Chapter 14

Toxics Release Inventory Data for Transportation (SIC Code 37)

A Look at the Transportation Equipment Industry (SIC Code 37)

The transportation equipment industry (SIC code 37) manufactures equipment to transport passengers and cargo by land, air, and water. Its best known product is the automobile. Automobile manufacture (including parts) dominates this sector; the largest industries are the production of motor vehicles and car bodies (SIC code 3711) and motor vehicle parts and accessories (SIC code 3714). Facilities that manufacture both motor vehicles and parts are also classified in SIC code 3711. Other forms of transportation equipment manufacturing range from aircraft to bicycles to space vehicles. Box 14-1 lists the Standard Industrial Classification (SIC) codes and their designations for the various transportation equipment categories. In TRI, SIC codes are given as reported by the facilities; these may differ from information in economic and other data collections.

Makers of transportation equipment shipped $465.17 billion (in current dollars) in products in 1996 and employed 1.47 million. Approximately one out of every 12 U.S. manufacturing employees in 1996 worked in this sector. The value of transportation equipment shipments was up slightly from $461.80 billion (in current dollars) in 1995, while employment was 1.52 million. Production in this sector dropped in 1990 and 1991 but generally increased thereafter. By 1996, production in the transportation equipment sector showed a net increase of just 1.0% since 1989, well behind the average growth (17.6%) for all manufacturing sectors during this period (see Chapter 1, Table 1-10). Employment in transportation equipment steadily decreased through those years.

Motor Vehicles and Equipment

Motor vehicles and equipment (SIC code 371 at the three-digit SIC code level) accounted for 70.8% of the sector's 1996 value of shipments, $329.15 billion (in current dollars). This consisted of nearly two-thirds ($200.70 billion) from motor vehicles and car bodies (SIC code 3711), one-third ($110.99 billion) from motor vehicle parts and accessories (SIC code 3714), and small amounts from other industries such as the manufacture of truck and bus bodies (SIC code 3713). Motor vehicles and equipment also provided more than half the sector's employment, 772,000 employees. Within this, parts and accessories accounted for the larger portion, employing 460,000, while production of motor

Box 14-1. SIC Code 37, Transportation Equipment: Codes and Classifications

SIC Code		Industry Description
371 Motor Vehicles and Motor Vehicle Equipment		
3711	Motor Vehicles and Passenger Car Bodies	Manufacture or assembly of complete passenger automobiles, trucks, commercial cars and buses, and special purpose motor vehicles for highway use. Manufacture of chassis and passenger car bodies.
3713	Truck and Bus Bodies	Manufacture of truck and bus bodies and cabs. Assembly of truck and bus bodies on purchased chassis.
3714	Motor Vehicle Parts and Accessories	Manufacture of motor vehicle parts and accessories (excludes tires, glass, automobile stampings, lighting equipment, ignition systems, batteries, carburetors, and engine parts).
3715	Truck Trailers	Manufacture of truck trailers, detachable truck bodies (cargo containers), and chassis.
3716	Motor Homes	Manufacture of self-contained motor homes on purchased chassis.
372 Aircraft and Parts		
3721	Aircraft	Manufacture or assembly of complete aircraft. Research and development on aircraft (establishments owned by aircraft manufacturers). Repair and rebuilding of aircraft on a factory basis.
3724	Aircraft Engines and Engine Parts	Manufacture of aircraft engines and engine parts (including research and development; factory repair and rebuilding of engines).
3728	Aircraft Parts and Auxiliary Equipment, nec*	Manufacture of miscellaneous aircraft parts and equipment (including research and development).
373 Ship and Boat Building and Repairing		
3731	Ship Building and Repairing	Building and repairing of ships, barges, and lighters. Conversion and alteration of ships. Manufacture of off-shore oil and gas well drilling and production platforms.
3732	Boat Building and Repairing	Building and repairing of boats (excluding rubber and nonrigid plastics boats).
374 Railroad Equipment		
3743	Railroad Equipment	Building and rebuilding of locomotives (including frames and parts). Building and rebuilding of railroad, street, and rapid transit cars and equipment for operation on rails (except mining cars).
375 Motorcycles, Bicycles, and Parts		
3751	Motorcycles, Bicycles, and Parts	Manufacture of motorcycles, bicycles, and similar equipment, and parts.
376 Guided Missiles and Space Vehicles and Parts		
3761	Guided Missiles and Space Vehicles	Manufacture of complete guided missiles and space vehicles (including research and development).
3764	Guided Missile and Space Vehicle Propulsion Units and Propulsion Unit Parts	Manufacture of guided missile propulsion units and parts (including research and development
3769	Guided Missile and Space Vehicle Parts and Auxiliary Equipment, nec*	Manufacture of miscellaneous guided missile and space vehicle parts and equipment.
379 Miscellaneous Transportation Equipment		
3792	Travel Trailers and Campers	Manufacture of travel trailers and campers for attachment to cars or other vehicles. Manufacture of campers and caps for pickup trucks.
3795	Tanks and Tank Components	Manufacture of complete tanks, specialized components for tanks, and self-propelled weapons.
3799	Transportation Equipment, nec*	Manufacture of miscellaneous transportation equipment, including all-terrain vehicles, boat trailers, golfcarts, snowmobiles, wheelbarrows, and others.

***nec:** not elsewhere classified; these are generally referred to as "miscellaneous" products in their categories.

vehicles and car bodies employed about half that number (225,000). Accounting for nearly three-quarters of the sector's value of shipments and more than half of the sector's employment, these two industry sectors accounted for much of the sector's TRI reporting.

Motor vehicle producers are consolidating and simplifying production. The Big Three U.S. auto producers—General Motors, Ford, and Chrysler—are involved in controlling, owning, or merging with foreign automotive companies, while also engaging in alliances to produce foreign automobiles in the United States. In addition, foreign auto manufacturers from abroad have located independent plants in the U.S. states over the last 15 years. Automotive parts suppliers are similarly undergoing consolidation into fewer, larger companies. At the same time, basic automotive structures (a vehicle's "platform") are being simplified to reduce cost by reducing parts and enabling the interchange of parts.

Motor vehicle parts production (SIC code 3714) includes the manufacture of a number of fundamental automotive parts, including non-diesel engines, brakes, wiring harnesses, drive shafts, differentials, exhaust systems, steering mechanisms, and others. Many vehicle parts, however, are classified outside of the transportation equipment sector. Tires are a rubber product (SIC code 30); automobile glass is classified with other glass in SIC code 32; automobile stampings are fabricated metals (SIC code 34); lighting systems are electrical equipment (SIC code 36); carburetors, pistons, piston rings, and engine intake and exhaust valves are classified in industrial machinery (SIC code 35). Automotive seats are considered furniture (SIC code 25).

Approximately 80% of the parts and accessories industry has provided vehicle manufacturers original automotive equipment. The remaining 20% supplied replacement parts for the aftermarket. In recent years, however, the improved quality and durability of original equipment have kept the replacement parts market constant.

Steel remains the largest material used (by weight) in vehicle production, followed by iron, plastics and composites, fluids and lubricants, aluminum, and rubber. Although production processes vary widely, as evidenced by the variety of materials, most include casting, forging, molding, extrusion, stamping, and welding. Metal parts may be cleaned, coated, painted, etched, or electroplated. Major structural pieces are welded together, including the underbody, side assemblies, roof supports, and roof. Assembled vehicles must then be welded in as many as 4,000 places. Finishing operations include anti-corrosion processes, priming, joint sealing, and color- and clear-coat applications. Finally, all components are assembled, hard trim, soft trim, gas tank, exhaust system, bumpers, engine, and tires.

Sources

Executive Office of the President, Office of Management and Budget, *Standard Industrial Classification Manual, 1987*: Standard Industrial Classification (SIC) codes and industry descriptions.

U.S. Industry & Trade Outlook '98, DRI/McGraw Hill, Standard & Poor's, and U.S. Department of Commerce, International Trade Administration, 1998: economic analyses, also provides some information on environment and industrial processes for selected industries.

U.S. Census Bureau, *1996 Annual Survey of Manufactures: Statistics for Industry Groups and Industries,* M96(AS)-1, February 1998 <http://www.census.gov/prod/www/titles.html#mm>: value of shipments and employment. Supplemental data from U.S. Census Bureau <http://www.census.gov> for some industries.

U.S. Environmental Protection Agency, Office of Enforcement and Compliance Assurance, Office of Compliance, *Profile of the Motor Vehicle Assembly Industry,* Sector Notebook project, EPA/310-R-95-009, September 1995; *Profile of the Shipbuilding and Repair Industry,* Sector Notebook project, EPA/310-R-97-008, November 1997 <http://es.epa.gov/oeca/sector/index.html>: industry processes and technologies, pollutant sources, and selected economic data.

Table 14-1. Summary of TRI Information by 4-digit SIC Code, 1996: Transportation Equipment, SIC Code 37

Total On- and Off-site Releases Rank	Total Production-related Waste Rank	SIC Code	Industry	Total Facilities Number	Total Forms Number	Form As Number	Total On-site Releases Pounds	Total Off-site Releases Pounds	Total On- and Off-site Releases Pounds
1	2	3711	Motor Vehicles & Car Bodies	71	1,006	53	40,587,234	1,517,251	42,104,485
5	7	3713	Truck & Bus Bodies	55	238	16	4,770,261	133,698	4,903,959
2	1	3714	Motor Vehicle Parts & Accessories	495	1,389	48	16,080,845	4,348,414	20,429,259
9	11	3715	Truck Trailers	43	110	2	1,821,756	16,370	1,838,126
11	13	3716	Motor Homes	22	71	6	1,353,532	1,438	1,354,970
6	8	3721	Aircraft	36	154	3	4,280,481	62,547	4,343,028
13	4	3724	Aircraft Engines & Engine Parts	58	199	20	644,882	430,432	1,075,314
8	9	3728	Aircraft Parts & Equipment, nec*	76	172	6	2,412,299	120,680	2,532,979
7	5	3731	Ship Building & Repairing	41	171	3	2,750,991	191,201	2,942,192
4	6	3732	Boat Building & Repairing	166	287	28	11,301,287	11,007	11,312,294
10	10	3743	Railroad Equipment	33	83	3	1,328,152	210,868	1,539,020
15	12	3751	Motorcycles, Bicycles, & Parts	7	30	2	721,200	9,050	730,250
19	19	3761	Guided Missiles & Space Vehicles	4	11	0	97,590	35,314	132,904
16	16	3764	Space Propulsion Units & Parts	5	8	0	475,327	975	476,302
17	17	3769	Space Vehicle Equipment, nec*	2	17	3	213,862	256	214,118
12	15	3792	Travel Trailers & Campers	35	50	1	1,276,632	49,181	1,325,813
18	18	3795	Tanks & Tank Components	9	20	0	178,435	4,385	182,820
14	14	3799	Transportation Equipment, nec*	23	53	5	900,726	7,101	907,827
3	3		Multiple within SIC Code 37	65	252	14	12,331,760	578,421	12,910,181
20	20		Invalid SIC Code within SIC Code 37	2	10	1	95,832	1,096	96,928
			Total for SIC Code 37	1,248	4,331	214	103,623,084	7,729,685	111,352,769

Note: On-site Releases from Section 5 of Form R. **On-site Waste Management** from Section 8 of Form R. **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Total Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. **Total Production-related Waste** sums Section 8 (Current Year, Column B) of Form R, except: **Non-production-related Waste** (remedial/catastrophic incidents). Facilities/forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category. One facility incorrectly reported 6,211,171 pounds of total releases under multiple codes in SIC code 37. The correct amount is 750. The total releases rank of multiple codes within SIC code 37 changes from 3 to 4.
***nec:** not elsewhere classified.

Materials in most of these processes—from binders used in sand-casting iron components to adhesives used in attaching trim—may contribute to releases or other waste management of toxic chemicals. Many processes involve solvents, in addition to wide-ranging uses of metals. During automotive assembly, the most significant chemical releases and wastes occur during vehicle painting and finishing. Air emissions result from both the paint/finish applications and cleaning operations, and consist primarily of organic solvents. In addition to their use as a cleaning agent, solvents such as xylenes are components of many finishes and coatings.

Aerospace and Shipbuilding

Aircraft (SIC code 372) represented the second-largest economic activity in the transportation equipment sector, with 1996 shipments valued at $83.39 billion (in current dollars) and 377,000 employees. Guided missiles and space vehicles (SIC code 376) was third with $17.93 billion in shipments. Employment in the guided missiles and space vehicles category was comparatively small at 81,000. These two SIC codes (372 and 376) make up the aerospace industry. Ship and boat building and repair (SIC code 373) was fourth in economic activity in the sector, with shipments of $15.63 billion and employment of 141,000. Although TRI reporting is dominated by vehicle manufacturing, the production of aircraft, ships, boats, and their parts also contributed to releases and waste management reported to TRI in this sector in 1996.

Table 14-1. Summary of TRI Information by 4-digit SIC Code, 1996: Transportation Equipment, SIC Code 37, Continued

SIC Code	Industry	Total Other On-site Waste Management Pounds	Total Transfers Off-site for Further Waste Management Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
3711	Motor Vehicles & Car Bodies	14,741,945	46,128,216	108,642,104	12,141
3713	Truck & Bus Bodies	441,106	4,308,171	9,383,177	50
3714	Motor Vehicle Parts & Accessories	16,813,336	103,728,587	145,532,921	33,970
3715	Truck Trailers	115,775	996,221	2,929,762	1,183
3716	Motor Homes	10,799	255,175	1,663,970	0
3721	Aircraft	1,627,828	2,283,762	8,282,570	23,050
3724	Aircraft Engines & Engine Parts	5,341,491	11,984,305	18,474,826	64,854
3728	Aircraft Parts & Equipment, nec*	1,296,527	2,504,350	6,312,036	1,257
3731	Ship Building & Repairing	2,740,363	7,760,908	12,528,303	0
3732	Boat Building & Repairing	1,200	469,057	11,767,867	37,995
3743	Railroad Equipment	96,610	1,983,439	3,636,132	0
3751	Motorcycles, Bicycles, & Parts	222,010	679,411	1,768,278	0
3761	Guided Missiles & Space Vehicles	77,954	80,087	271,040	15,700
3764	Space Propulsion Units & Parts	55,754	810,222	1,340,458	319
3769	Space Vehicle Equipment, nec*	182,510	133,450	525,297	0
3792	Travel Trailers & Campers	5,500	41,456	1,350,125	2,460
3795	Tanks & Tank Components	181,097	128,960	502,511	0
3799	Transportation Equipment, nec*	140,493	330,419	1,412,522	0
	Multiple within SIC Code 37	3,407,047	8,561,588	18,724,061	3,903
	Invalid SIC Code within SIC Code 37	0	25,518	121,350	0
	Total for SIC Code 37	47,499,345	193,193,302	355,169,310	196,882

Note: On-site Releases from Section 5 of Form R. **On-site Waste Management** from Section 8 of Form R. **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Total Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. **Total Production-related Waste** sums Section 8 (Current Year, Column B) of Form R, except: **Non-production-related Waste** (remedial/catastrophic incidents). Facilities/forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category. One facility incorrectly reported 6,211,171 pounds of total releases under multiple codes in SIC code 37. The correct amount is 750. The total releases rank of multiple codes within SIC code 37 changes from 3 to 4.
***nec:** not elsewhere classified.

1996 TRI Data for Transportation Equipment

Table 14-1 summarizes TRI reporting by the transportation equipment sector for 1996. More than 4,300 forms were submitted in this industry for 1996. Of these, 214, or 4.9%, were Form A certification statements, certifying that a facility's total annual reportable amount of a TRI chemical was less than 500 pounds for the year and that the facility did not manufacture, process, or otherwise use more than 1 million pounds. This is less than half the percentage of Form As (10.1%) submitted in all industries. (The Form A certification statement is explained in Chapter 1.)

Motor vehicle manufacture—specifically, motor vehicle parts and accessories (SIC code 3714) with 1,389 forms and motor vehicles and car bodies (SIC code 3711) with 1,006 forms—accounted for more than half (55.3%) of the submitted forms. Boat building and repairing (SIC code 3732) was third with 287.

As shown in Table 14-1, the two motor vehicle industries also reported the largest amounts of releases and waste management, ranking first or second in the summary categories and accounted for more than half the reporting in the transportation equipment SIC code. Producers of motor vehicles and car bodies (SIC code 3711) reported 42.1 million pounds of on-and off-site releases, 37.8% of the sector's total. On-site releases were 40.6 million pounds for motor vehicles and car bodies, 39.2% of the sector's total.

Producers of motor vehicle parts and accessories (SIC code 3714) reported the largest amounts in other categories, as shown in Table 14-1. Off-site releases reported by motor vehicle parts manufacturing equaled 4.3 million pounds, representing 56.3% of the sector's total off-site releases. This industry reported 16.8 million pounds in other on-site waste management, which was 35.4% of the sector's total. Reporting in SIC code 3714 totaled 103.7 million pounds in transfers off-site for waste management (53.7% of the total) and 145.5 million pounds in production-related waste (41.0%).

Boat building and repairing (SIC code 3732) ranked third for total releases with 11.3 million pounds. (The larger amount of releases in the multiple-codes category reflects a facility reporting error). Aircraft engines and engine parts (SIC code 3724) ranked third for other on-site waste management (5.3 million pounds) and third for transfers off-site for further waste management (12.0 million pounds). For total production-related waste, forms submitted with more than one four-digit SIC code ranked third. This reporting of multiple SIC codes, explained below, accounted for 18.7 million pounds of production-related waste.

Multiple SIC Codes in SIC Code 37

Some facilities in the transportation equipment sector manufacture products in similar but distinct categories, as designated in the Standard Industrial Classification (SIC) system. One common combination is manufacturing both automobiles (SIC code 3711) and motor vehicle parts (SIC code 3714). To describe their operations, some of these facilities may report both SIC codes on their TRI forms (others may report only SIC code 3711, which covers both automobiles and parts when they are manufactured by the same facility). Facilities in other segments of the transportation equipment sector may also produce multiple items—for example, miscellaneous parts for aircraft (SIC code 3728) and miscellaneous parts for guided missiles or space vehicles (SIC code 3769). These facilities also may report multiple SIC codes on their TRI forms. (Box 1-5 in Chapter 1 further explains reporting of multiple SIC codes and its affect on the analyses presented in the TRI data release.)

There were 252 forms that reported more than one four-digit SIC code within SIC code 37 in 1996. Table 14-2 examines reporting by this multiple-codes group. The most frequent pairing, reported on 61 forms, combined manufacturing activities of the two biggest industries: motor vehicles and passenger car bodies (SIC code 3711) and motor vehicle parts and accessories (SIC code 3714). This combination reported 2.7 million pounds of total on- and off-site releases and 7.6 million pounds of total production-related waste in 1996. These amounts represented the largest total releases and the largest total production-related waste reported by multiple-codes groups in SIC code 37. (One facility reporting SIC codes 3731 and 3743 reported 6.2 million pounds of air emissions in error.)

On- and Off-site Releases

Air emissions constituted the overwhelming majority of on- and off-site releases in 1996 by the transportation equipment sector: 102.7 million pounds (including a facility reporting error of 6.2 million pounds). On-site land releases totaled 705,000 pounds, mostly in land disposal other than RCRA subtitle C landfills. Surface water discharges were 224,000 pounds. No underground injection was reported. Off-site releases totaled 7.7 million pounds, the next-largest release type after

Table 14-2. Multiple SIC Codes, 1996: Transportation Equipment, SIC Code 37

SIC Codes				Total Forms Number	Form As Number	Total On-site Releases Pounds	Total Off-site Releases Pounds	Total On- and Off-site Releases Pounds	Total Other On-site Waste Management Pounds	Total Transfers Off-site for Further Waste Management Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
3711	3713			23	0	670,439	22,768	693,207	396,364	944,168	2,029,701	0
3711	3713	3714		3	0	112,379	177,412	289,791	0	0	289,791	0
3711	3714			61	1	2,643,322	16,741	2,660,063	1,126,390	3,774,429	7,574,110	0
3711	3751			26	0	101,416	1,551	102,967	7,864	47,110	155,805	0
3713	3714			4	0	98,408	0	98,408	31,709	8,637	138,755	0
3713	3714	3792		1	0	163,678	0	163,678	0	0	163,678	0
3713	3715			5	2	8,450	0	8,450	0	5,270	17,720	0
3713	3732			2	0	60,799	0	60,799	0	1,848	62,647	0
3713	3799			1	0	25,028	0	25,028	0	10,784	32,642	0
3714	3751			14	4	19,452	311,604	331,056	1,166,400	305,028	1,798,213	0
3714	3795			2	0	78,945	0	78,945	0	500	82,293	0
3714	3799			1	0	17,236	0	17,236	0	2,008	19,244	0
3715	3799			7	2	78,989	0	78,989	0	28,464	115,867	0
3716	3792			4	0	71,493	0	71,493	1,280	6,367	78,672	0
3716	3792	3798		1	0	28,278	0	28,278	0	1,000	28,927	0
3716	3799			1	0	10,521	0	10,521	0	7,892	18,413	0
3720	3721			3	0	64,010	3,735	67,745	0	23,589	91,393	0
3721	3724			4	1	19,410	0	19,410	0	183,132	202,137	0
3721	3724	3728		2	0	30,800	0	30,800	5,000	3,450	39,100	0
3721	3728			6	0	89,589	108	89,697	4,640	8,273	101,789	0
3724	3728			7	0	45,941	0	45,941	16,632	79,103	132,764	0
3724	3728	3769		2	0	8,690	0	8,690	0	3,340	12,030	1,100
3724	3728	3769	3795	1	0	16,553	0	16,553	0	343	16,896	0
3724	3769			3	0	12,694	0	12,694	1,668	32,116	46,313	0
3728	3764			9	2	182,521	0	182,521	95,400	85,626	403,124	0
3728	3769			23	0	483,781	20,237	504,018	518,700	585,711	1,628,742	0
3731	3732			7	0	86,185	0	86,185	0	58,930	150,582	0
3731	3743			6	0	6,365,071	0	6,365,071	30,000	402,481	586,331	0
3732	3799			5	2	103,443	0	103,443	0	11,480	114,923	0
3743	3799			10	0	324,494	24,195	348,689	0	1,909,938	2,241,138	3
3764	3769			3	0	93,910	70	93,980	5,000	0	103,920	2,800
3792	3799			3	0	206,223	0	206,223	0	10,073	216,296	0
3	3714			2	0	9,612	0	9,612	0	20,498	30,105	0
Total for SIC Code 37				252	14	12,331,760	578,421	12,910,447	3,407,047	8,561,588	18,724,061	3,903

Note: On-site Releases from Section 5 of Form R. **On-site Waste Management** from Section 8 of Form R. **Off-site Releases** are transfers off-site to disposal from Section 6 of Form R. **Total Transfers Off-site for Further Waste Management** from Section 6 of Form R. **Total Production-related Waste** sums Section 8 of Form R, except: **Non-production-related Waste** (remedial/catastrophic incidents). One facility incorrectly reported 6,211,171 pounds of air emissions under SIC codes 3731 and 3743. The correct amount is 750.

air emissions. Table 14-3 and Figure 14-1 present the sector's releases by type.

As noted earlier, two industries accounted for the majority of the sector's releases: motor vehicles and car bodies (SIC code 3711) and motor vehicle parts and accessories (SIC code 3714). Figure 14-2 shows the distribution of on- and off-site releases for the industries (four-digit SIC code) with the sector's largest releases.

Other On-site Waste Management

Table 14-4 and Figure 14-3 show other on-site waste management reported in the transportation equipment sector. The largest category was treatment, 29.5 million pounds or nearly two-thirds (62.1%) of the total other on-site waste management. Recycling was 16.5 million pounds; relatively little energy recovery (1.5 million pounds) was reported on-site.

The motor vehicles and car bodies industry (SIC code 3711) reported 14.0 million pounds, or 47.4% of all on-site treatment in this sector. For on-site recycling, the motor vehicle parts industry (SIC code 3714) reported the largest amount, 9.1 million pounds (55.0%). Of the 18 industries in the sector,

Table 14-3. TRI On-site and Off-site Releases, 1996: Transportation Equipment, SIC Code 37 (in Rank Order)

SIC Code	Industry	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection: Class I Wells Pounds	Underground Injection: Class II-V Wells Pounds	On-site Land Releases: RCRA Subtitle C Landfills Pounds	On-site Land Releases: Other On-site Land Releases Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
3711	Motor Vehicles & Car Bodies	40,561,496	10,428	0	0	14,445	865	40,587,234	1,517,251	42,104,485
3714	Motor Vehicle Parts & Accessories	15,634,030	83,564	0	0	51,929	311,322	16,080,845	4,348,414	20,429,259
	Multiple within SIC Code 37	12,323,358	2,901	0	0	266	5,235	12,331,760	578,421	12,910,181
3732	Boat Building & Repairing	11,274,153	0	0	0	0	27,134	11,301,287	11,007	11,312,294
3713	Truck & Bus Bodies	4,719,018	3,257	0	0	0	47,986	4,770,261	133,698	4,903,959
3721	Aircraft	4,247,896	16,719	0	0	15,830	36	4,280,481	62,547	4,343,028
3731	Ship Building & Repairing	2,707,317	19,752	0	0	0	23,922	2,750,991	191,201	2,942,192
3728	Aircraft Parts & Equipment, nec*	2,396,026	324	0	0	4,128	11,821	2,412,299	120,680	2,532,979
3715	Truck Trailers	1,705,764	265	0	0	0	115,727	1,821,756	16,370	1,838,126
3743	Railroad Equipment	1,328,150	1	0	0	0	1	1,328,152	210,868	1,539,020
3716	Motor Homes	1,353,532	0	0	0	0	0	1,353,532	1,438	1,354,970
3792	Travel Trailers & Campers	1,276,385	0	0	0	0	247	1,276,632	49,181	1,325,813
3724	Aircraft Engines & Engine Parts	484,200	86,909	0	0	0	73,773	644,882	430,432	1,075,314
3799	Transportation Equipment, nec*	900,151	28	0	0	0	547	900,726	7,101	907,827
3751	Motorcycles, Bicycles, & Parts	721,200	0	0	0	0	0	721,200	9,050	730,250
3764	Space Propulsion Units & Parts	475,327	0	0	0	0	0	475,327	975	476,302
3769	Space Vehicle Equipment, nec*	213,862	0	0	0	0	0	213,862	256	214,118
3795	Tanks & Tank Components	178,348	0	0	0	87	0	178,435	4,385	182,820
3761	Guided Missiles & Space Vehicles	97,590	0	0	0	0	0	97,590	35,314	132,904
	Invalid SIC Code within SIC Code 37	95,832	0	0	0	0	0	95,832	1,096	96,928
	Total for SIC Code 37	102,693,635	224,148	0	0	86,685	618,616	103,623,084	7,729,685	111,352,769

Note: On-site Releases from Section 5 of Form R. **Off-site Releases** from Section 6 (off-site transfers to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category. One facility incorrectly reported 6,211,171 pounds of air emissions under multiple codes in SIC code 37. The correct amount is 750. The total releases rank of multiple codes within SIC code 37 changes from 3 to 4.
***nec:** not elsewhere classified.

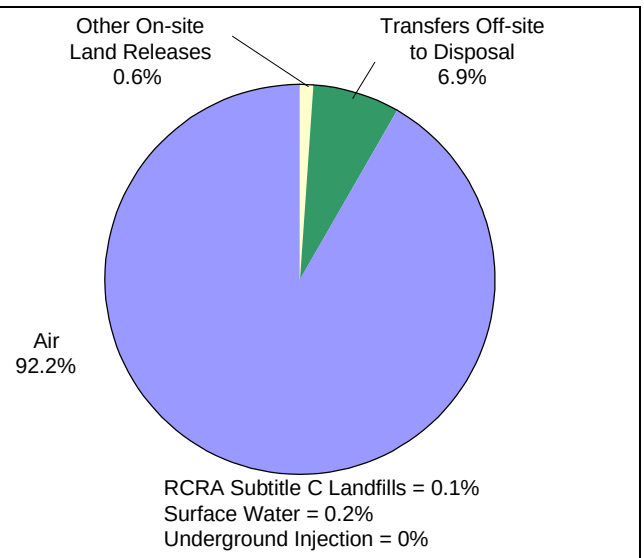


Figure 14-1. Distribution of TRI On-site and Off-site Releases, 1996: Transportation Equipment (SIC Code 37)

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

three reported on-site energy recovery. Figure 14-4 illustrates the distribution of on-site waste management reporting for the top 10 industries in this sector.

Transfers Off-site for Further Waste Management

Table 14-5 presents transfers off-site for further waste management for industries in the transportation equipment sector. Transfers to recycling were 165.0 million pounds, or 85.4% of all such transfers in this sector. Motor vehicle parts manufacturers (SIC code 3714) reported 95.5 million pounds, or 57.9%, of transfers to recycling, and producers of motor vehicles and car bodies (SIC code 3711) reported 36.8 million pounds, or 22.3%.

These two industries also ranked first or second for most other types of transfers. The exception was transfers off-site to treatment. The second-largest amount of transfers off-site to treatment was

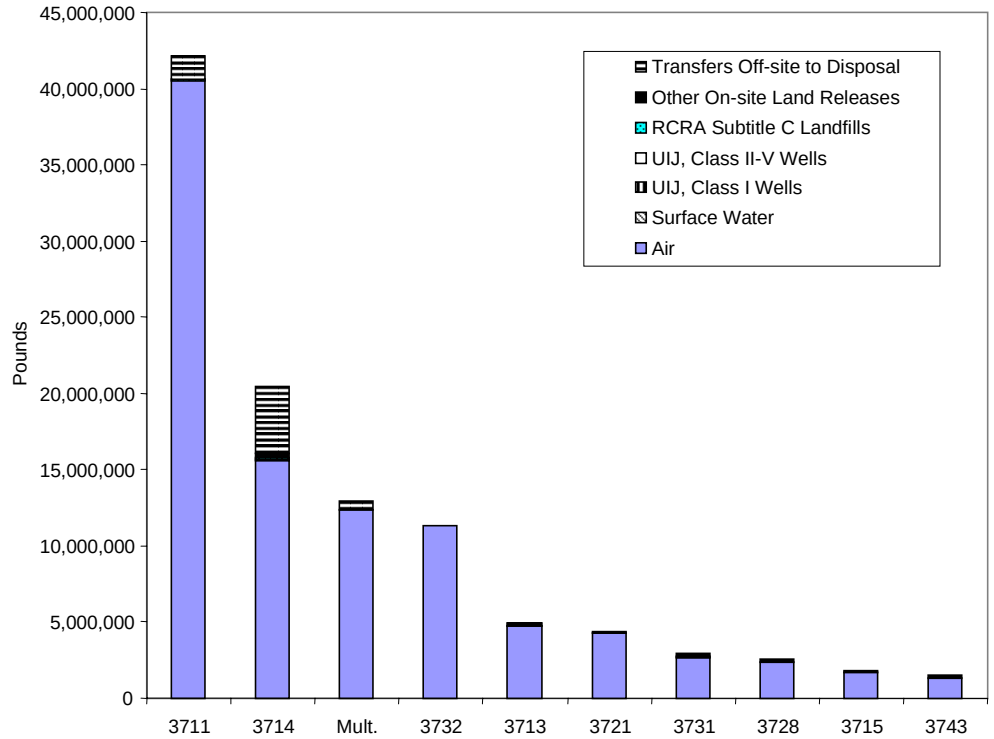


Figure 14-2. TRI On-site and Off-site Releases, SIC Codes with Largest Releases, 1996: Transportation Equipment (SIC Code 37)

Note: On-site Releases from Section 5 of Form R. **Off-site Releases** from Section 6 (transfers off-site to disposal). **UIJ** = underground injection. Forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category. One facility incorrectly reported 6,211,171 pounds of air emissions under multiple codes in SIC code 37. The correct amount is 750. The total releases rank of multiple codes within SIC code 37 changes from 3 to 4.

reported by makers of aircraft engines and engine parts (2.1 million pounds, SIC code 3724).

Figure 14-5 illustrates the distribution of types of off-site transfers for further waste management, and Figure 14-6 shows the data for the top industries in this sector.

1996 TRI Data by State for Transportation Equipment

States prominent in motor vehicle manufacturing led TRI reporting in this sector, as would be expected. Michigan produces more than 3 million vehicles per year, and Ohio, Missouri, and Kentucky each produce more than 1 million annually. Detroit hosts 19 assembly plants for cars or light trucks, all owned by one of the Big Three automakers (General Motors, Ford, and Chrysler). Missouri also produces vehicles for the Big Three (mostly light trucks), but 33% of Ohio's vehicle output is for Honda, and 40% of Kentucky's is for Toyota. Other states manufacturing from 500,000 to 1 million vehicles per year are Alabama, Illinois, New York, South Carolina, Tennessee, and Texas. To reduce shipping costs, automakers and their suppliers in the parts and accessories industry have traditionally located close to one another.

Shipbuilding, as would be expected, occurs largely in coastal states, including Washington, California, several Gulf Coast states, and Virginia. Centers of aircraft production include Kansas (small aircraft) and Washington state.

As shown in Table 14-6, more forms in SIC code 37 were submitted in Michigan (683) than in any other state. Ohio was second with 488 and Indiana was third with 394. Together, these three states accounted for more than one third (36.1%) of all forms in the sector.

These three states also led for total on- and off-site releases. Michigan reported 15.6 million pounds, Indiana 10.0 million pounds, and Ohio 9.5 million pounds. The three states accounted for 31.5% of the total releases. Michigan had the largest on-site releases, 15.0 million pounds, and Indiana was second with 9.2 million pounds. Ranking third was Missouri with 8.3 million pounds. For off-site releases, Ohio had the largest amount, 2.1 million pounds; other states and territories all had less than 1 million pounds in this release type.

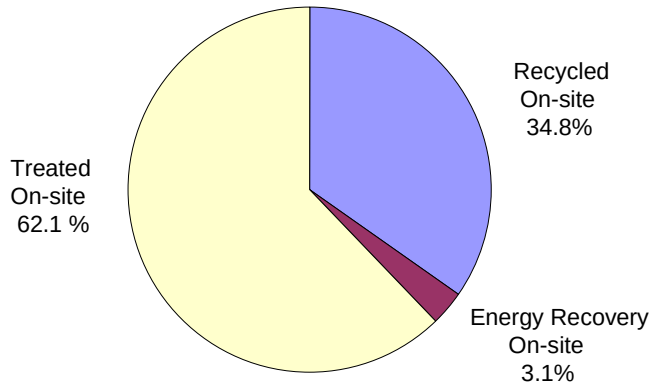


Figure 14-3. Distribution of TRI Other On-site Waste Management, 1996: Transportation Equipment (SIC Code 37)

Note: Data from Section 8 of Form R.

Table 14-4. TRI Other On-site Waste Management, 1996: Transportation Equipment, SIC Code 37 (in Rank Order)

SIC Code	Industry	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Total Other On-site Waste Management Pounds
3714	Motor Vehicle Parts & Accessories	9,082,191	13,903	7,717,242	16,813,336
3711	Motor Vehicles & Car Bodies	217,094	535,506	13,989,345	14,741,945
3724	Aircraft Engines & Engine Parts	4,146,424	0	1,195,067	5,341,491
	Multiple within SIC Code 37	1,666,978	852,360	887,709	3,407,047
3731	Ship Building & Repairing	51,741	0	2,688,622	2,740,363
3721	Aircraft	533,700	0	1,094,128	1,627,828
3728	Aircraft Parts & Equipment, nec*	83,108	57,190	1,156,229	1,296,527
3713	Truck & Bus Bodies	73,230	0	367,876	441,106
3751	Motorcycles, Bicycles, & Parts	69,810	0	152,200	222,010
3769	Space Vehicle Equipment, nec*	142,910	0	39,600	182,510
3795	Tanks & Tank Components	156,390	0	24,707	181,097
3799	Transportation Equipment, nec*	108,491	0	32,002	140,493
3715	Truck Trailers	93,375	0	22,400	115,775
3743	Railroad Equipment	80,498	0	16,112	96,610
3761	Guided Missiles & Space Vehicles	295	0	77,659	77,954
3764	Space Propulsion Units & Parts	0	0	55,754	55,754
3716	Motor Homes	10,799	0	0	10,799
3792	Travel Trailers & Campers	5,500	0	0	5,500
3732	Boat Building & Repairing	700	0	500	1,200
	Invalid SIC Code within SIC Code 37	0	0	0	0
	Total for SIC Code 37	16,523,234	1,458,959	29,517,152	47,499,345

Note: Other On-site Waste Management from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

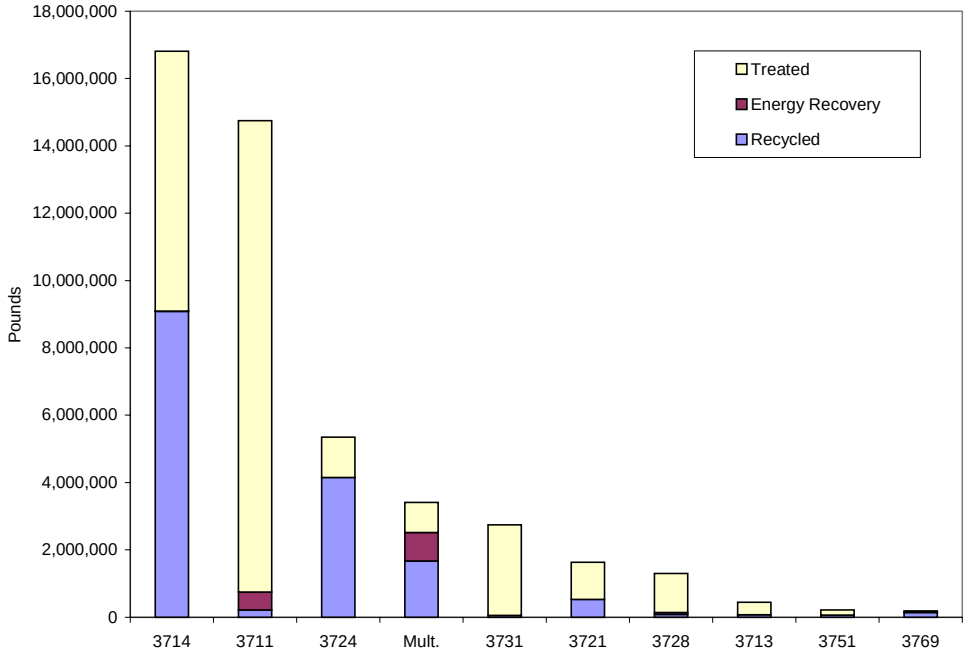


Figure 14-4. TRI Other On-site Waste Management, SIC Codes with Largest Totals, 1996: Transportation Equipment (SIC Code 37)

Note: Other On-site Waste Management from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category.

Table 14-5. TRI Transfers Off-site for Further Waste Management, 1996: Transportation Equipment, SIC Code 37 (in Rank Order)

SIC Code	Industry	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds	Other Off-site Transfers Pounds	Total Off-site Transfers for Further Waste Management Pounds
3714	Motor Vehicle Parts & Accessories	95,508,335	2,494,903	3,644,407	2,080,692	250	103,728,587
3711	Motor Vehicles & Car Bodies	36,825,062	5,209,256	1,278,966	2,814,932	0	46,128,216
3724	Aircraft Engines & Engine Parts	9,574,732	38,782	2,099,992	263,153	7,646	11,984,305
	Multiple within SIC Code 37	7,172,331	960,037	370,295	58,925	0	8,561,588
3731	Ship Building & Repairing	6,677,056	965,576	115,758	2,518	0	7,760,908
3713	Truck & Bus Bodies	2,723,533	1,406,098	88,149	90,391	0	4,308,171
3728	Aircraft Parts & Equipment, nec*	1,696,287	316,132	452,660	39,271	0	2,504,350
3721	Aircraft	799,247	949,147	417,523	117,845	0	2,283,762
3743	Railroad Equipment	1,400,556	546,857	34,779	1,247	0	1,983,439
3715	Truck Trailers	796,026	142,220	57,105	620	250	996,221
3764	Space Propulsion Units & Parts	762,576	39,071	8,570	5	0	810,222
3751	Motorcycles, Bicycles, & Parts	619,863	58,273	770	505	0	679,411
3732	Boat Building & Repairing	84,831	323,954	10,296	49,976	0	469,057
3799	Transportation Equipment, nec*	24,086	282,898	15,275	8,160	0	330,419
3716	Motor Homes	130,410	94,838	5,004	24,923	0	255,175
3769	Space Vehicle Equipment, nec*	65,200	33,055	35,195	0	0	133,450
3795	Tanks & Tank Components	88,599	0	40,356	5	0	128,960
3761	Guided Missiles & Space Vehicles	34,694	20,093	676	24,624	0	80,087
3792	Travel Trailers & Campers	515	40,691	250	0	0	41,456
	Invalid SIC Code within SIC Code 37	2,464	23,044	0	10	0	25,518
	Total for SIC Code 37	164,986,403	13,944,925	8,676,026	5,577,802	8,146	193,193,302

Note: Off-site Transfers for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

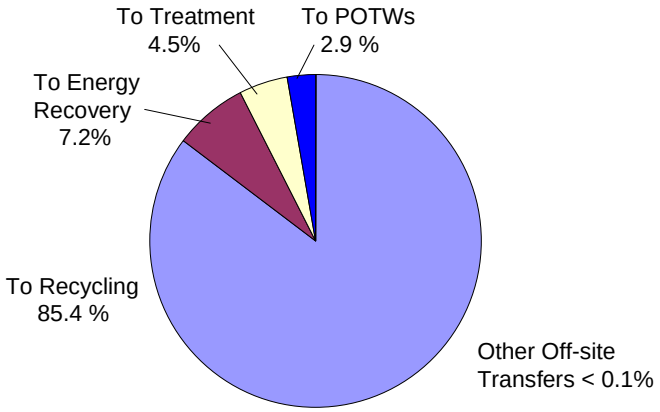


Figure 14-5. Distribution of TRI Transfers Off-site for Further Waste Management, 1996: Transportation Equipment (SIC Code 37)

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

Michigan also had the largest other on-site waste management, 10.4 million pounds, followed by Ohio with 7.5 million pounds. Third was Texas with 4.4 million pounds. For transfers off-site for further waste management, Ohio ranked first with 43.6 million pounds. Indiana was second with 28.0 million pounds, and Michigan was third with 20.9 Michigan also had the largest other on-site waste management, 10.4 million pounds, followed by million pounds. All other states reported less than 10 million pounds in transfers off-site for further waste management.

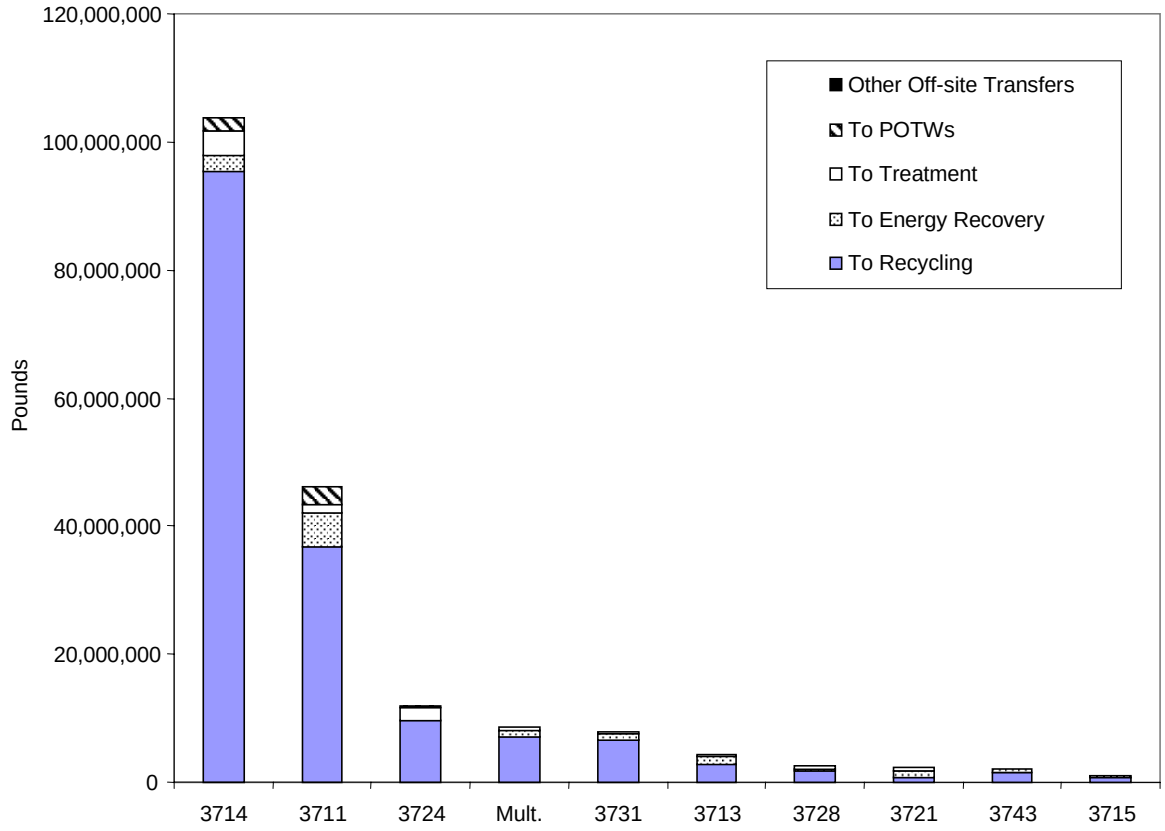


Figure 14-6. TRI Transfers Off-site for Further Waste Management, SIC Codes with Largest Totals, 1996: Transportation Equipment (SIC Code 37)

Note: Off-site Transfers for Further Waste Management from Section 6 (excluding off-site transfers to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category.

Table 14-6. Summary of TRI Information by State, 1996: Transportation Equipment, SIC Code 37

State	Total Facilities Number	Total Forms Number	Form As Number	Total On-site Releases Pounds	Total Off-site Releases Pounds	Total On- and Off-site Releases Pounds	Total Other On-site Waste Management Pounds	Total Transfers Off-site for Further Waste Management Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
Alabama	28	75	4	1,897,506	79,749	1,977,362	209,835	2,069,576	4,220,480	12,158
Arizona	10	33	2	328,735	361,510	690,290	187,815	4,117,579	4,993,020	15,770
Arkansas	19	56	2	1,093,596	2,165	1,095,838	168,680	532,909	1,777,997	20
California	69	169	8	2,826,891	255,688	3,082,825	1,864,859	2,223,971	7,271,702	26,095
Colorado	5	9	0	59,096	7,435	66,545	0	87,092	175,526	1,100
Connecticut	23	61	0	285,131	132,572	417,787	726,200	3,028,776	4,317,358	35
Delaware	2	22	1	686,694	3,350	690,069	72,933	743,409	1,507,111	0
Florida	69	146	21	3,379,853	18,918	3,399,007	137,315	605,304	3,948,552	10,000
Georgia	36	122	4	4,971,496	98,807	5,070,465	3,007,356	4,883,247	12,588,842	12,537
Hawaii	1	2	0	54,500	2,150	56,653	0	0	56,000	0
Idaho	3	5	0	47,115	0	47,123	141,700	302	189,103	0
Illinois	49	154	13	2,407,382	415,844	2,823,442	2,664,938	7,870,450	13,372,924	4,335
Indiana	124	394	29	9,158,621	798,127	9,957,295	1,419,081	28,010,292	41,093,386	750
Iowa	18	55	3	863,379	44,205	907,660	20,201	2,296,331	3,049,651	0
Kansas	26	85	1	2,298,781	23,492	2,322,385	324,106	1,744,653	4,492,754	16
Kentucky	36	164	4	7,161,312	510,709	7,672,225	2,659,668	7,718,853	19,619,287	0
Louisiana	13	62	2	687,664	161,529	849,270	458,400	2,444,879	3,733,667	767
Maine	8	31	0	212,458	8,971	221,468	45,000	2,832,983	1,568,829	0
Maryland	12	41	0	1,318,674	39,521	1,358,248	162,809	1,518,889	3,034,025	300
Massachusetts	7	12	0	19,158	35,452	54,629	214,179	115,313	372,302	0
Michigan	131	683	29	14,957,040	675,737	15,633,620	10,430,286	20,881,129	51,532,371	1,051
Minnesota	20	59	9	1,631,165	9,645	1,640,898	264,500	1,497,996	3,408,239	0
Mississippi	17	23	1	340,430	10,373	350,844	70,000	7,003,824	7,424,255	0
Missouri	39	195	1	8,283,279	191,666	8,475,180	1,531,121	7,948,441	18,772,403	9,875
Nebraska	10	39	2	655,674	84,899	740,624	384,023	946,139	2,061,261	20
Nevada	2	3	0	6,581	0	6,586	1,995,132	357,754	2,359,434	0
New Hampshire	3	7	0	14,465	22,750	37,225	36,621	234,491	219,839	64,610
New Jersey	9	42	3	910,300	42,849	953,203	329,405	1,002,994	2,270,647	0
New Mexico	2	12	0	38,848	1,317	40,179	55,447	831,163	926,346	0
New York	25	67	2	622,302	44,851	667,247	238,794	2,566,961	4,613,715	0
North Carolina	37	103	7	1,499,664	241,266	1,741,077	183,773	2,519,779	4,592,783	0
North Dakota	3	10	0	58,978	750	59,741	31,000	27,012	92,402	0
Ohio	102	488	40	7,467,538	2,050,635	9,518,803	7,486,310	43,648,669	61,464,229	4,286
Oklahoma	20	61	1	1,527,141	65,565	1,592,788	342,276	845,685	2,786,286	0
Oregon	17	53	0	7,405,804	44,060	7,449,934	353,774	5,812,805	7,423,762	60
Pennsylvania	32	94	2	1,804,100	167,802	1,972,030	2,064,350	3,353,979	7,078,720	3
Puerto Rico	1	1	0	2,210	0	2,212	0	7,370	9,580	0
Rhode Island	5	13	0	46,869	1,021	47,908	0	5,368	53,109	0
South Carolina	26	56	0	878,202	12,204	890,488	403,944	1,154,668	2,618,663	0
South Dakota	8	16	0	112,982	798	113,804	0	238,989	352,395	0
Tennessee	47	159	9	5,910,733	208,516	6,119,464	991,798	5,068,471	11,891,194	0
Texas	36	134	5	2,756,266	196,636	2,953,077	4,359,090	4,089,465	11,605,294	2,385
Utah	14	24	0	649,570	39,655	689,263	322	562,189	1,238,886	19
Vermont	3	13	0	1,558	8,657	10,231	50,660	2,254,628	2,305,571	0
Virginia	19	84	6	2,586,819	474,722	3,061,650	604,491	1,243,418	5,777,906	30,000
Washington	32	87	1	1,903,327	49,941	1,953,388	332,786	2,132,156	4,466,902	690
West Virginia	2	5	1	100,646	30,180	130,834	0	324,445	425,037	0
Wisconsin	28	102	1	1,692,551	52,996	1,745,678	474,367	3,788,506	6,015,565	0
Total for SIC Code 37	1,248	4,331	214	103,623,084	7,729,685	111,358,562	47,499,345	193,193,302	355,169,310	196,882

Note: On-site Releases from Section 5 of Form R. **On-site Waste Management** from Section 8 of Form R. **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Total Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. **Total Production-related Waste** sums Section 8 (Current Year, Column B) of Form R, except: **Non-production-related Waste** (remedial/catastrophic incidents). One facility in Oregon incorrectly reported 6,211,171 pounds of total releases. The correct amount is 750.

Ohio reported the largest total production-related waste (61.5 million pounds), followed by Michigan (51.5 million pounds) and Indiana (41.1 million pounds). All other states and territories had less than 20 million pounds each in this category.

Map 14-1 illustrates the geographic distribution of total on- and off-site releases in the transportation equipment sector.

1996 TRI Data by Chemical for Transportation Equipment

As shown in Table 14-7, the top 15 chemicals reported in the transportation equipment sector amounted to 97.1 million pounds of on- and off-site releases, or 87.2% of the sector's total of 111.4 million pounds. The bulk of this reporting occurred in air emissions, which totaled 94.0 million pounds, or 96.8% of total on- and off-site releases, for the 15 chemicals. (Excluding a reporting error of 6.2 million pounds of air emissions of manganese would not substantially alter this analysis.) Only for the 15th-ranked chemical, asbestos, was the majority of releases to another category, which was to off-site releases (transfers to disposal). All of the off-site releases of asbestos were reported by the motor vehicle parts and accessories industry (SIC code 3714); asbestos is used in clutch and brake linings.

The chemical reported in the largest amount was xylenes, with 25.5 million pounds of on- and off-site releases. The second-largest was styrene, with 13.4 million pounds, followed by glycol ethers, with 9.0 million pounds. The largest industrial source of xylenes was the motor vehicle and car bodies industry, which reported 16.2 million pounds of air emissions of this chemical, largely as point source emissions. This amounted to two-thirds (63.3%) of the sector's total releases of that chemical. Xylenes and other solvents such as toluene and methyl ethyl ketone are used in cleaning and finishing operations, especially coating and painting, in vehicle production.

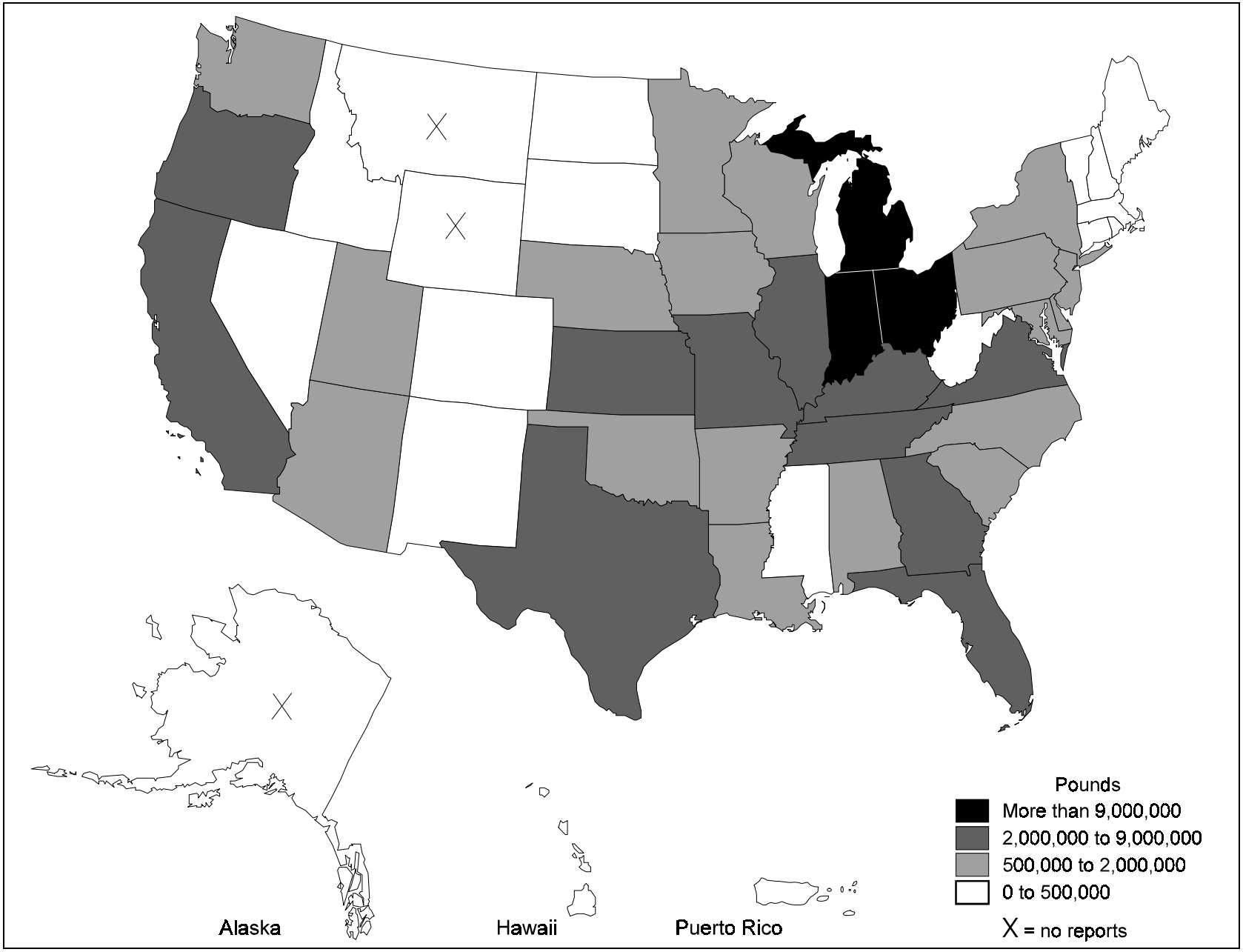
Boat building and repair (SIC code 3732) reported the largest styrene releases. The 9.2 million pounds of styrene air emissions reported in boat building and repair were 68.6% of all styrene releases. A principal use of styrene in this industry is in the manufacture and repair of fiberglass ships and boats (primarily in small and medium-sized shipyards). Some fiberglass construction processes involve use of gelcoat, a polyester resin that contains approximately 35% styrene.

OSHA Carcinogens

Table 14-8 shows the on- and off-site releases of chemicals designated as OSHA carcinogens for the four-digit industries in the transportation equipment sector. (OSHA carcinogens and the bases for their designation appear in Box 1-9 in Chapter 1.) The industry with the largest releases of these chemicals was boat building and repairing (SIC code 3732). This industry's total was 10.2 million pounds of OSHA carcinogens, almost all of it released to air. The motor vehicle parts and accessories industry (SIC code 3714) was second with 4.4 million pounds; this included 2.5 million pounds emitted to air and 1.7 million pounds transferred off-site to disposal.

Four of the top 15 chemicals for total releases in this sector were OSHA carcinogens: styrene, trichloroethylene, dichloromethane, and asbestos (see Table 14-7). As noted, the great majority of releases of these chemicals were reported as air emissions, except for asbestos, which was largely released off-site (transferred to disposal). These four chemicals represented 91.0% of the sector's releases of OSHA carcinogens. The OSHA carcinogen with the next-highest releases in this sector was tetrachloroethylene, with 763,000 pounds.

Map 14-1. Total On- and Off-site Releases, 1996: Transportation Equipment, SIC Code 37



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

Table 14-7. The 15 Chemicals with the Largest Total On-site and Off-site Releases, 1996: Transportation Equipment, SIC Code 37 (in Rank Order)

CAS Number	Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection: Class I Wells Pounds	Underground Injection: Class II-V Wells Pounds	On-site Land Releases: RCRA Subtitle C Landfills Pounds	On-site Land Releases: Other On-site Land Releases Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
1330-20-7	Xylene (mixed isomers)	25,433,986	10,571	0	0	1,716	1	25,446,274	97,202	25,543,476
100-42-5	Styrene	12,941,411	250	0	0	39,050	500	12,981,211	379,030	13,360,241
--	Glycol ethers	8,864,990	267	0	0	0	22,463	8,887,720	88,120	8,975,840
108-88-3	Toluene	7,275,585	556	0	0	16,867	26,634	7,319,642	24,489	7,344,131
78-93-3	Methyl ethyl ketone	7,186,517	520	0	0	0	0	7,187,037	25,326	7,212,363
7439-96-5	Manganese	6,399,724	1,360	0	0	0	47,759	6,448,843	608,903	7,057,746
108-10-1	Methyl isobutyl ketone	6,299,251	5	0	0	0	0	6,299,259	6,082	6,305,341
71-36-3	n-Butyl alcohol	4,927,040	3,744	0	0	0	0	4,930,784	40,345	4,971,129
100-41-4	Ethylbenzene	3,073,692	27	0	0	0	0	3,073,719	20,891	3,094,610
67-56-1	Methanol	2,772,937	6,401	0	0	250	0	2,779,588	4,507	2,784,095
79-01-6	Trichloroethylene	2,362,096	13	0	0	0	2,640	2,364,749	36,217	2,400,966
71-55-6	1,1,1-Trichloroethane	2,256,684	5	0	0	0	11,280	2,267,969	19,879	2,287,848
75-09-2	Dichloromethane	2,258,379	18	0	0	0	0	2,258,397	3,684	2,262,081
95-63-6	1,2,4-Trimethylbenzene	1,973,604	5	0	0	0	0	1,973,609	24,727	1,998,336
1332-21-4	Asbestos (friable)	902	0	0	0	0	58,090	58,992	1,486,697	1,545,689
	Subtotal	94,026,798	23,742	0	0	57,886	169,367	94,277,793	2,866,099	97,143,892
	Total for SIC Code 37	102,693,635	224,148	0	0	86,685	618,616	103,623,084	7,729,685	111,352,769

Note: On-site Releases from Section 5 of Form R. **Off-site Releases** from Section 6 (off-site transfers to disposal) of Form R. One facility incorrectly reported 6,211,171 pounds of air emissions of manganese. The correct amount is 750. The total releases rank of manganese changes from 6 to 19.

Table 14-8. TRI On-site and Off-site Releases of OSHA Carcinogens by 4-digit SIC Code, 1996: Transportation Equipment, SIC Code 37 (in Rank Order)

SIC Code	Industry	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection: Class I Wells Pounds	Underground Injection: Class II-V Wells Pounds	On-site Land Releases: RCRA Subtitle C Landfills Pounds	On-site Land Releases: Other On-site Land Releases Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
3732	Boat Building & Repairing	10,145,665	0	0	0	0	500	10,146,165	11,007	10,157,172
3714	Motor Vehicle Parts & Accessories	2,531,867	1,764	0	0	39,304	69,473	2,642,408	1,709,046	4,351,454
	Multiple within SIC Code 37	1,150,640	227	0	0	10	5	1,150,882	198,514	1,349,396
3721	Aircraft	1,193,790	15	0	0	0	0	1,193,805	3,649	1,197,454
3792	Travel Trailers & Campers	661,158	0	0	0	0	0	661,158	48,931	710,089
3728	Aircraft Parts & Equipment, nec*	648,803	31	0	0	0	338	649,172	4,530	653,702
3713	Truck & Bus Bodies	599,129	5	0	0	0	0	599,134	18,737	617,871
3711	Motor Vehicles & Car Bodies	348,604	1,148	0	0	0	5	349,757	189,757	539,514
3716	Motor Homes	479,272	0	0	0	0	0	479,272	0	479,272
3731	Ship Building & Repairing	376,894	662	0	0	0	0	377,556	5,359	382,915
3724	Aircraft Engines & Engine Parts	221,182	1,529	0	0	0	25,633	248,344	121,279	369,623
3799	Transportation Equipment, nec*	243,183	0	0	0	0	250	243,433	6,299	249,732
3795	Tanks & Tank Components	165,583	0	0	0	1	0	165,584	1	165,585
3715	Truck Trailers	103,941	5	0	0	0	18,684	122,630	2,750	125,380
3743	Railroad Equipment	122,112	0	0	0	0	0	122,112	921	123,033
3769	Space Vehicle Equipment, nec*	23,550	0	0	0	0	0	23,550	0	23,550
3751	Motorcycles, Bicycles, & Parts	265	0	0	0	0	0	265	6,900	7,165
	Invalid SIC Code within SIC Code 37	1,759	0	0	0	0	0	1,759	0	1,759
	Subtotal	19,017,397	5,386	0	0	39,315	114,888	19,176,986	2,327,680	21,504,666
	Total for SIC Code 37	102,693,635	224,148	0	0	86,685	618,616	103,623,084	7,729,685	111,352,769

Note: On-site Releases from Section 5 of Form R. **Off-site Releases** from Section 6 (off-site transfers to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

Figure 14-7 shows the on- and off-site releases of the four-digit SIC codes with the largest OSHA carcinogen releases.

1996 TRI Chemicals in Waste for Transportation Equipment

Table 14-9 presents waste management data for the four-digit SIC codes in the transportation equipment sector. Nearly half (48.4%) of the production-related waste was recycled off-site, 171.8 million pounds of the 355.2-million-pound total. The next largest waste management activity was on- and off-site releases. On- and off-site releases totaled 105.7 million pounds, or 19.8% of the total waste managed. Other types of waste management (recycling, energy recovery, and treatment on-site, along with energy recovery and treatment off-site) were all less than 30 million pounds each. Figure 14-8 illustrates the distribution of on- and off-site waste management and quantities released for this sector.

Off-site recycling was reported in the largest amounts by makers of motor vehicle parts and accessories (SIC code 3714), with 98.7 million pounds, and motor vehicles and car bodies (SIC code 3711), with 41.6 million pounds. Off-site recycling by these two industries amounted to 39.5% of all production-related waste reported in the sector.

Distribution of production-related waste for the top four-digit SIC codes appears in Figure 14-9.

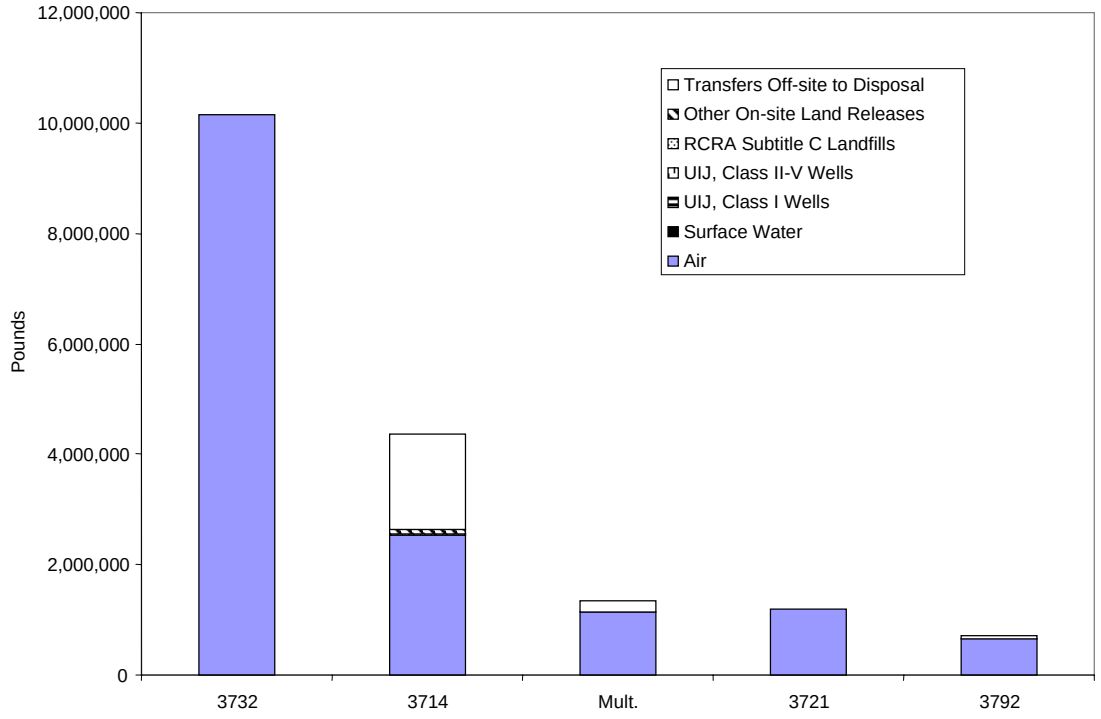


Figure 14-7. TRI On-site and Off-site Releases of OSHA Carcinogens, SIC Codes with Largest Totals, 1996: Transportation Equipment (SIC Code 37)

Note: On-site Releases from Section 5 of Form R. **Off-site Releases** from Section 6 (off-site transfers to disposal) of Form R. **UIJ** = underground injection. Forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category.

Table 14-9. Quantities of TRI Chemicals in Waste by 4-digit SIC Code, 1996: Transportation Equipment, SIC Code 37 (in Rank Order)

SIC Code	Industry	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Recycled Off-site Pounds	Energy Recovery Off-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Pounds	Non-Production-related Waste Pounds
3714	Motor Vehicle Parts & Accessories	9,082,191	13,903	7,717,242	98,735,280	3,977,606	5,841,070	20,165,629	145,532,921	33,970
3711	Motor Vehicles & Car Bodies	217,094	535,506	13,989,345	41,635,550	5,399,134	4,499,123	42,366,352	108,642,104	12,141
	Multiple within SIC Code 37	1,666,978	852,360	887,709	7,161,446	975,624	496,966	6,682,978	18,724,061	3,903
3724	Aircraft Engines & Engine Parts	4,146,424	0	1,195,067	9,831,291	38,782	2,305,458	957,804	18,474,826	64,854
3731	Ship Building & Repairing	51,741	0	2,688,622	5,163,707	794,377	115,178	3,714,678	12,528,303	0
3732	Boat Building & Repairing	700	0	500	83,831	294,110	56,281	11,332,445	11,767,867	37,995
3713	Truck & Bus Bodies	73,230	0	367,876	2,694,885	1,418,121	169,592	4,659,473	9,383,177	50
3721	Aircraft	533,700	0	1,094,128	806,133	908,320	466,111	4,474,178	8,282,570	23,050
3728	Aircraft Parts & Equipment, nec*	83,108	57,190	1,156,229	1,730,595	335,274	514,314	2,435,326	6,312,036	1,257
3743	Railroad Equipment	80,498	0	16,112	1,396,465	562,942	82,574	1,497,541	3,636,132	0
3715	Truck Trailers	93,375	0	22,400	857,599	132,700	68,556	1,755,132	2,929,762	1,183
3751	Motorcycles, Bicycles, & Parts	69,810	0	152,200	611,850	61,087	60	873,271	1,768,278	0
3716	Motor Homes	10,799	0	0	129,660	93,602	25,153	1,404,756	1,663,970	0
3799	Transportation Equipment, nec*	108,491	0	32,002	24,006	280,436	38,738	928,849	1,412,522	0
3792	Travel Trailers & Campers	5,500	0	0	325	28,574	185	1,315,541	1,350,125	2,460
3764	Space Propulsion Units & Parts	0	0	55,754	760,964	39,071	9,005	475,664	1,340,458	319
3769	Space Vehicle Equipment, nec*	142,910	0	39,600	65,200	31,570	32,862	213,155	525,297	0
3795	Tanks & Tank Components	156,390	0	24,707	98,857	0	40,968	181,589	502,511	0
3761	Guided Missiles & Space Vehicles	295	0	77,659	34,719	19,844	922	137,601	271,040	15,700
	Invalid SIC Code within SIC Code 37	0	0	0	2,464	23,044	0	95,842	121,350	0
	Total for SIC Code 37	16,523,234	1,458,959	29,517,152	171,824,827	15,414,218	14,763,116	105,667,804	355,169,310	196,882

Note: Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

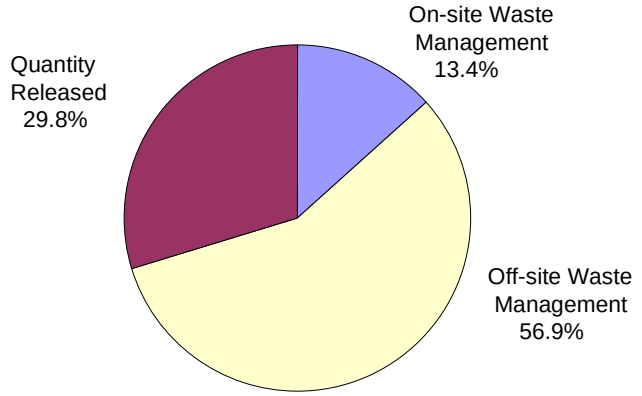


Figure 14-8. Distribution of TRI Production-related Waste, 1996: Transportation Equipment (SIC Code 37)

Note: Data from Section 8 of Form R.

Projected Quantities of TRI Chemicals in Waste

Facilities reporting in the transportation equipment sector projected relatively little change in their waste management through 1998, as shown in Table 14-10. (As explained in Chapter 1, facilities not only report current data but project waste management quantities for the next two years in their TRI submissions.) Total production-related waste is projected to decrease by just 0.7% (2.6 million pounds) over the 1996-1998 period. The largest component of this reduction is a projected decrease in quantities released on- and off-site of 4.7 million pounds, a 4.4% reduction. A decrease is also projected in off-site energy recovery, of 1.8 million pounds, or 11.9%.

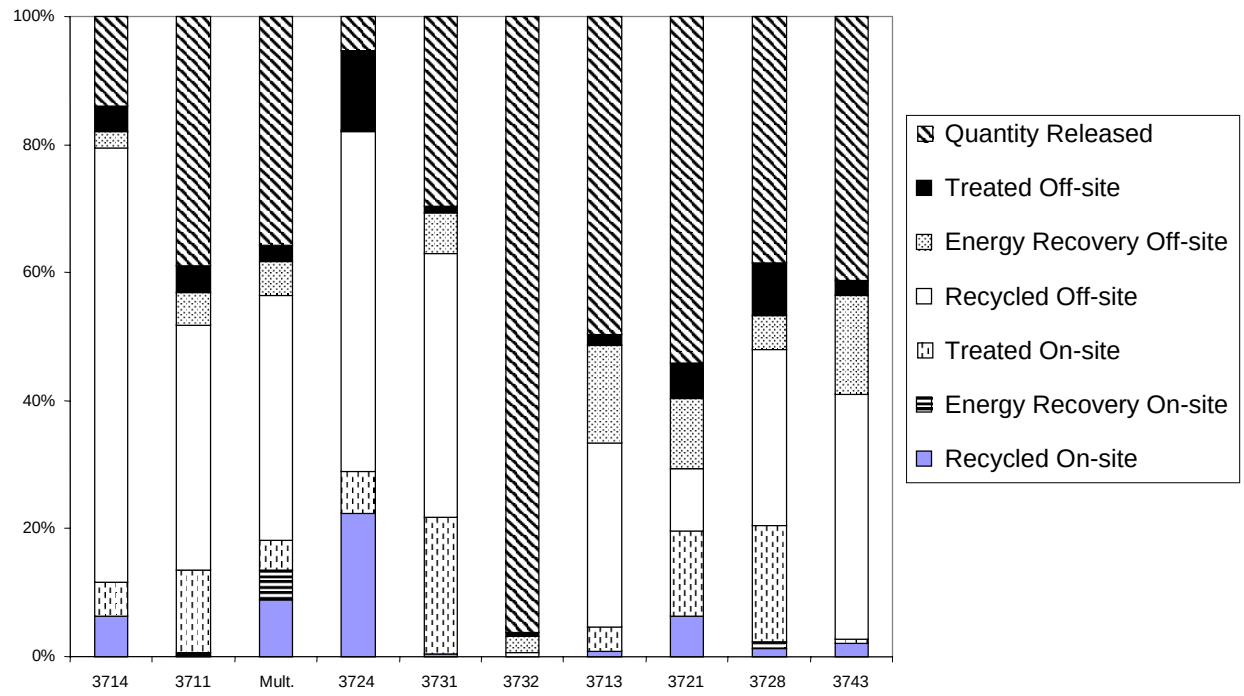


Figure 14-9. Distribution of Production-related Waste, SIC Codes with Largest Totals, 1996: Transportation Equipment (SIC Code 37)

Note: Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category.

Off-site recycling, the largest waste management option in this sector, was projected to increase 1.5% (2.6 million pounds) from 1996 to 1998, the net result of a projected decrease in the first year and increase in the second year. Other waste management options show smaller projected increases (in pounds) for the period.

The projected changes suggest little difference in the ways facilities in this sector expect to manage their TRI chemicals in waste. Off-site recycling would represent a slightly larger portion of overall waste management (increasing from 48.4% of production-related waste in 1996 to 49.5% in 1998). At the same time, releases would decrease from 29.8% of production-related waste, to 28.6%. These changes, while small in both percentage and absolute terms, nonetheless represent small positive movement, as measured by the environmental waste management hierarchy, explained in Chapter 1. In that hierarchy, recycling represents the most favorable waste management option for waste that cannot be or is not prevented in the first place, and releases represent the least favorable option.

Figure 14-10 shows the percentage change projected in quantities of TRI chemicals in waste for 1996-1998.

Source Reduction Activity

One form out of every five submitted in the transportation equipment sector reported undertaking one or more source reduction activities during 1996, as shown in Table 14-11. The largest number of forms (295) came from the motor vehicle parts and accessories industry (SIC code 3714) and the next-largest (136) came from the motor vehicles and car bodies industry (SIC code 3711). These numbers represent one-fifth of all forms from motor vehicle parts manufacturing and less than one-seventh of all forms in motor vehicle production. Because these two industries also

reported the largest releases and the largest production-related waste, their activities to reduce toxic chemicals at the source could have important results for the sector's performance. For both groups, good operating practices was the source reduction activity most frequently cited. Raw material and process modifications, which are more likely to represent innovative source reduction projects, were the activities cited on the next largest number of forms in both industries.

Year-to-Year Comparisons for Transportation Equipment

1995-1996 TRI Data for Transportation Equipment

From 1995 to 1996, the number of forms submitted in the transportation equipment sector decreased by

Table 14-10. Current Year and Projected Quantities of TRI Chemicals in Waste, 1996-1998: Transportation Equipment, SIC Code 37

Waste Management Activity	Current Year 1996		Projected 1997		Projected 1998	
	Total Pounds	Percent of Total	Total Pounds	Percent of Total	Total Pounds	Percent of Total
On-site Waste Management						
Recycled On-site	16,523,234	4.7	16,374,031	4.7	17,235,383	4.9
Energy Recovery On-site	1,458,959	0.4	1,512,020	0.4	1,499,329	0.4
Treated On-site	29,517,152	8.3	30,422,443	8.7	29,923,155	8.5
Off-site Waste Management						
Recycled Off-site	171,824,827	48.4	169,806,023	48.5	174,465,832	49.5
Energy Recovery Off-site	15,414,218	4.3	13,423,889	3.8	13,582,601	3.9
Treated Off-site	14,763,116	4.2	14,951,267	4.3	14,918,751	4.2
Quantity Released On- and Off-site	105,667,804	29.8	103,278,981	29.5	100,966,087	28.6
Total Production-related Waste for SIC Code 37	355,169,310	100.0	349,768,654	100.0	352,591,138	100.0

Waste Management Activity	Projected Change 1996-1997 Percent	Projected Change 1997-1998 Percent	Projected Change 1996-1998 Percent
On-site Waste Management			
Recycled On-site	-0.9	5.3	4.3
Energy Recovery On-site	3.6	-0.8	2.8
Treated On-site	3.1	-1.6	1.4
Off-site Waste Management			
Recycled Off-site	-1.2	2.7	1.5
Energy Recovery Off-site	-12.9	1.2	-11.9
Treated Off-site	1.3	-0.2	1.1
Quantity Released On- and Off-site	-2.3	-2.2	-4.4
Total Production-related Waste for SIC Code 37	-1.5	0.8	-0.7

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

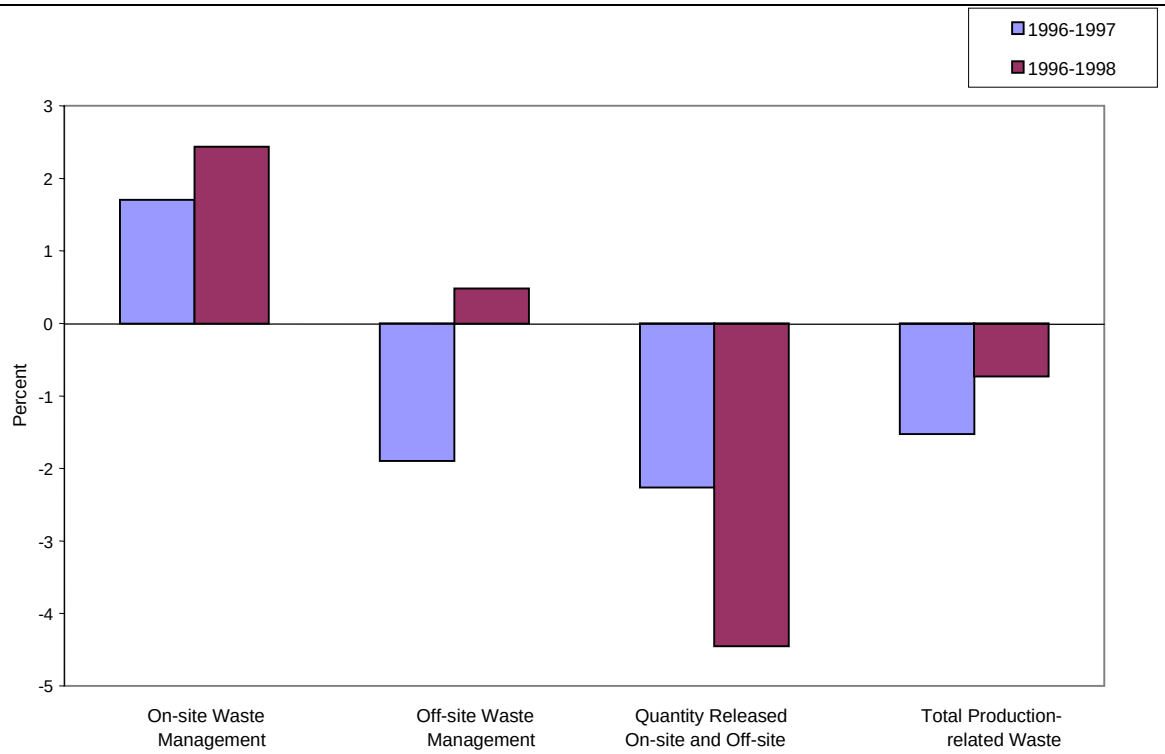


Figure 14-10. Projected Percentage Change in Quantities of TRI Chemicals in Waste, 1996-1998: Transportation Equipment (SIC Code 37)

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

4.6% (approximately 200 fewer forms in 1996). As shown in Table 14-12, the number of Form A certification statements increased markedly: 37.2% (an increase of 58 forms). This may reflect more widespread awareness of the Form A certification statement in its second year of availability. (The Form A certification statement is explained in Chapter 1.)

On- and Off-site Releases

Total on- and off-site releases, also shown in Table 14-12, decreased from 121.2 million pounds in 1995 to 111.4 million pounds in 1996, a decrease of 8.1%. The change in releases to the environmental media varied considerably. Air emissions, by far the largest release type in this sector, decreased 6.9% (or 7.6 million pounds). This represented a decrease in point source emissions of 9.0 million pounds (10.7% reduction), partly offset by a 1.3 million-pound increase in fugitive emissions (5.0% increase). This analysis includes a facility reporting error of 6.2 million pounds of air emissions in 1996. Without this error, percentage reductions would be larger.

As noted earlier in this chapter, transportation equipment manufacturers reported much smaller amounts in the other release types. However, small changes in absolute terms resulted in significant changes in percentage terms: a 71.6% increase in on-site land releases and a 23.4% decrease in off-site releases (transfers to disposal).

Figure 14-11 shows the percentage changes by release type for the transportation equipment sector.

Table 14-11. Number of Forms Reporting Source Reduction Activity, 1996: Transportation Equipment, SIC Code 37

SIC Code	Industry	Total Forms Number	Forms Reporting Source Reduction Activities: Number	Forms Reporting Source Reduction Activities: Percent of All Forms Percent	Category of Source Reduction Activity: Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Material Modifi-cations Number	Process Modifi-cations Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifi-cations Number
3711	Motor Vehicles & Car Bodies	1,006	136	13.5	71	12	13	36	27	1	21	9
3713	Truck & Bus Bodies	238	40	16.8	11	12	2	17	2	6	7	2
3714	Motor Vehicle Parts & Accessories	1,389	295	21.2	136	27	38	56	65	26	33	32
3715	Truck Trailers	110	23	20.9	9	2	2	5	3	0	7	0
3716	Motor Homes	71	23	32.4	1	3	0	15	0	3	7	1
3721	Aircraft	154	56	36.4	16	12	6	9	13	9	25	2
3724	Aircraft Engines & Engine Parts	199	30	15.1	5	3	1	4	20	7	0	0
3728	Aircraft Parts & Equipment, nec*	172	37	21.5	13	7	6	4	8	8	6	4
3731	Ship Building & Repairing	171	32	18.7	19	14	8	2	4	0	17	0
3732	Boat Building & Repairing	287	71	24.7	20	7	3	9	26	7	18	6
3743	Railroad Equipment	83	28	33.7	15	0	1	1	1	0	10	1
3751	Motorcycles, Bicycles, & Parts	30	0	0.0	0	0	0	0	0	0	0	0
3761	Guided Missiles & Space Vehicles	11	3	27.3	1	0	0	0	1	1	0	0
3764	Space Propulsion Units & Parts	8	3	37.5	2	0	0	0	0	1	0	0
3769	Space Vehicle Equipment, nec*	17	10	58.8	7	0	1	2	4	3	3	2
3792	Travel Trailers & Campers	50	21	42.0	8	1	4	7	5	0	3	1
3795	Tanks & Tank Components	20	9	45.0	5	0	1	2	2	1	1	1
3799	Transportation Equipment, nec*	53	23	43.4	9	0	0	5	1	0	10	2
	Multiple within SIC Code 37	252	70	27.8	38	2	5	15	13	11	7	6
	Invalid SIC Code within SIC Code 37	10	4	40.0	0	4	2	0	0	2	0	0
	Total for SIC Code 37	4,331	914	21.1	386	106	93	189	195	86	175	69

Note: Forms with more than one 4-digit SIC code within code 37 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

Other On-site Waste Management

Table 14-12 also shows the changes from 1995 to 1996 in this sector's on-site waste management. The overall decrease of 42.2% was accomplished primarily in on-site recycling. In 1995, recycling was the largest on-site waste management option, with 48.4 million pounds. A reduction of two thirds (65.9%, or 31.9 million pounds), to 16.5 million pounds in 1996, made on-site recycling the second-largest type of on-site management, behind treatment. (More than half of this reduction was the action of one facility, Preferred Technical Group, Inc., in Columbia City, Indiana, which eliminated a vapor degreaser in the plant, substituting an aqueous process. This facility reported 18.3 million pounds of on-site recycling of trichloroethylene in 1995 and none in 1996.)

On-site treatment also decreased, by 6.2%, or 1.9 million pounds. Energy recovery, much smaller in absolute amounts, dropped by more than one third (35.7%), or 809,000 pounds.

Transfers Off-site for Further Waste Management

All but one type of transfers off-site for further waste management decreased from 1995 to 1996 for the transportation equipment sector. As shown in Table 14-12, the exception was an increase of 12.4% (616,000 pounds) in transfers to POTWs.

The largest transfer type—to recycling—showed very little change, a decrease of 0.4%. This was a reduction of 688,000 pounds, from 165.7 million pounds in 1995 to 165.0 million pounds in 1996. Reductions in energy recovery and treatment were notably larger in both pounds and percentage. Reporting of energy recovery decreased 10.2%, or 1.6 million pounds. Treatment decreased 22.0%, or 2.4 million pounds.

Table 14-12. Comparison of TRI On-site and Off-Site Releases, Other On-site Waste Management, and Transfers Off-site for Further Waste Management, 1995-1996: Transportation Equipment, SIC Code 37

	1995	1996	Change 1995 to 1996
	Number	Number	Percent
Total Facilities	1,298	1,248	-3.9
Total Forms	4,538	4,331	-4.6
Form Rs	4,382	4,117	-6.0
Form As	156	214	37.2
	Pounds	Pounds	Percent
On-site Releases			
Total Air Emissions	110,305,552	102,693,635	-6.9
Fugitive Air	26,941,770	28,283,393	5.0
Point Source Air	83,363,782	74,410,242	-10.7
Surface Water Discharges	350,644	224,148	-36.1
Underground Injection	0	0	--
On-site Land Releases	410,995	705,301	71.6
Total On-site Releases	111,067,191	103,623,084	-6.7
Off-site Releases			
Transfers Off-site to Disposal	10,087,330	7,729,685	-23.4
Total On- and Off-site Releases	121,154,521	111,352,769	-8.1
Other On-site Waste Management			
Recycled On-site	48,440,164	16,523,234	-65.9
Energy Recovery On-site	2,268,436	1,458,959	-35.7
Treated On-site	31,454,243	29,517,152	-6.2
Total Other On-site Waste Management	82,162,843	47,499,345	-42.2
Transfers Off-site for Further Waste Management			
Transfers to Recycling	165,674,410	164,986,403	-0.4
Transfers to Energy Recovery	15,532,668	13,944,925	-10.2
Transfers to Treatment	11,121,508	8,676,026	-22.0
Transfers to POTWs	4,962,177	5,577,802	12.4
Other Off-site Transfers	500	8,146	1,529.2
Total Transfers Off-site for Further Waste Management	197,291,263	193,193,302	-2.1

Note: On-site Releases from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Other On-site Waste Management** from Section 8 of Form R. **Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. Breakdown of Underground Injection and On-site Land Releases not required in 1995. Other Off-site Transfers are transfers reported without a valid waste management code. One facility incorrectly reported 6,211,171 pounds of fugitive air emissions for 1996. The correct amount is 750 pounds. The percentage change from 1995 to 1996 in total air emissions changes from –6.9% to –12.5%, in fugitive air emissions changes from 5.0% to –18.1%, in total on-site releases changes from –6.7% to –12.3%, and in total on- and off-site releases changes from –8.1% to –13.2%.

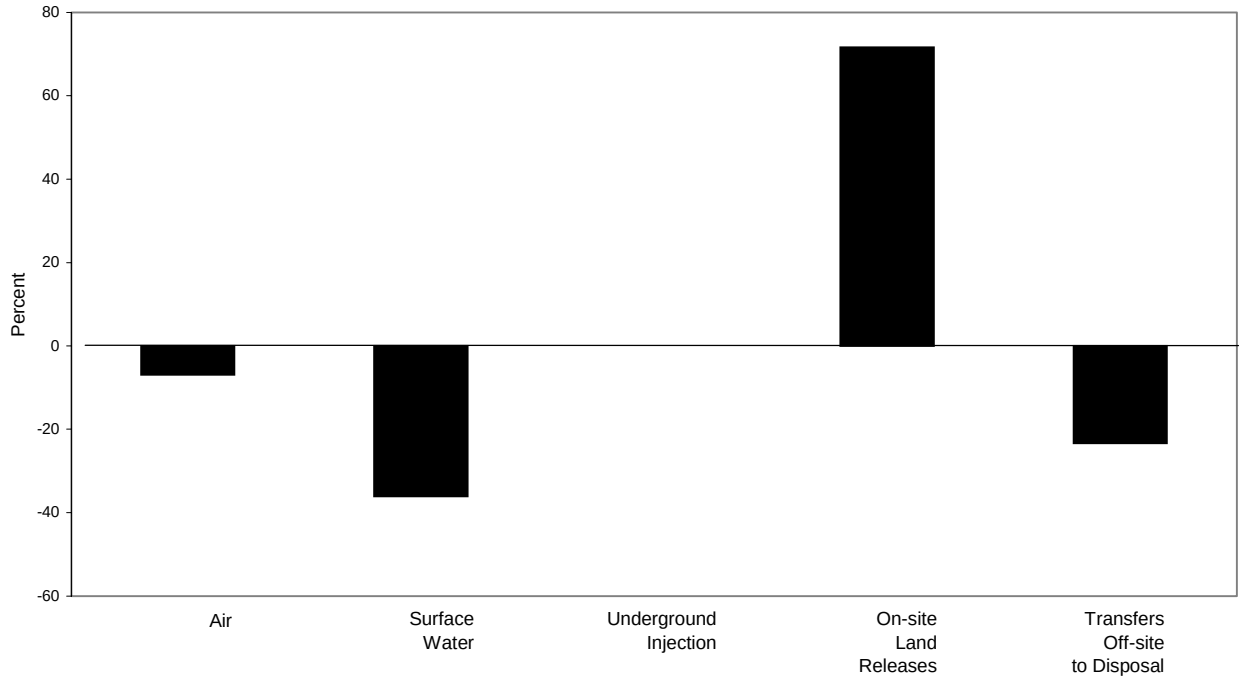


Figure 14-11. Percentage Change in On-site and Off-site Releases, 1995-1996: Transportation Equipment (SIC Code 37)

Note: On-site Releases from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. Breakdown of Underground Injection and On-site Land Releases not required in 1995. One facility incorrectly reported 6,211,171 pounds of fugitive air emissions for 1996. The correct amount is 750 pounds. The percentage change from 1995 to 1996 in total air emissions changes from –6.9% to –12.5%.

Changes in SIC Codes

As indicated in facility descriptions below, some facilities report different SIC codes over time. This may reflect new or discontinued lines of production, or it may represent a different understanding of how SIC code designations relate to a facility's business activities. These changes can contribute—sometimes largely—to apparent increases or decreases across comparison years in the amounts reported by the four-digit, or even two-digit, SIC codes.

1988-1996 TRI Data for Transportation Equipment

As explained in Chapter 1, comparisons from the 1988 TRI baseline year to the current year rely on the list of "core" TRI chemicals that were reportable, with the same reporting definition, in all years. These multi-year comparisons also review only the data elements that were collected in all years, which excludes from this section any analysis that distinguishes RCRA subtitle C landfills from other land releases as well as analysis based on the types of underground injection wells. On-site waste management data and transfers off-site to recycling and to energy recovery have been collected only since 1991; these data are included, but cannot be compared across the full 1988-1996 period.

On- and off-site releases of the "core" chemicals in the transportation equipment sector declined by half (49.5%) from 1988 to 1996, as shown in Table 14-13. This was a reduction of 103.2 million pounds. The largest component of this reduction was air emissions, also the largest release type for the sector. Point source emissions dropped by 42.6%, or 53.0 million pounds. Another 34.5 million pounds of the decrease was reported in fugitive emissions, a 56.0% decrease. Altogether,

Table 14-13. Comparison of TRI On-site Releases, Other On-site Waste Management, and Transfers Off-site for Further Waste Management, 1988 and 1994-1996: Transportation Equipment, SIC Code 37

	1988 Number	**1994** Number	**1995** Number	**1996** Number	**Change 1988 to 1996** Percent
Total Facilities	1,146	1,251	1,241	1,196	4.4
Total Forms	4,038	4,131	4,018	3,840	-4.9
Form Rs	4,038	4,131	3,924	3,699	-8.4
Form As	NA	NA	94	141	NA
	Pounds	Pounds	Pounds	Pounds	Percent
On-site Releases					
Total Air Emissions	185,947,325	119,327,514	105,335,919	98,432,463	-47.1
Fugitive Air	61,559,358	29,842,389	25,157,276	27,078,402	-56.0
Point Source Air	124,387,967	89,485,125	80,178,643	71,354,061	-42.6
Surface Water Discharges	272,596	65,549	67,423	48,537	-82.2
Underground Injection	76,185	5	0	0	-100.0
On-site Land Releases	2,333,399	188,560	322,550	659,438	-71.7
Total On-site Releases	188,629,505	119,581,628	105,725,892	99,140,438	-47.4
Off-site Releases					
Transfers Off-site to Disposal	19,762,341	8,557,725	9,020,364	6,091,120	-69.2
Total On- and Off-site Releases	208,391,846	128,139,353	114,746,256	105,231,558	-49.5
Other On-site Waste Management					
Recycled On-site	NA	53,488,818	47,899,715	16,066,124	NA
Energy Recovery On-site	NA	1,683,039	2,243,166	1,429,559	NA
Treated On-site	NA	26,110,553	23,769,239	25,528,963	NA
Total Other On-site Waste Management	NA	81,282,410	73,912,120	43,024,646	NA
Transfers Off-site for Further Waste Management					
Transfers to Recycling	NA	161,844,672	164,554,642	162,201,692	NA
Transfers to Energy Recovery	NA	16,396,952	15,045,145	13,608,973	NA
Transfers to Treatment	24,158,554	6,118,487	4,895,860	4,560,417	-81.1
Transfers to POTWs	4,016,448	3,156,448	2,365,799	2,738,328	-31.8
Other Off-site Transfers	3,632,015	2,260,713	500	8,146	-99.8
Total Transfers Off-site for Further Waste Management	NA	189,777,272	186,861,946	183,117,556	NA

Note: Does not include delisted chemicals, chemicals added in 1990, 1991, 1994, and 1995, and aluminum oxide, ammonia, hydrochloric acid, and sulfuric acid. **On-site Releases** from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. **Other On-site Waste Management** from Section 8 of Form R. **Transfers Off-site for Further Waste Management** from Section 6 (excluding transfers off-site to disposal) of Form R. Breakdown of Underground Injection and On-site Land Releases not required before 1996. For 1994-1996, Other Off-site Transfers are transfers reported without a valid waste management code. For 1988, Other Off-site Transfers are transfers reported without a valid waste management code or codes not required to be reported in 1988. One facility incorrectly reported 6,211,171 pounds of fugitive air emissions for 1996. The correct amount is 750 pounds. The percentage change from 1988 to 1996 in total air emissions changes from –47.1% to –50.4%, in fugitive air emissions changes from –56.0% to –66.1%, in total on-site releases changes from –47.4% to –50.7%, and in total on- and off-site releases changes from –49.5% to –52.2%. **NA:** not required to be reported in that year.

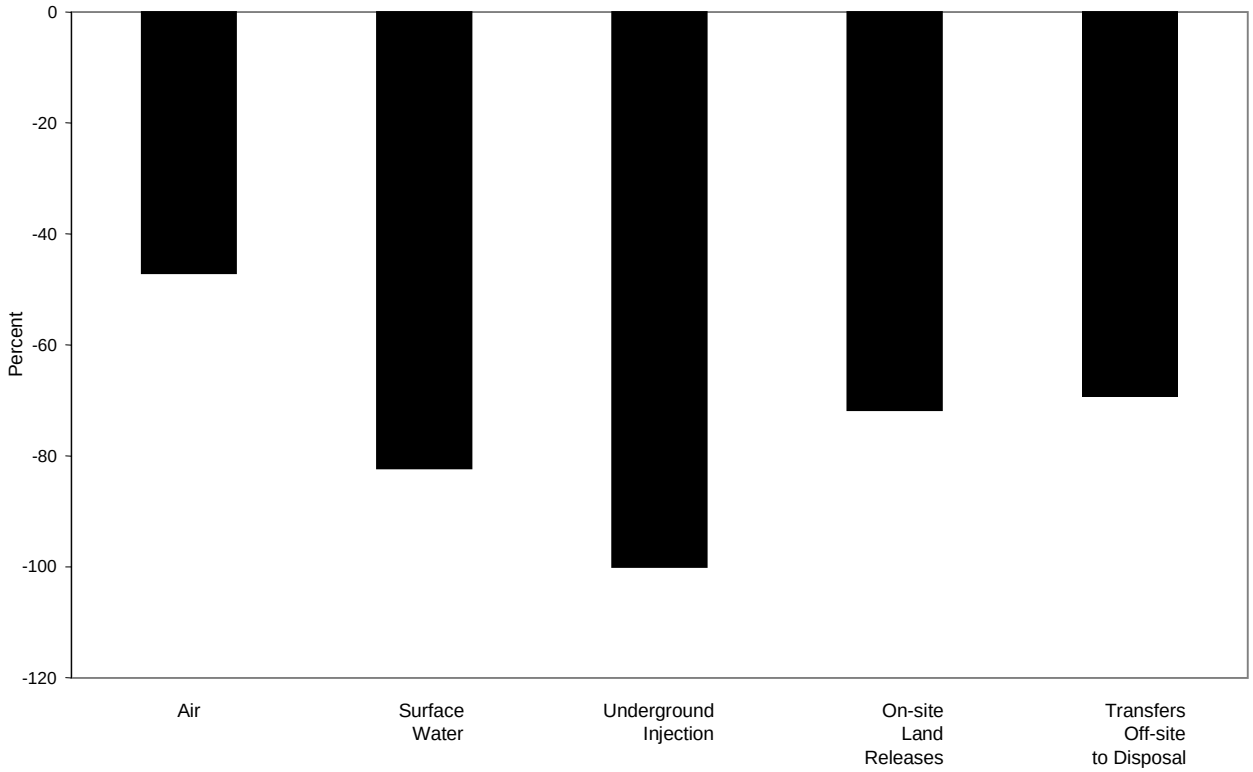


Figure 14-12. Percentage Change in On-site and Off-site Releases, 1988-1996: Transportation Equipment (SIC Code 37)

Note: Does not include delisted chemicals, chemicals added in 1990, 1991, 1994, and 1995, and aluminum oxide, ammonia, hydrochloric acid, and sulfuric acid. **On-site Releases** from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. Breakdown of Underground Injection and On-site Land Releases not required before 1996. One facility incorrectly reported 6,211,171 pounds of total air emissions for 1996. The correct amount is 750 pounds. The percentage change from 1988 to 1996 in total air emissions changes from –47.1% to –50.4%.

releases to air decreased 47.1%, or 87.5 million pounds. This analysis includes a facility reporting error of 6.2 million pounds of air emissions in 1996. Without this error, percentage reductions would be larger.

Other on-site release types also decreased, as shown in Table 14-13. On-site land releases decreased 1.7 million pounds, or 71.7%. Surface water discharges decreased 224,000 pounds, or 82.2%. Underground injection was reported in 1988 (76,000 pounds), but not in 1996. Off-site releases (transfers to disposal) decreased by more than two-thirds (69.2%), a reduction of 13.7 million pounds.

Figure 14-12 displays the percentage of percentage change in on- and off-site releases by medium.

On-site waste management and transfers off-site for recycling or energy recovery were not collected in 1988. For the 1994-1996 period, on-site waste management in this sector decreased 38.3 million pounds. The great majority of this reduction (37.4 million pounds) was reported in on-site recycling.

Other categories also showed decreases, except for transfers off-site to recycling. This category showed little change since 1994 (a net increase of 357,000 pounds).

For the two transfer categories reported across the full 1988-1996 comparison period, reductions amounted to 81.1% (19.6 million pounds) in treatment and 31.8% (1.3 million pounds) in transfers to POTWs.

Although the sector experienced little net expansion in production during this period, some new facilities opened and others expanded production as a result of joint ventures between U.S. and foreign-owned companies. Decreases in releases continued in the more recent years, even as the sector recovered its earlier production levels, as noted earlier in this chapter.

1988-1996 Data for Four-Digit Industries in Transportation Equipment

Tables 14-14 through 14-16 summarize data for 1988 and 1994-1996 for industries at the four-digit SIC code level within SIC code 37. The tables present, respectively, on- and off-site releases, other on-site waste management, and transfers off-site for further waste management.

On- and Off-site Releases

Two industries reported decreases in on- and off-site releases of 22 million pounds from 1988 to 1996, the largest such decreases. These were the two industries with the largest releases: motor vehicle parts and accessories (SIC code 3714), with a 22.4 million-pound reduction, and motor vehicles and car bodies (SIC code 3711), with a decrease of 22.1 million pounds. One other industry had a decrease of more than 10 million pounds: aircraft production (SIC code 3721), with 17.3 million pounds less in releases in 1996 than in 1988.

Producers of motor vehicle parts and accessories reported their largest reductions in air emissions, a decrease of 14.4 million pounds across the comparison period. Another 6.5 million-pound decrease was reported in off-site releases (transfers to disposal) and 1.3 million pounds in on-site land releases. Almost all of the reduction for makers of motor vehicles and car bodies was in air emissions (20.6 million pounds), along with 1.5 million pounds in off-site releases. In the aircraft industry, air emissions were also the largest area of reduction (13.7 million pounds), and off-site releases were reduced by 3.5 million.

A few industries reported increases in total on- and off-site releases over the period. The largest occurred in manufacture of travel trailers and campers (653,000 pound increase, SIC code 3792). This increase occurred before 1994; since that time, releases have been declining for this industry.

Table 14-14 provides release data for all four-digit SIC codes in the transportation equipment sector, for 1988-1996.

Other On-site Waste Management

One of the dominant industries in the transportation equipment sector also reported large decreases in other on-site waste management since 1994 (on-site waste management data were not collected in 1988). The decrease for motor vehicle parts and accessories was 36.5 million pounds; the bulk of this reduction (34.8 million pounds) was in on-site recycling and much of it occurred from 1995 to 1996.

The next largest decrease occurred in reporting for miscellaneous aircraft parts and equipment (SIC code 3728). This was a net difference of 4.1 million pounds for 1994-1996. The largest component was a reduction in on-site recycling. For this industry, both on-site recycling and on-site waste management as a whole increased in the first year of this period (1994 to 1995) and decreased substantially for 1996. Total other on-site waste management was 5.2 million pounds in 1994, 7.0 million pounds in 1995, and 1.1 million pounds in 1996.

Smaller changes were reported in on-site waste management by motor vehicle and car body manufacturers (SIC code 3711). In this industry, recycling and treatment increased for 1994-1996, but this was offset by a decrease in energy

Table 14-14. TRI On-site and Off-site Releases by 4-digit SIC Code, 1988 and 1994-1996: Transportation Equipment, SIC Code 37

SIC Code	Industry	Year	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
3711	Motor Vehicles & Car Bodies	96	39,686,967	9,062	0	15,310	39,711,339	1,087,718	40,799,057
		95	42,355,683	250	0	15,882	42,371,815	1,077,061	43,448,876
		94	47,429,041	250	0	11,767	47,441,058	1,294,303	48,735,361
		88	60,240,168	40,477	0	42,463	60,323,108	2,615,658	62,938,766
3713	Truck & Bus Bodies	96	4,599,018	1,384	0	47,986	4,648,388	130,772	4,779,160
		95	5,851,690	4,190	0	22,215	5,878,095	113,924	5,992,019
		94	7,156,982	4,138	0	21,164	7,182,284	102,089	7,284,373
		88	8,494,438	0	0	32,448	8,526,886	459,794	8,986,680
3714	Motor Vehicle Parts & Accessories	96	14,384,103	9,950	0	362,885	14,756,938	3,506,949	18,263,887
		95	15,625,573	7,576	0	273,783	15,906,932	4,408,018	20,314,950
		94	18,042,377	9,881	0	104,502	18,156,760	4,266,570	22,423,330
		88	28,832,435	125,338	1,378	1,656,308	30,615,459	10,019,878	40,635,337
3715	Truck Trailers	96	1,085,881	265	0	115,727	1,201,873	5,005	1,206,878
		95	2,077,484	20	0	1,500	2,079,004	604,029	2,683,033
		94	2,640,233	26	0	15,400	2,655,659	73,574	2,729,233
		88	2,331,013	0	0	0	2,331,013	55,957	2,386,970
3716	Motor Homes	96	1,222,812	0	0	0	1,222,812	1,438	1,224,250
		95	869,169	0	0	0	869,169	10,656	879,825
		94	1,293,916	0	0	0	1,293,916	1,270	1,295,186
		88	955,662	0	0	0	955,662	0	955,662
3721	Aircraft	96	4,118,781	1,719	0	15,866	4,136,366	62,547	4,198,913
		95	5,009,119	6,614	0	6,156	5,021,889	71,280	5,093,169
		94	5,881,852	2,450	0	1,941	5,886,243	356,850	6,243,093
		88	17,776,433	1,049	59,466	111,258	17,948,206	3,515,553	21,463,759
3724	Aircraft Engines & Engine Parts	96	326,661	3,151	0	28,773	358,585	196,579	555,164
		95	730,347	1,849	0	5	732,201	173,477	905,678
		94	1,290,320	2,717	0	20	1,293,057	135,770	1,428,827
		88	9,119,517	5,295	0	59,878	9,184,690	457,502	9,642,192
3728	Aircraft Parts & Equipment, nec*	96	2,363,767	324	0	15,949	2,380,040	46,922	2,426,962
		95	3,329,128	813	0	200	3,330,141	247,934	3,578,075
		94	3,459,368	1,031	5	325	3,460,729	163,858	3,624,587
		88	8,730,101	27,019	0	0	8,757,120	406,996	9,164,116
3731	Ship Building & Repairing	96	2,679,455	19,752	0	23,922	2,723,129	191,201	2,914,330
		95	2,405,561	29,715	0	1,500	2,436,776	248,980	2,685,756
		94	2,469,290	19,161	0	25,065	2,513,516	332,152	2,845,668
		88	4,010,237	1,010	250	0	4,011,497	608,486	4,619,983
3732	Boat Building & Repairing	96	11,196,267	0	0	27,134	11,223,401	11,007	11,234,408
		95	12,177,948	0	0	505	12,178,453	4,540	12,182,993
		94	10,972,637	0	0	4,194	10,976,831	3,668	10,980,499
		88	13,225,260	0	0	17,251	13,242,511	103,601	13,346,112
3743	Railroad Equipment	96	1,252,611	1	0	1	1,252,613	172,273	1,424,886
		95	1,389,483	765	0	0	1,390,248	170,921	1,561,169
		94	1,496,574	15	0	0	1,496,589	408,962	1,905,551
		88	2,016,238	750	1,000	0	2,017,988	191,956	2,209,944

Note: On-site Releases from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category. One facility reported 6,211,171 pounds of fugitive air emissions for 1996 under multiple codes within SIC code 37. The correct amount is 750 pounds.
***nec:** not elsewhere classified.

Table 14-14. TRI On-site and Off-site Releases by 4-digit SIC Code, 1988 and 1994-1996: Transportation Equipment, SIC Code 37, Continued

			On-site Releases					Off-site Releases	
SIC Code	**Industry**	**Year**	**Total Air Emissions** Pounds	**Surface Water Discharges** Pounds	**Underground Injection** Pounds	**Releases to Land** Pounds	**Total On-site Releases** Pounds	**Transfers Off-site to Disposal** Pounds	**Total On- and Off-site Releases** Pounds
3751	Motorcycles, Bicycles, & Parts	96	721,200	0	0	0	721,200	9,050	730,250
		95	983,016	510	0	0	983,526	10,050	993,576
		94	987,095	760	0	0	987,855	11,550	999,405
		88	319,813	1,500	0	0	321,313	6,070	327,383
3761	Guided Missiles & Space Vehicles	96	95,740	0	0	0	95,740	35,314	131,054
		95	204,683	0	0	0	204,683	80,166	284,849
		94	443,318	0	0	0	443,318	7	443,325
		88	3,564,892	250	0	216,520	3,781,662	54,950	3,836,612
3764	Space Propulsion Units & Parts	96	278,415	0	0	0	278,415	840	279,255
		95	842,627	5,517	0	0	848,144	12,838	860,982
		94	833,041	5,517	0	0	838,558	13,364	851,922
		88	5,961,063	0	0	15,221	5,976,284	123,318	6,099,602
3769	Space Vehicle Equipment, nec*	96	203,112	0	0	0	203,112	256	203,368
		95	12,830	0	0	0	12,830	0	12,830
		94	27,078	0	0	0	27,078	0	27,078
		88	589,170	0	0	0	589,170	87,642	676,812
3792	Travel Trailers & Campers	96	1,097,216	0	0	0	1,097,216	49,181	1,146,397
		95	1,437,374	0	0	0	1,437,374	108,747	1,546,121
		94	1,596,209	0	0	0	1,596,209	88,165	1,684,374
		88	439,875	0	0	0	439,875	53,602	493,477
3795	Tanks & Tank Components	96	178,333	0	0	87	178,420	1,185	179,605
		95	121,301	0	0	0	121,301	176	121,477
		94	126,503	0	0	0	126,503	377	126,880
		88	677,345	25,843	0	7,742	710,930	30,773	741,703
3799	Transportation Equipment, nec*	96	897,741	28	0	547	898,316	7,101	905,417
		95	1,129,420	51	0	769	1,130,240	12,035	1,142,275
		94	1,261,867	38	0	0	1,261,905	12,569	1,274,474
		88	502,292	0	0	0	502,292	1,500	503,792
	Multiple within SIC Code 37	96	11,948,551	2,901	0	5,251	11,956,703	574,686	12,531,389
		95	7,231,608	1,101	0	5	7,232,714	1,652,100	8,884,814
		94	9,652,733	11,271	0	32	9,664,036	1,249,723	10,913,759
		88	11,926,192	4,302	14,091	147,310	12,091,895	594,743	12,686,638
	Invalid SIC Code within SIC Code 37	96	95,832	0	0	0	95,832	1,096	96,928
		95	1,551,875	8,452	0	30	1,560,357	13,432	1,573,789
		94	2,267,080	8,294	0	4,150	2,279,524	42,904	2,322,428
		88	6,235,181	39,763	0	27,000	6,301,944	374,362	6,676,306
	Total for SIC Code 37	96	98,432,463	48,537	0	659,438	99,140,438	6,091,120	105,231,558
		95	105,335,919	67,423	0	322,550	105,725,892	9,020,364	114,746,256
		94	119,327,514	65,549	5	188,560	119,581,628	8,557,725	128,139,353
		88	185,947,325	272,596	76,185	2,333,399	188,629,505	19,762,341	208,391,846

Note: On-site Releases from Section 5 of Form R and **Off-site Releases** from Section 6 (transfers off-site to disposal) of Form R. Forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category. One facility reported 6,211,171 pounds of fugitive air emissions for 1996 under multiple codes within SIC code 37. The correct amount is 750 pounds.
***nec:** not elsewhere classified.

recovery. The net reduction in other on-site waste management of 450,000 pounds placed this industry third for decreases for the period.

The ship building and repairing industry (SIC code 3731) reported the largest increase, 2.6 million pounds. One facility accounted for this increase in 1996. In previous years, the facility's owners, adding barge services and a drydock to the facility's operations, classified its operations in SIC code 4491, outside TRI's reporting criteria. New owners in 1996 determined that more than 50% of the facility's income came from ship building and repairing (SIC code 3731). Accordingly, the facility filed in this SIC code for 1996.

On-site waste management data for 1994-1996 appear in Table 14-15.

Transfers Off-site for Further Waste Management

Four industries reported decreases of more than 1 million pounds each in transfers off-site for further waste management since 1994 (data for some types of off-site transfers were not collected in 1988). Leading these industries was the manufacture of truck trailers (SIC code 3715), with a 5.2 million-pound decrease. More than half of this reduction was reported in transfers to recycling (2.8 million pounds).

The multiple-codes group—forms submitted by facilities that used more than one SIC code to describe their operation—had the second largest reduction, a net decrease of 2.6 million pounds. As is typical of this more diverse group, no single transfer type accounted for this large decrease. Other industries with large reductions were aircraft engines and engine parts (1.7 million pounds, SIC code 3724) and railroad equipment (1.2 million pounds, SIC code 3743).

Two industries reported large increases in transfers off-site for further waste management from 1994 to 1996. These were ship building and repairing (SIC code 3731), with a net increase of 4.5 million pounds, and motor vehicles and car bodies (SIC code 3711) with an increase of 2.3 million pounds. In both cases, the increase occurred in transfers to recycling, only slightly offset by smaller reductions in other transfer types since 1994.

Table 14-16 provides data on transfers off-site for further waste management for all four-digit SIC codes in the transportation equipment sector.

Facilities with Large Increases and Decreases in Releases, 1988-1996

The facility with the largest increase in releases was Toyota Motor Manufacturing Kentucky in Georgetown, Kentucky (SIC codes 3711 and 3714), with a 2.0 million-pound increase. Over one-fourth of the change was accounted for by an increase in air emissions of xylene (mixed isomers). The facility, an automobile manufacturing plant, produced 18,527 vehicles in 1988 and 385,657 in 1996. Toyota attributes the increase in xylene emissions to the increase in production. Xylene is a component of the paint used on the new vehicles.

Saturn Corporation in Spring Hill, Tennessee (did not report in 1988, SIC code 3711 in 1996), ranked second for increases with a 1.2 million-pound change. The automobile manufacturing facility came into production in 1990; therefore, there were no data for 1988. There were 556,000 pounds of glycol ethers, a constituent of paint, reported as released to air in 1996.

Subaru-Isuzu Automotive, Inc., in Lafayette, Indiana (did not report in 1988, SIC code 3711 in 1996), was third in increases with 1.1 million pounds. This automobile manufacturing plant did not come into operation until after the 1988 reporting year. Therefore, the data for 1996 equals the total increase. Air emissions of xylene (mixed isomers), a paint constituent, accounted for almost half of this facility's overall increase.

Table 14-15. TRI Other On-site Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Transportation Equipment, SIC Code 37

SIC Code	Industry	Year	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Total Other On-site Waste Management Pounds
3711	Motor Vehicles & Car Bodies	96	217,094	535,506	13,036,452	13,789,052
		95	214,485	1,412,284	12,043,838	13,670,607
		94	185,302	1,199,480	12,854,559	14,239,341
		88	NA	NA	NA	NA
3713	Truck & Bus Bodies	96	73,230	0	314,076	387,306
		95	196,346	0	496,727	693,073
		94	91,366	0	490,479	581,845
		88	NA	NA	NA	NA
3714	Motor Vehicle Parts & Accessories	96	8,876,680	13,903	6,142,531	15,033,114
		95	35,097,838	2,450	7,593,928	42,694,216
		94	43,715,261	28,330	7,750,641	51,494,232
		88	NA	NA	NA	NA
3715	Truck Trailers	96	93,375	0	20,000	113,375
		95	19,817	0	13,000	32,817
		94	86,017	0	16,000	102,017
		88	NA	NA	NA	NA
3716	Motor Homes	96	10,799	0	0	10,799
		95	2,288	0	0	2,288
		94	0	0	125,792	125,792
		88	NA	NA	NA	NA
3721	Aircraft	96	533,700	0	360,848	894,548
		95	570,370	0	310,269	880,639
		94	651,815	0	628,481	1,280,296
		88	NA	NA	NA	NA
3724	Aircraft Engines & Engine Parts	96	4,146,424	0	1,003,150	5,149,574
		95	4,356,967	0	1,193,740	5,550,707
		94	2,878,603	0	1,541,707	4,420,310
		88	NA	NA	NA	NA
3728	Aircraft Parts & Equipment, nec*	96	83,108	30,190	937,161	1,050,459
		95	6,058,525	31,852	919,427	7,009,804
		94	4,327,458	0	830,447	5,157,905
		88	NA	NA	NA	NA
3731	Ship Building & Repairing	96	51,741	0	2,688,622	2,740,363
		95	33,373	0	44,031	77,404
		94	70,421	0	40,061	110,482
		88	NA	NA	NA	NA
3732	Boat Building & Repairing	96	700	0	500	1,200
		95	43,799	0	0	43,799
		94	4,237	0	24,072	28,309
		88	NA	NA	NA	NA
3743	Railroad Equipment	96	80,498	0	16,112	96,610
		95	80,526	0	15,959	96,485
		94	80,313	0	132,417	212,730
		88	NA	NA	NA	NA

Note: Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

Table 14-15. TRI Other On-site Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Transportation Equipment, SIC Code 37, Continued

SIC Code	Industry	Year	Recycled On-site Pounds	Energy Recovery On-site Pounds	Treated On-site Pounds	Total Other On-site Waste Management Pounds
3751	Motorcycles, Bicycles, & Parts	96	69,810	0	152,200	222,010
		95	108,060	0	128,400	236,460
		94	97,100	0	112,960	210,060
		88	NA	NA	NA	NA
3761	Guided Missiles & Space Vehicles	96	295	0	75,259	75,554
		95	198,000	0	77,036	275,036
		94	301,500	0	74,045	375,545
		88	NA	NA	NA	NA
3764	Space Propulsion Units & Parts	96	0	0	322	322
		95	0	0	2,476	2,476
		94	154,800	0	5,299	160,099
		88	NA	NA	NA	NA
3769	Space Vehicle Equipment, nec*	96	142,000	0	39,600	181,600
		95	500	0	0	500
		94	1,453	0	0	1,453
		88	NA	NA	NA	NA
3792	Travel Trailers & Campers	96	5,500	0	0	5,500
		95	0	0	58,882	58,882
		94	0	0	64,339	64,339
		88	NA	NA	NA	NA
3795	Tanks & Tank Components	96	156,390	0	24,283	180,673
		95	84,669	0	64,200	148,869
		94	35,116	0	48,651	83,767
		88	NA	NA	NA	NA
3799	Transportation Equipment, nec*	96	108,491	0	32,002	140,493
		95	220,754	0	29,096	249,850
		94	191,834	0	50,216	242,050
		88	NA	NA	NA	NA
	Multiple within SIC Code 37	96	1,416,289	849,960	685,845	2,952,094
		95	582,198	796,580	729,164	2,107,942
		94	573,547	455,229	1,247,178	2,275,954
		88	NA	NA	NA	NA
	Invalid SIC Code within SIC Code 37	96	0	0	0	0
		95	31,200	0	49,066	80,266
		94	42,675	0	73,209	115,884
		88	NA	NA	NA	NA
	Total for SIC Code 37	96	16,066,124	1,429,559	25,528,963	43,024,646
		95	47,899,715	2,243,166	23,769,239	73,912,120
		94	53,488,818	1,683,039	26,110,553	81,282,410
		88	NA	NA	NA	NA

Note: Data from Section 8 of Form R. Forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

Table 14-16. TRI Transfers Off-site for Further Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Transportation Equipment, SIC Code 37

SIC Code	Industry	Year	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds	Other Off-site Transfers Pounds	Total Transfers Off-site for Further Waste Management Pounds
3711	Motor Vehicles & Car Bodies	96	36,777,515	5,148,595	1,213,559	1,694,161	0	44,833,830
		95	38,484,555	6,374,726	1,183,900	1,393,163	0	47,436,344
		94	32,554,874	6,733,875	1,445,253	1,789,222	750	42,523,974
		88	NA	NA	5,962,593	1,349,190	772,796	NA
3713	Truck & Bus Bodies	96	2,723,533	1,405,814	88,148	81,440	0	4,298,935
		95	3,638,042	1,426,697	119,716	89,456	250	5,274,161
		94	3,071,159	1,411,993	91,853	203,063	0	4,778,068
		88	NA	NA	501,109	528,883	227,851	NA
3714	Motor Vehicle Parts & Accessories	96	93,685,644	2,359,241	1,228,506	763,947	250	98,037,588
		95	92,156,631	2,596,956	1,248,673	758,851	0	96,761,111
		94	93,683,430	2,377,165	1,524,382	889,573	0	98,474,550
		88	NA	NA	2,658,575	1,284,525	1,305,687	NA
3715	Truck Trailers	96	795,526	141,970	57,105	620	250	995,471
		95	4,876,767	242,957	37,033	545	0	5,157,302
		94	3,592,516	296,290	41,248	47	2,259,813	6,189,914
		88	NA	NA	255,063	43,877	89,697	NA
3716	Motor Homes	96	130,410	94,838	5,004	0	0	230,252
		95	125,985	55,116	2,000	0	0	183,101
		94	141,443	43,518	1,460	0	0	186,421
		88	NA	NA	22,610	0	0	NA
3721	Aircraft	96	799,247	949,147	393,778	70,945	0	2,213,117
		95	982,609	784,891	534,756	30,556	0	2,332,812
		94	877,775	971,081	744,209	52,329	0	2,645,394
		88	NA	NA	5,392,161	118,773	413,892	NA
3724	Aircraft Engines & Engine Parts	96	9,572,020	38,782	539,580	14,927	7,646	10,172,955
		95	7,178,479	54,952	739,731	2,905	0	7,976,067
		94	11,102,829	92,073	663,180	2,816	0	11,860,898
		88	NA	NA	1,278,509	114,039	8,498	NA
3728	Aircraft Parts & Equipment, nec*	96	1,696,037	301,053	422,625	38,771	0	2,458,486
		95	1,700,861	216,838	171,951	54,822	0	2,144,472
		94	2,047,204	240,429	261,716	17,691	150	2,567,190
		88	NA	NA	736,565	201,877	198,120	NA
3731	Ship Building & Repairing	96	6,598,311	965,327	115,758	2,518	0	7,681,914
		95	4,527,162	711,624	149,222	6,578	0	5,394,586
		94	1,812,538	1,061,644	292,572	7,180	0	3,173,934
		88	NA	NA	3,438,897	960	0	NA
3732	Boat Building & Repairing	96	84,831	306,854	10,296	49,976	0	451,957
		95	163,277	265,752	20,982	12,921	250	463,182
		94	129,984	206,320	47,268	253	0	383,825
		88	NA	NA	196,377	812	90,096	NA
3743	Railroad Equipment	96	1,400,556	546,857	32,743	1,247	0	1,981,403
		95	2,810,090	555,833	91,814	568	0	3,458,305
		94	2,735,055	203,526	134,629	90,452	0	3,163,662
		88	NA	NA	356,140	85,392	0	NA

Note: Transfers Off-site for Further Waste Management from Section 6 (excluding transfers off-site to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

Table 14-16. TRI Transfers Off-site for Further Waste Management by 4-digit SIC Code, 1988 and 1994-1996: Transportation Equipment, Continued

SIC Code	Industry	Year	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs Pounds	Other Off-site Transfers Pounds	Total Transfers Off-site for Further Waste Management Pounds
3751	Motorcycles, Bicycles, & Parts	96	619,863	58,273	770	505	0	679,411
		95	454,160	101,985	10,690	750	0	567,585
		94	171,004	101,850	4,175	0	0	277,029
		88	NA	NA	6,320	0	0	NA
3761	Guided Missiles & Space Vehicles	96	27,219	20,093	676	31	0	48,019
		95	25,196	9,790	12,286	27	0	47,299
		94	81,632	21,808	44,096	27	0	147,563
		88	NA	NA	324,090	2,500	56,216	NA
3764	Space Propulsion Units & Parts	96	69,251	0	8,570	5	0	77,826
		95	366,357	0	46,517	10	0	412,884
		94	363,054	1,300	149,200	10	0	513,564
		88	NA	NA	197,385	303	10,000	NA
3769	Space Vehicle Equipment, nec*	96	5,900	33,055	26,395	0	0	65,350
		95	188	0	0	0	0	188
		94	761	5,593	0	0	0	6,354
		88	NA	NA	302,744	24,500	48,750	NA
3792	Travel Trailers & Campers	96	515	40,691	250	0	0	41,456
		95	8,370	88,660	27,853	0	0	124,883
		94	500	79,019	0	0	0	79,519
		88	NA	NA	38,176	0	0	NA
3795	Tanks & Tank Components	96	88,599	0	40,356	0	0	128,955
		95	129,734	0	83,062	0	0	212,796
		94	537,808	902	74,027	1	0	612,738
		88	NA	NA	75,959	289	3,200	NA
3799	Transportation Equipment, nec*	96	24,086	263,298	14,843	8,160	0	310,387
		95	10,014	180,114	33,233	3,488	0	226,849
		94	15,673	186,126	43,698	7	0	245,504
		88	NA	NA	31,765	0	0	NA
	Multiple within SIC Code 37	96	7,100,165	912,041	361,455	11,065	0	8,384,726
		95	5,754,113	1,277,046	375,968	10,017	0	7,417,144
		94	8,010,287	2,299,022	549,743	102,775	0	10,961,827
		88	NA	NA	2,202,597	204,723	321,275	NA
	Invalid SIC Code within SIC Code 37	96	2,464	23,044	0	10	0	25,518
		95	1,162,052	101,208	6,473	1,142	0	1,270,875
		94	915,146	63,418	5,778	1,002	0	985,344
		88	NA	NA	180,919	55,805	85,937	NA
	Total for SIC Code 37	96	162,201,692	13,608,973	4,560,417	2,738,328	8,146	183,117,556
		95	164,554,642	15,045,145	4,895,860	2,365,799	500	186,861,946
		94	161,844,672	16,396,952	6,118,487	3,156,448	2,260,713	189,777,272
		88	NA	NA	24,158,554	4,016,448	3,632,015	NA

Note: Transfers Off-site for Further Waste Management from Section 6 (excluding transfers off-site to disposal) of Form R. Other Off-site Transfers are transfers reported without a valid waste management code. Forms with more than one 4-digit SIC code within SIC code 37 are assigned to the "multiple" category.
***nec:** not elsewhere classified.

Alliant Techsystems, Inc., in Magna, Utah (SIC code 3764 in 1988 and codes 2892, 3089 and 3764 in 1996), ranked first in decreases of releases. This facility manufactures large solid fuel rocket motors for the Department of Defense and several commercial ventures. Alliant's rank was largely the result of the phase-out of dichloromethane (methylene chloride) as a conditioning agent in graphite fiber manufacturing. When the Department of Defense changed its material specifications for military contractors as a result of the Montreal Protocol, this facility engaged in a reduction program. Substitution of a water-soluble compound for dichloromethane accounted for almost half of this facility's 2.73 million-pound reduction of releases.

Ford Electronics in Connersville, Indiana (SIC code 3714), was second in decreases with an overall 2.4 million-pound reduction. This manufacturer of automobile air conditioning systems reduced trichloroethylene air emissions by 1.4 million pounds, 59% of the facility’s total change, by substituting aqueous cleaning systems for vapor degreasing systems.

Chrysler Corporation in Fenton, Missouri (SIC code 3711), was third in decreases with a 2.2 million-pound reduction. Trucks and vans are manufactured at this Chrysler plant. The facility switched from solvent-based paints to water-based paints for new vehicles. Consequently, releases of paint solvents, such as xylene (mixed isomers), were significantly reduced. Xylene (mixed isomers) accounted for 63% of the facility's reduction in releases.

Other Apparent Increases and Decreases in Releases, 1988-1996

In the TRI database, there are other facilities with large apparent increases and decreases, which have been identified as reporting errors or plant closures. Because these are errors or plant closures and not actual changes in the data, these facilities are not discussed in detail here. There are four such facilities in the transportation equipment sector:

Ford Motor Company, Claycomo, Missouri, increase of 1.2 million pounds, reporting error. The facility contact stated that there may be an error in their 1988 reporting. At the time of this writing, the facility is considering whether or not to revise its 1988 submission.

General Motors NAO Van Nuys Plant, Panorama City, California, decrease of 2.7 million pounds, plant closure.

Gulfstream Aerospace Corporation, Savannah, Georgia, decrease of 2.7 million pounds, reporting error.

Gunderson, Inc., Portland, Oregon, increase of 6.2 million pounds, reporting error.

1991-1996 Waste Management Data for Transportation Equipment

Table 14-17 summarizes on- and off-site waste management data for the transportation equipment sector for 1991, when TRI began collecting this information, and the three most recent years (1994-1996). Total production-related waste decreased from 382.7 million pounds in 1991 to 334.9 million pounds in 1996, a 12.5% reduction. This reduction masks an even larger decrease in more recent years, since production-related waste had increased to 413.9 million pounds by 1994.

The largest changes were reported in recycling, and these changes partly offset each other. On-site recycling dropped from 65.8 million pounds in 1991 to 16.1 million pounds in 1996. At the same time, off-site recycling rose from 111.3 million pounds to 169.0 million pounds. The net decrease on-site for recycling was 49.8 million pounds and the increase off-site was 57.7 million pounds.

Quantities released on- and off-site in this sector decreased from 141.4 million pounds in 1991 to

Table 14-17. TRI Waste Management Data, 1991, 1994-1996: Transportation Equipment, SIC Code 37

Waste Management Activity	1991 Pounds	1994 Pounds	1995 Pounds	1996 Pounds
On-site Waste Management				
Recycled On-site	65,827,206	53,488,857	47,899,715	16,066,124
Energy Recovery On-site	2,173,685	1,683,039	2,243,166	1,429,559
Treated On-site	24,899,477	26,110,599	23,790,687	25,528,963
Total On-site Waste Management	92,900,368	81,282,495	73,933,568	43,024,646
Off-site Waste Management				
Recycled Off-site	111,282,173	179,735,895	167,879,298	169,017,748
Energy Recovery Off-site	22,851,506	16,627,429	15,075,555	15,053,396
Treated Off-site	14,294,515	9,543,937	7,811,174	8,167,845
Total Off-site Waste Management	148,428,194	205,907,261	190,766,027	192,238,989
Quantity Released On- and Off-site	141,357,987	126,712,093	112,730,438	99,612,655
Total Production-related Waste	382,686,549	413,901,849	377,430,033	334,876,290
Non-Production-related Waste	573,726	493,034	229,131	133,587

Waste Management Activity	Change 1994-1995 Percent	Change 1995-1996 Percent	Change 1991-1996 Percent
On-site Waste Management			
Recycled On-site	-10.4	-66.5	-75.6
Energy Recovery On-site	33.3	-36.3	-34.2
Treated On-site	-8.9	7.3	2.5
Total On-site Waste Management	-9.0	-41.8	-53.7
Off-site Waste Management			
Recycled Off-site	-6.6	0.7	51.9
Energy Recovery Off-site	-9.3	-0.1	-34.1
Treated Off-site	-18.2	4.6	-42.9
Total Off-site Waste Management	-7.4	0.8	29.5
Quantity Released On- and Off-site	-11.0	-11.6	-29.5
Total Production-related Waste	-8.8	-11.3	-12.5
Non-Production-related Waste	-53.5	-41.7	-76.7

Note: Does not include delisted chemicals, chemicals added in 1994 and 1995, ammonia, hydrochloric acid, and sulfuric acid. Data from Section 8 of Form R (Current Year, Column B) of year indicated.

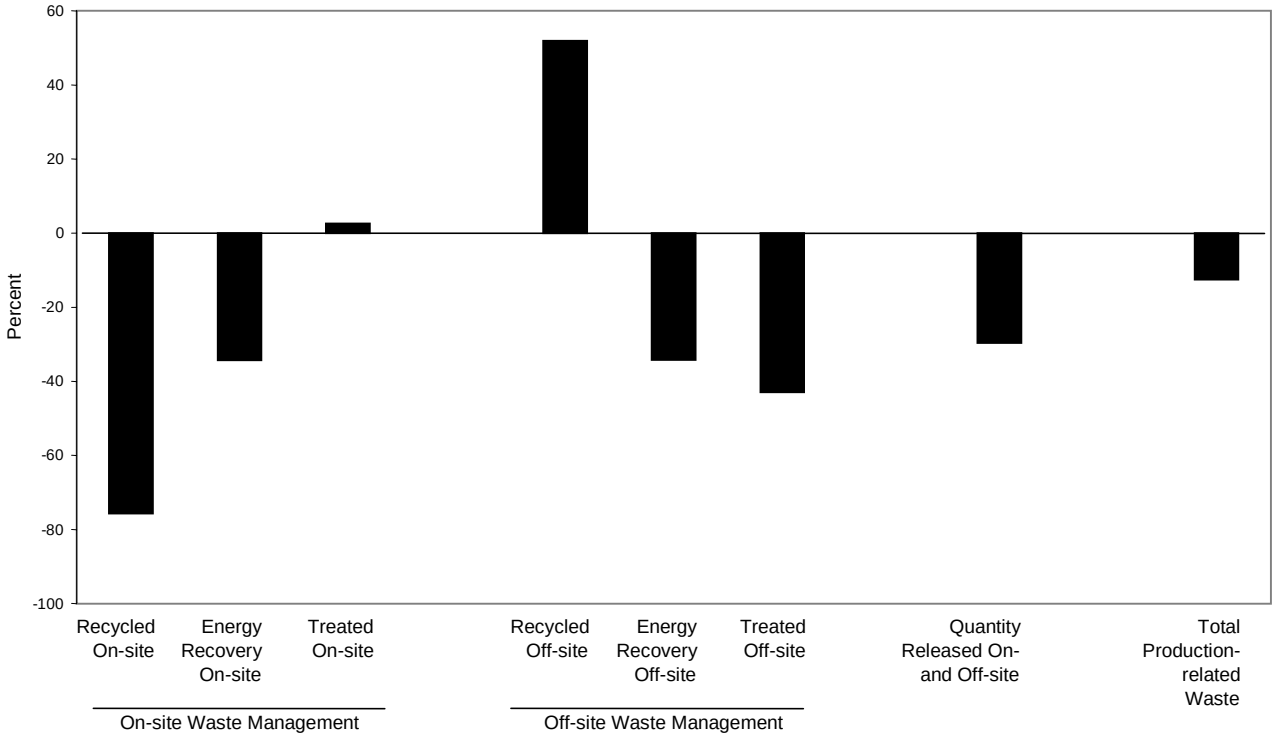


Figure 14-13. Percentage Change in Quantities of TRI Chemicals in Waste, 1991-1996: Transportation Equipment (SIC Code 37)

Note: Does not include delisted chemicals, chemicals added in 1994 and 1995, ammonia, hydrochloric acid, and sulfuric acid. Data from Section 8 of Form R (Current Year, Column B) of year indicated.

99.6 million pounds in 1996, a reduction of 29.5%. All other types of waste management decreased except on-site treatment, which had a net increase of 629,000 pounds for 1994-1996.

Thus, the largest changes in waste management in the transportation equipment sector for the comparison period were a reduction in quantities of TRI chemicals released on- and off-site accompanied by a net increase in recycling (on-and off-site combined). These changes suggest some improvements over time in how waste has been managed in this sector, in relation to the waste management hierarchy (described in Chapter 1). Furthermore, reductions in production-related waste altogether have continued in recent years, even as the sector has seen recovery to its earlier production levels. Notably, some facilities in this sector with large increases in production-related waste attribute those increases to expanding production, while some facilities with substantial reductions have undertaken process and material modifications that resulted in lesser quantities of toxic waste.

Figure 14-13 displays the 1994-1996 percentage changes in production-related waste by waste management type for this sector.

Facilities with Large Increases and Decreases in Waste Management, 1991-1996

Arvin N.A. Automotive in Franklin, Indiana (SIC code 3714), ranked first in increases of production-related waste. The facility buys stock stainless steel and produces finished tubing for automobiles. Scrap material is sent off-site for recycling. Manganese (a constituent of stainless steel) reported as recycled off-site accounted for 82 percent of the overall 14.3 million-pound increase.

The facility attributes this change to increased production over the 1991-1996 period.

Delphi Packard Electric Systems in Warren, Ohio (SIC codes 3714), was the second-largest increaser with a total change of 7.0 million pounds. The Delphi Packard facility manufactures wire harnesses for automobiles. Wire and wire terminal scrap are sent off-site for recycling. The facility reported a 7.5 million-pound increase in off-site recycling of copper compounds, a major component of the wire and wire terminals, as a result of a production increase. Decreases in other production-related waste categories resulted in an overall increase that was smaller than the increase in off-site recycling (for copper compounds).

The facility with the third largest increase is Mitsubishi Motor Manufacturing in Normal, Illinois (SIC code 3711), with a 5.4 million-pound increase. The increase is largely due to a change in the interpretation of TRI reporting requirements, according to the facility contact.[1] Nickel, a constituent of the metal used in the production of automobile body parts, was the chemical with the single-largest increase (1.0 million pounds, off-site recycling).

Preferred Technical Group, Inc., in Mitchell, Indiana (SIC code 3714 in 1988, did not report in 1996), had the biggest reduction in production-related waste with a total decrease of 22.4 million pounds. The facility, a manufacturer of automobile air conditioner components, eliminated the use of trichloroethylene as a degreaser by substituting water-based detergents. This was the only chemical reported to TRI by Preferred Technical Group (1987 to 1994), and it accounted for 100 percent of the facility's reduction.

Second was Modine Manufacturing Company in Logansport, Indiana (SIC code 3714). The facility, a manufacturer of air conditioner parts—historically for automobiles and currently for home and commercial applications—phased-out the use of 1,1,1-trichloroethane from a degreasing operation. An aqueous cleaner was substituted. The elimination of 1,1,1-trichloroethane was predominantly responsible for the overall decrease of 7.1 million pounds in production-related waste.

The third-ranked facility for decreases was the Cessna Aircraft Company in Columbus, Georgia (SIC code 3728), with a 4.1 million-pound reduction. The Cessna facility manufactures aircraft structural detail and assemblies such as wing flaps, ailerons, and stabilizers. 1,1,1-Trichloroethane (TCA), the chemical primarily responsible for the facility's ranking, was used in a degreasing process and was replaced by trichloroethylene. Because of the phase-out of TCA, no data were reported for the chemical in 1996. Therefore, the 1991 data for the chemical equals the total decrease. Nearly all of the 1991 data for TCA were reported as recycled on-site (4.08 million pounds). The facility states that its interpretation of how to calculate this quantity in 1991 resulted in a deceptively large figure. On-site recycling estimation methods at the plant have since changed.[2]

Other Apparent Increases and Decreases in Production-Related Waste, 1991-1996

In the TRI database, there are other facilities with large apparent increases and decreases, which have

[1] There are no TRI regulatory definitions of recycling. Facilities may use their own interpretations for purposes of reporting to TRI. Changes in these interpretations do not represent a change in guidance by EPA on how to report recycling.

[2] There are no TRI regulatory definitions of recycling. Facilities may use their own interpretations for purposes of reporting to TRI. Changes in these interpretations do not represent a change in guidance by EPA on how to report recycling.

been identified as reporting errors or plant closures. Because these are errors or plant closures and not actual changes in the data, these facilities are not discussed in detail here. There is one such facility in the transportation equipment sector:

TRW Automotive Electronics, Union Springs, New York, decrease of 4.7 million pounds, plant closure.

Facilities Contacted for Explanations (alphabetical by facility):

Alliant Techsystems, Inc., Magna, Utah: Mike Parker, July 21, 1998 (explanation provided)

Arvin N.A. Automotive, Franklin, Indiana: Dan Boucher, July 21, 1998 (explanation provided)

Cessna Aircraft Company, Columbus, Georgia: Michael Freier, August 5, 1998 (explanation provided)

Chrysler Corporation, Fenton, Missouri: Gary S. Sczepanski, August 27, 1998 (explanation provided)

Delphi Packard Electric Systems, Warren, Ohio: Dominic Imburgia, July 27, 1998 (explanation provided)

Ford Electronics, Connersville, Indiana: Joseph King, August 11, 1998 (explanation provided)

Ford Motor Company, Claycomo, Missouri: Ghani Baig, July 24, August 5, and September 2, 1998; Martin Whitehead, August 24, 1998 (explanation provided)

General Motors NAO Van Nuys Plant, Panorama City, California: Ed Piasecki, August 10, 1998 (explanation provided)

Gulfstream Aerospace Corp., Savannah, Georgia: William D. Sherrod, August 24, 1998 (explanation provided)

Gunderson, Inc, Portland, Oregon: Robert A. Bridgers, July 21, 1998 (explanation provided)

Mitsubishi Motor Manufacturing, Normal, Illinois: Troy Weirick, July 21, 1998 (explanation provided)

Modine Manufacturing Company, Logansport, Indiana: Thomas S. Sanicola, July 22 and July 30, 1990 (explanation provided)

Preferred Technical Group, Inc., Columbus City, Indiana: William S. Cochrane, July 31, 1998 (explanation provided)

Preferred Technical Group, Inc., Mitchell, Indiana: Dearl C. Reynolds, July 21, 1998 (explanation provided)

Saturn Corporation, Spring Hill, Tennessee: William R. Miller, III, August 4, 1998 (explanation provided)

Southwest Shipyard, L.P., Channelview, Texas: Lynn R. Jones, August 10, 1998 (explanation provided)

Subaru-Isuzu Automotive, Inc., Lafayette, Indiana: Michelle Byrd, August 26, 1998 (explanation provided)

Toyota Motor Manufacturing Kentucky, Georgetown, Kentucky: Robert Ernest, July 22, 1998 (explanation provided)

TRW Automotive Electronics, Union Springs, New York: Thomas C. Battaglia, July 21, 1998 (explanation provided)