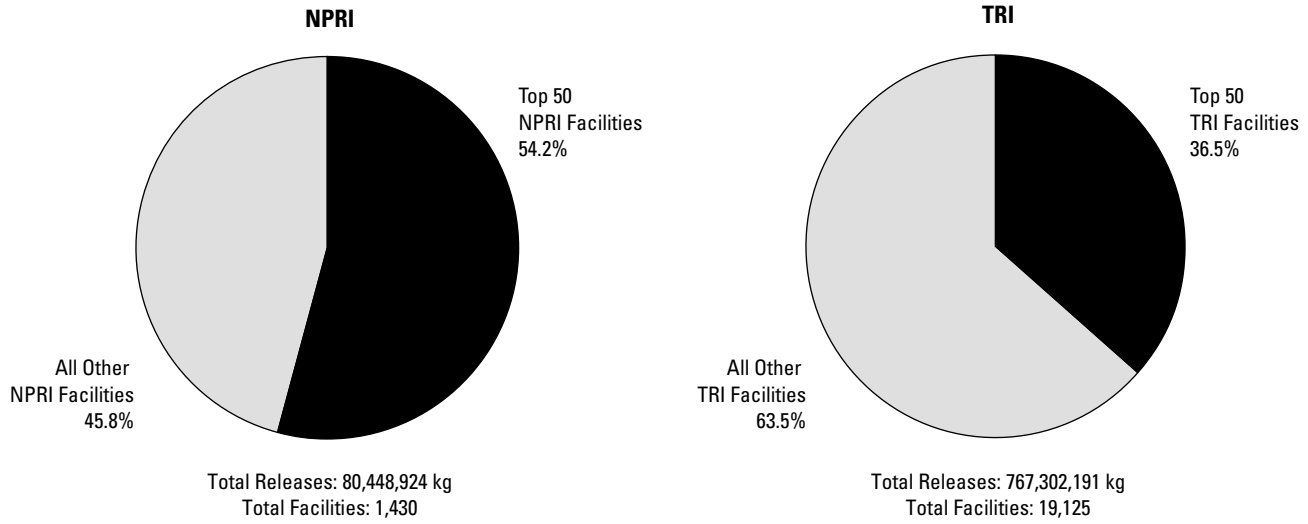


Figure 3–13
M 1997

Distribution of Total On-site Releases of Top 50 Facilities, NPRI and TRI, 1997

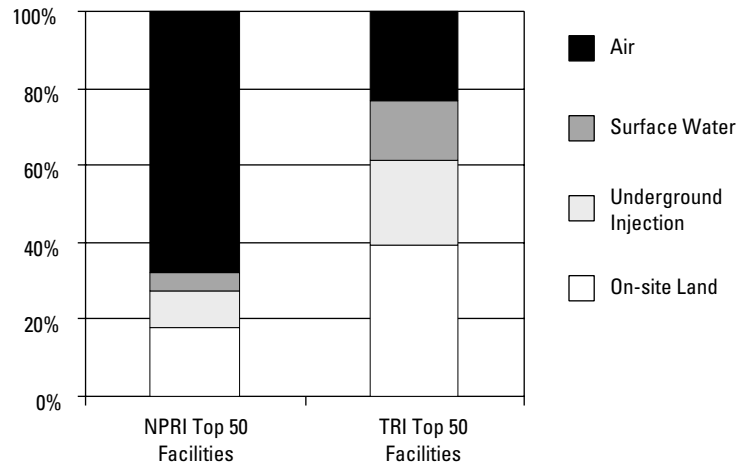


Table 3–13

M 1997

NPRI Total On-site Releases by All Facilities and by Facilities with Largest Amounts, by Province, 1997

Province	All NPRI Facilities						Top 50 Facilities		Top 50 Facilities as % of All Facilities	
	Number of Facilities	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Number of Facilities	Total Releases (kg)	Facilities (%)	Total Releases (%)
Alberta	107	6,535,005	422,063	4,195,518	825,838	11,987,370	7	8,455,835	6.5	70.5
British Columbia	77	5,099,159	281,346	0	70,769	5,459,128	6	2,603,220	7.8	47.7
Manitoba	44	1,584,802	34,570	0	1,774,178	3,397,552	2	2,527,519	4.5	74.4
New Brunswick	25	1,467,892	878,778	0	8,254	2,357,036	2	1,676,789	8.0	71.1
Newfoundland	8	409,896	1,054	0	1,356	412,606	0	0	0.0	0.0
Nova Scotia	23	710,039	45,264	0	308,191	1,063,517	0	0	0.0	0.0
Ontario	767	36,049,425	1,149,543	0	2,682,311	39,955,770	23	21,839,022	3.0	54.7
Prince Edward Island	3	18,648	194,922	0	6,200	219,770	0	0	0.0	0.0
Quebec	356	10,042,745	1,195,907	0	3,384,956	14,649,326	9	5,948,949	2.5	40.6
Saskatchewan	20	921,011	20,722	2,142	55	946,849	1	542,102	5.0	57.3
Total	**1,430**	**62,838,622**	**4,224,169**	**4,197,660**	**9,062,108**	**80,448,924**	**50**	**43,593,436**	**3.5**	**54.2**

Geographic Distribution of Top Facilities

Twenty-three of the NPRI facilities reporting the largest releases were located in Ontario, which ranked first among provinces for total releases in 1997. The 23 facilities represented three percent of Ontario's facilities, but contributed 55 percent of Ontario's total releases. Nine of the top facilities reported in Quebec, which ranked second for total releases. Constituting three percent of Quebec's facilities, their releases amounted to 41 percent of Quebec's total. In Alberta, which ranked third, seven facilities—seven percent of the province's facilities—reported 71 percent of the province's releases. However, facilities among NPRI's top 50 also contributed half or more of total releases in Manitoba, New Brunswick and Saskatchewan (**Table 3–13**).

In TRI, eight of the 50 facilities reporting the largest releases were in Texas, which was also the state with the largest total releases. These facilities represented one percent of Texas' facilities and reported 43 percent of the state's releases. Another eight of the top 50 TRI facilities reported in Louisiana, which ranked second overall. They constituted three percent of that state's facilities and reported 60 percent of its releases. Two facilities in Utah, amounting to two percent of that state's facilities, reported 94 percent of all its releases. Utah ranked third among US states for total releases. Facilities in TRI's top 50 also accounted for more than half the releases in five other states: Arizona, Idaho, Montana, New Mexico and Wyoming (**Table 3–14**).

Table 3–14

M 1997

TRI Total On-site Releases by All Facilities and by Facilities with Largest Amounts, by State, 1997

State	All TRI Facilities: Number of Facilities	All TRI Facilities: Total Air Emissions (kg)	All TRI Facilities: Surface Water Discharges (kg)	All TRI Facilities: Underground Injection (kg)	All TRI Facilities: On-site Land Releases (kg)	All TRI Facilities: Total Releases (kg)	Top 50 Facilities: Number of Facilities	Top 50 Facilities: Total Releases (kg)	Top 50 Facilities as % of All Facilities: Facilities (%)	Top 50 Facilities as % of All Facilities: Total Releases (%)
Alabama	461	24,083,443	1,814,015	4	4,302,073	30,199,535	2	9,323,558	0.4	30.9
Alaska	6	398,450	141,154	122	766	540,492	0	0	0.0	0.0
Arizona	175	3,657,642	19	2	9,778,878	13,436,541	2	11,485,598	1.1	85.5
Arkansas	326	7,448,214	727,009	656,793	1,395,928	10,227,944	0	0	0.0	0.0
California	1,154	6,743,559	1,855,386	13,217	309,372	8,921,534	0	0	0.0	0.0
Colorado	151	874,450	410,834	0	46,067	1,331,351	0	0	0.0	0.0
Connecticut	278	2,004,136	292,732	0	17,516	2,314,384	0	0	0.0	0.0
Delaware	60	780,983	94,961	0	135,131	1,011,075	0	0	0.0	0.0
District of Columbia	1	0	0	0	0	0	0	0	0.0	—
Florida	457	9,799,141	3,691,701	9,816,593	8,706,340	32,013,775	3	15,685,522	0.7	49.0
Georgia	609	16,090,372	3,074,232	0	1,209,219	20,373,823	0	0	0.0	0.0
Hawaii	10	123,603	258	3	0	123,864	0	0	0.0	0.0
Idaho	50	1,073,907	508,103	0	4,647,354	6,229,364	1	3,375,834	2.0	54.2
Illinois	1,166	17,846,951	2,158,283	1,520	11,138,116	31,144,870	2	9,559,899	0.2	30.7
Indiana	913	19,026,535	884,957	87,618	7,812,085	27,811,195	1	7,254,469	0.1	26.1
Iowa	356	5,808,061	1,117,395	0	904,592	7,830,048	0	0	0.0	0.0
Kansas	245	6,125,545	249,930	425,762	427,013	7,228,250	0	0	0.0	0.0
Kentucky	380	10,746,890	254,436	0	1,241,926	12,243,252	0	0	0.0	0.0
Louisiana	261	20,218,057	20,906,839	18,788,650	3,310,832	63,224,378	8	37,906,609	3.1	60.0
Maine	75	2,398,587	420,723	0	127,781	2,947,091	0	0	0.0	0.0
Maryland	165	2,399,558	884,574	0	1,162,227	4,446,359	0	0	0.0	0.0
Massachusetts	422	2,048,545	21,932	0	8,731	2,079,208	0	0	0.0	0.0
Michigan	786	16,610,760	163,603	2,151,240	1,074,965	20,000,568	0	0	0.0	0.0
Minnesota	429	5,238,940	66,321	0	65,957	5,371,218	0	0	0.0	0.0
Mississippi	264	13,104,815	5,277,258	3,851,531	2,519,643	24,753,247	3	9,873,070	1.1	39.9
Missouri	502	12,486,375	1,255,584	0	9,037,762	22,779,721	2	8,880,342	0.4	39.0
Montana	23	1,560,643	38,172	0	17,100,808	18,699,623	1	17,150,080	4.3	91.7
Nebraska	141	1,891,807	219,271	0	29,920	2,140,998	0	0	0.0	0.0
Nevada	43	586,225	0	0	1,235,152	1,821,377	0	0	0.0	0.0
New Hampshire	97	859,600	39,392	0	71,547	970,539	0	0	0.0	0.0
New Jersey	498	3,406,353	2,091,688	0	524,913	6,022,954	0	0	0.0	0.0
New Mexico	32	919,208	3,648	0	12,364,744	13,287,600	1	12,345,745	3.1	92.9
New York	600	9,265,335	1,901,094	113	540,875	11,707,417	1	3,057,892	0.2	26.1
North Carolina	736	17,855,348	2,834,574	13,197	8,332,258	29,035,377	2	8,099,165	0.3	27.9
North Dakota	29	315,176	193,895	0	776	509,847	0	0	0.0	0.0
Ohio	1,464	18,397,663	2,519,375	4,146,794	11,928,550	36,992,382	3	15,395,090	0.2	41.6
Oklahoma	261	4,772,487	293,724	750,444	251,223	6,067,878	0	0	0.0	0.0
Oregon	227	6,508,451	1,915,261	0	1,253,309	9,677,021	0	0	0.0	0.0
Pennsylvania	1,120	15,581,050	17,384,468	0	748,188	33,713,706	1	11,891,923	0.1	35.3
Puerto Rico	134	2,893,226	476	0	600	2,894,302	0	0	0.0	0.0
Rhode Island	116	702,832	952	0	1,964	705,748	0	0	0.0	0.0
South Carolina	439	17,660,101	1,078,794	0	611,086	19,349,981	1	2,264,656	0.2	11.7
South Dakota	64	526,009	816,327	0	1,060	1,343,396	0	0	0.0	0.0
Tennessee	568	29,475,027	433,000	3,857,299	2,112,648	35,877,974	3	14,012,966	0.5	39.1
Texas	1,080	38,699,081	9,086,284	27,113,580	8,984,055	83,883,000	8	35,913,813	0.7	42.8
Utah	125	29,292,846	551,154	0	11,991,001	41,835,001	2	39,292,824	1.6	93.9
Vermont	33	91,314	83,508	0	118	174,940	0	0	0.0	0.0
Virgin Islands	2	536,198	671	0	666	537,535	0	0	0.0	0.0
Virginia	387	17,163,630	1,657,917	0	526,512	19,348,059	1	2,190,391	0.3	11.3
Washington	254	7,685,887	947,713	0	102,277	8,735,877	1	1,968,673	0.4	22.5
West Virginia	125	4,885,110	2,957,563	0	22,647	7,865,320	0	0	0.0	0.0
Wisconsin	798	10,144,520	1,297,358	2	513,695	11,955,575	0	0	0.0	0.0
Wyoming	27	562,694	176	2,975,170	27,637	3,565,677	1	2,986,776	3.7	83.8
Total	**19,125**	**449,375,340**	**94,618,694**	**74,649,654**	**148,658,503**	**767,302,191**	**50**	**279,914,895**	**0.3**	**36.5**

Table 3–15

M 1997

The 25 NPRI Chemicals with the Largest Total On-site Releases, 1997

Rank	CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Under-ground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total
1	67-56-1	Methanol	15,543,558	1,154,512	2,320,000	6,875	19,031,512	23.7
2	1330-20-7	Xylene (mixed isomers)	6,372,745	2,713	13,501	2,907	6,401,451	8.0
3	108-88-3	Toluene	6,115,409	6,018	21,076	1,573	6,151,767	7.6
4	—	Zinc (and its compounds)	780,353	57,381	301	4,967,666	5,813,918	7.2
5	78-93-3	Methyl ethyl ketone	4,185,441	0	940,000	281	5,133,281	6.4
6	7664-93-9	Sulfuric acid	4,463,666	0	0	0	4,463,666	5.5
7	—	Nitric acid and nitrate compounds	101,941	2,407,847	538,340	39,576	3,089,698	3.8
8	110-82-7	Cyclohexane	2,892,115	1,150	10	430	2,893,761	3.6
9	75-09-2	Dichloromethane	2,302,312	72	0	49	2,303,223	2.9
10	74-85-1	Ethylene	1,991,309	2	0	2	1,992,363	2.5
11	—	Manganese (and its compounds)	51,292	233,638	1	1,615,414	1,909,572	2.4
12	50-00-0	Formaldehyde	1,557,910	205,448	60,500	0	1,828,117	2.3
13	7664-39-3	Hydrogen fluoride	1,725,586	0	0	0	1,725,590	2.1
14	71-43-2	Benzene	1,442,715	737	35,259	647	1,479,788	1.8
15	7647-01-0	Hydrochloric acid	1,401,424	0	0	0	1,401,424	1.7
16	—	Lead (and its compounds)	546,567	5,371	43	694,021	1,251,363	1.6
17	71-36-3	n-Butyl alcohol	1,196,101	0	0	30	1,200,412	1.5
18	10049-04-4	Chlorine dioxide	1,199,187	0	0	0	1,199,244	1.5
19	115-07-1	Propylene	972,163	0	0	0	972,363	1.2
20	7782-50-5	Chlorine	902,293	12,626	0	0	917,863	1.1
21	100-42-5	Styrene	811,993	0	63	542	818,325	1.0
22	—	Chromium (and its compounds)	39,548	12,999	220	718,372	776,821	1.0
23	108-10-1	Methyl isobutyl ketone	726,057	0	0	29	728,543	0.9
24	79-01-6	Trichloroethylene	694,039	0	0	0	695,270	0.9
25	—	Copper (and its compounds)	420,087	8,155	10	228,895	660,947	0.8
		Subtotal	**58,435,811**	**4,108,669**	**3,929,324**	**8,277,309**	**74,840,282**	**93.0**
		% of Total NPRI Releases	**93.0**	**97.3**	**93.6**	**91.3**	**93.0**	
		Total NPRI Releases	**62,838,622**	**4,224,169**	**4,197,660**	**9,062,108**	**80,448,924**	**100.0**

Releases by Chemical

Top Chemicals

Releases of the 25 chemicals reported in the largest amounts in each system constituted 93 percent of NPRI's total releases and 89 percent of those in TRI. In NPRI, releases of the top 25 chemicals totaled 74.8 million kg and in TRI the total was 683.3 million kg (**Tables 3–15** and **3–16**).

Both NPRI and TRI facilities reported larger releases of methanol than of any other chemical—19.0 million kg in NPRI and 99.4 million kg in TRI (**Figure 3–14**). However, this represented one quarter (24 percent) of NPRI releases and one eighth (13 percent) of TRI releases.

No other chemical accounted for as much as 10 percent of the NPRI releases. NPRI facilities reported approximately six million kg each of xylene, toluene and zinc and its compounds—each chemical comprising approximately eight percent of NPRI total releases.

TRI facilities, however, reported releasing 97.3 million kg of nitric acid and nitrate compounds (13 percent of the TRI total), nearly matching the TRI releases of methanol. TRI releases of zinc and its compounds totaled 59.2 million kg (eight percent of all releases), and TRI facilities also reported 51.6 million kg of toluene (seven percent of total releases).

Twenty-one substances appear on both the NPRI and TRI "top 25" lists. These consisted of n-butyl alcohol, chlorine, chromium and its compounds, copper and its compounds, dichloromethane, ethylene, formaldehyde, hydrochloric acid, lead and its compounds, manganese and its compounds, methanol, methyl ethyl ketone, methyl isobutyl ketone, nitric acid and nitrate compounds, propylene, styrene, sulfuric acid, toluene, trichloroethylene, xylene and zinc and its compounds.

Table 3–16

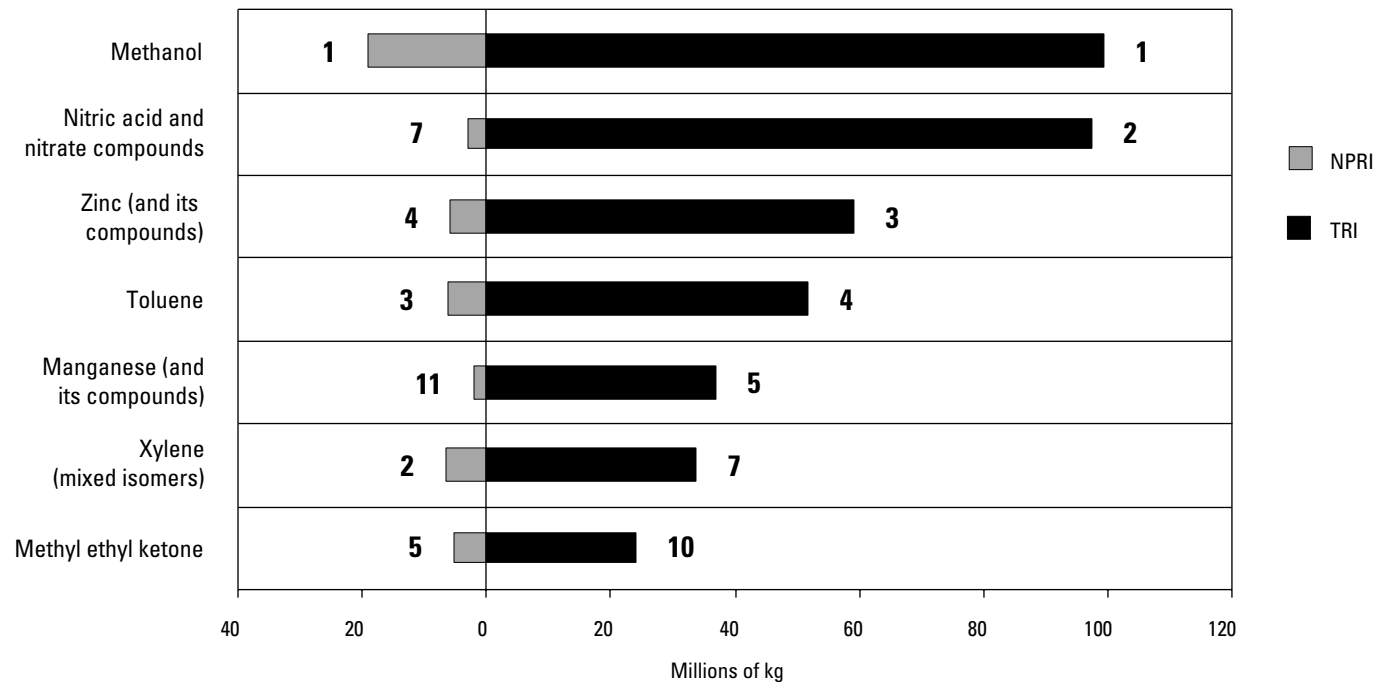
M 1997

The 25 TRI Chemicals with the Largest Total On-site Releases, 1997

Rank	CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total
1	67-56-1	Methanol	87,766,160	3,153,396	8,000,650	434,883	99,355,089	12.9
2	—	Nitric acid and nitrate compounds	1,383,796	67,684,998	26,735,791	1,511,642	97,316,227	12.7
3	—	Zinc (and its compounds)	3,595,567	542,493	167,112	54,942,228	59,247,400	7.7
4	108-88-3	Toluene	51,063,585	13,922	232,938	335,301	51,645,746	6.7
5	—	Manganese (and its compounds)	1,060,108	1,973,728	6,536,435	27,216,996	36,787,267	4.8
6	7664-38-2	Phosphoric acid	816,890	19,734,443	6,012	13,708,634	34,265,979	4.5
7	1330-20-7	Xylene (mixed isomers)	33,509,975	16,466	59,633	34,657	33,620,731	4.4
8	7782-50-5	Chlorine	29,195,071	114,168	27,480	33,455	29,370,174	3.8
9	7647-01-0	Hydrochloric acid	26,161,189	0	0	0	26,161,189	3.4
10	78-93-3	Methyl ethyl ketone	23,777,804	18,830	220,021	72,251	24,088,906	3.1
11	75-15-0	Carbon disulfide	23,122,430	12,992	234,723	2	23,370,147	3.0
12	75-09-2	Dichloromethane	21,257,652	4,275	239,467	5,070	21,506,464	2.8
13	—	Copper (and its compounds)	2,868,168	65,397	133,649	18,112,239	21,179,453	2.8
14	100-42-5	Styrene	19,972,442	19,930	91,785	224,860	20,309,017	2.6
15	—	Chromium (and its compounds)	432,407	50,147	513,178	13,489,871	14,485,603	1.9
16	74-85-1	Ethylene	13,690,956	420	1,194	50	13,692,620	1.8
17	71-36-3	n-Butyl alcohol	9,678,962	36,162	1,415,908	15,638	11,146,670	1.5
18	50-00-0	Formaldehyde	5,228,863	111,941	4,492,404	51,377	9,884,585	1.3
19	7664-93-9	Sulfuric acid	9,478,028	0	0	0	9,478,028	1.2
20	75-05-8	Acetonitrile	403,907	3,384	8,569,053	28	8,976,372	1.2
21	—	Lead (and its compounds)	584,366	22,719	119,718	8,091,358	8,818,161	1.1
22	79-01-6	Trichloroethylene	7,922,138	251	447	1,802	7,924,638	1.0
23	115-07-1	Propylene	7,375,613	2,357	1,194	304	7,379,468	1.0
24	108-10-1	Methyl isobutyl ketone	7,212,688	8,681	39,183	1,853	7,262,405	0.9
25	75-07-0	Acetaldehyde	5,740,593	100,748	168,516	53,572	6,063,429	0.8
		Subtotal	**393,299,358**	**93,691,848**	**58,006,491**	**138,338,071**	**683,335,768**	**89.1**
		% of Total TRI Releases	**87.5**	**99.0**	**77.7**	**93.1**	**89.1**	
		Total TRI Releases	**449,375,340**	**94,618,694**	**74,649,654**	**148,658,503**	**767,302,191**	**100.0**

Figure 3–14
M 1997

Comparisons for Top Five Chemicals under NPRI and TRI for Total On-site Releases, 1997



➤ Numbers indicate rank for releases in matched data set.

Carcinogens

Of the 48 substances in the matched data set designated as known or suspected carcinogens by the International Agency for Research on Cancer (IARC) <http://www.iarc.fr/> or by the US National Toxicological Program (NTP) <http://ntp-server.niehs.nih.gov/>, NPRI facilities reported releases of 36 and TRI facilities of all 48. In NPRI, these releases totaled 10.8 million kg, or 14 percent of all NPRI releases. In TRI, releases of known or suspected carcinogens totaled 117.1 million kg, or 15 percent of TRI releases (**Tables 3–17** and **3–18**).

Dichloromethane was reported in the largest amounts in both NPRI (2.3 million kg) and TRI (21.5 million kg). NPRI releases of three additional designated carcinogens exceeded one million kg each: formaldehyde (1.8 million kg), benzene (1.5 million kg) and lead and its compounds (1.3 million kg). In TRI, carcinogenic substances with the largest releases (following dichloromethane) were styrene (20.3 million kg), chromium and its compounds (14.5 million kg) and formaldehyde (9.9 million kg).

Table 3–17

M 1997

NPRI On-site Releases of Known or Suspected Carcinogens†, 1997

CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Under-ground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total for Carcinogens
75-09-2	Dichloromethane	2,302,312	72	0	49	2,303,223	21.2
50-00-0	Formaldehyde	1,557,910	205,448	60,500	0	1,828,117	16.8
71-43-2	Benzene	1,442,715	737	35,259	647	1,479,788	13.6
—	Lead (and its compounds)	546,567	5,371	43	694,021	1,251,363	11.5
100-42-5	Styrene	811,993	0	63	542	818,325	7.5
—	Chromium (and its compounds)	39,548	12,999	220	718,372	776,821	7.2
79-01-6	Trichloroethylene	694,039	0	0	0	695,270	6.4
—	Nickel (and its compounds)	294,522	23,945	1	43,233	364,094	3.4
108-05-4	Vinyl acetate	142,947	0	140,000	100	283,107	2.6
75-07-0	Acetaldehyde	226,475	3,620	38,000	0	268,195	2.5
67-66-3	Chloroform	215,365	5,479	0	0	221,835	2.0
—	Arsenic (and its compounds)	146,693	1,535	0	0	149,053	1.4
106-99-0	1,3-Butadiene	105,530	28	0	0	105,819	1.0
1332-21-4	Asbestos (friable)	0	0	0	53,026	53,026	0.5
127-18-4	Tetrachloroethylene	51,508	28	0	8	52,407	0.5
75-01-4	Vinyl chloride	43,581	210	0	0	43,991	0.4
—	Cadmium (and its compounds)	39,919	829	0	505	41,353	0.4
—	Cobalt (and its compounds)	8,207	1,647	0	10,572	20,614	0.2
117-81-7	Di(2-ethylhexyl) phthalate	19,287	0	0	36	19,849	0.2
107-06-2	1,2-Dichloroethane	18,247	27	0	1,319	19,603	0.2
75-21-8	Ethylene oxide	15,714	0	0	0	16,159	0.1
75-56-9	Propylene oxide	13,005	0	0	0	13,005	0.1
106-46-7	1,4-Dichlorobenzene	8,000	0	0	0	8,100	0.1
107-13-1	Acrylonitrile	5,190	0	0	0	6,469	0.1
123-91-1	1,4-Dioxane	1,298	2,700	0	0	3,998	0.0
139-13-9	Nitrilotriacetic acid	2,623	0	0	0	2,868	0.0
121-14-2	2,4-Dinitrotoluene	0	816	0	0	816	0.0
26471-62-5	Toluenediisocyanate (mixed isomers)	143	0	0	0	774	0.0
79-06-1	Acrylamide	327	0	0	0	527	0.0
56-23-5	Carbon tetrachloride	256	0	0	0	336	0.0
96-09-3	Styrene oxide	0	0	0	0	297	0.0
140-88-5	Ethyl acrylate	100	0	0	0	161	0.0
77-78-1	Dimethyl sulfate	10	0	0	0	10	0.0
584-84-9	Toluene-2,4-diisocyanate	0	0	0	0	10	0.0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	0	0	0	0	6	0.0
106-89-8	Epichlorohydrin	0	0	0	0	4	0.0
	Subtotal	**8,754,031**	**265,491**	**274,086**	**1,522,430**	**10,849,393**	**100.0**
	% of Total	**13.9**	**6.3**	**6.5**	**16.8**	**13.5**	
	Total	**62,838,622**	**4,224,169**	**4,197,660**	**9,062,108**	**80,448,924**	

† 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) is included if the chemical or any of its compounds is designated carcinogenic.

Table 3–18

M 1997

TRI On-site Releases of Known or Suspected Carcinogens†, 1997

CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Under-ground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total for Carcinogens
75-09-2	Dichloromethane	21,257,652	4,275	239,467	5,070	21,506,464	18.4
100-42-5	Styrene	19,972,442	19,930	91,785	224,860	20,309,017	17.3
—	Chromium (and its compounds)	432,407	50,147	513,178	13,489,871	14,485,603	12.4
50-00-0	Formaldehyde	5,228,863	111,941	4,492,404	51,377	9,884,585	8.4
—	Lead (and its compounds)	584,366	22,719	119,718	8,091,358	8,818,161	7.5
79-01-6	Trichloroethylene	7,922,138	251	447	1,802	7,924,638	6.8
75-07-0	Acetaldehyde	5,740,593	100,748	168,516	53,572	6,063,429	5.2
71-43-2	Benzene	3,950,990	5,074	164,558	27,872	4,148,494	3.5
79-06-1	Acrylamide	7,839	2,881	3,208,173	138,569	3,357,462	2.9
67-66-3	Chloroform	3,257,971	72,566	12,224	3,335	3,346,096	2.9
127-18-4	Tetrachloroethylene	3,044,491	914	6,856	2,300	3,054,561	2.6
—	Arsenic (and its compounds)	90,688	1,864	34,544	2,615,079	2,742,175	2.3
—	Nickel (and its compounds)	344,572	53,043	64,435	2,089,389	2,551,439	2.2
107-13-1	Acrylonitrile	555,359	553	1,828,525	374	2,384,811	2.0
108-05-4	Vinyl acetate	1,507,152	1,211	54,114	982	1,563,459	1.3
106-99-0	1,3-Butadiene	1,229,355	1,157	454	133	1,231,099	1.1
107-06-2	1,2-Dichloroethane	415,768	827	2,062	12	418,669	0.4
75-01-4	Vinyl chloride	417,089	37	168	0	417,294	0.4
—	Cadmium (and its compounds)	25,330	1,110	24	389,381	415,845	0.4
75-21-8	Ethylene oxide	401,738	1,647	6,869	446	410,700	0.4
—	Cobalt (and its compounds)	30,107	16,683	20,255	290,269	357,314	0.3
98-95-3	Nitrobenzene	29,168	135	289,369	3	318,675	0.3
75-56-9	Propylene oxide	246,536	10,413	5,306	402	262,657	0.2
1332-21-4	Asbestos (friable)	3,289	1	0	233,333	236,623	0.2
56-23-5	Carbon tetrachloride	162,130	142	14,947	61	177,280	0.2
123-91-1	1,4-Dioxane	64,068	89,012	0	2,090	155,170	0.1
106-89-8	Epichlorohydrin	142,514	4,219	0	4,312	151,045	0.1
117-81-7	Di(2-ethylhexyl) phthalate	106,799	262	0	32,203	139,264	0.1
106-46-7	1,4-Dichlorobenzene	118,942	783	907	889	121,521	0.1
140-88-5	Ethyl acrylate	82,905	71	0	233	83,209	0.1
26471-62-5	Toluenediisocyanate (mixed isomers)	23,498	115	0	164	23,777	0.0
79-46-9	2-Nitropropane	10,761	1,265	0	0	12,026	0.0
101-77-9	4,4'-Methylenedianiline	4,185	39	6,826	0	11,050	0.0
302-01-2	Hydrazine	5,063	5	0	113	5,181	0.0
139-13-9	Nitrilotriacetic acid	0	3,390	1,088	0	4,478	0.0
64-67-5	Diethyl sulfate	3,365	0	0	0	3,365	0.0
62-56-6	Thiourea	465	158	2,268	113	3,004	0.0
584-84-9	Toluene-2,4-diisocyanate	2,952	2	0	0	2,954	0.0
77-78-1	Dimethyl sulfate	2,042	0	0	0	2,042	0.0
91-08-7	Toluene-2,6-diisocyanate	1,271	0	0	0	1,271	0.0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	1,028	0	0	0	1,028	0.0
95-80-7	2,4-Diaminotoluene	888	0	0	0	888	0.0
121-14-2	2,4-Dinitrotoluene	817	41	0	0	858	0.0
94-59-7	Safrole	229	0	0	0	229	0.0
606-20-2	2,6-Dinitrotoluene	199	11	0	0	210	0.0
90-94-8	Michler's ketone	182	0	0	0	182	0.0
96-45-7	Ethylene thiourea	130	0	0	0	130	0.0
96-09-3	Styrene oxide	5	0	0	0	5	0.0
	Subtotal	**77,430,341**	**579,642**	**11,349,487**	**27,749,967**	**117,109,437**	**100.0**
	% of Total	**17.2**	**0.6**	**15.2**	**18.7**	**15.3**	
	Total	**449,375,340**	**94,618,694**	**74,649,654**	**148,658,503**	**767,302,191**	

† 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.

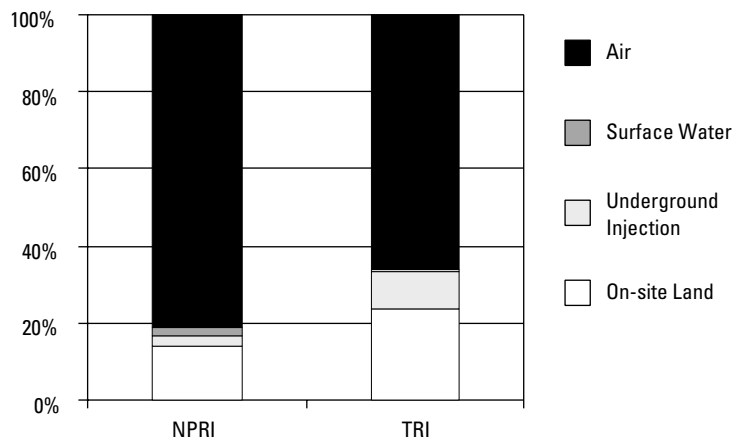
➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Releases of the designated carcinogens were distributed quite differently in the two PRTRs, although air emissions were predominant in both cases, totaling 8.8 million kg in NPRI and 77.4 million kg in TRI. On-site land releases ranked second among release types, with 1.5 million kg in NPRI and 27.7 million kg in TRI. NPRI facilities released approximately equal amounts of the designated carcinogens to surface waters (265,491 kg) and to underground injection (274,086 kg), whereas TRI facilities released almost 20 times the amount of such substances to underground injection (11.3 million kg) as to surface waters (579,642 kg).

Thus, although surface water discharges received the smallest percentage of releases of carcinogenic substances in both systems, this percentage was five times larger in NPRI (2.4 percent) than in TRI (0.5 percent). TRI facilities were more likely to release such substances to on-site land disposal (24 percent of TRI releases of the carcinogens) or to underground injection (10 percent) than their NPRI counterparts (14 percent and three percent, respectively—**Figure 3–15**).

Figure 3–15
M 1997

Distribution of NPRI and TRI On-site Releases of Known or Suspected Carcinogens†, 1997

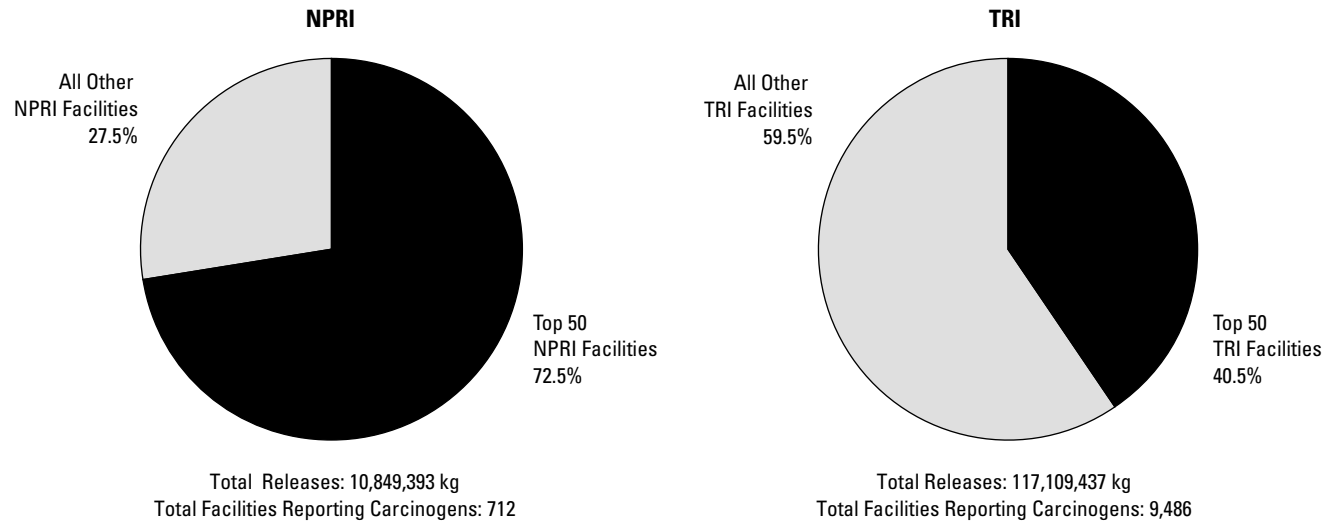


† Carcinogenic substances are those chemicals or chemical compounds listed in either the International Agency for Research on Cancer (IARC) Monographs or the US National Toxicological Program (NTP) Annual Report on Carcinogens.

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Figure 3–16
M 1997

NPRI and TRI On-site Releases of Known or Suspected Carcinogens†, Top 50 Facilities and All Others, 1997



† 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) is included if the chemical or any of its compounds is designated carcinogenic.

The 50 NPRI facilities with the largest releases of designated carcinogens in the matched data set reported 7.9 million kg of such releases, or 73 percent of NPRI's total releases of these substances. This included more than two-thirds of the total amounts reported in NPRI for carcinogenic substances in each release type, ranging from 69 percent (6.0 million kg) of the air emissions to 92 percent (1.4 million kg) of the on-site land releases (**Figure 3–16** and **Table 3–19**).

The 50 TRI facilities with the largest releases of designated carcinogens in the matched data set reported 47.4 million kg, or 41 percent of the total releases of carcinogens. These facilities reported a great majority of the TRI releases of carcinogenic substances to underground injection (10.1 million kg or 89 percent of the total) and on-site land disposal (23.5 million kg or 85 percent), but a much smaller proportion of all TRI releases to air (13.7 million kg or 18 percent) and surface waters (67,904 kg or 12 percent—**Figure 3–16** and **Table 3–20**).

Table 3–19

M 1997

The 50 NPRI Facilities with the Largest Total On-site Releases of Known or Suspected Carcinogens†, 1997

Rank	Facility	City, Province	SIC Codes Canada	SIC Codes US	Number of Forms
1	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	4
2	Celanese Canada Inc.	Edmonton, AB	37	28	6
3	Dofasco Inc.	Hamilton, ON	29	33	5
4	Novopharm Limited	Scarborough, ON	37	28	1
5	Carpenter Canada Ltd.	Woodbridge, ON	16	30	2
6	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33	5
7	MacMillan Bloedel Pembroke LP, MacMillan Bloedel Ltd.	Pembroke, ON	25	24	1
8	Domfoam International Inc.	St Léonard, QC	16	30	2
9	Stelco Inc., Hilton Works	Hamilton, ON	29	33	6
10	Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur, QC	29	33	2
11	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33	3
12	Novopharm Limited	Markham, ON	37	28	1
13	Valle Foam Industries Inc., Valle 1	Brampton, ON	16	30	2
14	Abitibi-Consolidated Inc., Division Port-Alfred	La Baie, QC	27	26	2
15	Sandvik Steel Canada, Sandvik Steel, Inc.	Arnprior, ON	29	33	1
16	Vitafoam Products Canada Ltd., Vita-Toronto	Downsview, ON	16	30	3
17	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33	2
18	Algoma Steel Inc, Algoma Steel Main Works	Sault Ste. Marie, ON	29	33	6
19	Foamex Canada Inc., Foamex L.P.	Toronto, ON	16	30	2
20	Weyerhaeuser Canada Ltd., Edson O.S.B. Mill	Edson, AB	25	24	2
21	Ispat Sidbec Inc., Sidbec-Feruni, Ispat Mexicana	Contrecoeur, QC	29	33	3
22	Mirolin Industries, MRL Incorporated	Toronto, ON	16	30	2
23	Weyerhaeuser Canada Ltd., Drayton Valley O.S.B. Mill	Drayton Valley, AB	25	24	2
24	Carpenter Canada Ltd., Calgary Division	Calgary, AB	16	30	2
25	Dow Chemical Canada Inc.	Sarnia, ON	37	28	17
26	Domtar Papers, Cornwall Business Unit	Cornwall, ON	27	26	1
27	Daishowa-Marubeni International, Peace River Pulp Div.	Peace River, AB	27	26	1
28	Co-Steel Lasco	Whitby, ON	29	33	3
29	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33	3
30	Valle Foam Industries Inc., Valle 2	Brampton, ON	16	30	2
31	Inco Limited, Manitoba Division	Thompson, MB	29	33	3
32	AT Plastics Inc., Edmonton Site	Edmonton, AB	37	28	1
33	Bayer Inc., Bayer AG	Sarnia, ON	37	28	5
34	Ainsworth Lumber Co. Ltd.	Grande Prairie, AB	25	24	1
35	Uniboard Canada Inc., Division Mont-Laurier	Mont-Laurier, QC	25	24	1
36	Uniboard Canada Inc., Division Val-d'Or, UniKunz Canada Inc.	Val-d'Or, QC	25	24	1
37	Weyerhaeuser Canada Ltd., Slave Lake O.S.B. Mill	Slave Lake, AB	25	24	2
38	De Havilland Inc., Bombardier Inc.	Downsview, ON	32	35	1
39	René Matériaux composites Ltée	St-Éphrem-de-Beauce, QC	32	37	2
40	Falconbridge Ltd., Kidd Metallurgical Div.	Cochrane, ON	29	33	4
41	Imperial Oil, Sarnia Chemical Plant	Sarnia, ON	37	28	4
42	Malette Québec Inc., Panneaux Malette OSB	St-Georges de Champlain, QC	25	24	1
43	MAAX Inc., Division fibre de verre moderne - usine 5	Tring-Jonction, QC	16	30	1
44	Nova Chemicals (Canada) Ltd.	Corunna, ON	36	29	2
45	Ranger Board Ltd., West Fraser Mills Ltd.	Blue Ridge, AB	25	24	1
46	Vitafoam Products Canada Ltd.	Calgary, AB	16	30	3
47	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	4
48	Wolverine Tube (Canada) Inc.	London, ON	29	33	1
49	Uniboard Canada Inc., Division Sayabec, UniKunz Canada Inc.	Sayabec, QC	25	24	1
50	Nova Chemicals (Canada) Ltd	Sarnia, ON	37	28	3
	Subtotal				**136**
	% of Total				**11.7**
	Total for All NPRI Matched Carcinogens				**1,166**

† 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) is included if the chemical or any of its compounds is designated carcinogenic.

Rank	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	248,650	0	0	649,000	897,650	Chromium and compounds (land)
2	151,422	0	227,000	0	378,422	Vinyl acetate, Acetaldehyde (UIJ)
3	315,968	446	0	82	316,496	Benzene (air)
4	313,250	0	0	0	313,250	Dichloromethane (air)
5	296,820	0	0	0	296,925	Dichloromethane (air)
6	278,510	2,520	0	0	281,030	Lead and compounds (air)
7	279,000	0	0	0	279,000	Formaldehyde (air)
8	245,996	0	0	0	245,996	Dichloromethane (air)
9	237,840	2,690	0	0	242,390	Benzene (air)
10	4,625	412	0	229,755	234,792	Lead and compounds (land)
11	233,458	996	0	0	234,454	Lead and compounds (air)
12	226,993	0	0	0	226,993	Dichloromethane (air)
13	218,200	0	0	0	218,252	Dichloromethane (air)
14	13,030	199,400	0	0	212,430	Formaldehyde (water)
15	203,760	0	0	0	203,760	Trichloroethylene (air)
16	201,660	0	0	0	202,260	Dichloromethane (air)
17	2,045	78	0	167,150	169,273	Lead and compounds (land)
18	165,794	2,112	0	0	167,918	Benzene (air)
19	156,995	0	0	0	157,075	Dichloromethane (air)
20	131,500	0	0	0	131,500	Formaldehyde (air)
21	0	0	0	125,530	125,530	Lead and compounds (land)
22	119,860	0	0	0	119,860	Dichloromethane, Styrene (air)
23	115,430	0	0	0	115,430	Formaldehyde (air)
24	103,050	0	0	0	103,060	Dichloromethane (air)
25	53,503	2	0	46,576	100,758	Asbestos (land), Benzene, Styrene (air)
26	100,000	3	0	0	100,003	Benzene (air)
27	92,090	2,250	0	0	94,340	Chloroform (air)
28	1,220	99	0	91,254	92,573	Lead and compounds (land)
29	3,312	5	0	87,410	90,727	Lead and compounds (land)
30	86,518	0	0	0	86,518	Dichloromethane (air)
31	67,452	17,851	0	0	85,303	Nickel and compounds (air)
32	84,600	0	0	0	84,600	Vinyl acetate (air)
33	81,872	31	0	0	82,673	1,3-Butadiene (air)
34	82,298	0	0	0	82,298	Formaldehyde (air)
35	78,500	0	0	0	78,500	Formaldehyde (air)
36	77,100	0	0	0	77,100	Formaldehyde (air)
37	76,330	0	0	0	76,330	Formaldehyde (air)
38	72,200	0	0	0	72,200	Trichloroethylene (air)
39	71,000	0	0	0	71,000	Styrene, Dichloromethane (air)
40	69,349	650	0	0	69,999	Lead and compounds (air)
41	69,711	219	0	0	69,991	Benzene (air)
42	66,857	0	0	0	66,857	Formaldehyde (air)
43	66,510	0	0	0	66,510	Styrene (air)
44	65,070	0	0	0	65,070	Benzene, 1,3-Butadiene (air)
45	64,585	0	0	0	64,585	Formaldehyde (air)
46	64,402	0	0	0	64,402	Dichloromethane (air)
47	63,689	288	0	0	63,977	Benzene (air)
48	62,500	0	0	0	62,500	Trichloroethylene (air)
49	62,136	0	0	0	62,136	Formaldehyde (air)
50	56,400	0	0	0	56,400	Styrene, Benzene (air)
	6,003,060	**230,052**	**227,000**	**1,396,757**	**7,861,096**	
	68.6	**86.7**	**82.8**	**91.7**	**72.5**	
	8,754,031	**265,491**	**274,086**	**1,522,430**	**10,849,393**	

* Chemicals accounting for more than 70% of total releases of carcinogens from the facility.
➤ UIJ - underground injection

Table 3–20

M 1997

The 50 TRI Facilities with the Largest Total On-site Releases of Known or Suspected Carcinogens†, 1997

Rank	Facility	City, State	US SIC Code	Number of Forms
1	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28	1
2	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	1
3	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	5
4	Monsanto Co.	Luling, LA	28	2
5	ASARCO Inc.	East Helena, MT	33	4
6	BP Chemicals Inc., Green Lake, BP America Inc.	Port Lavaca, TX	28	5
7	ASARCO Inc., Glover Plant	Annapolis, MO	33	4
8	Angus Chemical Co.	Sterlington, LA	28	4
9	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33	1
10	Aquaglass Corp., Masco Corp.	Adamsville, TN	30	1
11	Solutia Inc., Chocolate Bayou	Alvin, TX	28	3
12	Eastman Kodak Co., Kodak Park	Rochester, NY	38	9
13	BP Chemicals Inc., BP America Inc.	Lima, OH	28	10
14	Cytec Ind. Inc., Fortier Plant	Westwego, LA	28	5
15	Foamex L.P., Div. of Kihi	Corry, PA	30	2
16	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33	6
17	Borden Chemicals & Plastics LP	Geismar, LA	28	7
18	Carpenter Co., Tupelo Div.	Verona, MS	30	2
19	Abbott Health Prods. Inc., Abbott Labs.	Barceloneta, PR	28	1
20	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33	7
21	Northwestern Steel & Wire Co.	Sterling, IL	33	2
22	Boeing Co.	Wichita, KS	Mult.	6
23	Doe Run Co., Renco Group Inc.	Herculaneum, MO	33	5
24	Carpenter Co.	Russellville, KY	Mult.	5
25	Sterling Chemicals Inc.	Texas City, TX	28	9
26	Foamex Intl Inc.	Milan, TN	30	2
27	FMC Corp.	Pocatello, ID	28	4
28	GE Co.	Ottawa, IL	28	4
29	Vitafoam Inc., British Vita PLC	Tupelo, MS	30	3
30	Carpenter Co.	Richmond, VA	Mult.	3
31	Carpenter Co.	Elkhart, IN	Mult.	3
32	Aqua Glass Performance Plant, Masco Corp.	McEwen, TN	30	1
33	Pharmacia & Upjohn Caribe Inc., Pharmacia & Upjohn Inc.	Arecibo, PR	28	2
34	GE Plastics Co., GE Co.	Mount Vernon, IN	28	4
35	Foamex L.P., Foamex Intl. Inc.	Morristown, TN	30	2
36	General Foam Corp., PMC Inc.	West Hazelton, PA	30	3
37	U.S. Vanadium Corp., Strategic Minerals Corp.	Hot Springs, AR	33	1
38	Elkem Metals Co.	Marietta, OH	33	4
39	DuPont	Pass Christian, MS	28	4
40	Nu-Foam Prods. Inc., Ohio Decorative Prods. Inc.	Chattanooga, TN	30	2
41	Tomkins Ind. Inc., Lasco Bathware Div.	Three Rivers, MI	30	1
42	Flexible Foam Prods., Ohio Decorative Prods. Inc.	Elkhart, IN	30	2
43	Tomkins Ind. Inc., Lasco Bathware Div.	Cordele, GA	30	1
44	Cleveland Laminating Corp.	Cleveland, OH	26	1
45	Weyerhaeuser Co.	Longview, WA	Mult.	5
46	Kimberly-Clark Corp.	Mobile, AL	26	2
47	3V Inc.	Georgetown, SC	28	4
48	Rubicon Inc.	Geismar, LA	28	9
49	American Steel Foundries, Amsted Ind. Inc.	Granite City, IL	33	2
50	Dow Chemical Co.	Plaquemine, LA	28	18
	Subtotal			**194**
	% of Total			**1.2**
	Total for All TRI Carcinogens			**15,905**

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

➤ A chemical (and its compounds) is included if the chemical or any of its compounds is designated carcinogenic.

Rank	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	2,018	113	0	6,575,964	6,578,095	Chromium and compounds (land)
2	2,843	14	0	4,126,984	4,129,841	Chromium and compounds (land)
3	27,487	452	0	4,073,128	4,101,067	Lead/Arsenic and compounds (land)
4	15,601	0	3,221,043	0	3,236,644	Formaldehyde (UIJ)
5	23,355	1,262	0	1,739,278	1,763,895	Lead and compounds (land)
6	20,563	0	1,690,118	656	1,711,337	Acrylamide, Acrylonitrile (UIJ)
7	21,141	5	0	1,582,218	1,603,364	Lead and compounds (land)
8	12,481	1,956	1,126,995	0	1,141,432	Formaldehyde (UIJ)
9	34,921	7	0	1,062,717	1,097,645	Nickel and compounds (land)
10	1,057,867	0	0	0	1,057,867	Styrene (air)
11	13,064	0	1,025,986	0	1,039,050	Acrylonitrile (UIJ)
12	980,987	25,565	0	6,803	1,013,355	Dichloromethane (air)
13	27,171	0	965,267	0	992,438	Acrylamide (UIJ)
14	4,009	235	979,139	0	983,383	Acrylamide (UIJ)
15	903,448	0	0	0	903,448	Dichloromethane (air)
16	13,177	267	0	833,526	846,970	Lead/Arsenic/Chromium and compounds (land)
17	815,549	187	9	0	815,745	Benzene (air)
18	704,215	0	0	0	704,215	Dichloromethane (air)
19	689,524	0	0	0	689,524	Dichloromethane (air)
20	8,074	0	0	672,109	680,183	Lead/Chromium and compounds (land)
21	4,921	345	0	593,651	598,917	Chromium/Lead and compounds (land)
22	595,943	452	0	0	596,395	Tetrachloroethylene (air)
23	99,783	98	0	494,901	594,782	Lead and compounds (land)
24	571,776	0	0	0	571,776	Dichloromethane (air)
25	67,453	0	481,566	0	549,019	Acrylamide (UIJ)
26	521,285	0	0	0	521,285	Dichloromethane (air)
27	2,924	0	0	477,785	480,709	Chromium/Cadmium and compounds (land)
28	446,033	117	0	115	446,265	Styrene, Acrylonitrile (air)
29	425,644	0	0	0	425,644	Dichloromethane (air)
30	414,129	0	0	0	414,129	Dichloromethane (air)
31	408,975	0	0	0	408,975	Dichloromethane (air)
32	404,393	0	0	0	404,393	Styrene (air)
33	396,123	0	0	0	396,123	Dichloromethane (air)
34	392,178	270	0	0	392,448	Dichloromethane (air)
35	392,006	0	0	0	392,006	Dichloromethane (air)
36	377,050	0	0	0	377,050	Dichloromethane (air)
37	0	88	0	365,306	365,394	Nickel and compounds (land)
38	27,223	5,442	0	326,985	359,650	Chromium and compounds (land)
39	0	0	358,277	0	358,277	Chromium and compounds (UIJ)
40	354,187	0	0	0	354,187	Dichloromethane (air)
41	352,562	0	0	0	352,562	Styrene (air)
42	350,198	0	0	0	350,198	Dichloromethane (air)
43	347,116	0	0	0	347,116	Styrene (air)
44	346,032	0	0	0	346,032	Dichloromethane (air)
45	320,666	19,157	0	0	339,823	Acetaldehyde (air)
46	316,100	11,792	0	0	327,892	Chloroform (air)
47	319,397	0	0	0	319,397	Dichloromethane (air)
48	40,207	8	268,481	0	308,696	Nitrobenzene (UIJ)
49	2,422	0	0	298,413	300,835	Chromium and compounds (land)
50	69,173	72	0	229,595	298,840	Asbestos (land)
	13,743,394	**67,904**	**10,116,881**	**23,460,134**	**47,388,313**	
	17.7	**11.7**	**89.1**	**84.5**	**40.5**	
	77,430,341	**579,642**	**11,349,487**	**27,749,967**	**117,109,437**	

* Chemicals accounting for more than 70% of total releases of carcinogens from the facility.

➤ UIJ = underground injection

Metals

Fifteen percent of NPRI releases and 20 percent of TRI releases in 1997 consisted of metals and their compounds. These releases totaled 11.8 million kg in NPRI and 149.2 million kg in TRI. The 15 metals and their compounds were principally released on-site to land. The 8.8 million kg of metals and compounds released to on-site land disposal in NPRI amounted to 97 percent of all NPRI on-site land releases. The 129.0 million kg similarly reported in TRI amounted to 87 percent of all TRI on-site land releases (**Tables 3–21** and **3–22**).

Zinc and manganese (and their compounds) headed both the NPRI and TRI lists of metals for total releases. NPRI facilities reported releasing 5.8 million kg of zinc and its compounds and 1.9 million kg of manganese and its compounds. NPRI releases of lead and its compounds, ranking third, totaled 1.3 million kg. TRI releases included 59.2 million kg of zinc and its compounds and 36.8 million kg of manganese and its compounds. Copper and its compounds ranked third, with 21.2 million kg.

Table 3–21

M 1997

NPRI On-site Releases of Metals and Their Compounds, 1997

CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
—	Zinc (and its compounds)	780,353	57,381	301	4,967,666	5,813,918
—	Manganese (and its compounds)	51,292	233,638	1	1,615,414	1,909,572
—	Lead (and its compounds)	546,567	5,371	43	694,021	1,251,363
—	Chromium (and its compounds)	39,548	12,999	220	718,372	776,821
—	Copper (and its compounds)	420,087	8,155	10	228,895	660,947
7429-90-5	Aluminum (fume or dust)	62,897	334	0	469,900	534,619
—	Nickel (and its compounds)	294,522	23,945	1	43,233	364,094
7440-62-2	Vanadium (fume or dust)	212,229	163	0	2,863	215,356
—	Arsenic (and its compounds)	146,693	1,535	0	0	149,053
—	Cadmium (and its compounds)	39,919	829	0	505	41,353
—	Cobalt (and its compounds)	8,207	1,647	0	10,572	20,614
—	Selenium (and its compounds)	4,629	3,989	0	0	9,280
—	Antimony (and its compounds)	5,794	606	0	321	7,301
—	Silver (and its compounds)	1,255	172	0	52	1,479
—	Mercury (and its compounds)	52	2	0	184	244
	Subtotal	**2,614,044**	**350,766**	**576**	**8,751,998**	**11,756,014**
	% of Total	**4.2**	**8.3**	**0.0**	**96.6**	**14.6**
	Total	**62,838,622**	**4,224,169**	**4,197,660**	**9,062,108**	**80,448,924**

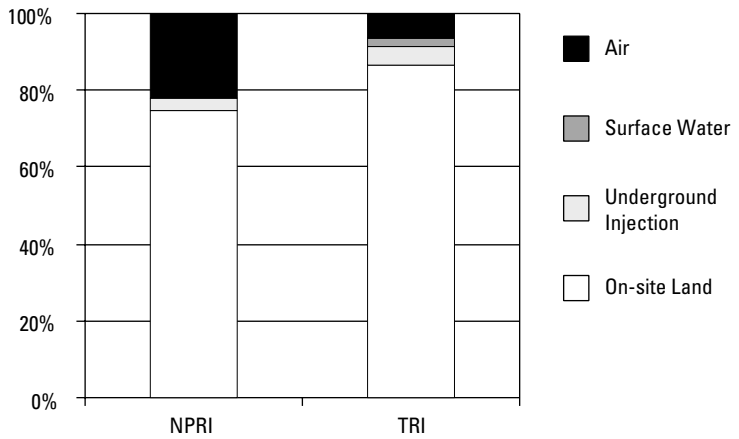
Table 3–22
M 1997

TRI On-site Releases of Metals and Their Compounds, 1997

CAS Number	Chemical	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)
—	Zinc (and its compounds)	3,595,567	542,493	167,112	54,942,228	59,247,400
—	Manganese (and its compounds)	1,060,108	1,973,728	6,536,435	27,216,996	36,787,267
—	Copper (and its compounds)	2,868,168	65,397	133,649	18,112,239	21,179,453
—	Chromium (and its compounds)	432,407	50,147	513,178	13,489,871	14,485,603
—	Lead (and its compounds)	584,366	22,719	119,718	8,091,358	8,818,161
—	Arsenic (and its compounds)	90,688	1,864	34,544	2,615,079	2,742,175
—	Nickel (and its compounds)	344,572	53,043	64,435	2,089,389	2,551,439
7429-90-5	Aluminum (fume or dust)	720,505	19,214	0	1,003,852	1,743,571
—	Antimony (and its compounds)	42,172	18,905	5,538	565,624	632,239
—	Cadmium (and its compounds)	25,330	1,110	24	389,381	415,845
—	Cobalt (and its compounds)	30,107	16,683	20,255	290,269	357,314
—	Selenium (and its compounds)	37,709	1,102	1,546	144,258	184,615
7440-62-2	Vanadium (fume or dust)	5,640	321	0	53,293	59,254
—	Silver (and its compounds)	7,055	2,833	71	18,589	28,548
—	Mercury (and its compounds)	6,544	190	19	3,574	10,327
	Subtotal	**9,850,938**	**2,769,749**	**7,596,524**	**129,026,000**	**149,243,211**
	% of Total	**2.2**	**2.9**	**10.2**	**86.8**	**19.5**
	Total	**449,375,340**	**94,618,694**	**74,649,654**	**148,658,503**	**767,302,191**

Figure 3–17
M 1997

Distribution of NPRI and TRI On-site Releases of Metals and Their Compounds, 1997



Although in both PRTRs the predominant release for metals and their compounds was on-site to land (74 percent of all releases of metals in NPRI and 86 percent in TRI), the distribution of other release types for these substances differed. NPRI facilities were more likely to release metals to air (2.6 million kg or 22 percent of all releases of metals and their compounds) than were TRI facilities (9.9 million kg or seven percent of such releases). NPRI facilities reported only a very small amount of underground injection of metals and their compounds (576 kg or less than one-hundredth of one percent of all releases of metals), while TRI facilities disposed of about five percent (7.6 million kg) of their releases of metals in this way. Surface waters received comparable percentages of NPRI metals releases (350,766 kg or three percent) to those in TRI (2.8 million kg or two percent—**Figure 3–17**).

In NPRI, 50 facilities reported nearly all the releases of metals and their compounds: 11.6 million kg of a total of 11.8 million kg (98 percent). This included 8.7 million kg of on-site land releases, from a total of 8.8 million kg (nearly 100 percent). These 50 facilities also reported more than 95 percent of the air emissions and surface water discharges of the metals. The 50 TRI facilities with the largest such releases reported a total of 129.3 million kg or 87 percent of the TRI total. This included most of the on-site land releases (117.2 million kg, or 91 percent of all TRI on-site land releases of metals) and most of the underground injection (7.3 million kg or 96 percent). However, these TRI facilities accounted for a much smaller proportion of the air emissions (4.2 million kg or 43 percent) and even less of the surface water discharges (527,893 kg or 19 percent—**Tables 3–23** and **3–24** and **Figure 3–18**).

Table 3–23

M 1997

The 50 NPRI Facilities with the Largest Total On-site Releases of Metals and Their Compounds, 1997

Rank	Facility	City, Province	SIC Codes Canada	SIC Codes US	Number of Forms
1	Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur, QC	29	33	5
2	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33	5
3	Co-Steel Lasco	Whitby, ON	29	33	6
4	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33	6
5	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33	6
6	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33	5
7	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33	11
8	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33	6
9	Ispat Sidbec Inc., Sidbec-Feruni, Ispat Mexicana	Contrecoeur, QC	29	33	5
10	Sydney Steel Corporation	Sydney, NS	29	33	8
11	Recyclage d'aluminium Québec Inc., Philip Services Corp.	Bécancour, QC	29	33	1
12	Les Produits forestiers Donohue Inc, usine de pâte kraft	St-Félicien, QC	27	26	2
13	Recyclage d'aluminium Québec, Ragueneau, Philip Services Corp.	Baie-Comeau, QC	29	33	1
14	Falconbridge Ltd., Kidd Metallurgical Div.	Cochrane, ON	29	33	9
15	North Atlantic Refining Ltd	Come By Chance, NF	36	29	4
16	CEZinc (Zinc électrolytique du Canada Limitée), Noranda Inc.	Salaberry-De-Valleyfield, QC	29	33	8
17	Daishowa-Marubeni International, Peace River Pulp Div.	Peace River, AB	27	26	2
18	Inco Limited, Manitoba Division	Thompson, MB	29	33	4
19	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29	4
20	Esco Limited	Port Coquitlam, BC	29	33	2
21	Falconbridge Limited, Smelter Complex	Falconbridge, ON	29	33	9
22	Inco Limited, Port Colborne Refinery	Port Colborne, ON	29	33	5
23	Meridian Operations Inc., Richmond Division	Long-Sault, ON	55	37	3
24	Norsk Hydro Canada Inc., Hydro Magnesium Canada	Bécancour, QC	29	33	2
25	Cartons St-Laurent Inc.	LaTuque, QC	27	26	2
26	Kronos Canada, Inc.	Varennes, QC	37	28	2
27	Shell Canada Products Ltd., Sarnia Manufacturing Centre	Corunna, ON	36	29	3
28	Weyerhaeuser Canada Limited, Kamloops Pulp Division	Kamloops, BC	27	26	1
29	ICI Canada Inc, ICI Explosifs	Brownsburg, QC	39	39	2
30	Dofasco Inc.	Hamilton, ON	29	33	6
31	Menasco Aerospace, Coltec Industries Inc.	Oakville, ON	32	37	1
32	Weyerhaeuser Saskatchewan Ltd., Prince Albert Pulp & Pap	Prince Albert, SK	27	26	1
33	Stelco Inc., Hilton Works	Hamilton, ON	29	33	8
34	Industries James Maclaren Inc., Division de la pâte kraft	Thurso, QC	27	26	1
35	Noranda Mining and Exploration Inc., Brunswick Smelting Div.	Belledune, NB	29	33	5
36	St. Anne-Nackawic Pulp Company Ltd.	Nackawic, NB	27	26	1
37	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33	5
38	Weyerhaeuser Canada Ltd.	Grande Prairie, AB	04	24	1
39	NRI Industries Inc., Cawthra Plant	Toronto, ON	15	30	1
40	Irving Oil Limited, Refining Division	Saint John, NB	36	29	3
41	Spruce Falls Inc., Tembec Inc.	Kapuskasing/O'Brien, ON	27	26	1
42	Petro-Canada, Raffinerie de Montréal	Montréal, QC	36	29	2
43	Gerdau Courtice Steel Inc., Courtice Steel Inc.	Cambridge, ON	29	33	5
44	Wabash Alloys, Wabash Alloys Ontario	Toronto, ON	29	33	4
45	Slater Steels, Hamilton Specialty Bar Division	Hamilton, ON	29	33	8
46	DuPont Canada Inc., Maitland Site	Maitland, ON	37	28	3
47	Crestbrook Forest Industries, Pulp Division	Cranbrook, BC	27	26	1
48	F.F. Soucy Inc., Brant Allen Ind.	Rivière-du-Loup, QC	27	26	2
49	Ivaco Rolling Mills	L'Orignal, ON	29	33	7
50	Michelin North America (Canada) Inc.	Bridgewater, NS	15	30	2
	Subtotal				**197**
	% of Total				**12.8**
	Total for All NPRI Matched Metals				**1,541**

Rank	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	48,835	550	0	2,300,405	2,349,790	Zinc and compounds (land)
2	22,322	152	0	1,730,140	1,752,614	Zinc and compounds (land)
3	14,253	362	0	1,245,254	1,259,869	Zinc and compounds (land)
4	365,986	0	0	649,000	1,014,986	Chromium and compounds (land), Nickel and compounds (air)
5	12,053	47	0	717,505	729,605	Zinc/Manganese and compounds (land)
6	706,574	3,780	0	0	710,354	Zinc/Lead and compounds (air)
7	482,280	15,840	0	0	498,120	Lead/Copper/Zinc and compounds (air)
8	18,012	2,682	0	442,030	462,724	Manganese and compounds (land)
9	0	0	0	402,950	402,950	Zinc/Lead and compounds (land)
10	0	300	0	289,990	290,290	Zinc/Manganese and compounds (land)
11	0	0	0	275,000	275,000	Aluminum (land)
12	0	74,800	0	127,400	202,200	Manganese and compounds (land, water)
13	0	0	0	185,000	185,000	Aluminum (land)
14	157,755	11,413	0	0	169,168	Lead/Copper and compounds (air)
15	132,922	0	0	0	132,922	Vanadium (air)
16	93,146	13,328	0	0	107,762	Zinc and compounds (air)
17	0	6,790	0	96,347	103,137	Zinc and compounds (land)
18	75,252	18,525	0	0	93,777	Nickel and compounds (air)
19	87,952	110	0	4,784	92,846	Vanadium (air)
20	609	0	0	63,886	64,495	Manganese and compounds (land)
21	55,299	2,428	0	21	57,748	Zinc/Lead/Nickel and compounds (air)
22	949	1,047	0	53,900	55,896	Nickel/Copper and compounds (land)
23	44,898	0	0	0	44,898	Aluminum (air)
24	0	0	0	40,000	40,000	Manganese and compounds (land)
25	1,532	36,834	0	0	38,366	Manganese and compounds (water)
26	0	32,500	0	0	32,500	Manganese and compounds (water)
27	28,487	0	0	345	28,836	Vanadium, Nickel and compounds (air)
28	0	28,500	0	0	28,500	Manganese and compounds (water)
29	0	400	0	25,400	25,800	Lead and compounds (land)
30	16,758	6,173	0	0	22,931	Zinc/Manganese and compounds (air)
31	21,505	0	0	0	21,505	Chromium and compounds (air)
32	0	20,700	0	0	20,700	Manganese and compounds (water)
33	9,400	8,900	0	0	19,660	Zinc and compounds (water, air), Manganese and compounds (air)
34	0	0	0	18,970	18,970	Manganese and compounds (land)
35	17,280	968	0	0	18,248	Lead and compounds (air)
36	0	11,130	0	6,870	18,000	Chromium and compounds (water, land)
37	16,600	0	0	0	17,750	Zinc and compounds (air)
38	0	14,200	0	0	14,200	Manganese and compounds (water)
39	100	0	0	12,900	13,000	Zinc and compounds (land)
40	12,470	0	0	0	12,470	Vanadium, Nickel and compounds (air)
41	2,330	0	0	9,100	11,430	Manganese and compounds (land)
42	11,190	0	0	0	11,190	Vanadium (air)
43	10,608	0	0	0	10,608	Zinc and compounds (air)
44	10,522	0	0	0	10,522	Aluminum (air)
45	8,721	0	0	200	10,321	Zinc/Lead and compounds (air)
46	7,580	2,527	0	0	10,107	Cobalt/Copper and compounds (air)
47	0	10,100	0	0	10,100	Manganese and compounds (water)
48	0	9,500	0	0	9,500	Manganese and compounds (water)
49	8,552	1	0	0	9,447	Zinc/Manganese and compounds (air)
50	0	83	0	9,151	9,234	Zinc/Copper and compounds (land)
	2,502,732	**334,670**	**0**	**8,706,548**	**11,550,046**	
	95.7	**95.4**	**0.0**	**99.5**	**98.2**	
	2,614,044	**350,766**	**576**	**8,751,998**	**11,756,014**	

* Chemicals accounting for more than 70% of total releases of metals from the facility.

Table 3–24

M 1997

The 50 TRI Facilities with the Largest Total On-site Releases of Metals and Their Compounds, 1997

Rank	Facility	City, State	US SIC Code	Number of Forms
1	ASARCO Inc.	East Helena, MT	33	9
2	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33	10
3	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33	8
4	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33	11
5	Northwestern Steel & Wire Co.	Sterling, IL	33	4
6	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN	33	11
7	American Chrome & Chemicals, Harrisons & Crosfield Americ	Corpus Christi, TX	28	1
8	GM Powertrain Defiance, General Motors Corp.	Defiance, OH	33	6
9	Elkem Metals Co.	Marietta, OH	33	5
10	ASARCO Inc., Glover Plant	Annapolis, MO	33	7
11	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28	1
12	Doe Run Co., Renco Group Inc.	Herculaneum, MO	33	8
13	DuPont	Pass Christian, MS	28	6
14	DuPont	New Johnsonville, TN	28	5
15	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33	11
16	Granite City Steel, National Steel Corp.	Granite City, IL	33	6
17	FMC Corp.	Pocatello, ID	28	9
18	USS Fairfield Works, USX Corp.	Fairfield, AL	33	8
19	Kerr-McGee Chemical LLC, Kerr-McGee Corp.	Hamilton, MS	Mult.	3
20	Chemetals Inc., Comilog	New Johnsonville, TN	28	1
21	Louisiana Pigment Co. L.P.	Westlake, LA	28	1
22	Kerr-McGee Chemical LLC	Henderson, NV	28	2
23	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33	1
24	Springs Chemical, Grace Complex, Springs Ind. Inc.	Lancaster, SC	22	7
25	P4 Production L.L.C.	Soda Springs, ID	Mult.	4
26	Austeel Lemont Co. Inc.	Lemont, IL	33	5
27	Imco Recycling Inc.	Morgantown, KY	33	4
28	Millennium Inorganic Chemicals, Millennium Chemicals Inc.	Baltimore, MD	28	2
29	General Motors Corp., GMPTG Saginaw Metal Casting	Saginaw, MI	33	6
30	Bethlehem Steel Corp.	Sparrows Point, MD	33	6
31	American Steel Foundries, Amsted Ind. Inc.	Granite City, IL	33	5
32	Griffin Wheel Co., Amsted Ind. Inc.	Keokuk, IA	33	2
33	GE Co., Silicone Prods.	Waterford, NY	28	2
34	Geneva Steel	Vineyard, UT	33	8
35	LTV Steel Co. Inc.	East Chicago, IN	33	4
36	Griffin Wheel Co., Columbus Plant, Amsted Ind. Inc.	Groveport, OH	33	2
37	Georgia-Pacific Corp.	Ashdown, AR	26	3
38	U.S. Vanadium Corp., Strategic Minerals Corp.	Hot Springs, AR	33	1
39	Griffin Wheel Co., Amsted Ind. Inc.	Bessemer, AL	33	2
40	Griffin Wheel Co., Amsted Ind. Inc.	Kansas City, KS	33	2
41	Great Southern Paper Co., Georgia-Pacific Corp.	Cedar Springs, GA	26	5
42	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33	8
43	Alabama River Pulp Co. Inc., Parsons & Whittemore Inc.	Perdue Hill, AL	26	3
44	AK Steel Corp., AK Steel Holding	Middletown, OH	33	9
45	Tenneco Packaging, Tenneco Inc.	Tomahawk, WI	26	2
46	LTV Steel Co. Inc.	Cleveland, OH	33	5
47	TXI Ops. L.P.	Midlothian, TX	32	4
48	WCI Steel Inc.	Warren, OH	33	6
49	Gulf States Steel Inc., GSS Holding Corp.	Gadsden, AL	33	6
50	U.S. Pipe & Fndy. Co., Walter Ind. Inc.	Birmingham, AL	33	1
	Subtotal			**248**
	% of Total			**1.2**
	Total for All TRI Matched Metals			**20,186**

Rank	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	Major Chemicals Reported (Primary Media)*
1	40,338	2,280	0	17,100,454	17,143,072	Zinc and compounds (land)
2	133,922	3,644	0	12,048,532	12,186,098	Zinc/Copper and compounds (land)
3	71,865	4,215	0	10,900,498	10,976,578	Copper/Zinc/Lead and compounds (land)
4	18,596	0	0	8,503,492	8,522,088	Copper and compounds (land)
5	55,261	1,179	0	6,716,100	6,772,540	Zinc/Manganese and compounds (land)
6	140,596	7,755	0	6,450,341	6,598,692	Zinc and compounds (land)
7	2,018	113	0	6,575,964	6,578,095	Chromium and compounds (land)
8	33,575	2,175	0	5,564,083	5,599,833	Zinc and compounds (land)
9	174,615	205,442	0	4,752,382	5,132,439	Manganese and compounds (land)
10	28,690	10	0	4,892,495	4,921,195	Zinc/Lead and compounds (land)
11	2,843	14	0	4,126,984	4,129,841	Chromium and compounds (land)
12	118,721	183	0	3,839,901	3,958,805	Zinc and compounds (land)
13	0	0	3,809,524	0	3,809,524	Manganese and compounds (UIJ)
14	0	0	3,516,553	0	3,516,553	Manganese and compounds (UIJ)
15	2,046,411	0	0	842,723	2,889,134	Copper and compounds (air)
16	22,216	5,704	0	2,667,815	2,695,735	Zinc and compounds (land)
17	4,674	338	0	2,167,628	2,172,640	Zinc/Chromium and compounds (land)
18	6,353	794	0	2,133,209	2,140,356	Zinc and compounds (land)
19	4,354	6,145	0	2,066,666	2,077,165	Manganese and compounds (land)
20	15,556	583	0	1,523,810	1,539,949	Manganese and compounds (land)
21	9	122	0	1,405,896	1,406,027	Manganese and compounds (land)
22	6,077	0	0	1,152,381	1,158,458	Manganese and compounds (land)
23	34,921	7	0	1,062,717	1,097,645	Nickel and compounds (land)
24	969,901	0	0	0	969,901	Zinc and compounds (air)
25	35,863	226	0	905,652	941,741	Zinc and compounds (land)
26	12,521	226	0	766,139	778,886	Zinc and compounds (land)
27	14,163	0	0	739,864	754,027	Aluminum (land)
28	0	68,027	0	603,175	671,202	Manganese and compounds (land)
29	15,320	0	0	561,405	576,725	Zinc/Manganese and compounds (land)
30	7,758	19,570	0	471,883	499,211	Manganese and compounds (land)
31	24,617	0	0	459,411	484,028	Chromium and compounds, Aluminum (land)
32	8,164	0	0	446,893	455,057	Manganese and compounds (land)
33	454	6,984	0	444,671	452,109	Copper and compounds (land)
34	1,169	771	0	437,700	439,640	Manganese/Zinc and compounds (land)
35	6,508	1,383	0	425,397	433,288	Manganese and compounds (land)
36	8,164	0	0	423,423	431,587	Manganese and compounds (land)
37	2,998	88,436	0	290,395	381,829	Manganese and compounds (land)
38	0	88	0	365,306	365,394	Nickel and compounds (land)
39	3,583	0	0	355,157	358,740	Manganese and compounds (land)
40	3,583	0	0	321,290	324,873	Manganese and compounds (land)
41	33,760	19,464	0	266,811	320,035	Zinc/Manganese and compounds (land)
42	61,102	0	0	257,326	318,428	Zinc/Lead and compounds (land)
43	821	54,422	0	259,410	314,653	Manganese and compounds (land)
44	21,406	172	0	285,171	306,749	Manganese and compounds (land)
45	6,754	7,800	0	280,635	295,189	Zinc and compounds (land)
46	9,361	1,089	0	284,118	294,568	Manganese/Zinc and compounds (land)
47	683	0	0	286,232	286,915	Manganese and compounds (land)
48	3,757	483	0	279,193	283,433	Manganese and compounds (land)
49	5,316	18,049	0	254,240	277,605	Zinc/Manganese and compounds (land)
50	227	0	0	267,574	267,801	Manganese and compounds (land)
	4,219,564	**527,893**	**7,326,077**	**117,232,542**	**129,306,076**	
	42.8	**19.1**	**96.4**	**90.9**	**86.6**	
	9,850,938	**2,769,749**	**7,596,524**	**129,026,000**	**149,243,211**	

* Chemicals accounting for more than 70% of total releases of metals from the facility.

➤ UIJ = underground injection

Figure 3–18
M 1997

NPRI and TRI On-site Releases of Metals and Their Compounds, Top 50 Facilities and All Others, 1997

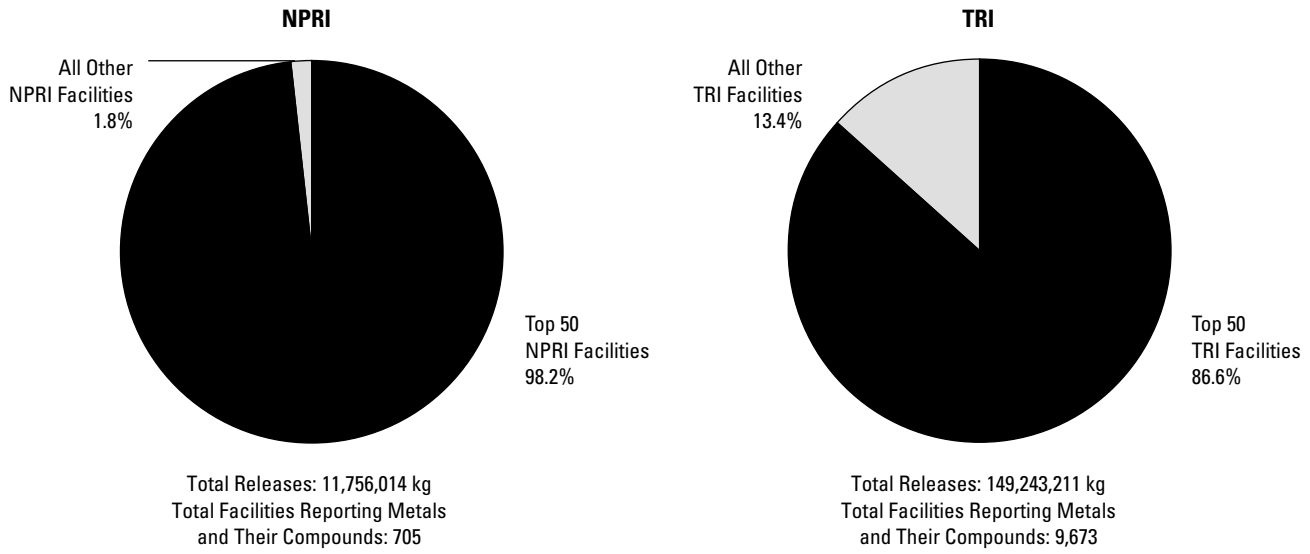


Table 3–25

M 1997

NPRI On-site Releases by Industry (US SIC Code), 1997

Rank	US SIC Code	Industry	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total
1	33	Primary Metals	9,744,792	671,989	0	8,593,216	19,025,036	23.6
2	28	Chemicals	13,212,747	855,945	4,126,753	75,807	18,334,510	22.8
3	26	Paper Products	14,916,645	1,880,731	0	268,191	17,068,622	21.2
4	37	Transportation Equipment	6,133,168	474	0	6,278	6,147,046	7.6
5	30	Rubber and Plastics Products	5,903,820	506	0	33,451	5,945,315	7.4
6	29	Petroleum and Coal Products	4,209,603	371,307	70,907	16,589	4,671,163	5.8
7	24	Lumber and Wood Products	2,203,872	14,570	0	0	2,219,981	2.8
8	34	Fabricated Metals Products	2,022,079	956	0	1,356	2,039,537	2.5
9	27	Printing and Publishing	1,605,074	3,693	0	0	1,609,267	2.0
10	32	Stone/Clay/Glass Products	856,086	4,781	0	5,436	868,511	1.1
11	25	Furniture and Fixtures	788,036	0	0	0	788,675	1.0
12	39	Misc. Manufacturing Industries	534,789	400	0	33,251	571,518	0.7
13	20	Food Products	63,295	416,097	0	24,076	503,468	0.6
14	22	Textile Mill Products	281,092	0	0	0	281,192	0.3
15	35	Industrial Machinery	268,290	20	0	0	269,113	0.3
16	36	Electronic/Electrical Equipment	71,274	2,700	0	4,457	82,010	0.1
17	31	Leather Products	23,680	0	0	0	23,680	0.0
18	23	Apparel and Other Textile Products	280	0	0	0	280	0.0
19	38	Measurement/Photographic Instruments	0	0	0	0	0	0.0
		Total	**62,838,622**	**4,224,169**	**4,197,660**	**9,062,108**	**80,448,924**	**100.0**

Releases by Industry

In 1997, the industries reporting the largest releases in NPRI were primary metals with 19.0 million kg, chemical manufacturing with 18.3 million kg and paper products with 17.1 million kg. TRI industries reporting the largest releases were chemical manufacturing with 254.6 million kg, primary metals with 171.0 million kg and paper products with 95.3 million kg (**Tables 3–25** and **3–26**). **Chapter 7** profiles the primary metals industry and its PRTR reporting in both countries.

In both countries, these three industries together reported two-thirds (68 percent) of all releases in the 1997 matched data set. In NPRI, however, the top three industries contributed roughly equal shares of the total releases (24 percent to 21 percent). TRI releases were more concentrated in the largest industry: chemical manufacturing with 33 percent of the total, primary metals with 22 percent, and paper products with 12 percent (**Figure 3–19**).

Facilities in the primary metals industry reported the largest on-site releases to land in both NPRI (8.6 million kg) and TRI (101.1 million kg). In NPRI, however, the primary metals industry reported more air emissions (9.7 million kg) than on-site land releases. In TRI, the sector's on-site land releases outweighed its air emissions (totaling 48.4 million kg) by two to one.

The chemical manufacturing industry reported the largest amounts in TRI for the other release types: 100.5 million kg of air emissions, 46.3 million kg of surface water discharges and 74.0 million kg of underground injection. In NPRI, the paper products sector was the largest industrial source of air emissions (14.9 million kg) and surface water discharges (1.9 million kg). Chemical manufacturing facilities reported nearly all of NPRI's underground injection (4.1 million kg).

Table 3–26

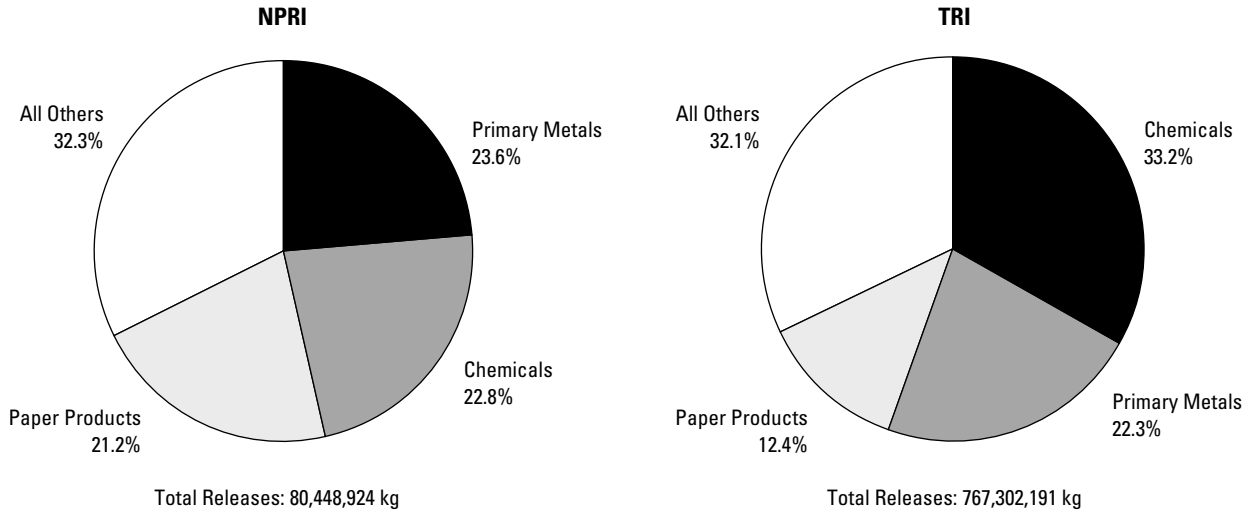
M 1997

TRI On-site Releases by Industry, 1997

Rank	US SIC Code	Industry	Total Air Emissions (kg)	Surface Water Discharges (kg)	Underground Injection (kg)	On-site Land Releases (kg)	Total Releases (kg)	% of Total
1	28	Chemicals	100,480,458	46,295,804	73,996,210	33,797,797	254,570,269	33.2
2	33	Primary Metals	48,370,696	21,324,497	170,771	101,141,817	171,007,781	22.3
3	26	Paper Products	82,388,810	7,360,415	13,197	5,507,600	95,270,022	12.4
4		Multiple Codes 20–39	33,568,587	4,991,863	231	3,573,169	42,133,850	5.5
5	30	Rubber and Plastics Products	38,734,551	5,840	0	369,434	39,109,825	5.1
6	37	Transportation Equipment	36,184,046	110,340	0	257,575	36,551,961	4.8
7	29	Petroleum and Coal Products	17,226,539	4,885,875	467,946	767,884	23,348,244	3.0
8	34	Fabricated Metals Products	19,698,973	636,859	3	385,877	20,721,712	2.7
9	32	Stone/Clay/Glass Products	9,637,487	19,895	0	1,524,740	11,182,122	1.5
10	20	Food Products	2,871,907	7,303,669	2	848,554	11,024,132	1.4
11	24	Lumber and Wood Products	10,843,057	3,206	0	21,308	10,867,571	1.4
12	25	Furniture and Fixtures	10,583,094	17	0	5,515	10,588,626	1.4
13	27	Printing and Publishing	10,582,010	556	0	113	10,582,679	1.4
14	22	Textile Mill Products	7,289,340	154,069	0	92,657	7,536,066	1.0
15	36	Electronic/Electrical Equipment	5,612,875	843,304	1,292	181,076	6,638,547	0.9
16	35	Industrial Machinery	6,141,376	3,737	0	104,668	6,249,781	0.8
17	38	Measurement/Photographic Instruments	4,033,302	587,910	0	55,644	4,676,856	0.6
18	39	Misc. Manufacturing Industries	3,855,139	627	2	7,710	3,863,478	0.5
19	21	Tobacco Products	585,081	77,587	0	0	662,668	0.1
20	31	Leather Products	450,325	10,039	0	4,484	464,848	0.1
21	23	Apparel and Other Textile Products	237,687	2,585	0	10,881	251,153	0.0
		Total	**449,375,340**	**94,618,694**	**74,649,654**	**148,658,503**	**767,302,191**	**100.0**

Figure 3–19
M 1997

Industries with Largest Total On-site Releases, NPRI and TRI, 1997



Average Releases

Facilities generally report using one form per substance. In 1997, NPRI facilities averaged somewhat larger total releases per reporting form—17,493 kg per form—than did TRI facilities—13,172 per form. Thus, NPRI releases per form were 1.3 times the TRI average (**Table 3–27**).

Comparing averages per reporting form instead of per facility compensates for the small difference between NPRI and TRI in the average number of forms per facility (3.22 forms per facility in NPRI and 3.05 in TRI). Differences in average releases per form can arise from various factors, including different types of industry and production capacity of facilities, different levels of pollution prevention and controls under different regulatory requirements, and different methods used to estimate amounts of releases. Some PRTR information, such as industry mix, can be examined to explore this difference between NPRI and TRI. Other factors that may influence facility averages—such as regulatory requirements—extend beyond the information supplied in NPRI and TRI and cannot be examined using PRTR data.

NPRI forms reported larger average releases than those in TRI in 13 of the industrial sectors in the matched data set (**Table 3–27** and **Figure 3–20**). These included four of the five industries reporting the largest releases to NPRI in 1997: the primary metals, paper products, rubber and plastics products and transportation equipment industries. Forms submitted by NPRI facilities in the primary metals and paper products sectors averaged 1.1 times the amount of releases reported on TRI forms in those industries. For the rubber and plastics products and transportation equipment industries, the difference was considerably greater: 1.7 times the TRI average.

There were six industry groups in which TRI releases per form exceeded those in NPRI (**Table 3–27**). These included chemical manufacturing. However, these larger TRI averages in particular sectors were outweighed by the predominance of industrial sectors in which NPRI forms had larger averages per form than in TRI.

The difference in NPRI and TRI average releases occurred specifically in air emissions. Air emissions constituted a considerably larger portion of NPRI releases than of those reported to TRI (see **Table 3–1**), and average air emissions—per form and per facility—were nearly twice as high in NPRI as in TRI (**Table 3–28**).

Releases to air reported to NPRI averaged 13,664 kg per reporting form—1.8 times the 7,714 kg average on TRI forms. On a per facility basis, air emissions averaged 43,943 kg in NPRI—1.9 times the 23,497 kg average for TRI facilities. In the other release types though, TRI forms and facilities reported greater releases on average than their NPRI counterparts.

Table 3–27

M 1997

Average On-site Releases per Form, by Industry, NPRI and TRI, 1997

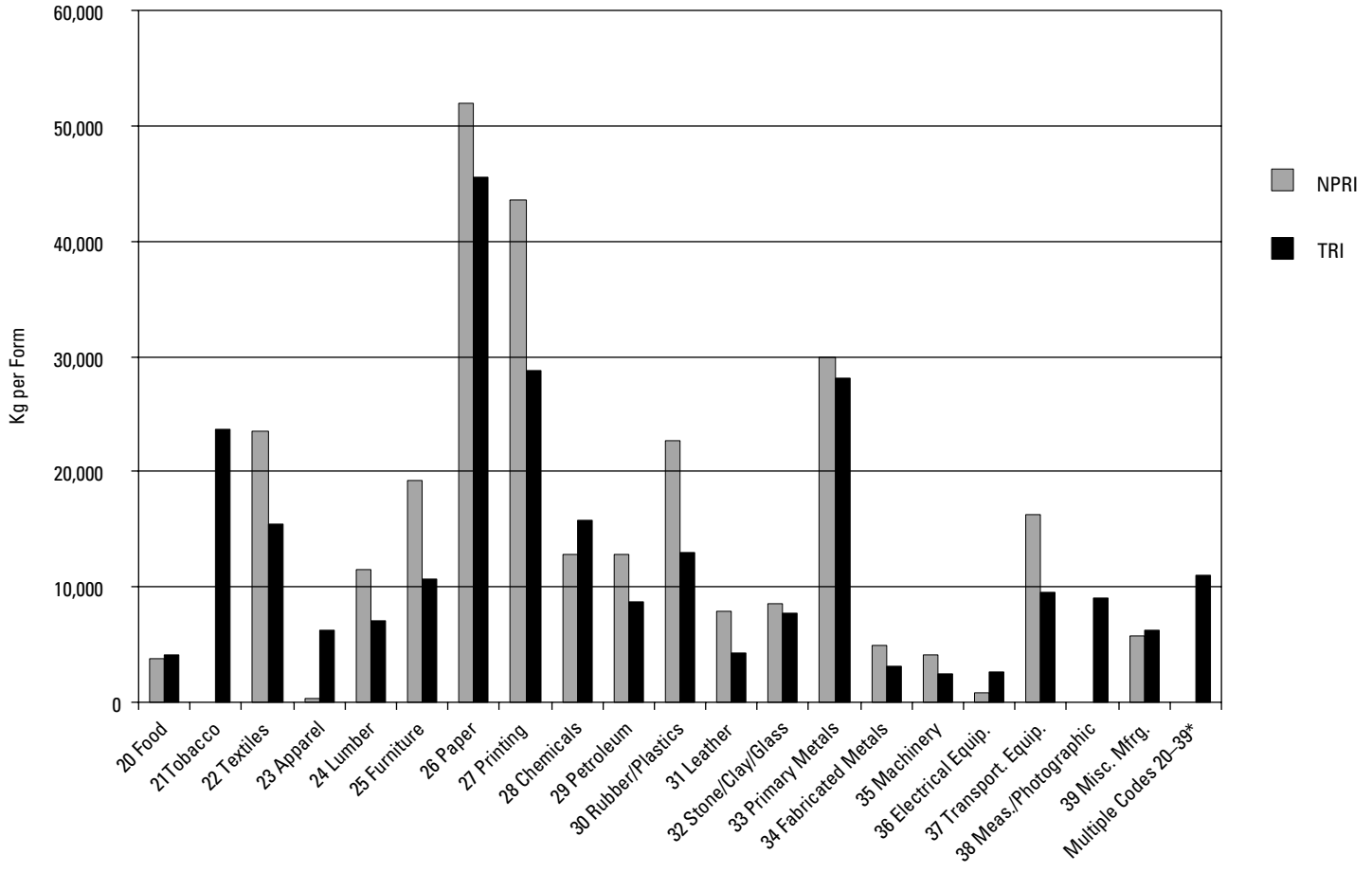
Rank	US SIC Code	Industry	NPRI (kg/form)	TRI (kg/form)	Ratio of Average per Form (NPRI/TRI)
1	31	Leather Products	7,893	4,226	1.9
2	25	Furniture and Fixtures	19,236	10,674	1.8
3	30	Rubber and Plastics Products	22,606	13,032	1.7
4	37	Transportation Equipment	16,349	9,516	1.7
5	24	Lumber and Wood Products	11,562	7,075	1.6
6	35	Industrial Machinery	4,077	2,546	1.6
7	34	Fabricated Metals Products	4,856	3,109	1.6
8	22	Textile Mill Products	23,433	15,443	1.5
9	27	Printing and Publishing	43,494	28,757	1.5
10	29	Petroleum and Coal Products	12,798	8,644	1.5
11	26	Paper Products	51,880	45,497	1.1
12	32	Stone/Clay/Glass Products	8,515	7,717	1.1
13	33	Primary Metals	29,867	28,099	1.1
14	20	Food Products	3,757	4,083	0.9
15	39	Misc. Manufacturing Industries	5,773	6,313	0.9
16	28	Chemicals	12,830	15,745	0.8
17	36	Electronic/Electrical Equipment	891	2,597	0.3
18	23	Apparel and Other Textile Products	280	6,279	0.0
19	38	Measurement/Photographic Instruments	0	8,959	0.0
	21	Tobacco Products	—	23,667	—
		Multiple Codes 20–39*	—	10,972	—
		Total	**17,493**	**13,172**	**1.3**

* Multiple SIC codes reported only in TRI data.

Figure 3–20

M 1997

Average On-site Releases per Form by Industry , NPRI and TRI, 1997



* Multiple SIC codes reported only in TRI data.

Table 3–28

M 1997

Average On-site Releases per Form, NPRI and TRI, 1997

	NPRI			TRI				
	Number	Forms/Facility		Number	Forms/Facility			
Total Facilities	1,430	3.2		19,125	3.0			
Total Forms	4,599			58,252				
	kg	kg/form	kg/facility	kg	kg/form	kg/facility	Ratio of Average per Form (NPRI/TRI)	Ratio of Average per Facility (NPRI/TRI)
Total Air Emissions	62,838,622	13,664	43,943	449,375,340	7,714	23,497	1.8	1.9
Surface Water Discharges	4,224,169	918	2,954	94,618,694	1,624	4,947	0.6	0.6
Underground Injection	4,197,660	913	2,935	74,649,654	1,281	3,903	0.7	0.8
On-site Land Releases	9,062,108	1,970	6,337	148,658,503	2,552	7,773	0.8	0.8
Matched Releases	**80,448,924**	**17,493**	**56,258**	**767,302,191**	**13,172**	**40,120**	**1.3**	**1.4**

3.3 Changes in Releases, 1995–1997

This section of *Taking Stock 1997* shows changes in amounts of releases reported from 1995 to 1997 using the 1997 matched data set. As noted in **Chapter 2**, the chemicals and industries covered by NPRI and TRI did not change from 1995 to 1997; however, as the sections below attest, the amounts of substances released did.

3.3.1 Overview

From 1995 to 1997, the number of facilities reporting to North American PRTRs declined by about 750 facilities to a total of 20,555. The number of forms decreased by about 2,000 to a total of 62,851. However, these changes resulted from a four percent decrease in TRI facilities and forms, offset in part by a 10 percent increase in NPRI reporting (**Table 3–29**).

Releases reported to North American PRTRs declined 80 million kg from 1995 to 1997, dropping from 927.7 million kg in 1995 to 847.8 million kg. Overall, North American facilities achieved a nine percent reduction in releases from 1995 to 1997, including a 13 percent reduction in releases reported to NPRI and an eight percent reduction in TRI releases (**Table 3–29** and **Figure 3–21**).

This 80-million-kg overall reduction reflected an even larger reduction in North American emissions to air over that period. Releases to air decreased 93.8 million kg, from 606.0 million kg to 512.2 million kg, from 1995 to 1997. Underground injection also decreased, from 87.8 million kg to 78.8 million kg, a reduction of 9.0 million kg. However, surface water discharges and on-site land releases both increased. Releases to surface waters increased from 86.9 million kg to 98.8 million kg (a 11.9-million-kg increase), while on-site land releases rose from 146.7 million kg to 157.7 million kg (an 11.0-million-kg increase).

These changes resulted from quite different trends in NPRI and TRI reporting from 1995 to 1997. In both PRTRs, air emissions decreased (by 4.1 million kg or six percent in NPRI and by 89.7 million kg or 17 percent in TRI). However, in all other release categories, NPRI and TRI facilities reported opposing trends. NPRI surface water discharges dropped by two-thirds (66 percent or 8.1 million kg), while surface water discharges in TRI increased by more than one-quarter (27 percent or 20.0 million kg). Underground injection increased in NPRI (18 percent or 640,733 kg) and decreased in TRI (11 percent or 9.6 million kg). For on-site land releases, NPRI facilities reported a decrease (6 percent or 545,635 kg) while TRI facilities reported an increase (eight percent or 11.5 million kg).

Overall, North American air emissions decreased 16 percent and underground injection 10 percent, while surface water discharges increased 14 percent and on-site land releases eight percent. These data more closely resemble the pattern of changes in TRI because of the relative sizes of the two PRTRs (**Figure 3–22**).

Table 3–29
M 1997

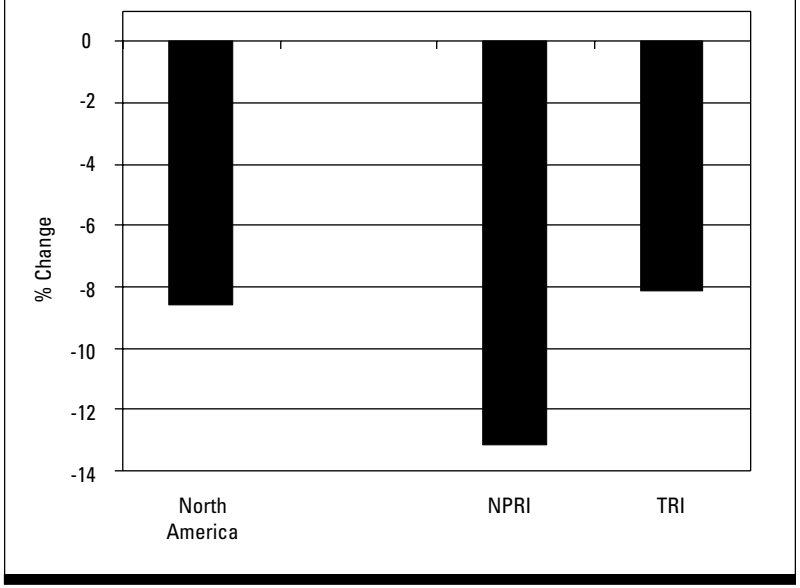
North American On-site Releases, 1995–1997

	North America				
	1995	1996	1997	Change 1995–1997	
	Number	Number	Number	Number	%
Total Facilities	21,308	20,914	20,555	-753	-3.5
Total Forms	64,918	63,275	62,851	-2,067	-3.2
On-site Releases	**kg**	**kg**	**kg**	**kg**	**%**
Total Air Emissions	606,027,858	563,409,745	512,213,962	-93,813,896	-15.5
Surface Water Discharges	86,945,023	81,681,095	98,842,863	11,897,840	13.7
Underground Injection	87,824,019	75,235,496	78,847,314	-8,976,705	-10.2
On-site Land Releases	146,726,294	153,435,348	157,720,611	10,994,317	7.5
Total Releases	**927,660,074**	**873,890,403**	**847,751,115**	**-79,908,959**	**-8.6**

➤ Canada and US data only. Mexico data not collected for 1995–1997.

Canadian NPRI					US TRI				
1995	1996	1997	Change 1995–1997		1995	1996	1997	Change 1995–1997	
Number	Number	Number	Number	%	Number	Number	Number	Number	%
1,302	1,355	1,430	128	9.8	20,006	19,559	19,125	-881	-4.4
4,164	4,314	4,599	435	10.4	60,754	58,961	58,252	-2,502	-4.1
kg	kg	kg	kg	%	kg	kg	kg	kg	%
66,987,712	64,152,247	62,838,622	-4,149,090	-6.2	539,040,146	499,257,498	449,375,340	-89,664,806	-16.6
12,330,846	5,128,041	4,224,169	-8,106,677	-65.7	74,614,177	76,553,054	94,618,694	20,004,517	26.8
3,556,927	4,812,379	4,197,660	640,733	18.0	84,267,092	70,423,117	74,649,654	-9,617,438	-11.4
9,607,743	8,950,491	9,062,108	-545,635	-5.7	137,118,551	144,484,857	148,658,503	11,539,952	8.4
92,620,108	**83,171,877**	**80,448,924**	**-12,171,184**	**-13.1**	**835,039,966**	**790,718,526**	**767,302,191**	**-67,737,775**	**-8.1**

Figure 3–21
M 1997
Percent Change in North American On-site Releases, 1995–1997

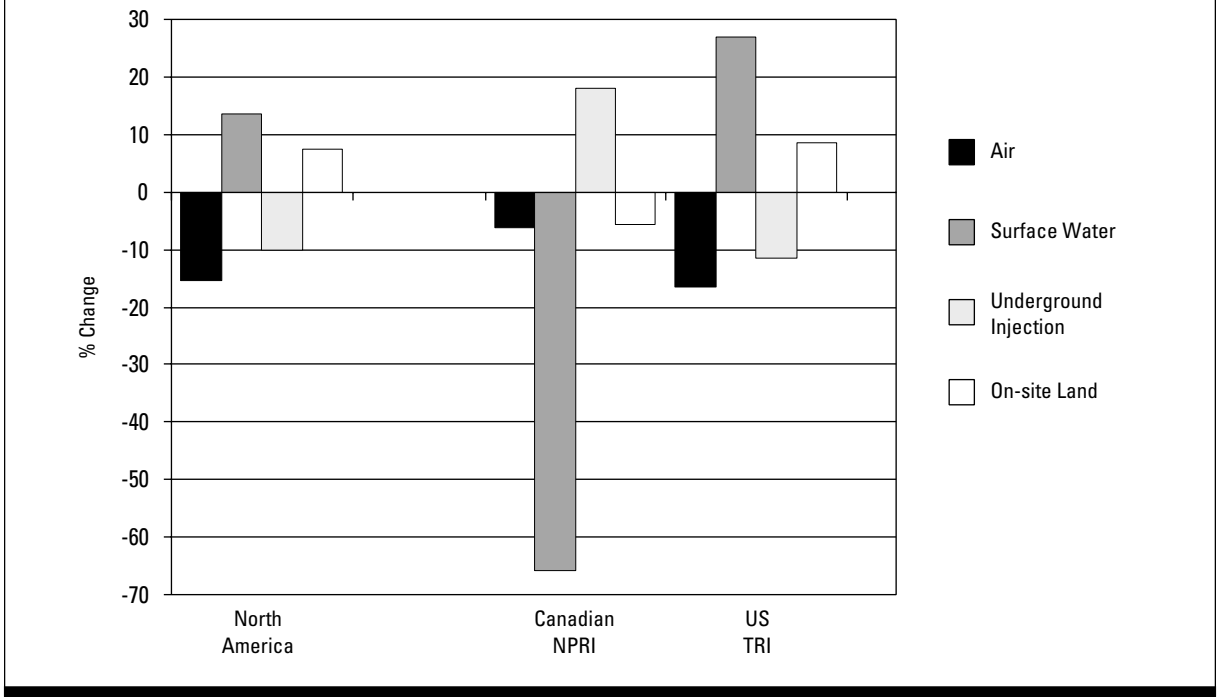


➤ Canada and US data only. Mexico data not collected for 1995–1997.

Figure 3–22

M 1997

Percent Change in North American On-site Releases, by Type, 1995–1997



➤ Canada and US data only. Mexico data not collected for 1995–1997.

Table 3–30
M 1997

NPRI On-site Releases by Province, 1995–1997
(Ordered by Total 1997 Releases)

Province	Total Releases 1995 (kg)	1996 (kg)	1997 (kg)	Change 1995–1997 kg	%
Ontario	45,919,331	38,871,441	39,955,770	-5,963,561	-13.0
Quebec	17,044,512	15,134,018	14,649,326	-2,395,186	-14.1
Alberta	15,000,884	14,635,572	11,987,370	-3,013,514	-20.1
British Columbia	5,438,945	5,710,382	5,459,128	20,183	0.4
Manitoba	1,530,130	3,062,727	3,397,552	1,867,422	122.0
New Brunswick	4,792,326	3,277,331	2,357,036	-2,435,290	-50.8
Nova Scotia	1,583,093	1,278,787	1,063,517	-519,576	-32.8
Saskatchewan	1,013,664	783,366	946,849	-66,815	-6.6
Newfoundland	284,203	400,700	412,606	128,403	45.2
Prince Edward Island	13,020	17,553	219,770	206,750	1,587.9
Total	**92,620,108**	**83,171,877**	**80,448,924**	**-12,171,184**	**-13.1**

3.3.2 Changes in Releases by State and Province

From 1995 to 1997, facilities in four Canadian provinces reported reductions in releases of more than two million kg each. The largest reduction—6.0 million kg—occurred in Ontario, where releases decreased from 45.9 million kg in 1995 to 40.0 million kg in 1997. This represented a 13 percent decrease in releases in the province that reported the largest total releases in all three years. In Quebec, which ranked second for total releases, the reduction from 1995 to 1997 was 2.4 million kg (from 17.0 million kg to 14.7 million kg). Facilities in Alberta reported a reduction of 3.0 million kg, from 15.0 million kg in 1995 to 12.0 million kg in 1997, a 20 percent decrease. Alberta ranked third for total releases in all three years. With a 51 percent reduction, New Brunswick dropped from fifth among the provinces in 1995 (with total releases of 4.8 million kg) to sixth in 1997 (with 2.4 million kg). This was a reduction of 2.4 million kg in New Brunswick's total releases over the period (**Table 3–30**).

Manitoba reported the largest increase—1.9 million kg—among Canadian provinces. Releases in Manitoba more than doubled—increasing from 1.5 million kg to 3.4 million kg. Altogether, six Canadian provinces reported decreases and four reported increases in total releases from 1995 to 1997.

In two US states, reductions in TRI releases from 1995 to 1997 exceeded 10 million kg. Texas facilities reported the largest decrease, from 105.8 million kg to 83.9 million kg, a reduction of 22.0 million kg or 21 percent. Texas ranked first among states for total releases in all three years. Alabama releases decreased 11.0 million kg, from 41.2 million kg in 1995 to 30.2 million kg in 1997. This amounted to a 27 percent reduction and lowered Alabama's rank from fourth in 1995 to ninth in 1997. Four states reported decreases of more than five million kg each: Michigan with a 6.7-million-kg decrease (25 percent), Ohio with a 5.6-million-kg reduction (13 percent), North Carolina with a 5.4-million-kg reduction (16 percent) and New Mexico also with a 5.4-million-kg reduction (29 percent). Releases declined in 38 states and territories from 1995 to 1997 (**Table 3–31**).

The largest increase in TRI releases was reported in Utah, where the total rose from 34.1 million kg in 1995 to 41.8 million kg in 1997. This increase of 7.8 million kg (23 percent) brought Utah from eighth among US states and territories in 1995 to third in 1997. Fourteen US states and territories reported increases from 1995 to 1997. The District of Columbia had zero releases in all three years.

From 1995 to 1997, releases decreased by more than 10 percent in 32 states and provinces and rose by more than 10 percent in 11 states and provinces (**Map 3–6**).

Table 3–31

M 1997

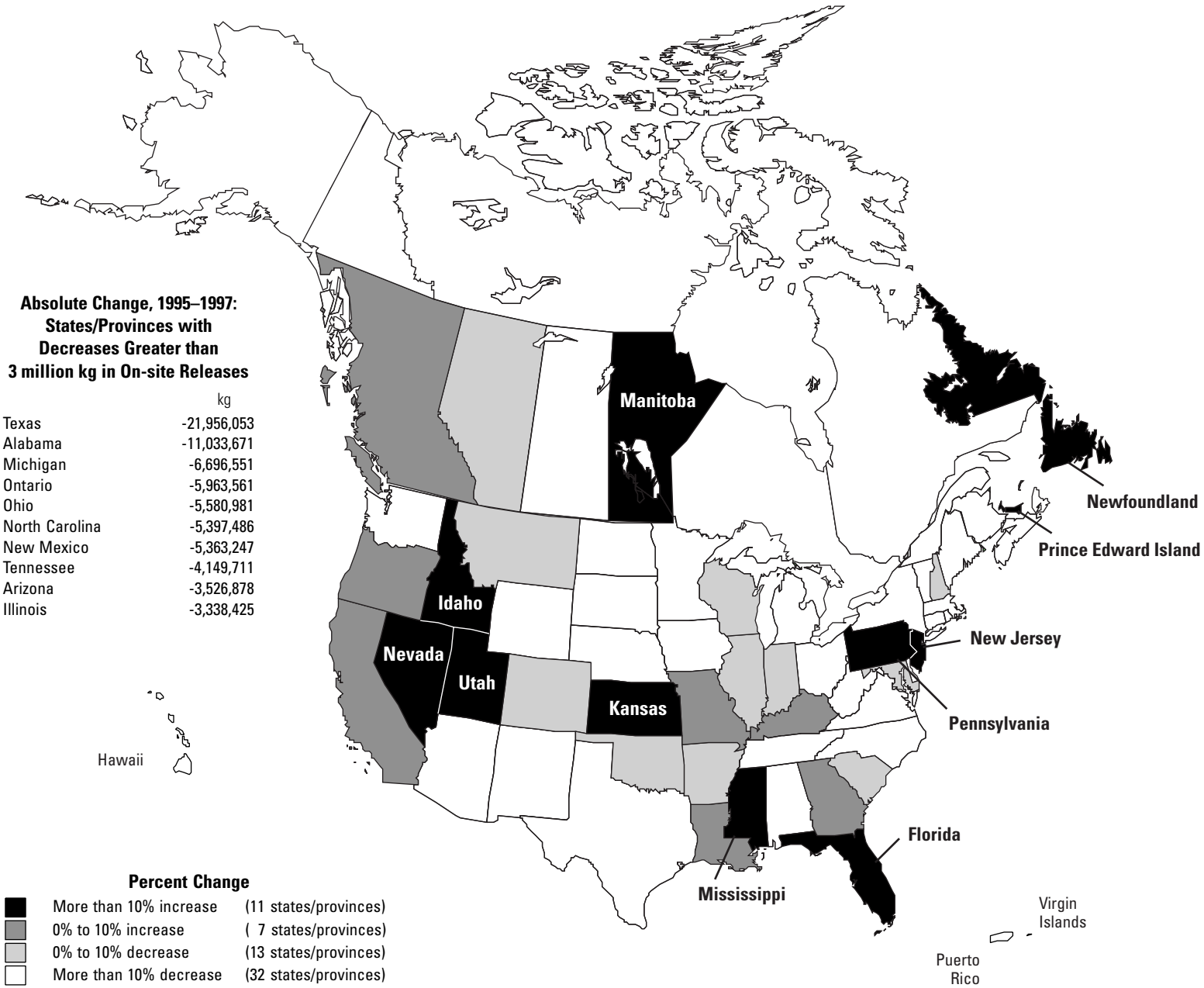
TRI On-site Releases by State, 1995–1997
(Ordered by Total 1997 Releases)

State	Total Releases 1995 (kg)	1996 (kg)	1997 (kg)	Change 1995–1997 kg	%
Texas	105,839,053	91,063,071	83,883,000	-21,956,053	-20.7
Louisiana	61,044,458	64,637,921	63,224,378	2,179,920	3.6
Utah	34,082,808	36,081,107	41,835,001	7,752,193	22.7
Ohio	42,573,363	40,360,658	36,992,382	-5,580,981	-13.1
Tennessee	40,027,685	35,549,923	35,877,974	-4,149,711	-10.4
Pennsylvania	28,224,217	27,547,979	33,713,706	5,489,489	19.4
Florida	28,517,751	27,011,094	32,013,775	3,496,024	12.3
Illinois	34,483,295	32,833,004	31,144,870	-3,338,425	-9.7
Alabama	41,233,206	36,075,889	30,199,535	-11,033,671	-26.8
North Carolina	34,432,863	32,574,227	29,035,377	-5,397,486	-15.7
Indiana	29,939,396	26,908,096	27,811,195	-2,128,201	-7.1
Mississippi	21,620,941	21,555,477	24,753,247	3,132,306	14.5
Missouri	21,856,481	21,723,345	22,779,721	923,240	4.2
Georgia	19,660,127	20,284,240	20,373,823	713,696	3.6
Michigan	26,697,119	22,628,926	20,000,568	-6,696,551	-25.1
South Carolina	20,721,736	19,086,974	19,349,981	-1,371,755	-6.6
Virginia	21,656,488	20,964,942	19,348,059	-2,308,429	-10.7
Montana	19,379,820	21,433,495	18,699,623	-680,197	-3.5
Arizona	16,963,419	20,397,574	13,436,541	-3,526,878	-20.8
New Mexico	18,650,847	17,145,406	13,287,600	-5,363,247	-28.8
Kentucky	12,210,951	12,656,973	12,243,252	32,301	0.3
Wisconsin	13,100,770	12,008,575	11,955,575	-1,145,195	-8.7
New York	14,566,183	12,391,013	11,707,417	-2,858,766	-19.6
Arkansas	10,452,876	10,079,983	10,227,944	-224,932	-2.2
Oregon	9,354,325	9,109,687	9,677,021	322,696	3.4
California	8,906,945	10,196,727	8,921,534	14,589	0.2
Washington	10,271,201	9,155,119	8,735,877	-1,535,324	-14.9
West Virginia	11,139,089	9,867,814	7,865,320	-3,273,769	-29.4
Iowa	10,327,183	8,724,919	7,830,048	-2,497,135	-24.2
Kansas	6,531,589	6,735,716	7,228,250	696,661	10.7
Idaho	4,772,712	5,266,030	6,229,364	1,456,652	30.5
Oklahoma	6,449,451	5,918,768	6,067,878	-381,573	-5.9
New Jersey	5,336,171	5,558,656	6,022,954	686,783	12.9
Minnesota	7,230,561	6,262,623	5,371,218	-1,859,343	-25.7
Maryland	4,704,290	4,181,828	4,446,359	-257,931	-5.5
Wyoming	4,089,641	3,371,010	3,565,677	-523,964	-12.8
Maine	3,698,236	3,100,407	2,947,091	-751,145	-20.3
Puerto Rico	3,540,065	3,197,532	2,894,302	-645,763	-18.2
Connecticut	3,573,272	2,751,379	2,314,384	-1,258,888	-35.2
Nebraska	3,255,960	2,222,705	2,140,998	-1,114,962	-34.2
Massachusetts	3,018,643	2,465,457	2,079,208	-939,435	-31.1
Nevada	1,494,614	1,464,088	1,821,377	326,763	21.9
South Dakota	1,675,907	1,429,801	1,343,396	-332,511	-19.8
Colorado	1,447,568	1,459,968	1,331,351	-116,217	-8.0
Delaware	1,472,223	1,051,470	1,011,075	-461,148	-31.3
New Hampshire	1,048,074	997,498	970,539	-77,535	-7.4
Rhode Island	1,119,455	812,554	705,748	-413,707	-37.0
Alaska	1,005,984	1,039,876	540,492	-465,492	-46.3
Virgin Islands	549,643	561,763	537,535	-12,108	-2.2
North Dakota	659,870	452,287	509,847	-150,023	-22.7
Vermont	284,806	193,295	174,940	-109,866	-38.6
Hawaii	146,635	169,657	123,864	-22,771	-15.5
District of Columbia	0	0	0	0	—
Total	**835,039,966**	**790,718,526**	**767,302,191**	**-67,737,775**	**-8.1**

Map 3–6

M 1997

Percent Change in North American Total On-site Releases, 1995–1997



➤ Canada and US data only. Mexico data not collected for 1997.

3.3.3 NPRI and TRI Facilities with Largest Changes

A few facilities accounted for large changes in on-site releases from 1995 to 1997. For NPRI, while the overall change from 1995 to 1997 was a net decrease of 12.2 million kg in the matched data set, 50 NPRI facilities reported decreases totaling 24.8 million kg and 50 reported increases of 12.7 million kg. For TRI, the overall change from 1995 to 1997 was a net decrease of 67.7 million kg and the 50 TRI facilities with the largest decreases reported a total decrease of 80.5 million kg and the 50 with the largest increases reported a total increase of 73.8 million kg. Year-to-year changes can result from many factors, including changes in production levels, efforts at pollution prevention, different techniques used to estimate releases, and one-time remedial efforts to clean-up wastes or spills.

NPRI Facilities with Largest Decreases/Increases

In NPRI, the 50 facilities with the largest reductions made by far the largest contribution to the overall reduction in releases from 1995 to 1997. Releases by the NPRI facilities that were not among the largest "increasers" or "decreasers" from 1995 to 1997 were essentially level throughout the period (**Figure 3–23**).

The 50 NPRI facilities with the largest reductions in total releases from 1995 to 1997 accomplished a 57 percent reduction, reporting 43.4 million kg in 1995 and 18.5 million kg in 1997. The number of forms they submitted varied from 404 in 1995 to 374 in 1996 to 399 in 1997, indicating that overall the facilities reported smaller amounts, not fewer substances. Seven of the facilities submitted no reports for chemicals in the matched data set in 1997 (**Table 3–32**).

Total releases of the 50 NPRI facilities with the largest increases from 1995 to 1997 rose from 17.0 million kg to 29.7 million kg, an increase of 74 percent. These facilities also reported on more substances, submitting one-third more forms in 1997 than in 1995 (up from 250 forms to 335 forms). Among them were eight facilities that did not report for chemicals in the matched data set in 1995 but did so in 1997 (**Table 3–33**).

Figure 3–23

M 1997

NPRI and TRI Total On-site Releases , 1995–1997: Facilities with Largest Changes and All Others

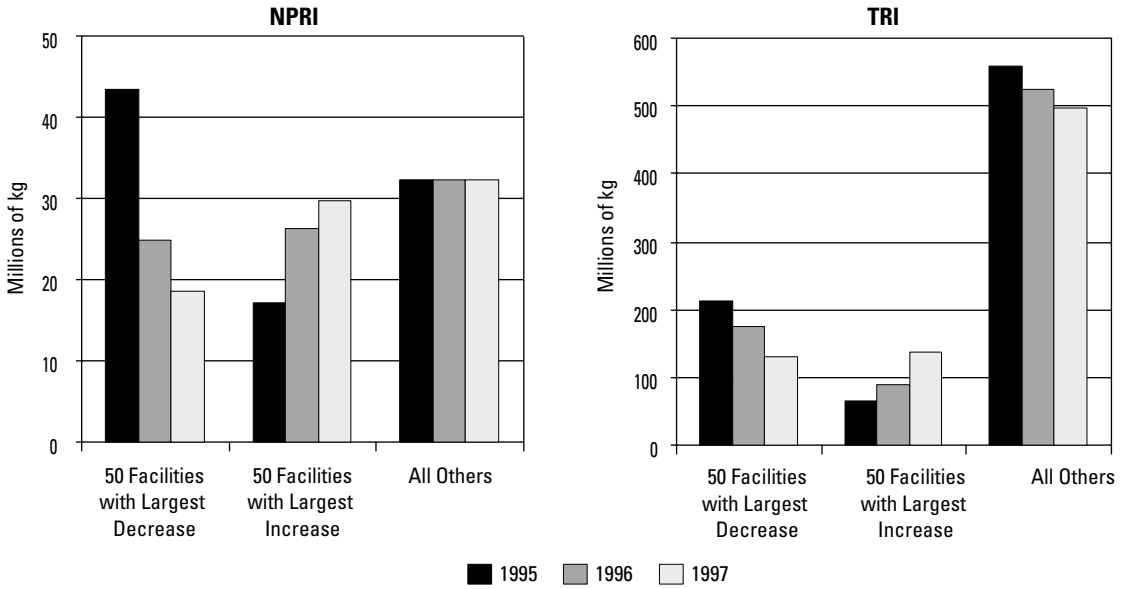


Table 3–32

M 1997

NPRI Facilities with Largest Decrease in On-site Releases, 1995–1997

Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	Irving Pulp & Paper, Ltd / Irving Tissue Company	Saint John, NB	27	26
2	Methanex Corporation	Medicine Hat, AB	37	28
3	Fort James Corporation, Fort James - Marathon, Ltd.	Marathon, ON	27	26
4	Sherritt International Corporation	Fort Saskatchewan, AB	37	28
5	Cartons St-Laurent Inc.	LaTuque, QC	27	26
6	Domtar Packaging, Red Rock Mill	Red Rock, ON	27	26
7	Algoma Steel Inc, Algoma Steel Main Works	Sault Ste. Marie, ON	29	33
8	Co-Steel Lasco	Whitby, ON	29	33
9	Bayer Inc., Bayer AG	Sarnia, ON	37	28
10	Les Papiers Perkins Ltée, Cascades	Candiac, QC	27	26
11	Standard Products (Canada) Limited, Rubber Plant #1	Stratford, ON	15	30
12	General Motors of Canada Ltd., Oshawa Truck Assembly Centre	Oshawa, ON	32	37
13	Chrysler Canada, Ltd., Windsor Assembly Plant	Windsor, ON	32	37
14	Norkraft Quévillon Inc., Domtar Inc.	Lebel-sur-Quévillon, QC	27	26
15	Fonderies canadiennes d'Acier Ltée, Fonderie de Montréal	Montréal, QC	31	35
16	Pétromont, Société en commandite	Montréal-est, QC	37	28
17	Domtar Papers, Cornwall Business Unit	Cornwall, ON	27	26
18	Avenor Inc., Thunder Bay Operations	Thunder Bay, ON	27	26
19	Sydney Steel Corporation	Sydney, NS	29	33
20	Rexam Metallising, Rexam Canada Ltd.	Brantford, ON	27	26
21	Ford Motor Company, St. Thomas Assembly Plant	St. Thomas, ON	32	37
22	Cami Automotive Inc.	Ingersoll, ON	32	37
23	Union Carbide Canada Inc., Prentiss Ethylene Glycol Plant	Lacombe County, AB	37	28
24	Velcro Canada Inc., Velcro Industries B.V.	Brampton, ON	19	22
25	Skeena Cellulose Inc., Skeena Pulp Operations	Skeena, BC	27	26
26	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33
27	Imperial Oil, IOL Dartmouth Refinery	Dartmouth, NS	36	29
28	DuPont Canada Inc., Maitland Site	Maitland, ON	37	28
29	Abitibi Consolidated Inc., Division Belgo, Stone Consolidated	Shawinigan, QC	27	26
30	Fletcher Challenge Canada, Elk Falls Mill	Campbell River, BC	27	26
31	Petro-Canada, Raffinerie de Montréal	Montréal, QC	36	29
32	Dofasco Inc.	Hamilton, ON	29	33
33	Inco Limited, Copper Cliff Nickel Refinery	Copper Cliff, ON	29	33
34	3M Canada Company (Perth)	Perth, ON	35	32
35	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33
36	Dow Chemical Canada Inc.	Sarnia, ON	37	28
37	Canadian General-Tower Ltd., Vinyl Manufacturer	Cambridge, ON	16	30
38	Petro-Canada, Edmonton Refinery	Edmonton, AB	36	29
39	Weyerhaeuser Saskatchewan Ltd., Prince Albert Pulp & Paper	Prince Albert, SK	27	26
40	Formica Canada Inc, Formica Corp.	St-Jean-sur-Richelieu, QC	27	26
41	Canac Kitchens Limited, Kohler Company	Thornhill, ON	25	24
42	General Motors of Canada Ltd., Oshawa Car Assembly Plant	Oshawa, ON	32	37
43	Nova Chemicals (Canada) Ltd., St. Clair Site	Corunna, ON	37	28
44	Advanced Monobloc Manufacturing, CCL Industries Inc.	Penetanguishene, ON	30	34
45	Novopharm Limited	Scarborough, ON	37	28
46	Abitibi-Consolidated Inc.	Kenora, ON	27	26
47	Plastcoat, Decoma International Inc.	Mississauga, ON	30	34
48	Imperial Oil, IOL Strathcona Refinery	Edmonton, AB	36	29
49	Ioco Refinery — Imperial Oil	Port Moody, BC	36	29
50	Freightliner of Canada Ltd., St. Thomas Truck Plant	St. Thomas, ON	32	37
	Total			

➤ Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to TRI.

Rank	1995 Number of Forms	1995 Total Releases (kg)	1996 Number of Forms	1996 Total Releases (kg)	1997 Number of Forms	1997 Total Releases (kg)	Change 95–97 Total Releases (kg)	Major Chemicals Reported with Decreases (Primary Media with Decreases)*
1	4	3,663,623	4	2,183,425	4	1,070,289	-2,593,334	Methanol (water)
2	4	3,353,220	3	1,454,080	3	790,700	-2,562,520	Methanol (air)
3	4	2,215,100	4	149,600	4	153,600	-2,061,500	Methanol (water)
4	13	2,275,064	10	179,700	8	224,280	-2,050,784	Methanol (air)
5	4	2,407,638	8	402,093	8	430,731	-1,976,907	Methanol (water)
6	1	1,900,000	2	235,117	2	273,348	-1,626,652	Methanol (water)
7	17	1,598,360	16	261,169	19	210,235	-1,388,125	Manganese and compounds (land)
8	6	2,411,507	6	1,254,893	6	1,259,869	-1,151,638	Copper and compounds (land)
9	15	2,336,921	16	1,725,826	17	1,421,799	-915,122	Chloromethane, Hydrochloric acid (air)
10	1	793,700	**	**	**	**	-793,700	Xylene (air)
11	3	951,015	3	582,700	3	427,400	-523,615	Xylene (air)
12	12	850,907	11	610,855	14	391,461	-459,446	Xylene, Toluene (air)
13	13	465,482	14	461,699	12	147,592	-317,890	Xylene (air)
14	5	399,568	7	351,160	11	99,375	-300,193	Methanol (air)
15	3	295,200	3	256,000	3	0	-295,200	Chromium and compounds (land)
16	1	350,611	2	131,106	2	63,938	-286,673	Ethylene (air)
17	6	598,950	6	386,122	6	342,683	-256,267	Methanol (water)
18	7	1,123,783	8	767,070	8	874,802	-248,981	Methanol (air)
19	10	533,500	9	331,280	9	290,290	-243,210	Zinc/Manganese/Lead and compounds (land)
20	2	240,000	2	290,100	**	**	-240,000	Methyl ethyl ketone (air)
21	12	626,463	11	543,878	11	386,554	-239,909	Xylene, Methyl isobutyl ketone, Ethylbenzene (air)
22	12	389,808	12	300,226	11	167,483	-222,325	Xylene, Methyl ethyl ketone (air)
23	5	653,459	5	605,923	6	444,335	-209,124	Ethylene glycol (air)
24	3	204,985	3	201,517	**	**	-204,985	Methyl ethyl ketone (air)
25	4	616,600	4	616,600	4	412,600	-204,000	Methanol, Chlorine (air)
26	11	748,235	11	563,787	11	549,017	-199,218	Nitric acid and nitrate compounds (water)
27	13	284,268	13	192,792	14	89,736	-194,532	Xylene, Toluene, 1,2,4-Trimethylbenzene (air)
28	15	566,115	16	579,650	16	375,364	-190,751	Nitric acid and nitrate compounds (water)
29	4	189,126	4	3,877	**	**	-189,126	Formaldehyde (water)
30	4	612,600	4	884,500	4	442,050	-170,550	Methanol (air)
31	15	308,871	15	282,231	19	138,763	-170,108	Sulfuric acid, Xylene, Benzene, Toluene (air)
32	18	591,844	18	586,441	18	431,063	-160,781	Benzene (air)
33	7	153,630	**	**	**	**	-153,630	Nickel/Lead and compounds (air)
34	5	209,287	3	47,137	6	59,047	-150,240	Xylene, Toluene (air)
35	13	663,045	12	693,550	12	515,120	-147,925	Lead and compounds (air)
36	20	482,557	20	411,891	39	336,134	-146,423	Asbestos (land)
37	7	959,979	10	998,783	8	817,865	-142,114	Methyl ethyl ketone, Toluene (air)
38	15	227,200	14	76,415	19	94,301	-132,899	Propylene, Xylene, Toluene (air)
39	4	672,732	6	437,406	5	542,102	-130,630	Chlorine (air)
40	2	420,000	2	339,192	2	290,800	-129,200	Methanol (air)
41	16	205,317	6	129,749	5	80,377	-124,940	Toluene, Xylene, Styrene (air)
42	12	1,412,204	11	1,216,263	13	1,299,855	-112,349	Xylene (air)
43	9	2,156,690	8	2,187,020	7	2,046,380	-110,310	Toluene, Cyclohexane (air)
44	1	109,380	1	87,240	**	**	-109,380	Tetrachloroethylene (air)
45	1	418,410	1	366,565	1	313,250	-105,160	Dichloromethane (air)
46	3	99,783	3	4,501	1	0	-99,783	Methanol (water)
47	3	134,200	3	169,800	3	35,031	-99,169	Methyl ethyl ketone, Xylene (air)
48	21	213,149	20	179,335	21	117,156	-95,993	Xylene, Toluene, 1,2,4-Trimethylbenzene, Ethylene, Naphthalene (air)
49	14	95,310	**	**	**	**	-95,310	Xylene, Toluene, 1,2,4-Trimethylbenzene, Cyclohexane, Propylene (air)
50	4	172,280	4	71,750	4	79,460	-92,820	Toluene (air)
	404	**43,361,676**	**374**	**24,792,014**	**399**	**18,536,235**	**-24,825,441**	

* Chemicals accounting for more than 70% of decrease in total releases from the facility.
** Indicates facility did not report any matched chemicals that year.

Table 3–33

M 1997

NPRI Facilities with Largest Increase in On-site Releases, 1995–1997

Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33
2	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33
3	Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur, QC	29	33
4	Agrium, Fort Saskatchewan Nitrogen Operations	Fort Saskatchewan, AB	37	28
5	Graphic Packaging Canada, Toronto Facility, ACX Technologies	Mississauga, ON	28	27
6	Maple Roll Leaf Co., Illinois Tool Works Canada Inc.	Windsor, ON	37	28
7	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33
8	Papiers Domtar - Centre d'affaires Windsor	Windsor, QC	27	26
9	International Wallcoverings Ltd.	Brampton, ON	27	26
10	Celanese Canada Inc.	Edmonton, AB	37	28
11	Uniboard Canada Inc., Division Sayabec, UniKunz Canada Inc.	Sayabec, QC	25	24
12	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29
13	Pétroles Coastal Canada Inc., Coastal Corporation	Montréal-est, QC	37	28
14	Agrium Products Inc., Redwater Fertilizer Operations	Redwater, AB	37	28
15	MacMillan Bloedel Pembroke LP, MacMillan Bloedel Ltd.	Pembroke, ON	25	24
16	Emballages Stone (Canada), Div. Chaleurs, Stone Container	New Richmond, QC	27	26
17	Falconbridge Ltd., Kidd Metallurgical Div.	Cochrane, ON	29	33
18	M.B. Paper, Alberni Specialties Division, MacMillan Bloedel	Port Alberni, BC	27	26
19	Crown Cork & Seal Canada Inc., Plant 244	Concord, ON	30	34
20	Novopharm Limited	Markham, ON	37	28
21	Kitchencraft of Canada Ltd.	Winnipeg, MB	25	24
22	Les Aciers Canam, Le Groupe Canam Manac Inc.	St-Gˆédéon, QC	30	34
23	Daishowa-Marubeni International, Peace River Pulp Div.	Peace River, AB	27	26
24	AT Plastics Inc., Edmonton Site	Edmonton, AB	37	28
25	Parmalat Canada	Winchester, ON	10	20
26	Chrysler Canada, Ltd., Bramalea Assembly Plant	Bramalea, ON	32	37
27	McCain Foods (Canada), Borden-Carleton Plants	Carleton, PE	10	20
28	Avenor Inc., Dryden Mill	Dryden, ON	27	26
29	Morbern Incorporated	Cornwall, ON	16	30
30	Secal, usine Vaudreuil	Jonquière, QC	37	28
31	Paintplas Inc.	Ajax, ON	32	30
32	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33
33	Western Pulp Limited Partnership, Port Alice Operation	Port Alice, BC	27	26
34	Carpenter Canada Ltd.	Woodbridge, ON	16	30
35	Abitibi-Consolidated Inc.	Fort Frances, ON	27	26
36	Société d'électrolyse et de chimie Alcan, usine Arvida	Jonquière, QC	29	33
37	Palliser Furniture Ltd, Defehr Division	Winnipeg, MB	26	25
38	Western Star Trucks Incorporated	Kelowna, BC	32	37
39	Prévost Car Inc., usine du boulevard Gagnon, Volvo Bus Corp.	Ste-Claire, QC	32	37
40	Canam Steel Works, Le Groupe Canam Manac Inc.	Calgary, AB	30	34
41	Dow Chemical Canada Inc., Western Canada Operations	Fort Saskatchewan, AB	37	28
42	Crestbrook Forest Industries, Pulp Division	Cranbrook, BC	27	26
43	Canam Steel Works, Le Groupe Canam Manac Inc.	Mississauga, ON	30	34
44	Les Produits forestiers Donohue Inc, usine de pâte kraft	St-Félicien, QC	27	26
45	Ainsworth Lumber Co. Ltd.	Grande Prairie, AB	25	24
46	Atlas Steels Inc., Atlas Specialty Steels	Welland, ON	29	33
47	Toyota Motor Manufacturing Canada Inc.	Cambridge, ON	32	37
48	Stelco Inc., Hilton Works	Hamilton, ON	29	33
49	Knoll North America Corp., Main Plant, E.M. Warburg Pincus	Toronto, ON	26	25
50	Uniboard Canada Inc., Division Val-d'Or, UniKunz Canada Inc.	Val-d'Or, QC	25	24
	Total			

➤ Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to TRI.

Rank	1995 Number of Forms	1995 Total Releases (kg)	1996 Number of Forms	1996 Total Releases (kg)	1997 Number of Forms	1997 Total Releases (kg)	Change 95–97 Total Releases (kg)	Major Chemicals Reported with Increases (Primary Media with Increases)*
1	7	3,662,640	7	4,773,818	7	4,908,786	1,246,146	Sulfuric acid (air), Chromium and compounds (land)
2	4	762,000	5	2,031,067	7	1,782,947	1,020,947	Zinc and compounds (land)
3	5	1,510,387	5	2,322,985	5	2,349,790	839,403	Zinc and compounds (land)
4	**	**	10	2,121,980	4	762,000	762,000	Methanol (air)
5	1	36,000	1	27,000	2	797,000	761,000	Methanol (air)
6	**	**	**	**	10	750,109	750,109	Methyl ethyl ketone, Methanol, Toluene (air)
7	6	181,387	6	437,092	6	744,572	563,185	Zinc/Lead and compounds (air)
8	5	143,400	4	116,200	6	527,484	384,084	Methanol (air)
9	4	316,000	4	416,300	4	669,500	353,500	Methyl ethyl ketone, Toluene (air)
10	10	3,497,171	10	4,492,813	11	3,836,908	339,737	Methanol (UIJ)
11	2	17,276	2	20,943	2	342,136	324,860	Methanol (air)
12	23	441,713	22	476,826	23	760,113	318,400	Nitric acid and nitrate compounds (water)
13	7	71,398	7	292,217	6	357,878	286,480	Xylene (air)
14	11	651,881	15	956,800	15	935,330	283,449	Nitric acid and nitrate compounds (UIJ, water)
15	**	**	**	**	1	279,000	279,000	Formaldehyde (air)
16	**	**	4	415,000	3	267,000	267,000	Methanol (air)
17	**	**	**	**	11	231,251	231,251	Lead and compounds, Sulfuric acid, Copper and compounds (air)
18	2	0	3	183,718	4	178,359	178,359	Nitric acid and nitrate compounds (water)
19	5	29,956	4	158,412	4	200,925	170,969	n-Butyl alcohol, Xylene (air)
20	1	72,981	1	61,955	2	238,198	165,217	Dichloromethane (air)
21	3	71,000	4	113,000	5	223,000	152,000	Toluene, Xylene, n-Butyl alcohol (air)
22	6	200,100	6	200,100	7	346,800	146,700	Xylene (air)
23	6	815,500	8	845,780	10	956,957	141,457	Zinc and compounds (land), Methanol (air)
24	4	149,778	6	213,487	5	289,000	139,222	Ethylene, Vinyl acetate (air)
25	2	0	2	0	3	137,177	137,177	Nitric acid and nitrate compounds (water)
26	11	153,985	12	407,240	13	284,621	130,636	Methyl ethyl ketone, Toluene (air)
27	**	**	**	**	1	127,540	127,540	Nitric acid and nitrate compounds (water)
28	6	474,560	7	497,880	7	601,092	126,532	Methanol, Chlorine (air)
29	3	632,240	3	746,600	3	757,500	125,260	Methyl ethyl ketone (air)
30	3	99,670	3	166,418	3	209,835	110,165	Hydrochloric acid (air)
31	10	447,900	9	447,160	10	552,000	104,100	Ethylbenzene, Toluene, Methyl ethyl ketone, Methanol (air)
32	6	626,833	6	609,901	6	729,605	102,772	Zinc and compounds (land)
33	3	1,600	3	1,600	4	104,360	102,760	Methanol (air)
34	2	196,585	2	238,953	2	296,925	100,340	Dichloromethane (air)
35	4	3,934	4	4,419	6	101,000	97,066	Methanol (air, water)
36	5	273,990	5	378,600	6	370,920	96,930	Hydrogen fluoride (air)
37	5	152,904	4	176,054	5	248,957	96,053	Toluene, Methyl ethyl ketone (air)
38	1	0	3	38,093	4	94,084	94,084	Toluene, Methanol (air)
39	2	9,800	2	14,580	4	98,825	89,025	Methanol, Xylene (air)
40	**	**	3	300	7	88,400	88,400	Xylene (air)
41	23	273,025	24	400,338	28	359,624	86,599	Ethylene (air)
42	2	160,400	2	158,400	3	246,700	86,300	Methanol (air)
43	4	39,000	4	39,000	7	123,701	84,701	Xylene (air)
44	7	315,900	7	418,300	6	398,400	82,500	Chlorine dioxide (air)
45	**	**	1	40,688	1	82,298	82,298	Formaldehyde (air)
46	5	81,141	5	123,600	7	162,714	81,573	Aluminum oxide (land)
47	9	129,726	9	109,257	9	209,111	79,385	Xylene, Methyl isobutyl ketone (air)
48	21	259,745	21	352,705	21	338,723	78,978	Benzene (air)
49	3	52,670	3	54,400	7	130,406	77,736	Methyl ethyl ketone, Toluene, 2-Methoxyethanol (air)
50	1	0	2	64,800	2	77,100	77,100	Formaldehyde (air)
	250	**17,016,176**	**280**	**26,166,779**	**335**	**29,666,661**	**12,650,485**	

* Chemicals accounting for more than 70% of increase in total releases from the facility.
** Indicates facility did not report any matched chemicals that year.
➤ UIJ=underground injection

TRI Facilities with Largest Decreases/Increases

In TRI, releases decreased not only for the 50 facilities with the largest reductions but also for the facilities that did not report the largest changes (either decreases or increases—**Figure 3–23**).

The 50 TRI facilities with the largest decreases reduced their releases from 212.3 million kg in 1995 to 131.8 million in 1997, a 38 percent reduction. The number of forms these facilities submitted fluctuated from 757 in 1995 to 765 in 1996 to 751 in 1997, again indicating reductions in amounts rather than in the number of substances reported. Four of the facilities filed no reports in 1997 for chemicals in the matched data set (**Table 3–34**).

Releases by the 50 TRI facilities with the largest increases more than doubled from 1995 to 1997, with a 114 percent increase from 65.0 million kg to 138.8 million kg. The number of forms submitted by these facilities rose 13 percent, from 508 in 1995 to 574 in 1997. Four of the facilities did not submit reports in 1995 for chemicals in the matched data set (**Table 3–35**).

Table 3–34

M 1997

TRI Facilities with Largest Decrease in On-site Releases, 1995–1997

Rank	Facility	City, State	US SIC Code
1	Courtaulds Fibers Inc., Courtaulds Finance U.S. Inc.	Axis, AL	28
2	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33
3	DuPont	Beaumont, TX	28
4	Hoechst-Celanese Chemical, Clear Lake Plant, Hoechst Corp.	Pasadena, TX	28
5	Huntsman Petrochemical Corp., Huntsman Corp.	Port Arthur, TX	28
6	Chino Mines Co., Phelps Dodge Corp.	Hurley, NM	33
7	Cytec Ind. Inc., Fortier Plant	Westwego, LA	28
8	Lenzing Fibers Corp.	Lowland, TN	28
9	Sterling Chemicals Inc.	Texas City, TX	28
10	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33
11	Bayer Corp.	New Martinsville, WV	28
12	IMC-Agrico Co., New Wales Plant	Mulberry, FL	Mult.
13	Pharmacia & Upjohn Co.	Portage, MI	28
14	Cabot Corp.	Ville Platte, LA	28
15	Monsanto Co., Chocolate Bayou	Alvin, TX	28
16	BASF Corp.	Freeport, TX	28
17	Witco Corp., Gretna Plant	Harvey, LA	28
18	Cabot Corp., Canal Plant	Franklin, LA	28
19	Osram Sylvania Prods. Inc., Osram GMBH	Versailles, KY	36
20	Reynolds Metals Co.	Sheffield, AL	34
21	Cabot Corp., Cab-o-Sil Div.	Tuscola, IL	28
22	Tennessee Eastman Div., Eastman Chemical Co.	Kingsport, TN	28
23	Gwaltney of Smithfield Ltd., Smithfield Foods Inc.	Smithfield, VA	20
24	Mobil Chemical Co., Mobil Corp.	Beaumont, TX	28
25	Degussa Corp., Ivanhoe	Louisa, LA	28
26	Magnesium Corp. of America, Renco Group Inc.	Rowley, UT	33
27	Flexel Indiana Inc.	Covington, IN	30
28	LTV Steel Co. Inc.	Cleveland, OH	33
29	Craig Ind.	Teresita, MO	28
30	Shell Oil Co.	Deer Park, TX	Mult.
31	Finch Pruyn & Co. Inc.	Glens Falls, NY	26
32	ASARCO Inc.	East Helena, MT	33
33	BP Chemicals Inc., BP America Inc.	Lima, OH	28
34	Tippecanoe Labs., Eli Lilly & Co.	Shadeland, IN	28
35	North American Rayon Corp., North American Corp.	Elizabethton, TN	28
36	Champion Intl. Corp.	Canton, NC	26
37	Fina Oil & Chemical, American Petrofina Inc.	Big Spring, TX	29
38	Wheeling-Pittsburgh Steel Corp., Steubenville East Plant	Follansbee, WV	33
39	Goodyear Tire & Rubber Co.	Lincoln, NE	30
40	Celanese Eng. Resins Inc., Hoechst Corp.	Bishop, TX	28
41	Alcoa	Riverdale, IA	33
42	Corn Prods. & Best Foods, Argo Plants, CPC Intl. Inc.	Bedford Park, IL	20
43	DuPont Sabine River Works	Orange, TX	28
44	O'Sullivan Corp.	Winchester, VA	30
45	GM Powertrain Defiance, General Motors Corp.	Defiance, OH	33
46	PCS Phosphate Co. Inc., Potash Corp. of Saskatchewan	Aurora, NC	28
47	Eastman Kodak Co., Kodak Park	Rochester, NY	38
48	Unocal Molycorp, Unocal Corp.	Mountain Pass, CA	28
49	Chemetals Inc., Comilog	New Johnsonville, TN	28
50	Exxon Chemical, Baton Rouge Chemical Plant, Exxon Corp.	Baton Rouge, LA	28
	Total		

➤ Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to NPRI.

Rank	1995 Number of Forms	1995 Total Releases (kg)	1996 Number of Forms	1996 Total Releases (kg)	1997 Number of Forms	1997 Total Releases (kg)	Change 95–97 Total Releases (kg)	Major Chemicals Reported with Decreases (Primary Media with Decreases)*
1	5	15,427,756	4	12,781,207	4	7,033,029	-8,394,727	Carbon disulfide (air)
2	9	7,908,991	9	4,676,363	9	375,009	-7,533,982	Copper/Zinc and compounds (land)
3	27	8,523,823	19	3,900,458	22	2,792,231	-5,731,592	Nitric acid and nitrate compounds, Acetonitrile (UIJ)
4	20	6,171,389	20	3,829,753	20	1,903,636	-4,267,753	Ethylene glycol (UIJ)
5	23	4,326,523	19	4,256,990	19	882,623	-3,443,900	Propylene (air)
6	3	3,233,586	2	3,539,360	**	**	-3,233,586	Copper and compounds (land)
7	22	10,573,159	23	9,372,030	24	7,669,796	-2,903,363	Acetonitrile, Acrylic acid (UIJ)
8	5	10,526,240	5	8,357,877	5	7,764,811	-2,761,429	Carbon disulfide (air)
9	36	5,384,579	36	3,072,310	34	2,872,333	-2,512,246	Nitric acid and nitrate compounds (UIJ)
10	11	14,607,892	11	12,764,989	13	12,345,745	-2,262,147	Zinc and compounds (land)
11	30	3,811,028	29	3,137,198	29	1,562,576	-2,248,452	Nitric acid and nitrate compounds (water)
12	2	3,746,031	2	2,056,689	3	1,631,746	-2,114,285	Phosphoric acid (land)
13	26	3,305,571	23	1,774,718	25	1,408,997	-1,896,574	Methanol (UIJ)
14	3	1,614,127	3	1,518,164	3	78,028	-1,536,099	Carbon disulfide (air)
15	19	1,856,700	17	1,586,005	4	471,070	-1,385,630	Acrylonitrile, Acetonitrile, Phenol, Hydrogen cyanide (UIJ)
16	25	7,853,878	24	6,507,355	26	6,502,858	-1,351,020	Nitric acid and nitrate compounds (water)
17	2	1,763,311	2	1,857,445	1	429,478	-1,333,833	Methanol (UIJ)
18	3	1,905,154	5	1,979,977	3	622,199	-1,282,955	Carbon disulfide, Ethylene (air)
19	6	1,173,335	6	992,874	6	130,704	-1,042,631	Xylene (air)
20	12	1,285,786	11	268,980	12	249,705	-1,036,081	Methyl ethyl ketone, Toluene (air)
21	6	1,121,425	6	946,558	6	123,465	-997,960	Chlorine (air)
22	62	3,627,446	59	2,923,885	63	2,664,613	-962,833	Hydrochloric acid (air)
23	2	936,314	2	463,670	1	0	-936,314	Nitric acid and nitrate compounds (water)
24	23	1,220,267	21	1,151,794	16	286,665	-933,602	Ethylene, Propylene (air)
25	2	929,705	2	671,202	2	30,385	-899,320	Carbon disulfide (air)
26	6	29,168,743	6	29,619,666	6	28,270,233	-898,510	Hydrochloric acid (air)
27	5	861,798	5	1,249,238	**	**	-861,798	Carbon disulfide (air)
28	9	1,176,778	9	382,522	7	316,264	-860,514	Manganese and compounds (land)
29	1	860,082	**	**	**	**	-860,082	Methanol (air)
30	51	1,904,354	93	1,020,507	94	1,052,840	-851,514	Phenol (UIJ)
31	5	1,983,407	5	1,101,449	6	1,203,200	-780,207	Nitric acid and nitrate compounds (water)
32	10	17,921,774	10	20,167,857	10	17,150,080	-771,694	Zinc/Lead and compounds (land)
33	27	5,045,344	27	4,875,406	27	4,289,188	-756,156	Acrylonitrile (UIJ)
34	18	1,090,023	18	498,579	20	369,981	-720,042	Nitric acid and nitrate compounds (water)
35	3	1,276,176	3	1,172,262	2	571,610	-704,566	Carbon disulfide (air)
36	14	1,931,912	14	1,296,197	17	1,233,001	-698,911	Methanol (air)
37	15	830,819	15	239,283	15	143,167	-687,652	Propylene (air)
38	14	700,370	13	131,976	11	25,837	-674,533	Ethylene, Benzene (air)
39	5	1,054,510	5	443,643	7	385,450	-669,060	Toluene (air)
40	17	924,037	20	764,816	20	259,175	-664,862	Formaldehyde, Methanol (UIJ)
41	13	817,375	10	399,687	9	171,141	-646,234	Methyl ethyl ketone, Toluene (air)
42	2	1,021,317	4	234,923	4	384,583	-636,734	Hydrochloric acid (air)
43	33	1,606,323	32	1,335,752	30	973,073	-633,250	Ethylene, Vinyl acetate, Cyclohexane (air)
44	10	848,342	7	316,393	7	228,671	-619,671	Methyl ethyl ketone, Methyl isobutyl ketone (air)
45	17	6,567,613	17	6,407,425	20	5,973,237	-594,376	Zinc and compounds (land)
46	6	4,559,331	6	4,361,486	6	3,969,324	-590,007	Phosphoric acid (land)
47	50	3,637,563	50	3,242,952	46	3,057,892	-579,671	Methanol, Dichloromethane (air)
48	5	576,230	**	**	**	**	-576,230	Nitric acid and nitrate compounds (land)
49	3	2,108,049	2	1,689,015	2	1,540,532	-567,517	Manganese and compounds (land)
50	34	953,396	34	335,426	35	388,830	-564,566	Nitric acid and nitrate compounds (water)
	757	**212,259,682**	**765**	**175,674,311**	**751**	**131,789,011**	**-80,470,671**	

* Chemicals accounting for more than 70% of decrease in total releases from the facility.
** Indicates facility did not report any matched chemicals that year.
➤ UIJ=underground injection

Table 3–35

M 1997

TRI Facilities with Largest Increase in On-site Releases, 1995–1997

Rank	Facility	City, State	US SIC Code
1	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33
2	Armco Inc. (Route 8 S.)	Butler, PA	33
3	PCS Nitrogen Fertilizer L.P., Potash Corp. of Saskatchewan	Geismar, LA	28
4	Solutia Inc.	Gonzalez, FL	28
5	DuPont	Pass Christian, MS	28
6	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN	33
7	DuPont	New Johnsonville, TN	28
8	Mulberry Phosphates Inc., Mulberry Corp.	Mulberry, FL	28
9	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33
10	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28
11	ASARCO Inc., Glover Plant	Annapolis, MO	33
12	Solutia Inc., Chocolate Bayou	Alvin, TX	28
13	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33
14	Monsanto Co.	Luling, LA	28
15	DuPont	Belle, WV	28
16	Springs Chemical, Grace Complex, Springs Ind. Inc.	Lancaster, SC	22
17	Amoco Petroleum Prods., Amoco Corp.	Texas City, TX	29
18	Exxon Co. USA, Baton Rouge Refinery, Exxon Corp.	Baton Rouge, LA	29
19	P4 Production L.L.C.	Soda Springs, ID	Mult.
20	DuPont Chambers Works	Deepwater, NJ	28
21	Borden Chemicals & Plastics LP	Geismar, LA	28
22	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28
23	Austeel Lemont Co. Inc.	Lemont, IL	33
24	American Synthetic Rubber, Michelin Corp.	Louisville, KY	28
25	Geneva Steel	Vineyard, UT	33
26	Royal Oak Ents. Inc., Kenbridge Kilns	Kenbridge, VA	28
27	GM Nao Mid-Lux Car Div., General Motors Corp.	Doraville, GA	37
28	New Boston Coke Corp.	New Boston, OH	33
29	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33
30	Three Rivers Refy., Ultramar Diamond Shamrock Corp.	Three Rivers, TX	29
31	Gencorp Inc.	Columbus, MS	22
32	International Paper Co., Mansfield Mill	Mansfield, LA	26
33	Imco Recycling Inc.	Morgantown, KY	33
34	IMC-Agrico Co., IMC Global Inc.	Uncle Sam, LA	28
35	Foamex L.P., Div. of Kihi	Corry, PA	30
36	Freeport Brick Co., Freeport Refractories Inc.	Freeport, PA	32
37	Boeing Co.	Wichita, KS	Mult.
38	USS Fairfield Works, USX Corp.	Fairfield, AL	33
39	Armco Inc. (Bantam Ave.)	Butler, PA	33
40	Oregon Metallurgical Corp., Allegheny Teledyne Inc.	Albany, OR	33
41	Angus Chemical Co.	Sterlington, LA	28
42	Vicksburg Chemical Co.	Vicksburg, MS	28
43	Tesa Tape Inc.	Middletown, NY	26
44	Georgia-Pacific Corp.	Palatka, FL	26
45	Aquaglass Corp., Masco Corp.	Adamsville, TN	30
46	BWX Techs., McDermott Intl. Inc.	Lynchburg, VA	34
47	J & L Specialty Steel Inc.	Midland, PA	33
48	Georgia-Pacific Corp.	Ashdown, AR	26
49	Patio Chef Co. LLC	Licking, MO	28
50	Armco Inc.	Coshocton, OH	33
	Total		

➤ Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to NPRI.

Rank	1995 Number of Forms	1995 Total Releases (kg)	1996 Number of Forms	1996 Total Releases (kg)	1997 Number of Forms	1997 Total Releases (kg)	Change 95–97 Total Releases (kg)	Major Chemicals Reported with Increases (Primary Media with Increases)*
1	14	2,715,080	14	4,239,677	14	11,022,591	8,307,511	Copper/Lead/Arsenic and compounds (land)
2	14	4,728,754	14	5,711,005	14	11,891,923	7,163,169	Nitric acid and nitrate compounds (water)
3	11	6,939,334	11	9,740,677	12	13,827,714	6,888,380	Phosphoric acid (water)
4	21	5,936,347	18	7,808,148	18	9,817,381	3,881,034	Nitric acid and nitrate compounds (UIJ)
5	5	232,766	5	292,680	11	4,091,982	3,859,216	Manganese and compounds (UIJ)
6	29	3,462,571	34	3,389,124	33	7,254,469	3,791,898	Zinc and compounds (land)
7	6	160,851	6	65,227	11	3,583,542	3,422,691	Manganese and compounds (UIJ)
8	4	13,514	4	11,156	4	3,183,329	3,169,815	Phosphoric acid (water)
9	11	204,604	7	2,562,032	13	2,889,134	2,684,530	Copper and compounds (air)
10	2	4,266,281	2	5,127,596	2	6,578,798	2,312,517	Chromium and compounds (land)
11	6	2,959,545	6	4,030,227	7	4,921,195	1,961,650	Zinc/Lead and compounds (land)
12	**	**	**	**	16	1,803,515	1,803,515	Acrylonitrile, Hydrogen cyanide, Phenol (UIJ)
13	13	7,066,233	13	11,590,932	13	8,596,464	1,530,231	Copper and compounds (land)
14	13	1,978,881	13	2,673,597	14	3,406,590	1,427,709	Formaldehyde (UIJ)
15	25	116,311	25	336,545	24	1,209,295	1,092,984	Nitric acid and nitrate compounds (water)
16	**	**	1	0	11	1,083,600	1,083,600	Zinc/Chromium and compounds (air)
17	32	630,312	33	1,713,945	33	1,709,465	1,079,153	Methanol (air)
18	30	1,253,307	30	1,303,901	32	2,231,062	977,755	Nitric acid and nitrate compounds (water)
19	2	37,152	3	51,930	7	995,441	958,289	Zinc and compounds (land)
20	47	418,280	43	1,001,751	40	1,354,680	936,400	Nitric acid and nitrate compounds (water)
21	19	284,849	16	407,080	18	1,164,851	880,002	Benzene (air)
22	2	3,313,375	2	4,084,753	1	4,129,841	816,466	Chromium and compounds (land)
23	4	24,748	5	668,314	5	778,886	754,138	Zinc and compounds (land)
24	6	727,995	6	619,324	6	1,442,907	714,912	Toluene (air)
25	20	338,396	21	544,065	22	1,030,210	691,814	Nitric acid and nitrate compounds (water)
26	**	**	1	597,739	1	674,939	674,939	Methanol (air)
27	11	127,930	12	177,815	19	790,372	662,442	Xylene, n-Butyl alcohol, Methyl isobutyl ketone (air)
28	2	58,268	10	544,918	10	720,110	661,842	Ethylene (air)
29	1	547,715	1	922,590	1	1,097,645	549,930	Nickel and compounds (land)
30	22	58,796	20	505,230	20	594,781	535,985	Toluene, o-Xylene (land)
31	7	1,135,155	7	1,726,992	7	1,659,872	524,717	Methyl ethyl ketone, Toluene (air)
32	8	1,400,789	7	1,519,581	10	1,912,480	511,691	Hydrochloric acid, Manganese and compounds (land)
33	4	281,499	5	621,453	4	754,027	472,528	Aluminum (land)
34	3	978,002	3	1,617,102	3	1,440,174	462,172	Phosphoric acid (water)
35	4	448,338	3	756,420	2	903,448	455,110	Dichloromethane (air)
36	1	0	1	453,514	1	453,514	453,514	Phosphoric acid (land)
37	29	432,708	20	564,842	20	885,604	452,896	Tetrachloroethylene (air)
38	9	1,845,966	12	1,999,073	15	2,290,529	444,563	Zinc and compounds (land), 1,2,4-Trimethylbenzene (air)
39	5	1,319,634	5	1,399,377	6	1,763,799	444,165	Nitric acid and nitrate compounds (water)
40	6	32,763	4	31,928	5	464,241	431,478	Nitric acid and nitrate compounds (water)
41	11	2,529,837	11	2,835,644	11	2,957,484	427,647	Nitric acid and nitrate compounds (UIJ)
42	3	3,279,594	3	2,746,967	3	3,703,331	423,737	Nitric acid and nitrate compounds (water)
43	1	231,146	1	448,854	1	626,608	395,462	Toluene (air)
44	8	443,033	8	443,415	13	838,486	395,453	Methanol (air)
45	1	665,652	4	1,048,317	2	1,057,867	392,215	Styrene (air)
46	6	278	5	307	6	390,778	390,500	Nitric acid and nitrate compounds (water)
47	9	405,480	9	455,503	9	789,590	384,110	Nitric acid and nitrate compounds (water)
48	15	361,250	15	391,185	17	740,061	378,811	Manganese and compounds (land)
49	**	**	**	**	1	367,216	367,216	Methanol (air)
50	6	577,167	6	600,922	6	926,509	349,342	Nitric acid and nitrate compounds (water)
	508	**64,970,486**	**505**	**90,383,374**	**574**	**138,802,330**	**73,831,844**	

* Chemicals accounting for more than 70% of increase in total releases from the facility.
** Indicates facility did not report any matched chemicals that year.
➤ UIJ=underground injection

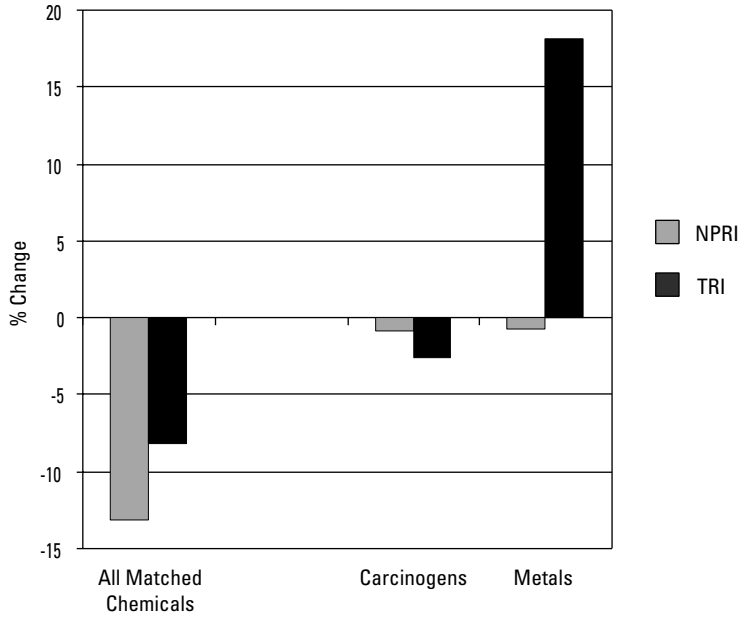
3.3.4 Changes in Releases by Chemical

Although releases of all chemicals in the matched data set decreased nine percent from 1995 to 1997, the picture for carcinogens and metals differed strikingly from the overall pattern. While NPRI facilities reported 13 percent fewer releases of all matched chemicals, their reductions in releases of designated carcinogens and of metals and metal compounds were less than one percent. At the same time, TRI facilities, with an eight percent overall reduction in releases, reported a three percent decrease in releases of designated carcinogens and an 18 percent increase in releases of metals and metal compounds (**Figure 3–24**).

In both NPRI and TRI, methanol had the largest reductions in releases from 1995 to 1997. Despite this, methanol still ranked first for total releases in both PRTRs in all three years.

Figure 3–24
M 1997

Percent Change in Total On-site Releases of Selected Chemicals, NPRI and TRI, 1995–1997



➤ 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) is included if the chemical or any of its compounds is designated carcinogenic.
➤ Canada and US data only. Mexico data not collected for 1997.

Table 3–36

M 1997

The 10 Chemicals with the Largest Decrease in NPRI Releases, 1995–1997

CAS Number	Chemical	Total Releases 1995 (kg)	1996 (kg)	1997 (kg)	Change 1995–1997 kg	%
67-56-1	Methanol	30,029,869	21,113,142	19,031,512	-10,998,357	-36.6
1330-20-7	Xylene (mixed isomers)	7,968,505	6,187,036	6,401,451	-1,567,054	-19.7
—	Copper (and its compounds)	1,682,999	684,342	660,947	-1,022,052	-60.7
—	Manganese (and its compounds)	2,639,005	1,882,345	1,909,572	-729,433	-27.6
74-87-3	Chloromethane	970,846	648,505	434,586	-536,260	-55.2
—	Nickel (and its compounds)	752,118	396,159	364,094	-388,024	-51.6
74-85-1	Ethylene	2,325,160	2,246,030	1,992,363	-332,797	-14.3
71-43-2	Benzene	1,809,253	1,796,748	1,479,788	-329,465	-18.2
7782-50-5	Chlorine	1,237,753	904,783	917,863	-319,890	-25.8
115-07-1	Propylene	1,248,941	995,162	972,363	-276,578	-22.1

Table 3–37

M 1997

The 10 Chemicals with the Largest Increase in NPRI Releases, 1995–1997

CAS Number	Chemical	Total Releases 1995 (kg)	1996 (kg)	1997 (kg)	Change 1995–1997 kg	%
—	Zinc (and its compounds)	4,122,249	5,647,993	5,813,918	1,691,669	41.0
—	Nitric acid and nitrate compounds	1,969,928	2,859,452	3,089,698	1,119,770	56.8
7664-93-9	Sulfuric acid	3,660,258	4,944,817	4,463,666	803,408	21.9
50-00-0	Formaldehyde	1,153,288	1,406,018	1,828,117	674,829	58.5
—	Chromium (and its compounds)	503,603	493,593	776,821	273,218	54.3
1344-28-1	Aluminum oxide (fibrous forms)	3,424	325	192,424	189,000	5,519.9
78-93-3	Methyl ethyl ketone	4,958,690	5,728,682	5,133,281	174,591	3.5
10049-04-4	Chlorine dioxide	1,062,318	1,169,215	1,199,244	136,926	12.9
7647-01-0	Hydrochloric acid	1,272,821	1,336,809	1,401,424	128,603	10.1
75-09-2	Dichloromethane	2,178,740	2,198,402	2,303,223	124,483	5.7

NPRI Chemicals with Largest Decreases/Increases

NPRI facilities reported a reduction in methanol releases from 30.0 million kg to 19.0 million kg or 37 percent. NPRI facilities reported reductions exceeding one million kg in two other substances: xylene (from 8.0 million kg to 6.4 million kg, a 20 percent reduction) and copper and its compounds (from 1.7 million kg to 660,947 kg, a 61 percent reduction—**Table 3–36**).

The chemical with the largest absolute increase in NPRI releases was zinc and its compounds, rising from 4.1 million kg in 1995 to 5.8 million kg in 1997, a 41 percent increase. The only other chemical with more than a one-million-kg increase in NPRI reporting of releases was nitric acid and nitrate compounds, increasing from 2.0 million kg in 1995 to 3.1 million kg in 1997, or 57 percent (**Table 3–37**).

Among the top 10 chemicals in NPRI for reduced releases were two carcinogens (nickel and its compounds and benzene) and three metals (copper, manganese and nickel, with their compounds). Three of the 10 NPRI chemicals with the largest 1995–1997 increases in releases were carcinogens: formaldehyde, chromium and its compounds and dichloromethane.

Two also were metals: zinc and chromium (and their compounds). Releases of chemicals in these groups are further examined in subsequent sections of this chapter.

TRI Chemicals with Largest Decreases/Increases

In TRI, methanol releases declined from 114.8 million kg to 99.4 million kg or 14 percent. TRI facilities reported a reduction in toluene releases nearly equaling the reduction for methanol. TRI releases of toluene decreased from 66.8 million kg to 51.6 million kg (23 percent). Carbon disulfide ranked third for TRI decreases with releases of 38.2 million kg in 1995 and 23.4 million kg in 1997 (a 39 percent reduction—**Table 3–38**).

TRI facilities reported a larger increase in releases of manganese and its compounds than of any other chemical in the matched data set. Releases of manganese and its compounds rose from 25.0 million kg in 1995 to 36.8 million kg in 1997, a 47 percent increase. Phosphoric acid ranked second for TRI increases, from 26.1 million kg to 34.3 million kg, a 31 percent increase (**Table 3–39**).

The top 10 chemicals for TRI reductions included one carcinogen (dichloromethane) but no metals. Six of the top 10 TRI chemicals for increases were carcinogens and six were metals. Of these, four appear in both categories: chromium, arsenic, nickel and lead (with their compounds). The two remaining carcinogens were styrene and formaldehyde, and the two remaining metals were manganese and zinc (and their compounds). These chemical groups are discussed in the following sections of this chapter.

Table 3–38

M 1997

The 10 Chemicals with Largest Decrease in TRI On-site Releases, 1995–1997

CAS Number	Chemical	Total Releases 1995 (kg)	1996 (kg)	1997 (kg)	Change 1995–1997 kg	%
67-56-1	Methanol	114,832,463	108,833,037	99,355,089	-15,477,374	-13.5
108-88-3	Toluene	66,817,960	57,366,276	51,645,746	-15,172,214	-22.7
75-15-0	Carbon disulfide	38,169,907	33,039,827	23,370,147	-14,799,760	-38.8
1330-20-7	Xylene (mixed isomers)	44,026,068	37,660,822	33,620,731	-10,405,337	-23.6
78-93-3	Methyl ethyl ketone	31,708,522	27,184,989	24,088,906	-7,619,616	-24.0
115-07-1	Propylene	12,413,182	11,992,443	7,379,468	-5,033,714	-40.6
107-21-1	Ethylene glycol	9,486,605	6,613,450	4,513,272	-4,973,333	-52.4
7647-01-0	Hydrochloric acid	30,967,552	28,838,728	26,161,189	-4,806,363	-15.5
75-09-2	Dichloromethane	26,191,163	24,277,712	21,506,464	-4,684,699	-17.9
75-05-8	Acetonitrile	13,087,292	10,816,369	8,976,372	-4,110,920	-31.4

Table 3–39

M 1997

The 10 Chemicals with Largest Increase in TRI On-site Releases, 1995–1997

CAS Number	Chemical	Total Releases 1995 (kg)	1996 (kg)	1997 (kg)	Change 1995–1997 kg	%
—	Manganese (and its compounds)	25,047,476	25,006,199	36,787,267	11,739,791	46.9
7664-38-2	Phosphoric acid	26,118,439	27,863,741	34,265,979	8,147,540	31.2
—	Nitric acid and nitrate compounds	91,401,095	85,954,606	97,316,227	5,915,132	6.5
—	Chromium (and its compounds)	11,133,551	13,052,706	14,485,603	3,352,052	30.1
—	Zinc (and its compounds)	55,911,373	57,400,317	59,247,400	3,336,027	6.0
—	Arsenic (and its compounds)	855,366	989,070	2,742,175	1,886,809	220.6
100-42-5	Styrene	18,871,150	19,263,600	20,309,017	1,437,867	7.6
50-00-0	Formaldehyde	8,783,564	9,641,204	9,884,585	1,101,021	12.5
—	Nickel (and its compounds)	1,634,152	2,218,571	2,551,439	917,287	56.1
—	Lead (and its compounds)	7,991,107	7,971,606	8,818,161	827,054	10.3

Table 3–40

M 1997

Change in NPRI On-site Releases of Known or Suspected Carcinogens†, 1995–1997

CAS Number	Chemical	Total Releases 1995 (kg)	1996 (kg)	1997 (kg)	Change 1995–1997 kg	%
—	Nickel (and its compounds)	752,118	396,159	364,094	-388,024	-51.6
71-43-2	Benzene	1,809,253	1,796,748	1,479,788	-329,465	-18.2
1332-21-4	Asbestos (friable)	223,307	155,193	53,026	-170,281	-76.3
106-99-0	1,3-Butadiene	222,979	124,455	105,819	-117,160	-52.5
127-18-4	Tetrachloroethylene	148,626	131,990	52,407	-96,219	-64.7
—	Lead (and its compounds)	1,345,674	1,392,954	1,251,363	-94,311	-7.0
79-01-6	Trichloroethylene	783,072	837,874	695,270	-87,802	-11.2
117-81-7	Di(2-ethylhexyl) phthalate	54,329	29,042	19,849	-34,480	-63.5
75-07-0	Acetaldehyde	302,525	427,394	268,195	-34,330	-11.3
67-66-3	Chloroform	238,583	208,161	221,835	-16,748	-7.0
75-21-8	Ethylene oxide	26,204	23,094	16,159	-10,045	-38.3
107-13-1	Acrylonitrile	16,322	10,775	6,469	-9,853	-60.4
—	Cobalt (and its compounds)	29,129	25,646	20,614	-8,515	-29.2
56-23-5	Carbon tetrachloride	7,769	489	336	-7,433	-95.7
79-06-1	Acrylamide	6,214	1,086	527	-5,687	-91.5
123-91-1	1,4-Dioxane	7,059	6,054	3,998	-3,061	-43.4
106-46-7	1,4-Dichlorobenzene	9,864	9,200	8,100	-1,764	-17.9
140-88-5	Ethyl acrylate	1,090	280	161	-929	-85.2
26471-62-5	Toluenediisocyanate (mixed isomers)	1,111	930	774	-337	-30.3
584-84-9	Toluene-2,4-diisocyanate	300	2	10	-290	-96.7
106-89-8	Epichlorohydrin	133	127	4	-129	-97.0
79-46-9	2-Nitropropane	125	125	0	-125	-100.0
101-77-9	4,4'-Methylenedianiline	100	0	0	-100	-100.0
91-08-7	Toluene-2,6-diisocyanate	0	0	0	0	—
62-56-6	Thiourea	0	0	0	0	—
302-01-2	Hydrazine	0	0	0	0	—
77-78-1	Dimethyl sulfate	8	11	10	2	25.0
101-14-4	4,4'-Methylenebis(2-chloroaniline)	4	5	6	2	50.0
121-14-2	2,4-Dinitrotoluene	700	2,350	816	116	16.6
96-09-3	Styrene oxide	100	537	297	197	197.0
139-13-9	Nitrilotriacetic acid	626	646	2,868	2,242	358.1
—	Cadmium (and its compounds)	38,829	18,952	41,353	2,524	6.5
75-56-9	Propylene oxide	10,469	11,448	13,005	2,536	24.2
107-06-2	1,2-Dichloroethane	6,168	17,316	19,603	13,435	217.8
75-01-4	Vinyl chloride	18,136	20,408	43,991	25,855	142.6
108-05-4	Vinyl acetate	244,509	322,740	283,107	38,598	15.8
100-42-5	Styrene	745,807	886,533	818,325	72,518	9.7
—	Arsenic (and its compounds)	57,770	125,128	149,053	91,283	158.0
75-09-2	Dichloromethane	2,178,740	2,198,402	2,303,223	124,483	5.7
—	Chromium (and its compounds)	503,603	493,593	776,821	273,218	54.3
50-00-0	Formaldehyde	1,153,288	1,406,018	1,828,117	674,829	58.5
	Subtotal	**10,944,643**	**11,081,865**	**10,849,393**	**-95,250**	**-0.9**
	% of Total	**11.8**	**13.3**	**13.5**		
	Total for Matched NPRI Chemicals	**92,620,108**	**83,171,877**	**80,448,924**	**-12,171,184**	**-13.1**

† 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) is included if the chemical or any of its compounds is designated carcinogenic.

Carcinogens

NPRI releases of substances designated as known or suspected carcinogens decreased one percent, from 10.9 million kg in 1995 to 10.8 million kg in 1997. This contrasted sharply with a 13 percent overall reduction in NPRI releases. Chemical by chemical, however, NPRI releases of carcinogens varied widely over this period. Of the 41 carcinogens for which NPRI facilities submitted reports in all three years, 33 showed increases or decreases of more than 10 percent (**Table 3–40**).

Among known or suspected carcinogens, the largest reduction reported by NPRI facilities was for nickel and its compounds, with releases declining from 752,118 kg in 1995 to 364,094 kg in 1997. Benzene releases decreased from 1.8 million kg to 1.5 million kg. These were the only carcinogens with reductions in releases of more than 300,000 kg from 1995 to 1997. Two others decreased by more than 100,000 kg each: asbestos (from 223,307 kg in 1995 to 53,026 kg in 1997) and 1,3-butadiene (from 222,979 kg to 105,819 kg). (The latter is used primarily as a chemical intermediary and polymer component in the manufacture of synthetic rubber, especially for tires, hoses, belts, etc. Other uses are in the manufacture of latex adhesives, various rubber products, nylon carpet backings, paper coatings, pipes, conduits, appliance and electrical equipment components, and luggage.)

NPRI facilities increased their releases of three carcinogens by more than 100,000 kg each from 1995 to 1997: formaldehyde (from 1.2 million kg to 1.8 million kg), chromium and its compounds (from 503,603 kg to 776,821 kg) and dichloromethane (from 2.2 million kg to 2.3 million kg).

TRI facilities reported 120.3 million kg of releases of known or suspected carcinogens in 1995 and 117.1 million kg in 1997, a reduction of three percent. This was less than half the eight percent reduction in releases achieved for all chemicals in the matched data set. As in NPRI, changes in TRI releases of carcinogens varied widely from 1995 to 1997. Releases increased or decreased by more than 10 percent for 39 of the 48 carcinogens in the matched data set (**Table 3–41**).

The largest TRI reduction in releases of these substances came in dichloromethane, which decreased from 26.2 million kg in 1995 to 21.5 million kg in 1997, trichloroethylene (from 11.7 million kg to 7.9 million kg), chloroform (from 4.8 million kg to 3.3 million kg), and tetrachloroethylene (from 4.3 million kg to 3.1 million kg). No other carcinogen showed a reduction of more than one million kg in TRI releases from 1995 to 1997. (Chloroform is used in the production of plastics, especially vinyl chloride; as a solvent in the extraction and purification of some antibiotics, alkaloids, vitamins, and flavors; in lacquers, floor polishes, resins, fats, greases, gums, waxes, etc; and in photography and dry cleaning. Tetrachloroethylene is widely used for dry cleaning and metal degreasing. Other uses include rubber coatings, solvent soaps, printing inks, adhesives and glues, sealants, polishes, lubricants, and pesticides. Chloroform and tetrachloroethylene were also used in producing chlorofluorocarbons.)

Table 3–41

M 1997

Change in TRI On-site Releases of Known or Suspected Carcinogens†, 1995–1997

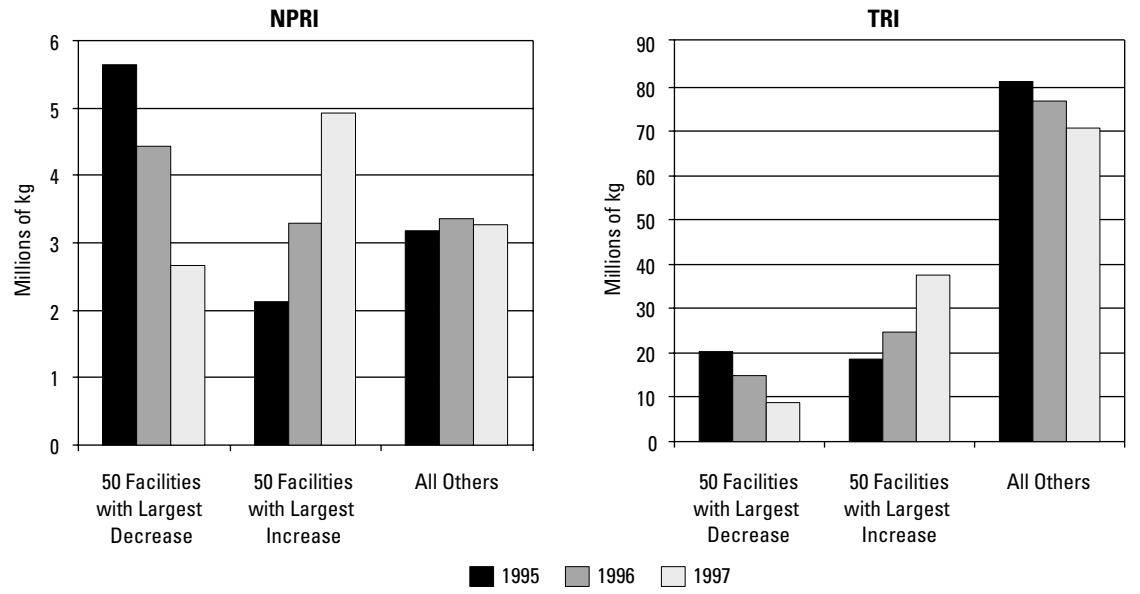
CAS Number	Chemical	Total Releases 1995 (kg)	1996 (kg)	1997 (kg)	Change 1995–1997 kg	%
75-09-2	Dichloromethane	26,191,163	24,277,712	21,506,464	-4,684,699	-17.9
79-01-6	Trichloroethylene	11,726,040	9,695,181	7,924,638	-3,801,402	-32.4
67-66-3	Chloroform	4,827,141	4,420,834	3,346,096	-1,481,045	-30.7
127-18-4	Tetrachloroethylene	4,270,659	3,480,656	3,054,561	-1,216,098	-28.5
107-13-1	Acrylonitrile	3,050,437	2,217,881	2,384,811	-665,626	-21.8
108-05-4	Vinyl acetate	2,206,641	1,869,501	1,563,459	-643,182	-29.1
75-07-0	Acetaldehyde	6,429,508	6,023,380	6,063,429	-366,079	-5.7
71-43-2	Benzene	4,384,312	3,912,699	4,148,494	-235,818	-5.4
107-06-2	1,2-Dichloroethane	573,327	477,003	418,669	-154,658	-27.0
106-99-0	1,3-Butadiene	1,385,187	1,261,319	1,231,099	-154,088	-11.1
75-56-9	Propylene oxide	408,181	290,935	262,657	-145,524	-35.7
117-81-7	Di(2-ethylhexyl) phthalate	236,857	227,905	139,264	-97,593	-41.2
75-01-4	Vinyl chloride	474,023	462,891	417,294	-56,729	-12.0
123-91-1	1,4-Dioxane	202,076	160,216	155,170	-46,906	-23.2
56-23-5	Carbon tetrachloride	203,562	179,401	177,280	-26,282	-12.9
106-89-8	Epichlorohydrin	166,558	168,423	151,045	-15,513	-9.3
140-88-5	Ethyl acrylate	94,407	84,881	83,209	-11,198	-11.9
101-77-9	4,4'-Methylenedianiline	15,197	23,087	11,050	-4,147	-27.3
79-46-9	2-Nitropropane	15,540	16,816	12,026	-3,514	-22.6
302-01-2	Hydrazine	6,090	4,636	5,181	-909	-14.9
77-78-1	Dimethyl sulfate	2,918	2,627	2,042	-876	-30.0
62-56-6	Thiourea	3,790	3,084	3,004	-786	-20.7
584-84-9	Toluene-2,4-diisocyanate	3,539	3,383	2,954	-585	-16.5
90-94-8	Michler's ketone	715	0	182	-533	-74.5
96-45-7	Ethylene thiourea	351	234	130	-221	-63.0
91-08-7	Toluene-2,6-diisocyanate	1,380	6,219	1,271	-109	-7.9
121-14-2	2,4-Dinitrotoluene	954	1,015	858	-96	-10.1
606-20-2	2,6-Dinitrotoluene	270	257	210	-60	-22.2
96-09-3	Styrene oxide	6	14	5	-1	-16.7
94-59-7	Safrole	116	229	229	113	97.4
64-67-5	Diethyl sulfate	3,165	2,556	3,365	200	6.3
75-21-8	Ethylene oxide	410,392	330,559	410,700	308	0.1
95-80-7	2,4-Diaminotoluene	227	714	888	661	291.2
101-14-4	4,4'-Methylenebis(2-chloroaniline)	118	569	1,028	910	771.2
26471-62-5	Toluenediisocyanate (mixed isomers)	22,332	20,720	23,777	1,445	6.5
139-13-9	Nitrilotriacetic acid	1,330	720	4,478	3,148	236.7
106-46-7	1,4-Dichlorobenzene	111,910	109,234	121,521	9,611	8.6
—	Cobalt (and its compounds)	306,039	300,054	357,314	51,275	16.8
—	Cadmium (and its compounds)	259,358	314,128	415,845	156,487	60.3
98-95-3	Nitrobenzene	161,809	105,151	318,675	156,866	96.9
1332-21-4	Asbestos (friable)	62,291	213,955	236,623	174,332	279.9
79-06-1	Acrylamide	2,785,147	2,681,483	3,357,462	572,315	20.5
—	Lead (and its compounds)	7,991,107	7,971,606	8,818,161	827,054	10.3
—	Nickel (and its compounds)	1,634,152	2,218,571	2,551,439	917,287	56.1
50-00-0	Formaldehyde	8,783,564	9,641,204	9,884,585	1,101,021	12.5
100-42-5	Styrene	18,871,150	19,263,600	20,309,017	1,437,867	7.6
—	Arsenic (and its compounds)	855,366	989,070	2,742,175	1,886,809	220.6
—	Chromium (and its compounds)	11,133,551	13,052,706	14,485,603	3,352,052	30.1
	Subtotal	**120,273,953**	**116,489,019**	**117,109,437**	**-3,164,516**	**-2.6**
	% of Total	**14.4**	**14.7**	**15.3**		
	Total for Matched TRI Chemicals	**835,039,966**	**790,718,526**	**767,302,191**	**-67,737,775**	**-8.1**

† 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) is included if the chemical or any of its compounds is designated carcinogenic.

Figure 3–25
M 1997

NPRI and TRI Total On-site Releases of Known or Suspected Carcinogens†, 1995–1997: Facilities with Largest Changes and All Others



† 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) is included if the chemical or any of its compounds is designated carcinogenic.

Reporting of TRI releases increased by more than one million kg each for four carcinogens: chromium and its compounds (from 11.1 million kg to 14.5 million kg), arsenic and its compounds (from 855,366 kg to 2.7 million kg), styrene (18.9 million kg to 20.3 million kg), and formaldehyde (8.8 million kg to 9.9 million kg). (Largely a byproduct of copper and lead smelting, arsenic is primarily used as a wood preservative. Arsenic is also used in agricultural products, in glass, and in nonferrous alloys.)

The facilities with the largest decreases from 1995 to 1997 in carcinogen releases cut these releases by more than half in both NPRI and TRI, while the facilities with the largest increases more than doubled their releases in both NPRI and TRI (**Figure 3–25**).

NPRI Facilities with Largest Decreases/Increases

In NPRI, the reduction by the facilities with the largest decreases in releases of carcinogenic substances slightly outpaced the increase by the facilities with the largest increases. NPRI facilities that were not among the largest "decreasers" or "increasers" showed essentially no change over the 1995–1997 period (**Figure 3–25**).

The 50 NPRI facilities with the largest reductions in releases of carcinogenic substances released 5.6 million kg of these substances in 1995 and 2.7 million kg in 1997. Nine of these facilities submitted forms for carcinogens in the matched data set in 1995 but not in 1997 (**Table 3–42**).

The 50 NPRI facilities with the largest increases reported releasing 2.1 million kg of designated carcinogens in 1995 and 4.9 million kg in 1997. A total of 23 of these facilities did not report carcinogens in the matched data set in 1995 but did so in 1997 (**Table 3–43**).

Table 3–42

M 1997

NPRI Facilities with Largest Decrease in On-site Releases of Known or Suspected Carcinogens†, 1995–1997

Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	Fonderies canadiennes d'Acier Ltée, Atchison Casting Corp.	Montréal, QC	31	35
2	Bayer Inc., Bayer AG	Sarnia, ON	37	28
3	Co-Steel Lasco	Whitby, ON	29	33
4	Dow Chemical Canada Inc.	Sarnia, ON	37	28
5	Abitibi Consolidated Inc., Division Belgo, Stone Consolidated	Shawinigan, QC	27	26
6	Dofasco Inc.	Hamilton, ON	29	33
7	Celanese Canada Inc.	Edmonton, AB	37	28
8	Inco Limited, Copper Cliff Nickel Refinery	Copper Cliff, ON	29	33
9	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33
10	Advanced Monobloc Manufacturing, CCL Industries Inc.	Penetanguishene, ON	30	34
11	Novopharm Limited	Scarborough, ON	37	28
12	Sydney Steel Corporation	Sydney, NS	29	33
13	Wolverine Tube (Canada) Inc.	London, ON	29	33
14	MAAX Inc., Division fibre de verre moderne - usine 4	Tring-Jonction, QC	37	28
15	Atlas Steels Inc., Atlas Specialty Steels	Welland, ON	29	33
16	Ford Motor Company, Essex Aluminum Plant	Windsor, ON	29	33
17	Bombardier Inc., Bombardier Produits récréatifs	St-Antoine-de-Tilly, QC	16	30
18	Blount Canada Ltd., Blount Inc.	Guelph, ON	30	34
19	E.B. Eddy Forest Products Ltd., George Weston Ltd.	Espanola, ON	27	26
20	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33
21	DuPont Canada Inc., Maitland Site	Maitland, ON	37	28
22	St. Anne-Nackawic Pulp Company Ltd.	Nackawic, NB	27	26
23	Camoplast Inc, Division Roski I	Roxton Falls, QC	32	37
24	Shell Canada Products Ltd., Sarnia Manufacturing Centre	Corunna, ON	36	29
25	Petro-Canada, Raffinerie de Montréal	Montréal, QC	36	29
26	Malette Québec Inc., Panneaux Malette OSB	St-Georges de Champlain, QC	25	24
27	Inco Limited, Manitoba Division	Thompson, MB	29	33
28	Suzorite Mica Products Inc., Mica Plant, Zemex Corp.	Boucherville, QC	35	32
29	Bombardier Inc., Bombardier Produits récréatifs	Valcourt, QC	32	37
30	Wyeth - Ayerst, Canada Inc., American Home Products	St-Laurent, QC	37	28
31	Woodbridge Foam Corporation, Kipling Plant, Woodbridge Group	Woodbridge, ON	16	30
32	Neste Resins, Neste Resins Canada	North Bay, ON	37	28
33	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33
34	Canac Kitchens Limited, Kohler Company	Thornhill, ON	25	24
35	Pétromont, Société en commandite	Varennes, QC	37	28
36	Mitsubishi Electronics Industries Canada Inc.	Midland, ON	33	36
37	Norkraft Quévillon Inc., Domtar Inc.	Lebel-sur-Quévillon, QC	27	26
38	Sandvik Steel Canada, Sandvik Steel, Inc.	Arnprior, ON	29	33
39	Crown Packaging Ltd., Paper Mill Division	Burnaby, BC	27	26
40	Delhi Industries Inc.	Delhi, ON	30	34
41	CCL Industries Ltd., KG Packaging	Concord, ON	37	28
42	Norbord Industries Inc., Noranda Forest Inc.	La Sarre, QC	25	24
43	Inco Limited, Central Mills	Copper Cliff, ON	29	33
44	AOC Canada, Inc., Alpha/Owens-Corning (Canada) Inc.	Guelph, ON	37	28
45	Produits American Biltrite Ltée., American Biltrite Inc.	Sherbrooke, QC	15	30
46	Techno Caoutchouc Inc., Soucy International Inc.	Rock Forest, QC	15	26
47	Owens-Corning Canada Inc., Owens Corning Fiberglas Corp.	Candiac, QC	35	32
48	Long Manufacturing Ltd., Echlin Inc.	Mississauga, ON	30	34
49	Valle Foam Industries Inc., Valle 2	Brampton, ON	16	30
50	Dow Chemical Canada Inc., Western Canada Operations	Fort Saskatchewan, AB	37	28
	Total			

† 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) is included if the chemical or any of its compounds is designated carcinogenic.

➤ Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to TRI.

Rank	1995 Number of Forms	1995 Total Releases (kg)	1996 Number of Forms	1996 Total Releases (kg)	1997 Number of Forms	1997 Total Releases (kg)	Change 95–97 Total Releases (kg)	Major Chemicals Reported with Decreases (Primary Media with Decreases)*
1	2	290,100	2	251,600	2	0	-290,100	Chromium and compounds (land)
2	5	361,475	5	162,400	5	82,673	-278,802	Benzene, 1,3-Butadiene (air)
3	3	334,898	3	233,261	3	92,573	-242,325	Lead and compounds (land)
4	8	248,425	8	214,262	17	100,758	-147,667	Asbestos (land)
5	1	147,397	1	3,135	**	**	-147,397	Formaldehyde (water)
6	5	460,142	5	457,530	5	316,496	-143,646	Benzene (air)
7	5	507,498	5	570,772	6	378,422	-129,076	Acetaldehyde (UIJ)
8	5	126,800	**	**	**	**	-126,800	Nickel and compounds (air)
9	6	398,980	5	393,700	5	281,030	-117,950	Lead and compounds (air)
10	1	109,380	1	87,240	**	**	-109,380	Tetrachloroethylene (air)
11	1	418,410	1	366,565	1	313,250	-105,160	Dichloromethane (air)
12	3	105,200	3	33,180	3	29,120	-76,080	Lead/Cadmium and compounds (land)
13	1	133,212	1	133,212	1	62,500	-70,712	Trichloroethylene (air)
14	1	91,820	1	19,373	1	22,200	-69,620	Styrene (air)
15	2	60,019	2	114,557	2	699	-59,320	Chromium and compounds (land)
16	5	53,000	4	0	4	0	-53,000	Styrene (air)
17	1	90,000	1	82,000	1	47,600	-42,400	Styrene (air)
18	3	40,943	3	74,616	**	**	-40,943	Trichloroethylene (air)
19	2	63,345	2	44,149	2	22,421	-40,924	Chloroform, Acetaldehyde (air)
20	3	102,969	4	59,558	4	63,977	-38,992	Benzene (air)
21	5	49,240	5	10,600	5	10,837	-38,403	Asbestos (land)
22	3	54,270	1	14,000	1	18,000	-36,270	Chloroform (air)
23	1	80,000	1	69,000	1	44,600	-35,400	Styrene (air)
24	5	81,863	4	78,614	4	52,160	-29,703	Benzene (air)
25	2	69,284	2	63,938	3	39,615	-29,669	Benzene (air)
26	1	96,380	1	55,108	1	66,857	-29,523	Formaldehyde (air)
27	3	114,525	3	92,844	3	85,303	-29,222	Nickel and compounds (air)
28	1	60,000	1	60,000	1	33,000	-27,000	Dichloromethane (air)
29	1	26,033	**	**	2	0	-26,033	Dichloromethane (air)
30	1	43,419	1	23,017	1	18,579	-24,840	Dichloromethane (air)
31	2	48,008	2	58,809	2	24,001	-24,007	Dichloromethane (air)
32	2	33,600	1	37,220	1	10,770	-22,830	Formaldehyde (air)
33	3	46,270	3	23,190	3	23,870	-22,400	Chromium/Nickel and compounds (water)
34	4	21,522	1	12,148	**	**	-21,522	Styrene (air)
35	3	55,080	3	37,466	3	33,802	-21,278	Benzene (air, water)
36	2	21,149	2	12,423	**	**	-21,149	Trichloroethylene (air)
37	1	28,900	1	19,360	2	8,854	-20,046	Chloroform (air)
38	1	223,200	1	246,420	1	203,760	-19,440	Trichloroethylene (air)
39	1	19,170	**	**	**	**	-19,170	Formaldehyde (water)
40	2	17,711	2	93	2	96	-17,615	Trichloroethylene (air)
41	3	32,100	3	16,334	3	15,131	-16,969	Dichloromethane (air)
42	1	26,800	1	14,300	1	11,204	-15,596	Formaldehyde (air)
43	1	14,453	1	29,851	**	**	-14,453	Nickel and compounds (water)
44	1	14,257	1	0	1	0	-14,257	Styrene (air)
45	1	17,900	1	4,300	1	3,800	-14,100	Di(2-ethylhexyl) phthalate (land)
46	2	14,000	**	**	**	**	-14,000	Di(2-ethylhexyl) phthalate (air)
47	2	37,153	2	22,993	2	23,222	-13,931	Formaldehyde (air)
48	2	13,800	1	0	1	0	-13,800	Trichloroethylene (air)
49	2	99,876	2	102,021	2	86,518	-13,358	Dichloromethane (air)
50	11	40,852	12	38,764	13	27,596	-13,256	Formaldehyde (air)
	133	**5,644,828**	**116**	**4,443,923**	**122**	**2,655,294**	**-2,989,534**	

* Chemicals accounting for more than 70% of decrease in total releases of carcinogens from the facility.
** Indicates facility did not report any matched carcinogens that year.
➤ UIJ=underground injection

Table 3–43

M 1997

NPRI Facilities with Largest Increase in On-site Releases of Known or Suspected Carcinogens†, 1995–1997

Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33
2	MacMillan Bloedel Pembroke LP, MacMillan Bloedel Ltd.	Pembroke, ON	25	24
3	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33
4	Novopharm Limited	Markham, ON	37	28
5	Carpenter Canada Ltd.	Woodbridge, ON	16	30
6	Domtar Papers, Cornwall Business Unit	Cornwall, ON	27	26
7	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33
8	Abitibi-Consolidated Inc., Division Port-Alfred	La Baie, QC	27	26
9	Ainsworth Lumber Co. Ltd.	Grande Prairie, AB	25	24
10	Uniboard Canada Inc., Division Val-d'Or, UniKunz Canada Inc.	Val-d'Or, QC	25	24
11	René Matériaux composites Ltée	St-Éphrem-de-Beauce, QC	32	37
12	Falconbridge Ltd., Kidd Metallurgical Div.	Cochrane, ON	29	33
13	Stelco Inc., Hilton Works	Hamilton, ON	29	33
14	MAAX Inc., Division fibre de verre moderne - usine 5	Tring-Jonction, QC	16	30
15	Uniboard Canada Inc., Division Sayabec, UniKunz Canada Inc.	Sayabec, QC	25	24
16	Domfoam International Inc.	St-Léonard, QC	16	30
17	AT Plastics Inc., Edmonton Site	Edmonton, AB	37	28
18	Beauce Composites Inc., ADS Groupe Composites Inc.	Ste-Clotilde-de-Beauce, QC	32	37
19	Louisiana-Pacific Canada Ltd., Dawson Creek OSB	Dawson Creek, BC	25	24
20	Ranger Board Ltd., West Fraser Mills Ltd.	Blue Ridge, AB	25	24
21	Bonar Inc, Plastics Division, Low & Bonar PLC	Burlington/Halton, ON	16	26
22	Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur, QC	29	33
23	Menasco Aerospace, Coltec Industries Inc.	Oakville, ON	32	37
24	West Fraser Mills Ltd., Westpine, MDF	Quesnel, BC	25	24
25	Frank Fair Industries Ltd., Motor Coach Industries Ltd.	Winnipeg, MB	32	30
26	Cartons St-Laurent Inc.	LaTuque, QC	27	26
27	Macmillan Bloedel, North Superior Forest Products	Wawa, ON	25	24
28	ICI Canada Inc, ICI Explosifs	Brownsburg, QC	37	39
29	Avenor Inc., Thunder Bay Operations	Thunder Bay, ON	27	26
30	Grant Forest Products Corp., OSB Plant	Englehart, ON	25	24
31	De Havilland Inc., Bombardier Inc.	Downsview, ON	32	35
32	Chrysler Canada, Ltd., Windsor Assembly Plant	Windsor, ON	32	37
33	Carpenter Canada Ltd., Calgary Division	Calgary, AB	16	30
34	Fleet Industries Ltd., Magellan Aerospace Corp.	Fort Erie, ON	32	37
35	Kimberly-Clark Corporation	Terrace Bay, ON	27	26
36	MAAX Inc., Division Acrylica	Ste-Marie, QC	37	30
37	Nova Chemicals (Canada) Ltd	Sarnia, ON	37	28
38	Avenor Inc., Gold River Operations	Gold River, BC	27	26
39	Weyerhaeuser Canada Ltd., Slave Lake O.S.B. Mill	Slave Lake, AB	25	24
40	Domtar Packaging, Red Rock Mill	Red Rock, ON	27	26
41	Pétroles Coastal Canada Inc., Coastal Corporation	Montréal-est, QC	37	28
42	Reinforced Plastic Systems Inc., Mahone Bay Plant	Mahone Bay, NS	16	30
43	Foamex Canada Inc., Foamex L.P.	Toronto, ON	16	30
44	Abitibi-Consolidated, Division Laurentide	Grand-Mere, QC	27	26
45	Avenor Inc., Dryden Mill	Dryden, ON	27	26
46	Unicell Limited	Toronto, ON	32	37
47	Lilly Industries, Inc.	Cornwall, ON	37	28
48	Norbord Industries Inc., Val d'Or Division	Val-d'Or, QC	25	24
49	Smith & Nephew Inc.	Lachine, QC	37	28
50	Vitafoam Products Canada Ltd.	Winnipeg, MB	16	30
	Total			

† 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) is included if the chemical or any of its compounds is designated carcinogenic.

➤ Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to TRI.

Rank	1995 Number of Forms	1995 Total Releases (kg)	1996 Number of Forms	1996 Total Releases (kg)	1997 Number of Forms	1997 Total Releases (kg)	Change 95–97 Total Releases (kg)	Major Chemicals Reported with Increases (Primary Media with Increases)*
1	4	498,950	4	215,858	4	897,650	398,700	Chromium and compounds (land)
2	**	**	**	**	1	279,000	279,000	Formaldehyde (air)
3	3	41,177	3	166,644	3	234,454	193,277	Lead and compounds (air)
4	1	72,981	1	61,955	1	226,993	154,012	Dichloromethane (air)
5	2	196,585	2	238,953	2	296,925	100,340	Dichloromethane (air)
6	**	**	1	104,411	1	100,003	100,003	Benzene (air)
7	1	80,000	1	217,440	2	169,273	89,273	Lead and compounds (land)
8	1	129,500	1	229,000	2	212,430	82,930	Formaldehyde (water)
9	**	**	1	40,688	1	82,298	82,298	Formaldehyde (air)
10	**	**	1	64,800	1	77,100	77,100	Formaldehyde (air)
11	**	**	2	144,000	2	71,000	71,000	Styrene, Dichloromethane (air)
12	**	**	**	**	4	69,999	69,999	Lead and compounds (air)
13	6	174,590	6	234,615	6	242,390	67,800	Benzene (air)
14	**	**	1	58,119	1	66,510	66,510	Styrene (air)
15	1	3,323	1	3,582	1	62,136	58,813	Formaldehyde (air)
16	2	195,472	2	230,802	2	245,996	50,524	Dichloromethane (air)
17	1	36,083	1	85,914	1	84,600	48,517	Vinyl acetate (air)
18	**	**	2	43,536	2	43,536	43,536	Styrene (air)
19	**	**	1	36,598	1	41,712	41,712	Formaldehyde (air)
20	1	24,455	1	16,508	1	64,585	40,130	Formaldehyde (air)
21	**	**	1	29,300	1	36,000	36,000	Trichloroethylene (air)
22	2	202,179	2	230,540	2	234,792	32,613	Lead and compounds (land)
23	**	**	**	**	2	31,920	31,920	Chromium and compounds, Trichloroethylene (air)
24	**	**	**	**	1	31,134	31,134	Formaldehyde (air)
25	1	14,533	1	11,861	1	45,200	30,667	Styrene (air)
26	**	**	2	30,034	2	29,283	29,283	Chloroform, Acetaldehyde (air)
27	**	**	1	35,400	1	29,230	29,230	Formaldehyde (air)
28	1	6,000	1	6,000	2	34,960	28,960	Lead and compounds (land)
29	**	**	2	28,140	2	28,584	28,584	Acetaldehyde, Chloroform (air)
30	**	**	1	81,800	1	28,370	28,370	Formaldehyde (air)
31	1	44,470	1	44,278	1	72,200	27,730	Trichloroethylene (air)
32	1	0	2	20,800	2	27,082	27,082	Formaldehyde (air)
33	2	76,086	2	92,783	2	103,060	26,974	Dichloromethane (air)
34	**	**	1	30,970	1	26,250	26,250	Trichloroethylene (air)
35	**	**	**	**	1	22,530	22,530	Chloroform (air)
36	1	27,000	1	30,085	1	45,850	18,850	Styrene (air)
37	3	37,590	3	43,300	3	56,400	18,810	Styrene (air)
38	**	**	1	18,400	1	18,400	18,400	Acetaldehyde (air)
39	2	59,420	2	85,930	2	76,330	16,910	Formaldehyde (air)
40	**	**	1	14,117	1	16,348	16,348	Acetaldehyde (air)
41	1	1,690	1	5,798	1	17,948	16,258	Benzene (air)
42	1	5,955	1	4,200	1	21,900	15,945	Styrene (air)
43	2	141,169	2	137,960	2	157,075	15,906	Dichloromethane (air)
44	**	**	**	**	1	15,690	15,690	Formaldehyde (air)
45	**	**	1	14,800	1	15,630	15,630	Acetaldehyde (air)
46	**	**	**	**	1	15,390	15,390	Styrene (air)
47	3	1,769	2	11,700	2	16,977	15,208	Styrene (air)
48	1	31,700	1	43,020	1	46,489	14,789	Formaldehyde (air)
49	1	12,120	1	23,500	1	26,873	14,753	Dichloromethane (air)
50	1	4,780	1	12,556	1	19,500	14,720	Dichloromethane (air)
	47	**2,119,577**	**67**	**3,280,695**	**81**	**4,915,985**	**2,796,408**	

* Chemicals accounting for more than 70% of increase in total releases of carcinogens from the facility.
** Indicates facility did not report any matched carcinogens that year.
➤ UIJ=underground injection

TRI Facilities with Largest Decreases/Increases

In TRI, both the largest decreasing facilities and the facilities that did not report large changes contributed reductions in releases from 1995 to 1997. However, releases reported by the 50 facilities with the largest increases minimized the TRI reduction in these substances from 1995 to 1997 (**Figure 3–25**).

Among TRI facilities, the 50 with the largest reductions in releases of designated carcinogens reported 20.4 million kg of such releases in 1995 and 8.8 million kg in 1997. Eight of these facilities did not submit reports for any of the matched carcinogens in 1997 (**Table 3–44**).

TRI facilities with the largest increases reported releasing 18.7 million kg of these substances in 1995 and 37.6 million kg in 1997. Eleven of them had not filed reports for the carcinogens in 1995 (**Table 3–45**).

Table 3–44

M 1997

TRI Facilities with Largest Decrease in On-site Releases of Known or Suspected Carcinogens†, 1995–1997

Rank	Facility	City, State	US SIC Code
1	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33
2	BP Chemicals Inc., BP America Inc.	Lima, OH	28
3	Monsanto Co., Chocolate Bayou	Alvin, TX	28
4	Heatcraft Inc., Lennox Intl. Inc.	Grenada, MS	Mult.
5	Pharmacia & Upjohn Co.	Portage, MI	28
6	Piper Impact Inc.	New Albany, MS	34
7	Hoechst-Celanese Chemical, Clear Lake Plant, Hoechst Corp.	Pasadena, TX	28
8	Celanese Eng. Resins Inc., Hoechst Corp.	Bishop, TX	28
9	Eastman Kodak Co., Kodak Park	Rochester, NY	38
10	GE Plastics Co., GE Co.	Mount Vernon, IN	28
11	Simpson Pasadena Paper Co., Simpson Investment Co.	Pasadena, TX	26
12	DuPont	Towanda, PA	38
13	DuPont	Beaumont, TX	28
14	Gaska Tape Inc.	Elkhart, IN	30
15	Trinity American Corp.	High Point, NC	30
16	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33
17	Vitafoam Inc., British Vita PLC	Tupelo, MS	30
18	Weyerhaeuser Co.	Longview, WA	Mult.
19	Foamex L.P., Foamex Intl. Inc.	La Porte, IN	30
20	Pharmacia & Upjohn Caribe Inc., Pharmacia & Upjohn Inc.	Arecibo, PR	28
21	Doe Run Co., Renco Group Inc.	Herculaneum, MO	33
22	Huntsman Petrochemical Corp., Huntsman Corp.	Port Arthur, TX	28
23	Celanese Ltd.	Bay City, TX	28
24	Tokico USA Inc.	Berea, KY	37
25	ASARCO Inc.	East Helena, MT	33
26	Dow Chemical Co.	Freeport, TX	28
27	Vitafoam Inc.	High Point, NC	30
28	Hoechst-Celanese Corp., Hoechst Corp.	Spartanburg, SC	Mult.
29	Great Lakes Chemical Corp.	El Dorado, AR	28
30	Willamette Ind. Inc.	Bennettsville, SC	24
31	International Paper Co., Natchez Mill	Natchez, MS	26
32	Texas Fibers, Leggett & Platt Inc.	Brenham, TX	30
33	Fort James Camas LLC, Fort James Corp.	Camas, WA	Mult.
34	Allegheny Ludlum Corp., Allegheny Teledyne Inc.	Latrobe, PA	33
35	Crest Foam, Leggett & Platt Inc.	Newburyport, MA	30
36	Ford Motor Co., Sheldon Rd. Plant	Plymouth, MI	37
37	Louisiana Pigment Co. L.P.	Westlake, LA	28
38	Electronic Concepts Inc.	Lee, MA	30
39	Schering-Plough Prods. Inc., Schering-Plough Corp.	Las Piedras, PR	28
40	Tippecanoe Labs., Eli Lilly & Co.	Shadeland, IN	28
41	DuPont Sabine River Works	Orange, TX	28
42	Karo Mfg. Inc.	Naugatuck, CT	34
43	DuPont Cape Fear	Leland, NC	28
44	Hexcel Corp.	Salt Lake City, UT	28
45	Pro-Line Boats Inc., American Marine Holdings	Homosassa, FL	37
46	Bayer Corp.	Orange, TX	28
47	Lukens Steel Co., Lukens Inc.	Coatesville, PA	33
48	Armco Inc. (Route 8 S.)	Butler, PA	33
49	Wheatland Tube Co., John Maneely Co.	Chicago, IL	33
50	General Foam Corp.	Bridgeview, IL	30
	Total		

† 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) is included if the chemical or any of its compounds is designated carcinogenic.

➤ Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to NPRI.

Rank	1995 Number of Forms	1995 Total Releases (kg)	1996 Number of Forms	1996 Total Releases (kg)	1997 Number of Forms	1997 Total Releases (kg)	Change 95–97 Total Releases (kg)	Major Chemicals Reported with Decreases (Primary Media with Decreases)*
1	4	1,237,100	4	945,577	4	56,321	-1,180,779	Lead and compounds (land)
2	10	1,821,315	10	1,195,459	10	992,438	-828,877	Acrylonitrile (UIJ)
3	4	801,396	3	657,431	1	43,284	-758,112	Acrylonitrile (UIJ)
4	1	447,951	1	164,902	1	48,202	-399,749	Trichloroethylene (air)
5	5	430,090	4	114,818	4	65,320	-364,770	Dichloromethane (air)
6	2	358,617	2	127,778	2	227	-358,390	Tetrachloroethylene (air)
7	6	404,831	6	128,816	6	61,319	-343,512	Vinyl acetate (UIJ)
8	4	447,212	5	385,525	5	106,392	-340,820	Formaldehyde (UIJ)
9	10	1,352,547	9	1,142,344	9	1,013,355	-339,192	Dichloromethane, Acetaldehyde (air)
10	4	698,118	7	569,534	4	392,448	-305,670	Dichloromethane (air)
11	2	287,075	2	286,168	2	39,455	-247,620	Chloroform (air)
12	1	244,898	1	222,222	**	**	-244,898	Dichloromethane (air)
13	9	341,818	4	107,635	5	98,399	-243,419	Acrylonitrile, Nitrobenzene, Carbon tetrachloride (air)
14	2	252,550	2	33,149	2	18,301	-234,249	Dichloromethane, Tetrachloroethylene (air)
15	2	276,214	1	160,100	2	53,574	-222,640	Dichloromethane (air)
16	7	891,992	7	1,321,13 5	7	680,183	-211,809	Lead and compounds (land)
17	2	205,427	3	352,260	**	**	-205,427	Dichloromethane (air)
18	6	537,293	6	402,497	5	339,823	-197,470	Chloroform (air, water), Acetaldehyde (air)
19	2	196,516	2	45,972	**	**	-196,516	Dichloromethane (air)
20	2	590,522	2	409,501	2	396,123	-194,399	Dichloromethane (air)
21	6	785,764	6	689,212	5	594,782	-190,982	Lead and compounds (land)
22	5	295,193	4	214,753	4	106,712	-188,481	Benzene (air)
23	5	191,243	3	35,597	3	11,550	-179,693	Vinyl acetate (UIJ, air), Acetaldehyde (UIJ)
24	2	167,659	2	75,799	1	116	-167,543	Trichloroethylene (air)
25	4	1,931,363	4	1,896,534	4	1,763,895	-167,468	Lead and compounds (land)
26	21	462,411	21	406,386	21	297,191	-165,220	Propylene oxide, Dichloromethane, Benzene, 1,3-Butadiene (air)
27	3	338,776	3	201,395	2	174,720	-164,056	Dichloromethane (air)
28	5	177,338	5	38,575	5	13,822	-163,516	Acetaldehyde (air)
29	2	391,977	2	299,060	2	228,899	-163,078	Dichloromethane (UIJ)
30	1	148,190	**	**	**	**	-148,190	Formaldehyde (air)
31	4	222,506	3	161,507	3	76,523	-145,983	Chloroform, Dichloromethane (air)
32	2	208,390	2	61,429	2	65,102	-143,288	Dichloromethane (air)
33	4	260,551	4	152,519	5	118,730	-141,821	Chloroform (air)
34	3	147,927	3	155,124	3	7,890	-140,037	Chromium and compounds (land)
35	2	138,165	2	45,125	1	227	-137,938	Dichloromethane (air)
36	1	137,596	1	3,583	**	**	-137,596	Trichloroethylene (air)
37	1	131,804	**	**	**	**	-131,804	Chromium and compounds (land)
38	2	127,309	2	72,391	**	**	-127,309	Dichloromethane (air)
39	2	253,660	2	205,587	2	128,277	-125,383	Dichloromethane (air)
40	3	180,159	3	85,490	4	60,045	-120,114	Dichloromethane (air)
41	8	259,681	8	253,256	6	139,938	-119,743	Vinyl acetate (air)
42	1	127,438	1	63,946	1	10,612	-116,826	Tetrachloroethylene (air)
43	4	255,215	4	148,634	4	141,702	-113,513	Acetaldehyde (air)
44	2	134,516	1	35,311	1	21,887	-112,629	Dichloromethane (air)
45	2	176,616	1	73,197	1	64,844	-111,772	Styrene (air)
46	1	174,655	1	145,238	2	63,605	-111,050	1,3-Butadiene (air)
47	3	170,168	3	120,151	3	59,905	-110,263	Chromium/Nickel and compounds (land)
48	3	111,859	3	117,260	3	2,997	-108,862	Chromium/Nickel and compounds (land)
49	2	104,582	1	32,508	**	**	-104,582	Dichloromethane (air)
50	3	323,982	3	322,330	3	219,477	-104,505	Dichloromethane (air)
	192	**20,360,175**	**179**	**14,884,720**	**162**	**8,778,612**	**-11,581,563**	

* Chemicals accounting for more than 70% of decrease in total releases of carcinogens from the facility.
** Indicates facility did not report any matched carcinogens that year.
➤ UIJ=underground injection

Table 3–45

M 1997

TRI Facilities with Largest Increase in On-site Releases of Known or Suspected Carcinogens†, 1995–1997

Rank	Facility	City, State	US SIC Code
1	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33
2	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28
3	Monsanto Co.	Luling, LA	28
4	Solutia Inc., Chocolate Bayou	Alvin, TX	28
5	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28
6	Borden Chemicals & Plastics LP	Geismar, LA	28
7	ASARCO Inc., Glover Plant	Annapolis, MO	33
8	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33
9	Foamex L.P., Div. of Kihi	Corry, PA	30
10	Aquaglass Corp., Masco Corp.	Adamsville, TN	30
11	Boeing Co.	Wichita, KS	Mult.
12	DuPont	Pass Christian, MS	28
13	Vitafoam Inc., British Vita PLC	Tupelo, MS	30
14	BP Chemicals Inc., Green Lake, BP America Inc.	Port Lavaca, TX	28
15	DuPont	New Johnsonville, TN	28
16	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33
17	Carpenter Co.	Russellville, KY	Mult.
18	Rubicon Inc.	Geismar, LA	28
19	3V Inc.	Georgetown, SC	28
20	Tennessee Mat Co.	Nashville, TN	30
21	Aqua Glass Performance Plant, Masco Corp.	McEwen, TN	30
22	Burkart Foam Inc., Ohio Decorative Prods. Inc.	Cairo, IL	30
23	Shell Chemical Co., Shell Oil Co.	Geismar, LA	28
24	Plum Creek Mfg. LP, Plum Creek Timber Co. LP	Columbia Falls, MT	24
25	Eastman Chocolate Bayou	Alvin, TX	28
26	Springs Chemical, Grace Complex, Springs Ind. Inc.	Lancaster, SC	22
27	Firestone Synthetic Rubber & Latex, Bridgestone/Firestone Inc.	Sulphur, LA	28
28	Abbott Health Prods. Inc., Abbott Labs.	Barceloneta, PR	28
29	Pioga LLC, Creative Design & Mfg., Pioneer Intl. Inc.	Nashville, GA	37
30	Dow Chemical Co.	Plaquemine, LA	Mult.
31	Universal-Rundle Corp., Nortek Inc.	Ottumwa, IA	30
32	Tomkins Ind. Inc., Lasco Bathware Div.	Cordele, GA	30
33	American Steel Foundries, Amsted Ind. Inc.	Granite City, IL	33
34	DuPont	Circleville, OH	28
35	Carpenter Co.	Elkhart, IN	Mult.
36	Selmer Co. Inc., Vincent Bach Div.	Elkhart, IN	39
37	Future Foam Inc.	Middleton, WI	30
38	Cleveland Laminating Corp.	Cleveland, OH	26
39	Star Enterprise	Delaware City, DE	29
40	DuPont Chambers Works	Deepwater, NJ	28
41	Foamex Intl. Inc.	Milan, TN	30
42	Carpenter Co., Tupelo Div.	Verona, MS	30
43	Georgia-Pacific Corp.	Big Island, VA	26
44	U.S. Vanadium Corp., Strategic Minerals Corp.	Hot Springs, AR	33
45	P4 Production L.L.C.	Soda Springs, ID	Mult.
46	Lee-Var Inc.	Andrews, TX	30
47	Chaparral Boats Inc., RPC Energy Services Inc.	Nashville, GA	37
48	Flexible Foam Prods. Inc., Ohio Decorative Prods. Inc.	Miami, FL	30
49	DuPont	Old Hickory, TN	Mult.
50	Albemarle Corp.	Orangeburg, SC	28
	Total		

† 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) is included if the chemical or any of its compounds is designated carcinogenic.

➤ Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to NPRI.

Rank	1995 Number of Forms	1995 Total Releases (kg)	1996 Number of Forms	1996 Total Releases (kg)	1997 Number of Forms	1997 Total Releases (kg)	Change 95–97 Total Releases (kg)	Major Chemicals Reported with Increases (Primary Media with Increases)*
1	5	759,954	5	741,870	5	4,101,067	3,341,113	Lead/Arsenic and compounds (land)
2	1	4,265,578	1	5,126,893	1	6,578,095	2,312,517	Chromium and compounds (land)
3	2	1,823,991	2	2,549,116	2	3,236,644	1,412,653	Formaldehyde (UIJ)
4	**	**	**	**	3	1,039,050	1,039,050	Acrylonitrile (UIJ)
5	1	3,313,374	1	4,084,751	1	4,129,841	816,467	Chromium and compounds (land)
6	7	38,378	6	77,681	7	815,745	777,367	Benzene (air)
7	4	960,950	4	1,445,774	4	1,603,364	642,414	Lead and compounds (land)
8	1	547,715	1	922,590	1	1,097,645	549,930	Nickel and compounds (land)
9	2	448,333	2	756,420	2	903,448	455,115	Dichloromethane (air)
10	1	665,652	1	1,046,797	1	1,057,867	392,215	Styrene (air)
11	9	230,411	6	350,371	6	596,395	365,984	Tetrachloroethylene (air)
12	**	**	**	**	4	358,277	358,277	Chromium and compounds (UIJ)
13	2	98,199	2	35,755	3	425,644	327,445	Dichloromethane (air)
14	5	1,398,049	5	1,243,881	5	1,711,337	313,288	Acrylamide (UIJ)
15	**	**	**	**	2	296,145	296,145	Chromium and compounds (UIJ)
16	5	22,155	4	60,361	7	291,902	269,747	Arsenic and compounds (land)
17	3	353,610	3	374,128	5	571,776	218,166	Dichloromethane (air)
18	9	106,728	9	110,086	9	308,696	201,968	Nitrobenzene (UIJ)
19	4	120,369	4	168,468	4	319,397	199,028	Dichloromethane (air)
20	**	**	1	4	1	198,200	198,200	Dichloromethane (air)
21	1	206,396	1	269,465	1	404,393	197,997	Styrene (air)
22	2	684	2	278,642	2	189,911	189,227	Dichloromethane (air)
23	4	34,607	5	75,637	5	222,355	187,748	Ethylene oxide (air)
24	1	17,460	1	16,440	1	201,020	183,560	Formaldehyde (air)
25	**	**	1	194,105	1	182,358	182,358	Dichloromethane (air)
26	**	**	1	0	4	181,137	181,137	Chromium/Lead and compounds (air)
27	2	29,513	2	16,701	2	209,167	179,654	1,3-Butadiene (air)
28	1	520,117	1	585,261	1	689,524	169,407	Dichloromethane (air)
29	**	**	1	156,546	1	164,296	164,296	Styrene (air)
30	18	138,667	20	248,455	18	298,840	160,173	Asbestos (land)
31	**	**	1	114,131	1	156,537	156,537	Styrene (air, land)
32	1	192,302	1	309,375	1	347,116	154,814	Styrene (air)
33	2	151,141	2	296,726	2	300,835	149,694	Chromium and compounds (land)
34	**	**	3	77,419	3	148,784	148,784	Acetaldehyde (air)
35	2	260,674	3	293,377	3	408,975	148,301	Dichloromethane (air)
36	1	0	1	0	1	147,846	147,846	Trichloroethylene (air)
37	1	227	2	130,359	2	145,352	145,125	Dichloromethane (air)
38	1	208,617	1	292,063	1	346,032	137,415	Dichloromethane (air)
39	3	6,914	2	15,374	5	138,019	131,105	Nickel and compounds (land)
40	13	32,126	10	91,385	8	158,080	125,954	Acrylamide (land)
41	2	396,587	1	457,282	2	521,285	124,698	Dichloromethane (air)
42	2	580,417	2	689,399	2	704,215	123,798	Dichloromethane (air)
43	1	45,576	1	41,814	2	164,158	118,582	Benzene, Acetaldehyde (air)
44	1	247,306	1	232,185	1	365,394	118,088	Nickel and compounds (land)
45	**	**	**	**	3	114,781	114,781	Cadmium and compounds (land)
46	**	**	1	11,338	1	113,379	113,379	Styrene (air)
47	2	123,322	2	142,678	3	229,342	106,020	Styrene (air)
48	2	163,929	2	192,064	2	266,521	102,592	Dichloromethane (air)
49	4	109,478	4	109,389	4	210,408	100,930	Acetaldehyde (air)
50	2	103,143	2	246,979	2	203,446	100,303	Dichloromethane (air)
	130	**18,722,649**	**134**	**24,679,535**	**158**	**37,574,041**	**18,851,392**	

* Chemicals accounting for more than 70% of increase in total releases of carcinogens from the facility.
** Indicates facility did not report any matched carcinogens that year.
➤ UIJ=underground injection

Metals

NPRI facilities reported almost no change in the amount of metals and their compounds they released from 1995 to 1997. NPRI releases of metals and metal compounds totaled 11.84 million kg in 1995 and 11.76 million kg in 1997, a reduction of less than one percent. Because releases of other substances decreased much more substantially (a 13 percent reduction), metals occupied an increasing portion of total NPRI releases, rising from 13 percent of all releases in 1995 to 15 percent in 1997 (**Table 3–46**).

The metal with the largest absolute reduction achieved in this period was copper and its compounds, with releases of 1.7 million kg in 1995 and 660,947 kg in 1997. This reduction amounted to a 61 percent decrease. At the same time, NPRI facilities reported increasing releases of zinc and its compounds from 4.1 million kg in 1995 to 5.8 million kg in 1997, a 41 percent increase. NPRI facilities reported increases for nine of the 15 metals.

TRI facilities reported a substantial increase in their releases of metals and metal compounds from 1995 to 1997—from 126.3 million kg to 149.2 million kg. This amounted to an 18 percent increase, a sharp reversal of the eight percent reduction for all chemicals in the matched data set. As releases of other chemicals decreased, the proportion of metals in TRI total releases increased from 15 percent in 1995 to 20 percent in 1997 (**Table 3–47**).

Table 3–46

M 1997

Change in NPRI On-site Releases of Metals and Their Compounds, 1995–1997

CAS Number	Chemical	Total Releases 1995 (kg)	1996 (kg)	1997 (kg)	Change 1995–1997 kg	%
—	Copper (and its compounds)	1,682,999	684,342	660,947	-1,022,052	-60.7
—	Manganese (and its compounds)	2,639,005	1,882,345	1,909,572	-729,433	-27.6
—	Nickel (and its compounds)	752,118	396,159	364,094	-388,024	-51.6
—	Lead (and its compounds)	1,345,674	1,392,954	1,251,363	-94,311	-7.0
—	Cobalt (and its compounds)	29,129	25,646	20,614	-8,515	-29.2
—	Antimony (and its compounds)	10,049	9,516	7,301	-2,748	-27.3
—	Mercury (and its compounds)	46	34	244	198	430.4
—	Silver (and its compounds)	903	1,203	1,479	576	63.8
—	Cadmium (and its compounds)	38,829	18,952	41,353	2,524	6.5
—	Selenium (and its compounds)	3,913	5,490	9,280	5,367	137.2
7440-62-2	Vanadium (fume or dust)	170,862	189,526	215,356	44,494	26.0
7429-90-5	Aluminum (fume or dust)	485,916	499,143	534,619	48,703	10.0
—	Arsenic (and its compounds)	57,770	125,128	149,053	91,283	158.0
—	Chromium (and its compounds)	503,603	493,593	776,821	273,218	54.3
—	Zinc (and its compounds)	4,122,249	5,647,993	5,813,918	1,691,669	41.0
	Subtotal	**11,843,065**	**11,372,024**	**11,756,014**	**-87,051**	**-0.7**
	% of Total	**12.8**	**13.7**	**14.6**		
	Total for Matched NPRI Chemicals	**92,620,108**	**83,171,877**	**80,448,924**	**-12,171,184**	**-13.1**

Table 3–47

M 1997

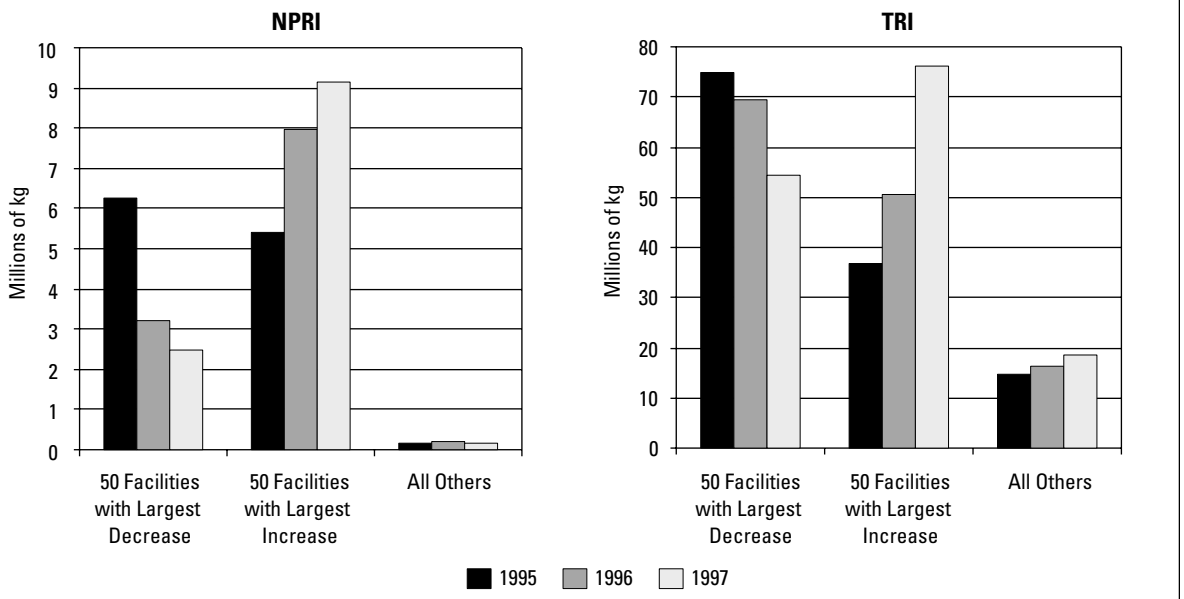
Change in TRI On-site Releases of Metals and Their Compounds, 1995–1997

CAS Number	Chemical	Total Releases 1995 (kg)	1996 (kg)	1997 (kg)	Change 1995–1997 kg	%
—	Antimony (and its compounds)	819,752	994,015	632,239	-187,513	-22.9
7429-90-5	Aluminum (fume or dust)	1,764,092	1,820,272	1,743,571	-20,521	-1.2
7440-62-2	Vanadium (fume or dust)	71,991	56,879	59,254	-12,737	-17.7
—	Silver (and its compounds)	30,511	38,274	28,548	-1,963	-6.4
—	Mercury (and its compounds)	8,005	8,243	10,327	2,322	29.0
—	Selenium (and its compounds)	134,449	119,624	184,615	50,166	37.3
—	Cobalt (and its compounds)	306,039	300,054	357,314	51,275	16.8
—	Cadmium (and its compounds)	259,358	314,128	415,845	156,487	60.3
—	Copper (and its compounds)	20,369,958	26,105,906	21,179,453	809,495	4.0
—	Lead (and its compounds)	7,991,107	7,971,606	8,818,161	827,054	10.3
—	Nickel (and its compounds)	1,634,152	2,218,571	2,551,439	917,287	56.1
—	Arsenic (and its compounds)	855,366	989,070	2,742,175	1,886,809	220.6
—	Zinc (and its compounds)	55,911,373	57,400,317	59,247,400	3,336,027	6.0
—	Chromium (and its compounds)	11,133,551	13,052,706	14,485,603	3,352,052	30.1
—	Manganese (and its compounds)	25,047,476	25,006,199	36,787,267	11,739,791	46.9
	Subtotal	**126,337,180**	**136,395,864**	**149,243,211**	**22,906,031**	**18.1**
	% of Total	**15.1**	**17.2**	**19.5**		
	Total for Matched TRI Chemicals	**835,039,966**	**790,718,526**	**767,302,191**	**-67,737,775**	**-8.1**

Figure 3–26

M 1997

NPRI and TRI Total On-site Releases of Metals and Their Compounds, 1995–1997: Facilities with Largest Changes and All Others



The largest reduction by TRI facilities in metals releases was reported for antimony and its compounds, from 819,752 kg in 1995 to 632,239 kg in 1997. By far the largest increase occurred in releases of manganese and its compounds—from 25.0 million kg in 1995 to 36.8 in 1997. TRI facilities reported increases for 11 of the 15 metals.

NPRI Facilities with Largest Decreases/Increases

In NPRI, virtually all releases of metals for 1995 through 1997 were reported by the 50 facilities making the largest reductions in such releases and the 50 facilities making the largest increases in such releases. Overall, their respective decreases and increases effected very little net change during this period (**Figure 3–26**).

The 50 NPRI facilities with the largest reductions in releases of metals and their compounds reported 6.3 million kg of such releases in 1995 and 2.5 million kg in 1997. Their 3.8-million-kg reduction amounted to a percentage decrease of 61 percent. Thirteen of the 50 facilities did not report metals releases in 1997. The number of forms the top 50 facilities submitted for metals declined from 168 in 1995 to 132 in 1997 (**Table 3–48**).

For the 50 NPRI facilities reporting the largest increases, the releases of metals rose from 5.4 million kg in 1995 to 9.1 million kg in 1997. This amounted to an increase of 3.7 million kg, or 69 percent. Twenty-three facilities in this group did not report for the metals and their compounds in 1995 (**Table 3–49**).

Table 3–48

M 1997

NPRI Facilities with Largest Decrease in On-site Releases of Metals and Their Compounds, 1995–1997

Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	Algoma Steel Inc, Algoma Steel Main Works	Sault Ste. Marie, ON	29	33
2	Co-Steel Lasco	Whitby, ON	29	33
3	Fonderies canadiennes d'Acier Ltée, Atchison Casting Corp.	Montréal, QC	31	35
4	Sydney Steel Corporation	Sydney, NS	29	33
5	Inco Limited, Copper Cliff Nickel Refinery	Copper Cliff, ON	29	33
6	Métallurgie Noranda Inc, Fonderie Horne	Rouyn Noranda, QC	29	33
7	Atlas Steels Inc., Atlas Specialty Steels	Welland, ON	29	33
8	Ford Motor Company, Windsor Casting Plant	Windsor, ON	29	33
9	Riverside Brass, Riverside Brass & Aluminum Foundry	New Hamburg, ON	29	33
10	Inco Limited, Manitoba Division	Thompson, MB	29	33
11	Inco Limited, Copper Refinery	Copper Cliff, ON	29	33
12	Sammi Atlas Inc., Aciers inoxydables Atlas	Tracy, QC	29	33
13	Inco Limited, Central Mills	Copper Cliff, ON	29	33
14	Esco Limited	Port Coquitlam, BC	29	33
15	QIT-Fer et Titane Inc., RTZ Fer et Titane, Inc.	Tracy, QC	29	33
16	Metalex Products Ltd.	Richmond, BC	29	33
17	Wolverine Tube (Canada) Inc., Strip Operation	Fergus, ON	29	33
18	Kronos Canada, Inc.	Varennes, QC	37	28
19	Owens-Corning Canada Inc., Guelph Glass Plant	Guelph, ON	35	32
20	CEZinc (Zinc électrolytique du Canada Limitée), Noranda Inc	Salaberry-de-Valleyfield, QC	29	33
21	Ivaco Rolling Mills	L'Orignal, ON	29	33
22	Nova Chemicals (Canada) Ltd.	Corunna, ON	36	29
23	Sherritt International Corporation	Fort Saskatchewan, AB	37	28
24	F.F. Soucy Inc., Brant Allen Ind.	Rivière-du-Loup, QC	27	26
25	Shell Canada Products Ltd., Sarnia Manufacturing Centre	Corunna, ON	36	29
26	Produits American Biltrite Ltée., American Biltrite Inc.	Sherbrooke, QC	15	30
27	Goodyear Canada Inc., Goodyear Tire and Rubber Co.	Medicine Hat, AB	15	30
28	Ford Motor Company of Canada Ltd., Windsor Aluminum Plant	Windsor, ON	29	33
29	Vintex Inc.	Mount Forest, ON	16	30
30	Chrysler Canada, Ltd., Windsor Assembly Plant	Windsor, ON	32	37
31	Maritime Electric Company Ltd., Thermal Generating Station	Charlottetown, PE	31	35
32	Mondo America Inc.	Laval, QC	15	30
33	Petro-Canada, Raffinerie de Montréal	Montréal, QC	36	29
34	General Motors of Canada Limited, Oshawa Battery Plant	Oshawa, ON	33	36
35	Norcast Division de Tritech Precision Inc., fonderie Norcast	Mont-Joli, QC	30	34
36	Mitsubishi Electronics Industries Canada Inc.	Midland, ON	33	36
37	Dana Canada Inc., Barrie Axle Plant, Dana US Inc.	Barrie, ON	32	37
38	Gerdau Courtice Steel Inc., Gerdau Canada	Cambridge, ON	29	33
39	Goodyear Canada Inc., Goodyear Tire & Rubber Co.	St-Jean-sur-Richelieu, QC	15	30
40	General Motors of Canada Limited, St. Catharines Foundry	St. Catharines, ON	32	37
41	Henkel Canada Ltd., Henkel Surface Technologies	Toronto, ON	37	28
42	Sifto Canada Inc., North American Salt Co.	Unity, SK	35	28
43	Rockwell International of Canada, Tilbury Brake Plant	Tilbury, ON	32	37
44	Cadorath Plating Co. Ltd.	Winnipeg, MB	30	34
45	Fisher Controls Inc., Emerson Electric Company	Woodstock, ON	30	34
46	ETI Canada Inc., Canadian Investment Capital Ltd.	North Bay, ON	37	28
47	Brunswick Smelting Division, Fertilizer Operation	Belledune, NB	37	28
48	Varity/Kelsey-Hayes Canada Ltd., Eureka Foundry Division	Woodstock, ON	29	33
49	Celanese Canada Inc.	Edmonton, AB	37	28
50	Alcatel Canada Wire	Fergus, ON	33	33
	Total			

➤ Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to TRI.

Rank	1995 Number of Forms	1995 Total Releases (kg)	1996 Number of Forms	1996 Total Releases (kg)	1997 Number of Forms	1997 Total Releases (kg)	Change 95–97 Total Releaes (kg)	Major Chemicals Reported with Decreases (Primary Media with Decreases)*
1	6	1,401,740	5	5,499	7	7,628	-1,394,112	Manganese and compounds (land)
2	6	2,411,507	6	1,254,893	6	1,259,869	-1,151,638	Copper and compounds (land)
3	3	295,200	3	256,000	3	0	-295,200	Chromium and compounds (land)
4	8	530,500	8	331,280	8	290,290	-240,210	Zinc/Manganese/Lead and compounds (land)
5	7	153,630	**	**	**	**	-153,630	Nickel/Lead and compounds (air)
6	11	648,045	10	676,550	11	498,120	-149,925	Lead and compounds (air)
7	4	70,041	4	115,351	6	2,443	-67,598	Chromium and compounds (land)
8	5	66,670	5	53,530	5	5,942	-60,728	Zinc and compounds (water)
9	4	52,000	1	500	4	6,818	-45,182	Copper/Zinc and compounds (air)
10	4	130,315	4	104,466	4	93,777	-36,538	Nickel/Copper and compounds (air)
11	7	30,090	**	**	**	**	-30,090	Copper and compounds (air)
12	4	27,640	4	1,820	4	1,420	-26,220	Chromium/Nickel and compounds (water)
13	2	17,310	2	36,430	**	**	-17,310	Nickel and compounds (water)
14	2	79,213	2	65,720	2	64,495	-14,718	Manganese and compounds (land)
15	6	21,240	3	12,900	2	6,660	-14,580	Zinc and compounds (water, air), Aluminum (air)
16	4	10,250	5	24,229	5	371	-9,879	Lead/Copper and compounds (land)
17	3	15,423	3	14,495	3	5,885	-9,538	Zinc/Copper and compounds (land)
18	2	40,700	2	45,350	2	32,500	-8,200	Manganese and compounds (water)
19	1	7,728	1	1,250	**	**	-7,728	Zinc and compounds (air)
20	8	115,361	8	118,880	8	107,762	-7,599	Zinc and compounds (air)
21	5	16,256	7	11,020	7	9,447	-6,809	Zinc and compounds (air)
22	7	6,671	2	1,462	**	**	-6,671	Zinc/Nickel and compounds (land)
23	4	7,336	4	1,990	4	1,190	-6,146	Nickel and compounds (air, water)
24	2	14,300	2	10,600	2	9,500	-4,800	Manganese and compounds (water)
25	3	33,087	3	28,925	3	28,836	-4,251	Vanadium, Nickel and compounds (air)
26	1	4,100	1	0	1	0	-4,100	Zinc and compounds (land)
27	1	3,834	1	619	1	301	-3,533	Zinc and compounds (air)
28	2	3,591	2	141	2	135	-3,456	Aluminum (air)
29	1	3,100	1	10	1	12	-3,088	Antimony and compounds (land)
30	3	4,910	4	1,774	3	2,008	-2,902	Copper and compounds (air)
31	1	2,800	**	**	**	**	-2,800	Vanadium (air)
32	1	2,268	1	0	1	0	-2,268	Zinc and compounds (land)
33	1	13,400	1	12,300	2	11,190	-2,210	Vanadium (air)
34	2	2,503	2	228	2	329	-2,174	Lead and compounds (air)
35	4	2,534	4	4,062	4	491	-2,043	Chromium/Manganese and compounds (land)
36	2	1,489	2	287	**	**	-1,489	Lead/Zinc and compounds (land)
37	3	3,640	3	1,900	4	2,300	-1,340	Manganese/Chromium and compounds (air)
38	5	11,928	5	11,754	5	10,608	-1,320	Zinc/Lead and compounds (air)
39	1	1,344	1	1,318	1	30	-1,314	Zinc and compounds (land)
40	4	1,303	**	**	**	**	-1,303	Manganese/Copper/Chromium and compounds (air)
41	3	1,300	3	900	3	1	-1,299	Zinc/Manganese and compounds (total releases)
42	1	1,330	1	150	1	110	-1,220	Zinc and compounds (UIJ)
43	1	1,165	1	34	**	**	-1,165	Manganese and compounds (water)
44	1	1,000	1	1,000	**	**	-1,000	Chromium and compounds (air)
45	4	920	4	760	**	**	-920	Copper/Manganese/Nickel and compounds (land)
46	1	904	1	964	**	**	-904	Aluminum (total releases)
47	2	900	2	360	**	**	-900	Vanadium, Chromium and compounds (total releases)
48	1	1,582	1	1,433	1	688	-894	Manganese and compounds (air)
49	1	1,080	1	208	1	230	-850	Chromium and compounds (air)
50	3	900	3	700	3	300	-600	Antimony/Lead and compounds (total releases)
	168	**6,276,078**	**140**	**3,214,042**	**132**	**2,461,686**	**-3,814,392**	

* Chemicals accounting for more than 70% of decrease in total releases of metals from the facility.
** Indicates facility did not report any matched metals that year.
➤ UIJ=underground injection

Table 3–49

M 1997

NPRI Facilities with Largest Increase in On-site Releases of Metals and Their Compounds, 1995–1997

Rank	Facility	City, Province	SIC Codes	
			Canada	US
1	Gerdau MRM Steel Inc., Grupo Gerdau	Selkirk, MB	29	33
2	Ispat Sidbec Inc. Aciérie, Ispat Mexicana	Contrecoeur, QC	29	33
3	Hudson Bay Mining and Smelting Co., Metallurgical Complex	Flin Flon, MB	29	33
4	Inco Limited, Copper Cliff Smelter Complex	Copper Cliff, ON	29	33
5	Falconbridge Ltd., Kidd Metallurgical Div.	Cochrane, ON	29	33
6	AltaSteel Ltd., Stelco Inc.	Edmonton, AB	29	33
7	Daishowa-Marubeni International, Peace River Pulp Div.	Peace River, AB	27	26
8	Imperial Oil, IOL Sarnia Refinery	Sarnia, ON	36	29
9	Meridian Operations Inc., Richmond Division	Long-Sault, ON	55	37
10	Norsk Hydro Canada Inc., Hydro Magnesium Canada	Bécancour, QC	29	33
11	Cartons St-Laurent Inc.	LaTuque, QC	27	26
12	Ispat Sidbec Inc., Sidbec-Feruni, Ispat Mexicana	Contrecoeur, QC	29	33
13	Weyerhaeuser Canada Limited, Kamloops Pulp Division	Kamloops, BC	27	26
14	Les Produits forestiers Donohue Inc, usine de pâte kraft	St-Félicien, QC	27	26
15	Menasco Aerospace, Coltec Industries Inc.	Oakville, ON	32	37
16	Weyerhaeuser Saskatchewan Ltd., Prince Albert Pulp & Paper	Prince Albert, SK	27	26
17	ICI Canada Inc, ICI Explosifs	Brownsburg, QC	37	28
18	Falconbridge Limited, Smelter Complex	Falconbridge, ON	29	33
19	Industries James Maclaren Inc., Division de la pâte kraft	Thurso, QC	27	26
20	Lake Erie Steel Company Ltd., Stelco Inc.	Nanticoke, ON	29	33
21	Weyerhaeuser Canada Ltd.	Grande Prairie, AB	04	24
22	Inco Limited, Port Colborne Refinery	Port Colborne, ON	29	33
23	NRI Industries Inc., Cawthra Plant	Toronto, ON	15	30
24	Irving Oil Limited, Refining Division	Saint John, NB	36	29
25	Spruce Falls Inc., Tembec Inc.	Kapuskasing/O'Brien, ON	27	26
26	North Atlantic Refining Ltd.	Come By Chance, NF	36	29
27	Crestbrook Forest Industries, Pulp Division	Cranbrook, BC	27	26
28	Recyclage d'aluminium Québec Inc., Philip Services Corp.	Bécancour, QC	29	33
29	Recyclage d'aluminium Québec, Ragueneau, Philip Services Corp.	Baie-Comeau, QC	29	33
30	Produits Shell Canada Ltée., Raffinerie de Montréal-est	Montréal-est, QC	36	29
31	Stelco McMaster Ltée, Stelco Inc.	Contrecoeur, QC	29	33
32	Long Manufacturing Inc., Echlin Corporation	Cambridge, ON	32	34
33	NRI Industries Inc.	Toronto, ON	15	30
34	Dofasco Inc.	Hamilton, ON	29	33
35	I-XL Industries Ltd., Medicine Hat Brick & Tile Plant	Medicine Hat, AB	35	32
36	NRI Industries Inc., Symington Plant	Toronto, ON	15	30
37	General Motors of Canada Limited, London Diesel Division	London, ON	32	37
38	Michelin North America (Canada) Inc.	Bridgewater, NS	15	30
39	Riverside Brass Ltd.	New Hamburg, ON	29	33
40	Krupp Fabco Company, Krupp Hoesch Automotive of America Inc.	Dresden, ON	32	37
41	Burlington Techologies Inc., Burlington Division	Burlington, ON	30	34
42	Trentonworks Ltd., Greenbrier Companies	Trenton, NS	32	37
43	Alcatel Cable	Montréal-est, QC	29	33
44	Vulcan Containers Ltd., Metal Decorating Lithographers	Toronto, ON	28	27
45	Cobalt Refinery Company, Sherritt International Corp.	Fort Saskatchewan, AB	29	33
46	DuPont Canada Inc., Maitland Site	Maitland, ON	37	28
47	Esco Limited, Poho Foundry	Port Hope, ON	29	33
48	Can Mar Manufacturing Ltd. Inc.	Niagara Falls, ON	39	39
49	Motor Coach Industries, Fort Garry Plants 4&5, MCIL Holdings	Winnipeg, MB	32	37
50	Friede Goldman Newfoundland Limited	Marystown, NF	30	34
	Total			

➤ Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to TRI.

Rank	1995 Number of Forms	1995 Total Releases (kg)	1996 Number of Forms	1996 Total Releases (kg)	1997 Number of Forms	1997 Total Releases (kg)	Change 95–97 Total Releases (kg)	Major Chemicals Reported with Increases (Primary Media with Increases)*
1	3	762,000	4	2,031,067	5	1,752,614	990,614	Zinc and compounds (land)
2	5	1,510,387	5	2,322,985	5	2,349,790	839,403	Zinc and compounds (land)
3	5	161,217	5	416,922	5	710,354	549,137	Zinc/Lead and compounds (air)
4	6	621,640	6	427,818	6	1,014,986	393,346	Chromium and compounds (land)
5	**	**	**	**	9	169,168	169,168	Lead/Copper and compounds (air)
6	5	624,322	5	608,341	6	729,605	105,283	Zinc and compounds (land)
7	**	**	**	**	2	103,137	103,137	Zinc and compounds (land)
8	4	42,330	4	79,116	4	92,846	50,516	Vanadium (air)
9	**	**	**	**	3	44,898	44,898	Aluminum (air)
10	2	0	2	0	2	40,000	40,000	Manganese and compounds (land)
11	**	**	2	33,811	2	38,366	38,366	Manganese and compounds (water)
12	5	371,800	5	457,180	5	402,950	31,150	Zinc/Lead and compounds (land)
13	**	**	1	31,300	1	28,500	28,500	Manganese and compounds (water)
14	2	177,200	2	214,600	2	202,200	25,000	Manganese and compounds (water)
15	**	**	**	**	1	21,505	21,505	Chromium and compounds (air)
16	**	**	1	22,200	1	20,700	20,700	Manganese and compounds (water)
17	2	5,330	2	8,350	2	25,800	20,470	Lead and compounds (land)
18	8	38,754	8	45,771	9	57,748	18,994	Zinc and compounds (air)
19	**	**	**	**	1	18,970	18,970	Manganese and compounds (land)
20	6	446,525	7	481,240	6	462,724	16,199	Manganese and compounds (land)
21	**	**	1	19,370	1	14,200	14,200	Manganese and compounds (water)
22	5	42,462	5	57,397	5	55,896	13,434	Copper/Nickel and compounds (land)
23	**	**	1	200	1	13,000	13,000	Zinc and compounds (land)
24	**	**	**	**	3	12,470	12,470	Vanadium, Nickel and compounds (air)
25	**	**	1	10,501	1	11,430	11,430	Manganese and compounds (land)
26	4	122,723	4	130,507	4	132,922	10,199	Vanadium (air)
27	**	**	**	**	1	10,100	10,100	Manganese and compounds (water)
28	1	265,000	1	275,000	1	275,000	10,000	Aluminum (land)
29	1	175,000	1	185,000	1	185,000	10,000	Aluminum (land)
30	2	20	2	0	4	7,950	7,930	Vanadium (air)
31	5	10,030	5	17,410	5	17,750	7,720	Zinc and compounds (air)
32	2	158	2	7,818	2	7,818	7,660	Copper and compounds (air)
33	**	**	1	200	1	6,800	6,800	Zinc and compounds (land)
34	6	16,617	6	15,909	6	22,931	6,314	Zinc and compounds (air)
35	**	**	2	4,700	2	5,000	5,000	Chromium/Manganese and compounds (land)
36	**	**	1	200	1	4,800	4,800	Zinc and compounds (land)
37	4	1,951	4	3,486	4	5,836	3,885	Chromium/Manganese/Nickel and compounds (air)
38	6	5,354	2	12,712	2	9,234	3,880	Zinc/Copper and compounds (land)
39	**	**	3	13,000	3	3,740	3,740	Copper and compounds (air)
40	**	**	3	6,668	4	3,499	3,499	Zinc and compounds (air)
41	**	**	**	**	3	3,222	3,222	Aluminum (air)
42	**	**	2	950	2	3,210	3,210	Manganese and compounds (land)
43	1	0	1	2,000	1	2,650	2,650	Copper and compounds (air)
44	**	**	**	**	1	2,370	2,370	Aluminum (air)
45	**	**	4	11,260	4	2,094	2,094	Nickel/Zinc and compounds (land)
46	3	8,170	3	7,892	3	10,107	1,937	Copper and compounds (water), Cobalt and compounds (air)
47	3	2,432	3	2,322	3	4,290	1,858	Manganese/Chromium and compounds (land)
48	1	5,930	1	5,300	1	7,750	1,820	Chromium and compounds (land)
49	2	1,100	2	1,000	3	2,903	1,803	Manganese and compounds, Aluminum (air)
50	**	**	**	**	1	1,456	1,456	Manganese and compounds (land)
	99	**5,418,452**	**120**	**7,971,503**	**151**	**9,132,289**	**3,713,837**	

* Chemicals accounting for more than 70% of increase in total releases of metals from the facility.
** indicates facility did not report any matched metals that year.

TRI Facilities with Largest Decreases/Increases

In TRI, reductions in releases of metals and their compounds by the facilities reporting the largest decreases were more than offset by the largest "increasers." At the same time, releases of metals by the facilities that did not report large changes also increased (**Figure 3–26**).

TRI's 50 facilities with the largest decreases reduced their metals releases from 74.9 million kg in 1995 to 54.5 million kg in 1997. The 20.4-million-kg reduction amounted to a 27 percent decrease. Seven of the 50 facilities reported metals releases in 1995 but not in 1997 (**Table 3–50**).

The 50 TRI facilities that reported the largest increases had releases of 36.8 million kg in 1995 and 76.1 million in 1997. In both absolute and percentage terms, these increases outstripped the largest reductions by TRI facilities. The 50 largest increases together amounted to a 39.3-million-kg or 107 percent increase. Sixteen of the facilities did not report metals releases in 1995 (**Table 3–51**).

Table 3–50

M 1997

TRI Facilities with Largest Decrease in On-site Releases of Metals and Their Compounds, 1995–1997

Rank	Facility	City, State	US SIC Code
1	ASARCO Inc., Ray Complex/Hayden Smelter	Hayden, AZ	33
2	Chino Mines Co., Phelps Dodge Corp.	Hurley, NM	33
3	Phelps Dodge Hidalgo Inc., Phelps Dodge Corp.	Playas, NM	33
4	LTV Steel Co. Inc.	Cleveland, OH	33
5	ASARCO Inc.	East Helena, MT	33
6	GM Powertrain Defiance, General Motors Corp.	Defiance, OH	33
7	Chemetals Inc., Comilog	New Johnsonville, TN	28
8	General Motors Corp., GMPTG Saginaw Metal Casting	Saginaw, MI	33
9	Northwestern Steel & Wire Co.	Sterling, IL	33
10	Elkem Metals Co.	Marietta, OH	33
11	Gulf States Steel Inc., GSS Holding Corp.	Gadsden, AL	33
12	Imco Recycling Inc.	Sapulpa, OK	33
13	North Star Recycling, Cargill Inc.	Saint Paul, MN	33
14	FMC Corp.	Pocatello, ID	28
15	Intermet Corp., Archer Creek Plant	Lynchburg, VA	33
16	Georgia-Pacific Paper Ops., Georgia-Pacific Corp.	Crossett, AR	26
17	Allegheny Ludlum Corp., Allegheny Teledyne Inc.	Latrobe, PA	33
18	Armco Inc. (Route 8 S.)	Butler, PA	33
19	DuPont Chambers Works	Deepwater, NJ	28
20	Lukens Steel Co., Lukens Inc.	Coatesville, PA	33
21	North Star Steel Houston, Cargill Inc.	Houston, TX	34
22	American Racing Equipment, Plant I, Noranda Aluminum Inc.	Rancho Dominguez, CA	Mult.
23	U.S. Sugar Corp.	Bryant, FL	20
24	Courtaulds Fibers Inc., Courtaulds Finance U.S. Inc.	Axis, AL	28
25	R.J. Reynolds Tobacco, Avoca Div., RJR Nabisco Holding Corp.	Merry Hill, NC	20
26	GMC Powertrain Div., General Motors Corp.	Danville, IL	33
27	Bethlehem Steel Corp.	Burns Harbor, IN	33
28	Kemira Pigments Inc., Kemira Holdings Inc.	Savannah, GA	28
29	ASARCO Inc.	El Paso, TX	33
30	Hayes-Albion Corp., Harvard Ind. Inc.	Albion, MI	33
31	Electralloy Corp., G. O. Carlson Inc.	Oil City, PA	33
32	Behlen Mfg. Co.	Columbus, NE	34
33	U.S. Sugar Corp./Western Div.	Clewiston, FL	20
34	GNB Techs. Inc., Pacific Dunlop GNB Corp.	Leavenworth, KS	36
35	Schuylkill Metals Corp., Exide Corp.	Baton Rouge, LA	33
36	Wabash Alloys L.L.C., Connell LP	Wabash, IN	33
37	Keystone Steel & Wire Co., Keystone Consolidated Ind. Inc.	Peoria, IL	33
38	Champion Intl. Corp.	Bucksport, ME	26
39	Pharmacia & Upjohn Co.	Portage, MI	28
40	American Steel Foundries, Amsted Ind. Inc.	Granite City, IL	33
41	American Alloys Inc.	New Haven, WV	33
42	GE Co., Silicone Prods.	Waterford, NY	28
43	Zinc Corp. of America, Horsehead Ind. Inc.	Monaca, PA	33
44	Keymark Corp.	Fonda, NY	33
45	USS/Kobe Steel Co.	Lorain, OH	33
46	American Steel Foundries, Amsted Ind. Inc.	Alliance, OH	33
47	F.W. Winter Inc. & Co.	Camden, NJ	33
48	Caterpillar Inc.	Mapleton, IL	33
49	Magotteaux Corp., Magotteaux Intl.	Pulaski, TN	33
50	Clinton Labs., Eli Lilly & Co.	Clinton, IN	28
	Total		

➤ Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to NPRI.

Rank	1995 Number of Forms	1995 Total Releases (kg)	1996 Number of Forms	1996 Total Releases (kg)	1997 Number of Forms	1997 Total Releases (kg)	Change 95–97 Total Releases (kg)	Major Chemicals Reported with Decreases (Primary Media with Decreases)*
1	8	7,854,444	8	4,618,520	8	318,428	-7,536,016	Copper/Zinc and compounds (land)
2	2	3,169,958	1	3,476,043	**	**	-3,169,958	Copper and compounds (land)
3	10	14,457,959	10	12,606,649	10	12,186,098	-2,271,861	Zinc and compounds (land)
4	5	1,151,427	5	360,980	5	294,568	-856,859	Manganese and compounds (land)
5	9	17,914,439	9	20,160,568	9	17,143,072	-771,367	Zinc/Lead and compounds (land)
6	6	6,229,325	6	6,042,825	6	5,599,833	-629,492	Zinc and compounds (land)
7	2	2,108,027	1	1,685,692	1	1,539,949	-568,078	Manganese and compounds (land)
8	6	1,125,076	6	1,019,211	6	576,725	-548,351	Zinc and compounds (land)
9	4	7,126,231	4	6,545,333	4	6,772,540	-353,691	Zinc and compounds (land)
10	5	5,379,659	5	5,308,851	5	5,132,439	-247,220	Manganese and compounds (water, land)
11	6	488,078	6	337,532	6	277,605	-210,473	Zinc/Lead and compounds (land)
12	5	218,825	4	8,331	5	12,883	-205,942	Aluminum (land)
13	6	200,408	6	0	6	0	-200,408	Copper/Zinc and compounds (land)
14	9	2,371,621	9	2,588,613	9	2,172,640	-198,981	Zinc and compounds (land)
15	5	219,214	3	27,005	3	20,420	-198,794	Zinc/Manganese and compounds (land)
16	1	276,746	1	236,125	2	108,033	-168,713	Zinc and compounds (air, land)
17	5	164,888	5	170,702	5	12,538	-152,350	Chromium and compounds (land)
18	6	160,403	6	164,798	6	10,198	-150,205	Chromium/Nickel and compounds (land)
19	5	157,213	4	58,873	5	32,724	-124,489	Zinc and compounds (land)
20	6	203,887	6	150,202	6	81,153	-122,734	Chromium/Nickel and compounds (land)
21	3	114,740	3	44,344	3	0	-114,740	Manganese/Chromium and compounds (land)
22	1	101,209	1	112,098	**	**	-101,209	Aluminum (air)
23	2	92,137	2	58,026	**	**	-92,137	Manganese and compounds (land)
24	2	260,681	1	218,032	1	184,594	-76,087	Zinc and compounds (land)
25	1	69,587	1	11,368	1	0	-69,587	Manganese and compounds (land)
26	6	66,848	**	**	**	**	-66,848	Zinc/Manganese and compounds (land)
27	5	277,394	5	255,761	5	210,614	-66,780	Manganese and compounds (land)
28	3	208,526	3	175,465	3	144,989	-63,537	Chromium and compounds (land)
29	6	84,925	6	93,033	6	22,241	-62,684	Copper and compounds (air)
30	4	201,488	3	236,857	3	139,718	-61,770	Manganese and compounds (land)
31	4	68,933	4	4,551	4	7,500	-61,433	Chromium and compounds (air)
32	2	60,204	2	1,221	2	1,053	-59,151	Zinc and compounds (land)
33	2	58,193	1	34,412	**	**	-58,193	Manganese and compounds (land)
34	1	57,197	1	54	1	59	-57,138	Lead and compounds (land)
35	3	134,465	3	110,560	3	80,807	-53,658	Lead/Antimony and compounds (land)
36	3	100,342	3	60,340	3	49,937	-50,405	Copper and compounds (land)
37	3	85,614	3	763,440	5	35,600	-50,014	Zinc/Lead and compounds (land)
38	1	119,698	1	79,076	1	73,384	-46,314	Zinc and compounds (land)
39	3	64,854	4	40,844	4	19,406	-45,448	Zinc and compounds (UIJ)
40	5	528,953	5	502,006	5	484,028	-44,925	Aluminum (land)
41	2	43,504	2	145,434	2	962	-42,542	Manganese and compounds (land)
42	2	492,814	2	436,287	2	452,109	-40,705	Copper and compounds (land)
43	10	265,389	9	220,257	9	225,113	-40,276	Zinc and compounds (air)
44	1	39,730	**	**	**	**	-39,730	Aluminum (air)
45	5	42,194	5	4,241	5	4,266	-37,928	Manganese and compounds (land)
46	4	37,386	5	3,027	**	**	-37,386	Chromium and compounds (air)
47	5	40,244	4	12,663	2	3,704	-36,540	Chromium and compounds (air)
48	6	114,965	4	101,360	4	79,138	-35,827	Chromium and compounds (land)
49	7	41,177	5	5,394	5	6,193	-34,984	Aluminum (air)
50	3	56,717	3	96,697	3	22,203	-34,514	Zinc and compounds (land)
	216	**74,907,936**	**196**	**69,393,701**	**189**	**54,539,464**	**-20,368,472**	

* Chemicals accounting for more than 70% of decrease in total releases of metals from the facility.
** Indicates facility did not report any matched metals that year.
➤ UIJ=underground injection

Table 3–51

M 1997

TRI Facilities with Largest Increase in On-site Releases of Metals and Their Compounds, 1995–1997

Rank	Facility	City, State	US SIC Code
1	Kennecott Utah Copper, Kennecott Holdings Corp.	Magna, UT	33
2	DuPont	Pass Christian, MS	28
3	U.S. Steel, USS Gary Works, USX Corp.	Gary, IN	33
4	DuPont	New Johnsonville, TN	28
5	BHP Copper Metals Co., BHP Copper Co.	San Manuel, AZ	33
6	American Chrome & Chemicals, Harrisons & Crosfield American	Corpus Christi, TX	28
7	ASARCO Inc., Glover Plant	Annapolis, MO	33
8	Cyprus Miami Mining Corp., Cyprus Climax Metals Co.	Claypool, AZ	33
9	Springs Chemical, Grace Complex, Springs Ind. Inc.	Lancaster, SC	22
10	P4 Production L.L.C.	Soda Springs, ID	Mult.
11	Occidental Chemical Corp., Occidental Petroleum Corp.	Castle Hayne, NC	28
12	Austeel Lemont Co. Inc.	Lemont, IL	33
13	Glenbrook Nickel Co., Cominco American Inc.	Riddle, OR	33
14	Imco Recycling Inc.	Morgantown, KY	33
15	Georgia-Pacific Corp.	Ashdown, AR	26
16	Granite City Steel, National Steel Corp.	Granite City, IL	33
17	USS Fairfield Works, USX Corp.	Fairfield, AL	33
18	Alabama River Pulp Co. Inc., Parsons & Whittemore Inc.	Perdue Hill, AL	26
19	Doe Run Co., Renco Group Inc.	Herculaneum, MO	33
20	Louisiana Pigment Co. L.P.	Westlake, LA	28
21	Kerr-McGee Chemical LLC	Henderson, NV	28
22	Kerr-McGee Chemical LLC, Kerr-McGee Corp.	Hamilton, MS	Mult.
23	Champion Intl. Corp., Donohue Inc.	East Houston, TX	26
24	TXI Ops. L.P.	Midlothian, TX	32
25	Griffin Pipe Prods. Co., Amsted Ind. Inc.	Florence, NJ	33
26	Weyerhaeuser Co.	Valliant, OK	26
27	Alcoa	Rockdale, TX	33
28	Tenneco Packaging, Tenneco Inc.	Tomahawk, WI	26
29	Georgia-Pacific Corp.	Zachary, LA	26
30	Mead Coated Board Inc., Mead Corp.	Cottonton, AL	26
31	Nutra-Flo Co.	Sergeant Bluff, IA	Mult.
32	International Paper Co., Natchez Mill	Natchez, MS	26
33	International Paper Co., Texarkana Mill	Domino, TX	26
34	International Paper Co., Mansfield Mill	Mansfield, LA	26
35	International Paper Co.	Augusta, GA	26
36	Union Camp Corp.	Eastover, SC	Mult.
37	Eagle Zinc Co., T. L. Diamond & Co. Inc.	Hillsboro, IL	28
38	Riverwood Intl. Corp.	Macon, GA	26
39	International Paper Co., Pineville Mill	Pineville, LA	26
40	Geneva Steel	Vineyard, UT	33
41	Holnam Inc., Holdernam Inc.	Clarksville, MO	32
42	Lenzing Fibers Corp.	Lowland, TN	28
43	Bowater Inc., Coated Paper & Pulp Div.	Catawba, SC	26
44	International Paper Co., Mobile Mill	Mobile, AL	26
45	Star Enterprise	Delaware City, DE	29
46	Beta Steel Corp.	Portage, IN	33
47	McQuay Intl.	Scottsboro, AL	35
48	U.S. Vanadium Corp., Strategic Minerals Corp.	Hot Springs, AR	33
49	International Paper Co.	Riegelwood, NC	26
50	Willamette Ind. Inc.	Campti, LA	26
	Total		

➤ Does not include ammonia, isopropyl alcohol, non-air emissions of hydrochloric acid and sulfuric acid, and chemicals not reported to NPRI.

Rank	1995 Number of Forms	1995 Total Releases (kg)	1996 Number of Forms	1996 Total Releases (kg)	1997 Number of Forms	1997 Total Releases (kg)	Change 95–97 Total Releases (kg)	Major Chemicals Reported with Increases (Primary Media with Increases)*
1	8	2,674,512	8	4,188,084	8	10,976,578	8,302,066	Copper/Lead/Arsenic and compounds (land)
2	**	**	**	**	6	3,809,524	3,809,524	Manganese and compounds (UIJ)
3	9	2,954,636	11	2,730,167	11	6,598,692	3,644,056	Zinc and compounds (land)
4	**	**	**	**	5	3,516,553	3,516,553	Manganese and compounds (UIJ)
5	9	204,604	5	2,562,032	11	2,889,134	2,684,530	Copper and compounds (air)
6	1	4,265,578	1	5,126,893	1	6,578,095	2,312,517	Chromium and compounds (land)
7	6	2,959,545	6	4,030,227	7	4,921,195	1,961,650	Zinc/Lead and compounds (land)
8	11	7,015,825	11	11,478,460	11	8,522,088	1,506,263	Copper and compounds (land)
9	**	**	**	**	7	969,901	969,901	Zinc and compounds (air)
10	**	**	**	**	4	941,741	941,741	Zinc and compounds (land)
11	1	3,313,374	1	4,084,751	1	4,129,841	816,467	Chromium and compounds (land)
12	4	24,748	5	668,314	5	778,886	754,138	Zinc and compounds (land)
13	1	547,715	1	922,590	1	1,097,645	549,930	Nickel and compounds (land)
14	4	281,499	5	621,453	4	754,027	472,528	Aluminum (land)
15	1	16,336	1	19,379	3	381,829	365,493	Manganese and compounds (land)
16	6	2,359,007	6	2,619,943	6	2,695,735	336,728	Zinc and compounds (land)
17	7	1,822,917	7	1,868,437	8	2,140,356	317,439	Zinc and compounds (land)
18	**	**	**	**	3	314,653	314,653	Manganese and compounds (land)
19	9	3,676,472	9	3,573,720	8	3,958,805	282,333	Zinc and compounds (land)
20	2	1,128,410	1	1,269,959	1	1,406,027	277,617	Manganese and compounds (land)
21	2	886,203	2	955,375	2	1,158,458	272,255	Manganese and compounds (land)
22	3	1,811,170	3	2,350,576	3	2,077,165	265,995	Manganese and compounds (land)
23	1	6,498	1	80,459	2	251,010	244,512	Zinc and compounds (land)
24	2	47,114	3	12,003	4	286,915	239,801	Manganese and compounds (land)
25	2	17,111	2	41,281	2	234,153	217,042	Manganese and compounds (land)
26	**	**	**	**	2	204,647	204,647	Manganese and compounds (land)
27	4	17,844	4	17,196	7	221,580	203,736	Manganese/Copper and compounds (land)
28	1	99,100	1	139,599	2	295,189	196,089	Zinc and compounds (land)
29	**	**	**	**	2	195,510	195,510	Manganese and compounds (land, water)
30	**	**	**	**	3	193,679	193,679	Manganese and compounds (land)
31	1	0	2	0	2	191,605	191,605	Zinc and compounds (land)
32	**	**	**	**	2	179,547	179,547	Manganese and compounds (land)
33	**	**	**	**	2	175,853	175,853	Manganese and compounds (land)
34	**	**	**	**	1	173,736	173,736	Manganese and compounds (land)
35	1	4,136	1	8,120	3	175,231	171,095	Manganese and compounds (land, water)
36	1	9,075	2	42,698	2	172,086	163,011	Manganese and compounds (land)
37	1	24,208	1	27,276	1	184,356	160,148	Zinc and compounds (land)
38	**	**	1	0	2	155,873	155,873	Manganese and compounds (land)
39	**	**	**	**	2	151,292	151,292	Manganese/Zinc and compounds (land)
40	7	296,213	8	494,417	8	439,640	143,427	Zinc and compounds (land)
41	3	2,276	3	40,396	5	145,571	143,295	Zinc and compounds (land)
42	2	4,580	2	149,206	2	145,532	140,952	Zinc and compounds (land)
43	1	86,706	2	196,204	2	219,907	133,201	Manganese and compounds (water, land), Zinc and compounds (land, air)
44	**	**	**	**	2	132,426	132,426	Manganese and compounds (land)
45	4	7,052	1	0	4	136,705	129,653	Nickel and compounds (land)
46	**	**	**	**	12	126,579	126,579	Zinc and compounds (land)
47	1	340	1	22,222	3	119,728	119,388	Zinc and compounds, Aluminum (air)
48	1	247,306	1	232,185	1	365,394	118,088	Nickel and compounds (land)
49	1	20,227	**	**	1	138,186	117,959	Manganese and compounds (land)
50	**	**	**	**	2	115,691	115,691	Manganese and compounds (land)
	118	**36,832,337**	**119**	**50,573,622**	**199**	**76,144,549**	**39,312,212**	

* Chemicals accounting for more than 70% of increase in total releases of metals from the facility.
** Indicates facility did not report any matched metals that year
➤ UIJ=underground injection

3.3.5 Changes in Releases by Industry

Two of the three industries with the largest releases in both NPRI and TRI—chemical manufacturing and paper products—reduced their releases from 1995 to 1997. The primary metals industry, however, which ranked first in NPRI and second in TRI for total releases, increased those releases from 1995 to 1997. (**Chapter 7** takes a closer look at the primary metals industry and its PRTR reporting in North America.)

In the three industries, percentage changes in reporting to NPRI represented larger reductions/smaller increases than those reported to TRI. Chemical manufacturing releases decreased 20 percent in NPRI and 10 percent in TRI from 1995 to 1997. An even larger difference appeared in reporting by the paper products sector—reductions of 35 percent in NPRI and five percent in TRI. (A special chapter in *Taking Stock 1995* examined the pulp and paper industry and its PRTR reporting and identified influences that have contributed to this trend.) While the increase in NPRI releases by the primary metals industry was two percent, the industry's releases increased seven percent in TRI (**Figure 3–27**).

Figure 3–27
M 1997
Percent Change in On-site Releases for Primary Industries, NPRI and TRI, 1995–1997

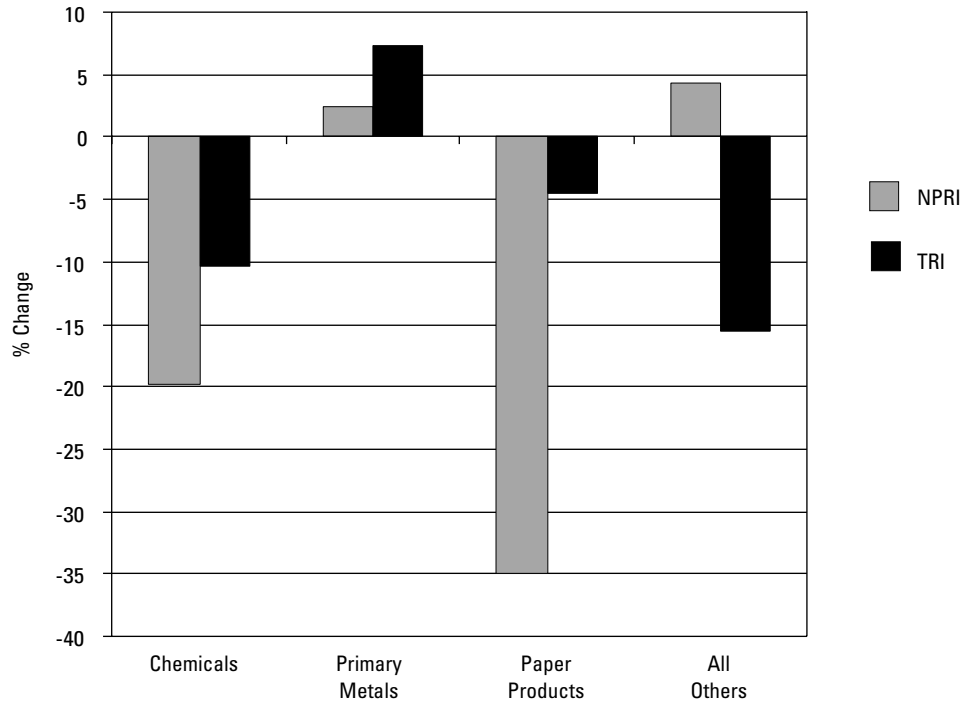


Table 3–52

M 1997

Change in NPRI On-site Releases by Industry (US SIC Code), 1995–1997

US SIC Code	Industry	Total Releases 1995 (kg)	1996 (kg)	1997 (kg)	Change 1995–1997 kg	%
20	Food Products	35,513	369,250	503,468	467,955	1,317.7
22	Textile Mill Products	918,196	533,168	281,192	-637,004	-69.4
23	Apparel and Other Textile Products	860	740	280	-580	-67.4
24	Lumber and Wood Products	1,211,133	1,734,425	2,219,981	1,008,848	83.3
25	Furniture and Fixtures	486,807	475,075	788,675	301,868	62.0
26	Paper Products	26,270,269	17,858,690	17,068,622	-9,201,647	-35.0
27	Printing and Publishing	766,524	671,354	1,609,267	842,743	109.9
28	Chemicals	22,852,744	21,282,041	18,334,510	-4,518,234	-19.8
29	Petroleum and Coal Products	4,903,716	4,703,762	4,671,163	-232,553	-4.7
30	Rubber and Plastics Products	6,325,235	5,964,113	5,945,315	-379,920	-6.0
31	Leather Products	17,858	5,900	23,680	5,822	32.6
32	Stone/Clay/Glass Products	1,062,555	917,908	868,511	-194,044	-18.3
33	Primary Metals	18,575,952	19,240,477	19,025,036	449,084	2.4
34	Fabricated Metals Products	1,779,841	2,037,404	2,039,537	259,696	14.6
35	Industrial Machinery	464,018	419,754	269,113	-194,905	-42.0
36	Electronic/Electrical Equipment	225,527	85,985	82,010	-143,517	-63.6
37	Transportation Equipment	6,599,971	6,334,159	6,147,046	-452,925	-6.9
38	Measurement/Photographic Instruments	1	5	0	-1	-100.0
39	Misc. Manufacturing Industries	123,388	537,667	571,518	448,130	363.2
	Total	**92,620,108**	**83,171,877**	**80,448,924**	**-12,171,184**	**-13.1**

In NPRI, paper products manufacturing (US SIC code 26) accounted for 26.3 million kg of releases in 1995 and 17.1 million kg in 1997. The largest absolute decrease among NPRI industrial sectors, this 9.2-million-kg decrease represented more than a one-third reduction in the paper products sector's releases. Paper products ranked third in NPRI for total releases in 1997. With a 4.5-million-kg reduction, the chemical manufacturing sector (US SIC code 28) reported the second-largest NPRI reduction, from 22.9 million kg to 18.3 million kg. Chemical manufacturing, which ranked second for NPRI releases in 1997, decreased 20 percent over the 1995–1997 period (**Table 3–52**).

The primary metals industry (US SIC code 33) reported 18.6 million kg of total releases to NPRI in 1995 and 19.0 million kg in 1997. This 449,084-kg increase placed primary metals fourth among all industries for increased NPRI releases. The largest NPRI increases came principally from industries that have not ranked high for total releases. The largest increase—1.0 million kg—was reported by the lumber and wood products industry (US SIC code 24). The second- and third-largest increases were printing and publishing (US SIC code 27)—842,743 kg—and food products (US SIC code 20)—467,955 kg. Among the 19 industries in the matched data set, these industries ranked seventh, ninth and thirteenth, respectively, for total NPRI releases in 1997.

Table 3-53
M 1997

Change in TRI On-site Releases by Industry (US SIC Code), 1995-1997

US SIC Code	Industry	Total Releases 1995 (kg)	1996 (kg)	1997 (kg)	Change 1995-1997 kg	%
20	Food Products	12,153,180	10,746,739	11,024,132	-1,129,048	-9.3
21	Tobacco Products	469,506	634,847	662,668	193,162	41.1
22	Textile Mill Products	6,776,812	6,670,103	7,536,066	759,254	11.2
23	Apparel and Other Textile Products	443,240	400,673	251,153	-192,087	-43.3
24	Lumber and Wood Products	13,891,478	12,411,876	10,867,571	-3,023,907	-21.8
25	Furniture and Fixtures	17,900,746	15,465,510	10,588,626	-7,312,120	-40.8
26	Paper Products	99,829,242	95,964,680	95,270,022	-4,559,220	-4.6
27	Printing and Publishing	13,421,828	11,685,250	10,582,679	-2,839,149	-21.2
28	Chemicals	284,082,530	262,100,541	254,570,269	-29,512,261	-10.4
29	Petroleum and Coal Products	21,169,073	23,371,219	23,348,244	2,179,171	10.3
30	Rubber and Plastics Products	43,825,986	42,375,154	39,109,825	-4,716,161	-10.8
31	Leather Products	770,966	542,092	464,848	-306,118	-39.7
32	Stone/Clay/Glass Products	9,127,252	11,484,064	11,182,122	2,054,870	22.5
33	Primary Metals	159,411,557	170,189,594	171,007,781	11,596,224	7.3
34	Fabricated Metals Products	26,482,991	22,282,709	20,721,712	-5,761,279	-21.8
35	Industrial Machinery	7,988,220	6,896,090	6,249,781	-1,738,439	-21.8
36	Electronic/Electrical Equipment	9,704,981	8,295,914	6,638,547	-3,066,434	-31.6
37	Transportation Equipment	41,701,697	37,806,703	36,551,961	-5,149,736	-12.3
38	Measurement/Photographic Instruments	6,092,644	5,479,760	4,676,856	-1,415,788	-23.2
39	Misc. Manufacturing Industries	4,852,821	3,916,149	3,863,478	-989,343	-20.4
	Multiple Codes 20–39	54,943,216	41,998,859	42,133,850	-12,809,366	-23.3
	Total	**835,039,966**	**790,718,526**	**767,302,191**	**-67,737,775**	**-8.1**

In TRI, chemical manufacturing (US SIC code 28) accounted for the largest absolute reduction (29.5 million kg), from 284.1 million kg in 1995 to 254.6 million kg in 1997. This industry reported TRI's largest releases in 1997. The second-largest reduction (12.8 million kg) occurred in the group of forms that reported more than one SIC code to identify their activities. This group occurs only in TRI because NPRI facilities report only one industry or business activity. The multiple-codes group in TRI reported 54.9 million kg of releases in 1995 and 42.1 million in 1997 (the fourth-largest TRI total in 1997—**Table 3–53**).

TRI's primary metals industry (US SIC code 33, ranking second in TRI for total releases in 1997), reported the largest 1995–1997 increase. In 1995, primary metals reported releases of 159.4 million kg, and in 1997 the industry's total was 171.0 million kg, an increase of 11.6 million kg. Petroleum and coal products (US SIC code 29), with 21.2 million kg of releases in 1995 and 23.3 million kg in 1997, had an increase of 2.2 million kg, followed by stone/clay/glass production (US SIC code 32), with 9.1 million kg in 1995 and 11.2 million in 1997, an increase of 2.1 million kg. Petroleum refining and stone/clay/glass manufacture ranked seventh and ninth, respectively, for TRI releases in 1997.