# TOXIC RELEASES AND HEALTH

## A Review of Pollution Data and Current Knowledge on the Health Effects of Toxic Chemicals

**Tony Dutzik**
**Jeremiah Baumann**
**Meghan Purvis**

**U.S. PIRG Education Fund**

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# Executive Summary

Each year, industrial facilities nationwide release hundreds of millions of pounds of chemicals linked to cancer, to developmental and reproductive problems, and to neurological and respiratory disorders into the nation's air and water. Yet, communities in the shadow of industrial facilities typically have access to only limited information on how these discharges may be affecting their health.

A review of data reported to the EPA's Toxics Release Inventory (TRI) demonstrates the degree to which toxic substances with links to serious health problems are released into our communities and highlights which industry sectors and companies are responsible for the bulk of toxic pollution. More importantly, these data demonstrate the need for more and better information about chemical toxicity, the release of toxics into the environment, and the links between toxic chemicals and the development of chronic disease.

**Toxic chemicals linked to severe health problems continue to be released in massive quantities nationwide.**

- In 2000, more than 100 million pounds of **cancer-causing chemicals** were released to the nation's air and water, with dichloromethane—an industrial solvent that is also used in the manufacture of photographic film—the most frequently released carcinogen nationwide.
- More than 138 million pounds of chemicals linked to **developmental problems** such as birth defects and learning disabilities, and 50 million pounds of chemicals related to **reproductive disorders** were released to air and water in 2000. Toluene (a developmental toxicant) and carbon disulfide (a developmental and reproductive toxicant) were released in the greatest quantities.
- More than one billion pounds of suspected **neurological toxicants** were released to air and water in 2000. Methanol—a solvent and product of wood pulping—was the most commonly released chemical with suspected links to neurological disorders.
- In 2000, more than 1.7 billion pounds of suspected **respiratory toxicants** were released to the nation's air, with acid aerosols of hydrochloric acid the most commonly released toxic substance.
- More than 7,000 grams of **dioxins**—regarded as among the most toxic substances known to science—were released to air and water in 2000.
- Significant releases were also reported of several **persistent, highly toxic substances**, such as lead (275,000 pounds), lead compounds (1.3 million pounds), mercury (30,000 pounds) and mercury compounds (136,000 pounds).

**High-volume toxic chemical releases appear to be concentrated among a small number of communities.**

- Approximately three-quarters (76 percent) of all air and water releases of reproductive toxicants in 2000 occurred within just 10 U.S. zip codes. Similarly, nearly two-thirds (65 percent) of all dioxin releases and one-third (32 percent) of all developmental toxicant releases occurred within just 10 zip codes.
- Many communities have been subjected to high-volume toxic releases year after year. Since the start of TRI reporting in 1987, 10 zip codes have received more than two-thirds (68 percent) of all reported air and water releases of reproductive toxicants and more than one-quarter (26 percent) of all developmental toxicant releases.

**The "Sunbelt" has supplanted the "Rust Belt" as the nation's leading source of toxic chemical releases with known or suspected links to serious health problems.**

- Thirteen southern states, stretching from North Carolina to New Mexico, were responsible for 48 percent of all carcinogen releases reported by original TRI industries nationwide in 2000, up from just 33 percent in 1987. By contrast, the 19 states of the industrial Northeast and Midwest saw their proportion of carcinogen releases decline from approximately 52 percent of the national total in 1987 to 41 percent in 2000.

- The southern states were also responsible for more than three-quarters (78 percent) of all reported air and water releases of reproductive toxicants in 2000, as well as 67 percent of all dioxin releases, 59 percent of all developmental toxicant releases, and 50 percent of all suspected neurotoxicant releases. In each category except dioxin releases (for which reporting began in 2000), the South's proportion of toxic chemical releases has increased significantly since 1987.

- Individual Sunbelt states are also among the leading releasers of toxic chemicals. Texas experienced greater releases of carcinogens, neurological toxicants and dioxins than any other state and ranked in the top five for releases of developmental and reproductive toxicants. Tennessee ranked first for releases of developmental and reproductive toxicants and in the top five for releases of carcinogens and suspected neurological toxicants.

**Communities subjected to high-volume toxic releases have access to only limited information about how those releases might affect their health.**

- Many states—especially those with high levels of toxic releases—fail to adequately track cases of cancer, birth defects, asthma and other chronic diseases. Only three states—California, Iowa and Massachusetts—possess cancer and birth defects registries that meet the highest standards for quality as well as any system at all for the tracking of asthma cases. As a result, researchers, health officials, and the public can't adequately determine whether disease rates show patterns reflecting the release of high quantities of chemicals linked to those diseases.

- Scientific information on the health effects of many toxic chemicals is limited or nonexistent. A 1998 EPA review found that only 7 percent of the nearly 3,000 chemicals made or imported to the U.S. in large quantities possessed a complete set of publicly available screening data on their toxicity. Even for those chemicals that have been studied, little information exists on how those substances can influence human health at environmental levels of exposure.

- Government surveys that measure human exposure to toxic chemicals cover only about 6 percent of the potentially dangerous chemicals on the market today. The information that does exist on human exposure is limited and generally of little use in determining the degree to which residents of a particular area have been exposed to toxicants.

- The Toxics Release Inventory only covers releases of less than one percent of the estimated 80,000 chemicals in commerce today. Further, TRI covers only releases from the largest facilities in a limited number of industries. As a result, releases of potentially health-threatening releases of toxic chemicals are greater than are reported to TRI.

**Creation of a Nationwide Health Tracking Network would enable citizens, scientists and public health officials to better assess and respond to the threats posed by toxic releases. An effective health tracking network would include**:

- Expanded monitoring of human exposure to toxic chemicals, so that public health officials have a clearer understanding of the levels of toxicants to which Americans are exposed.

- Enhanced tracking of chronic diseases—such as asthma, cancer, birth defects and Alzheimer's—in order to help evaluate the potential links between these diseases and toxic exposures.

- An early warning system to alert communities to immediate health crises such as heavy metal and pesticide poisonings.

- Rapid response teams to quickly evaluate disease clusters and other health threats thought to be linked to specific toxic exposures.

Other steps—such as expanded reporting of toxic releases, increased emphasis on reducing the use of toxics, and better information on the health effects of chemicals on the market—could also help protect communities from the potential health impacts of toxic releases.

# Introduction

Every day in America, industrial facilities release millions of pounds of toxic substances into the nation's air and water. Many Americans—especially those who live in close proximity to industrial facilities—harbor deep concern about how those toxic releases may affect their health.

Those concerns are justified. Scientists have identified hundreds of substances—including many that are used and released in vast quantities by American industry—that can cause cancer, impair normal development, impede reproduction, disrupt the nervous system and cause respiratory disease. Research conducted by the Environmental Protection Agency has shown that levels of airborne toxicants and dioxins to which Americans are routinely exposed result in an elevated risk of cancer. And government and academic researchers continue to amass evidence linking exposure to a range of environmental pollutants with serious health effects.

Yet, for any particular community, understanding the potential health threats that could result from toxic releases is a nearly impossible task. Public health officials often lack sufficient understanding of how citizens have been exposed to toxic substances, how those substances work within the body, and how many people have contracted chronic disease within a community to render conclusive judgments as to whether particular toxic exposures have led—or can lead—to increases in disease.

Moreover, while many Americans assume that chemicals are thoroughly tested for safety before they are introduced to the market, the opposite is true. Many of the 80,000 chemicals in commerce today have simply never been fully studied for their ability to cause cancer, reproductive or developmental problems, or other health impacts. Futher, regulatory agencies have severely limited ability to restrict or prohibit the use of chemicals even when links to health effects are well known.

The information that does exist about toxic releases in the United States is far from reassuring. Since 1987, industries have been required to report their releases of certain toxic chemicals to the federal government through the Toxics Release Inventory (TRI). TRI does not cover all industries, all chemicals, or all releases of those chemicals, and within covered industries, only the largest facilities report. But the partial picture that it paints of toxic releases in the United States suggests that many communities have ample reason for concern.

This report uses TRI data to quantify industrial releases of toxic chemicals that have been linked to five categories of health effects: cancer, reproductive disorders, developmental problems, neurological disorders and respiratory disease. It identifies the communities that have experienced the greatest toxic releases to air and water, the toxic chemicals that have been released in the greatest quantities nationwide, and the industries that were responsible for the largest releases.

What this report cannot do is to answer an important question: How have these toxic releases affected our health? To answer that question, scientists, public health officials and communities must have access to much more information than is currently available about toxic chemicals and health. They must be able to quantify whether, and to what extent, the toxic chemicals that are released into our air and water find their way into our bodies. They must have better knowledge of how those chemicals work when they do enter the body. They must have access to up-to-date information about patterns of chronic disease in our communities. And they must have the resources to conduct investigations capable of making sound conclusions about the potential impact of toxic exposures on a community's health.

# Toxic Releases in the U.S.

## CANCER-CAUSING CHEMICALS

The link between various toxic exposures and cancer has long been understood. For example, occupational exposure to vinyl chloride has been conclusively linked to liver cancer, while exposure to asbestos fibers has been proven to cause the rare cancer, mesothelioma.

The carcinogenicity of various chemicals has also traditionally received more scrutiny than other health impacts. The National Toxicology Program—an interagency program involving the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), and the Food and Drug Administration (FDA)—has published nine editions of its *Report on Carcinogens*, which lists substances that are known or reasonably considered to cause cancer. The ninth edition of the report, published in May 2000, included 218 substances known or reasonably anticipated to cause cancer.[1]

The most comprehensive list of substances known to cause cancer is compiled by the state of California for implementation of Proposition 65 (Prop 65), a measure passed by voters in that state in 1986. Prop 65 required the state of California to identify carcinogens and reproductive toxicants based on information from a variety of sources. Chemicals that have been classified as carcinogens or reproductive toxicants by an "authoritative" source—such as the Environmental Protection Agency (EPA), the FDA or the National Toxicology Program—can be added to the list. Chemicals may also be added if they are required to be labeled or identified as a carcinogen or reproductive toxicant by the federal government or the state of California. Substances not listed for other reasons may be added to the Prop 65 list if the state's "qualified experts"—two independent commissions of scientists and health experts—find that the chemical has been clearly shown to cause cancer, developmental problems or reproductive harm.

California's Proposition 65 list identifies more than 440 chemicals as "known to the state of California to cause cancer." Of these substances, releases of approximately 230 chemicals are reported to the EPA's Toxics Release Inventory (TRI).[2]

**Table 1: Releases of Carcinogens, 2000 (pounds)**

| Chemical | Air | Water | Total |
|---|---|---|---|
| DICHLOROMETHANE | 30,782,468 | 10,292 | 30,792,760 |
| ACETALDEHYDE | 12,376,449 | 195,014 | 12,571,463 |
| FORMALDEHYDE | 11,607,326 | 408,134 | 12,015,460 |
| TRICHLOROETHYLENE | 9,716,016 | 593 | 9,716,609 |
| BENZENE | 6,895,255 | 22,660 | 6,917,915 |
| CHLOROFORM | 3,444,301 | 56,341 | 3,500,642 |
| TETRACHLOROETHYLENE | 3,453,932 | 1,159 | 3,455,091 |
| NAPHTHALENE | 2,324,487 | 48,855 | 2,373,342 |
| 1,3-BUTADIENE | 2,165,441 | 1,163 | 2,166,604 |
| CHLOROETHANE | 2,067,847 | 693 | 2,068,540 |

### Releases by Chemical

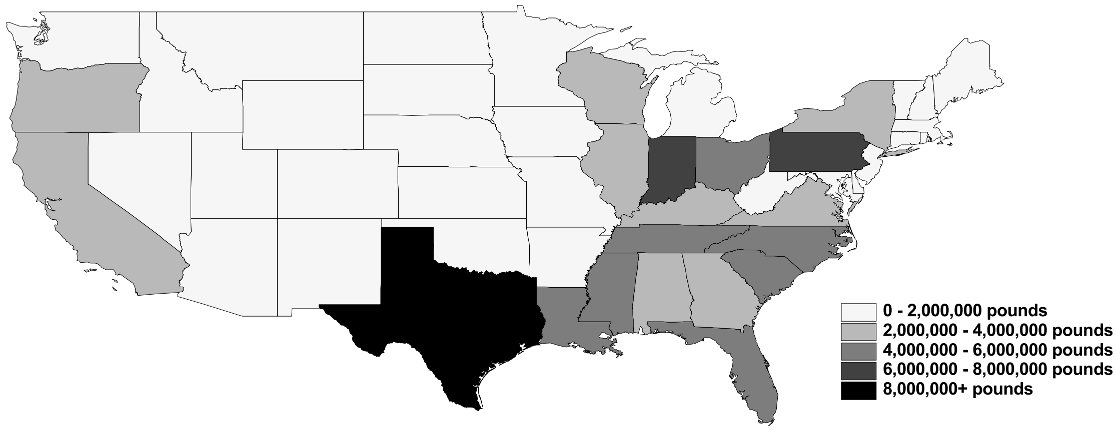
In 2000, more than 100 million pounds of carcinogens were released directly to the air and water by facilities reporting to TRI. Dichloromethane was the most frequently released carcinogen to air and water in 2000, with total releases of more than 30 million pounds. A total of 538 facilities reported dichloromethane releases to air or water in 2000.

Dichloromethane—also known as methylene chloride—is used as an industrial solvent and paint stripper and is also used in the manufacture of photographic film. It is primarily released to the environment through the air, and mostly dissipates within two to four months. High-level exposure to dichloromethane can cause dizziness and nausea, while inhalation of smaller amounts may reduce attention and accuracy in tasks involving hand-eye coordination. Its impact on developmental and reproductive health is unknown, although some birth defects have been seen in animals inhaling high levels of dichloromethane.[3] In addition to being listed as a known carcinogen under Prop 65, dichloromethane is a suspected respiratory and neurological toxicant.

### Releases by Location

The states of Texas, Pennsylvania and Indiana ranked first, second and third for total carcinogen releases in 2000. Zip code 38879 in Verona, Mississippi, site of a Carpenter Co. facility in the plastic foam products industry, ranked first for total releases, followed by zip codes in Elkhart, Indiana and Corry, Pennsylvania.

**Fig. 1: Carcinogen Emissions by State, 2000**




Over the 1987-2000 period, more than 2.9 billion pounds of carcinogenic substances were reported released to air and surface water under TRI. Zip code 14652 in Rochester, New York—home to the Eastman Kodak Co.—experienced the greatest overall releases, followed by zip codes in Mount Vernon, Indiana and Verona, Mississippi. Kodak's releases of cancer-causing chemicals have dropped considerably since the start of TRI reporting, from approximately 9.6 million pounds in 1987 to about 1.3 million pounds in 2000, but the facility's releases were still large enough to rank its Rochester zip code sixth for carcinogen releases reported to TRI in 2000. (See box, next page.)

**Table 2: Top 20 U.S. Zip Codes for Carcinogen Releases, 2000 (pounds)**

| City | State | Zip | Air | Water | Total |
|---|---|---|---|---|---|
| VERONA | MS | 38879 | 1,929,778 | 0 | 1,929,778 |
| ELKHART | IN | 46516 | 1,908,293 | 0 | 1,908,293 |
| CORRY | PA | 16407 | 1,782,417 | 0 | 1,782,417 |
| BARCELONETA | PR | 00617 | 1,366,418 | 0 | 1,366,418 |
| GEORGETOWN | SC | 29440 | 1,346,667 | 4,705 | 1,351,372 |
| ROCHESTER | NY | 14652 | 1,308,713 | 8,933 | 1,317,646 |
| MILAN | TN | 38358 | 1,306,181 | 0 | 1,306,181 |
| HAZLETON | PA | 18201 | 1,079,909 | 0 | 1,079,909 |
| TUPELO | MS | 38801 | 1,056,116 | 0 | 1,056,116 |
| SPENCERVILLE | OH | 45887 | 1,020,618 | 0 | 1,020,618 |
| LOUISVILLE | KY | 40216 | 837,987 | 1,197 | 839,184 |
| MORRISTOWN | TN | 37814 | 792,259 | 0 | 792,259 |
| BRYANT | FL | 33439 | 791,520 | 0 | 791,520 |
| GEISMAR | LA | 70734 | 757,849 | 19,447 | 777,296 |
| HANNIBAL | OH | 43931 | 763,500 | 0 | 763,500 |
| LONGVIEW | WA | 98632 | 737,309 | 13,938 | 751,247 |
| LATHROP | CA | 95330 | 711,095 | 0 | 711,095 |
| ELKHART | IN | 46517 | 686,133 | 0 | 686,133 |
| MIAMI | FL | 33167 | 665,504 | 0 | 665,504 |
| CHATTANOOGA | TN | 37406 | 592,720 | 0 | 592,720 |

### Community Profile: Rochester, New York

Zip code 14652 in Rochester, New York led all zip codes for emissions of cancer-causing chemicals from 1987 to 2000. Of the 64.4 million pounds of carcinogens released over that period, more than 58 million pounds were air releases of dichloromethane by the Eastman Kodak Co. In addition, Eastman Kodak's Kodak Park facility in Rochester ranked among the top 100 facilities nationwide for TRI releases of dioxin in 2000, emitting just under 5 grams of the substance to air and water.

For many years, scientists, health officials and local residents have inquired as to what the impact of Kodak's emissions might be on residents of the densely populated urban area nearby—with conflicting results. A 1991 study by University of Rochester researchers found no significant adverse impact on birthweight resulting from dichloromethane exposure.[4] However, a 1995 New York State Department of Health study found that women living near the Kodak Park manufacturing facility had an approximately 80 percent greater risk of developing pancreatic cancer. The U.S. Agency for Toxic Substances and Disease Registry (ATSDR), in a 1998 study designed to examine a possible cluster of childhood brain cancer cases in surrounding Monroe County, uncovered what may have been an excess in thyroid cancer cases in young girls in the county. Another study conducted by the county and the state department of health found no increase in cancer incidence in the area.[5]

More research remains to be done—especially with regard to following up on ATSDR's 1998 recommendation that an intensive review be conducted of childhood brain and spinal cord cancer cases in the area. Kodak's continued releases of dichloromethane and dioxin and the questions raised by earlier health studies demonstrate the importance of expanding efforts to investigate the impact of toxic releases on communities.

**Table 3. Top 20 U.S. Zip Codes for Carcinogen Releases, 1987-2000 (pounds)**

| City | State | Zip | Air | Water | Total |
|---|---|---|---|---|---|
| ROCHESTER | NY | 14652 | 62,799,357 | 1,583,283 | 64,382,640 |
| MOUNT VERNON | IN | 47620 | 35,123,556 | 56,799 | 35,180,355 |
| VERONA | MS | 38879 | 33,026,913 | 0 | 33,026,913 |
| BARCELONETA | PR | 00617 | 28,753,259 | 0 | 28,753,259 |
| KALAMAZOO | MI | 49001 | 27,641,689 | 51,627 | 27,693,316 |
| WICHITA | KS | 67210 | 25,709,955 | 7,665 | 25,717,620 |
| ELKHART | IN | 46516 | 20,894,355 | 0 | 20,894,355 |
| CLINTON | IN | 47842 | 18,752,060 | 16,655 | 18,768,715 |
| FREEPORT | TX | 77541 | 18,236,245 | 404,120 | 18,640,365 |
| CORRY | PA | 16407 | 17,973,555 | 0 | 17,973,555 |
| GEISMAR | LA | 70734 | 17,776,982 | 175,070 | 17,952,052 |
| CONOVER | NC | 28613 | 16,920,524 | 0 | 16,920,524 |
| GRENADA | MS | 38901 | 15,984,662 | 2,583 | 15,987,245 |
| WHITMORE LAKE | MI | 48189 | 14,827,257 | 0 | 14,827,257 |
| TOWANDA | PA | 18848 | 14,801,394 | 20,179 | 14,821,573 |
| LAFAYETTE | IN | 47909 | 14,166,338 | 8,087 | 14,174,425 |
| MILAN | TN | 38358 | 14,017,081 | 0 | 14,017,081 |
| CONNERSVILLE | IN | 47331 | 12,842,701 | 0 | 12,842,701 |
| RUSSELLVILLE | KY | 42276 | 12,288,000 | 19 | 12,288,019 |
| HIGH POINT | NC | 27263 | 12,027,465 | 0 | 12,027,465 |

**Table 4: Carcinogen Releases by Industry Sector, 2000 (pounds)**

| Industry | Air | Water | Total |
|---|---|---|---|
| PLASTICS FOAM PRODUCTS | 18,942,129 | 5 | 18,942,134 |
| INDUSTRIAL ORGANIC CHEMICALS, NEC | 7,094,810 | 156,469 | 7,251,278 |
| PULP MILLS | 6,396,524 | 343,878 | 6,740,402 |
| RECONSTITUTED WOOD PRODUCTS | 5,552,142 | 1,101 | 5,553,243 |
| PLASTICS MATERIALS AND RESINS | 4,529,880 | 108,735 | 4,638,615 |
| PAPER MILLS | 3,902,474 | 198,116 | 4,100,589 |
| PAPERBOARD MILLS | 3,763,525 | 45,556 | 3,809,081 |
| PETROLEUM REFINING | 3,160,385 | 42,103 | 3,202,488 |
| PHARMACEUTICAL PREPARATIONS | 2,851,794 | 1,950 | 2,853,745 |
| ELECTRIC SERVICES | 1,731,458 | 481,611 | 2,213,068 |

NEC= Not Elsewhere Classified

**Table 5: Carcinogen Releases by Parent Company, 2000 (pounds)**

| Parent Company | Total |
|---|---|
| FOAMEX INTL. INC. | 5,729,403 |
| CARPENTER CO. | 3,845,257 |
| GEORGIA-PACIFIC CORP. | 3,508,070 |
| INTERNATIONAL PAPER CO. | 3,371,576 |
| OHIO DECORATIVE PRODS. INC. | 3,146,670 |
| DOW CHEMICAL CO. | 2,083,146 |
| WEYERHAEUSER CO. | 1,793,158 |
| ABBOTT LABS. | 1,446,819 |
| EASTMAN KODAK CO. | 1,317,646 |
| E. I. DU PONT DE NEMOURS & CO. INC. | 1,270,446 |

### Releases by Industry Sector and Parent Company

TRI data also indicate which industry sectors and companies are responsible for the greatest releases of chemicals with various toxic effects. Not all industry sectors are required to report to TRI, nor are all companies within a given sector. As a result, TRI data provide an incomplete picture of the degree of toxic releases in our communities.

One way to gauge just how much toxic pollution is not reported to TRI is to compare the number of facilities reporting releases to TRI with the number of establishments within a given industry sector as reported to the U.S. Census Bureau in its 1997 Economic Census. While this is a crude measurement, it does suggest that the majority of facilities within certain industry sectors do not meet either the size or chemical use thresholds that trigger reporting under TRI.

The plastics foam products industry was responsible for about 19 percent of all releases of carcinogenic substances during 2000. A total of 97 facilities within the plastics foam products industry reported air or water releases of cancer-causing chemicals—or about 8 percent of the estimated 1,178 facilities within the industry sector nationwide as reported to the 1997 Economic Census.[6] Plastic foam products include polystyrene and urethane foams used in automobiles, furniture, carpeting, packaging and other consumer products. More than half of all carcinogen releases from the plastic foam products sector were air emissions of dichloromethane.

Two companies within the plastic foam products industry—Foamex, Inc. and Carpenter Co.—led all corporations for air and water releases of carcinogens reported to TRI in 2000. They were followed by Georgia-Pacific Corp., which released large amounts of acetaldehyde and formaldehyde.

## DEVELOPMENTAL AND REPRODUCTIVE TOXICANTS

Some toxic chemicals have also been shown to impede the proper physical and mental development of young children. Potential developmental health effects cover a wide range of conditions including fetal death, structural defects such as cleft lip/cleft palate and heart abnormalities, and functional defects such as neurological, hormonal or immune system problems.

Less is known about the developmental impacts of many toxic chemicals than about their carcinogenicity, in part because developmental effects have been less widely studied and in part because the mechanism by which toxic substances can impact development is very complex. Very few chemicals have been fully tested for their impact on the developing fetus. In fact, of the nearly 3,000 high production volume chemicals studied by EPA in 1998, 77 percent did not have publicly available screening-level information on developmental or reproductive toxicity.[7] In addition, the timing of an exposure during a fetus or child's development can be of critical importance. Maternal exposure to a

**Table 6. Developmental Toxicant Releases, 2000 (pounds)[8]**

| Chemical | Air | Water | Total |
|---|---|---|---|
| TOLUENE | 81,257,581 | 40,497 | 81,298,078 |
| CARBON DISULFIDE | 40,584,960 | 3,704 | 40,588,664 |
| BENZENE | 6,895,255 | 22,660 | 6,917,915 |
| N-METHYL-2-PYRROLIDONE | 3,109,498 | 18,652 | 3,128,150 |
| CHLOROMETHANE | 1,910,923 | 1,187 | 1,912,110 |
| LEAD COMPOUNDS | 1,225,794 | 80,506 | 1,306,299 |
| BROMOMETHANE | 930,371 | 37 | 930,408 |
| 2-METHOXYETHANOL | 886,237 | 22,286 | 908,523 |
| ARSENIC COMPOUNDS | 240,956 | 166,482 | 407,438 |
| LEAD | 260,040 | 14,579 | 274,619 |

**Table 7: Reproductive Toxicant Releases, 2000 (pounds)**

| Chemical | Air | Water | Total |
|---|---|---|---|
| CARBON DISULFIDE | 40,584,960 | 3,704 | 40,588,664 |
| BENZENE | 6,895,255 | 22,660 | 6,917,915 |
| LEAD COMPOUNDS | 1,225,794 | 80,506 | 1,306,299 |
| 2-METHOXYETHANOL | 886,237 | 22,286 | 908,523 |
| ETHYLENE OXIDE | 465,243 | 6,912 | 472,155 |
| LEAD | 260,040 | 14,579 | 274,619 |
| EPICHLOROHYDRIN | 201,065 | 389 | 201,454 |
| 2-ETHOXYETHANOL | 75,376 | 380 | 75,756 |
| CADMIUM COMPOUNDS | 30,292 | 8,755 | 39,047 |
| 1,2-DIBROMOETHANE | 13,822 | 11 | 13,833 |

toxic substance at a critical time during pregnancy may result in a developmental defect, while exposure during another time may not.

Based on available knowledge, the state of California has listed more than 240 substances as known to cause developmental disorders under Prop 65. Of these substances, releases of 45 are reported to TRI.

Toxic substances also have the potential to impair the male or female reproductive system, leading to sterility, spontaneous abortion or stillbirth. The state of California has listed approximately 37 substances as known to cause reproductive disorders in females and about 54 substances known to cause reproductive disorders in males. Of the substances linked to male or female reproductive disorders, releases of 30 are reported to TRI.

## Releases by Chemical

Because many of the same chemicals that are linked to developmental disorders are also linked to reproductive problems, it is more appropriate to review the two categories together.

In 2000, more than 138 million pounds of developmental toxicants were released directly to the air and water by facilities that report to TRI. Toluene was the most commonly released developmental toxicant in 2000, followed by carbon disulfide and benzene.

A total of 50.8 million pounds of reproductive toxicants were released nationally in 2000. Carbon disulfide was the reproductive toxicant released in the greatest quantity to air and water in 2000, followed by benzene and lead compounds.[9]

Toluene occurs naturally in crude oil and is produced in the process of refining oil and making coke from coal. It is also used in the manufacture of paints, fingernail polish, adhesives and other products. Toluene does not remain in the environment for long, nor does it accumulate within animal tissue. At high levels of exposure, toluene can affect the kidneys, induce light-headedness or cause unconsciousness or death. Lower level exposures can affect the nervous system and cause fatigue, nausea, and temporary hearing and color vision loss. No evidence links toluene to cancer, but inhalation of high levels of toluene during pregnancy can result in children with birth defects and mental retardation. Less is known about the developmental impacts of low-level exposure during pregnancy.[10] Toluene is also a suspected neurological and respiratory toxicant.

Carbon disulfide is used in various manufacturing processes and can be lethal at high levels of exposure due to impacts on the nervous system. Animal studies suggest that carbon disulfide can affect the normal functions of the brain, liver and heart and can lead to birth defects and neonatal death.[11]

## Releases by Location

Tennessee ranked first overall in releases of both developmental and reproductive toxicants, followed by Alabama and Illinois. In all three states, one facility in one zip code contributed a sizable

Table 8: Top 20 U.S. Zip Codes for Releases of Developmental Toxicants, 2000 (pounds)

| City | State | Zip | Air | Water | Total |
|---|---|---|---|---|---|
| LOWLAND | TN | 37778 | 16,959,799 | 750 | 16,960,549 |
| AXIS | AL | 36505 | 11,327,588 | 981 | 11,328,569 |
| DANVILLE | IL | 61832 | 3,236,668 | 0 | 3,236,668 |
| COLUMBIA | SC | 29201 | 2,404,000 | 0 | 2,404,000 |
| LOUDON | TN | 37774 | 2,115,007 | 0 | 2,115,007 |
| DICKSON | TN | 37055 | 1,782,322 | 0 | 1,782,322 |
| HICKORY | NC | 28601 | 1,710,773 | 0 | 1,710,773 |
| CORINTH | MS | 38834 | 1,458,743 | 0 | 1,458,743 |
| MEMPHIS | TN | 38116 | 1,420,632 | 0 | 1,420,632 |
| OSCEOLA | AR | 72370 | 1,315,004 | 250 | 1,315,254 |
| TECUMSEH | KS | 66542 | 1,281,839 | 0 | 1,281,839 |
| FRANKLIN | KY | 42134 | 1,240,434 | 0 | 1,240,434 |
| RICHMOND | VA | 23228 | 1,205,862 | 0 | 1,205,862 |
| LOUISVILLE | KY | 40216 | 1,137,572 | 77 | 1,137,649 |
| EDINBURGH | IN | 46124 | 1,000,310 | 0 | 1,000,310 |
| ATGLEN | PA | 19310 | 935,451 | 0 | 935,451 |
| BARNSDALL | OK | 74002 | 911,700 | 0 | 911,700 |
| LOMIRA | WI | 53048 | 904,200 | 0 | 904,200 |
| MATTOON | IL | 61938 | 868,880 | 0 | 868,880 |
| WESTVILLE | NJ | 08093 | 857,016 | 60 | 857,076 |

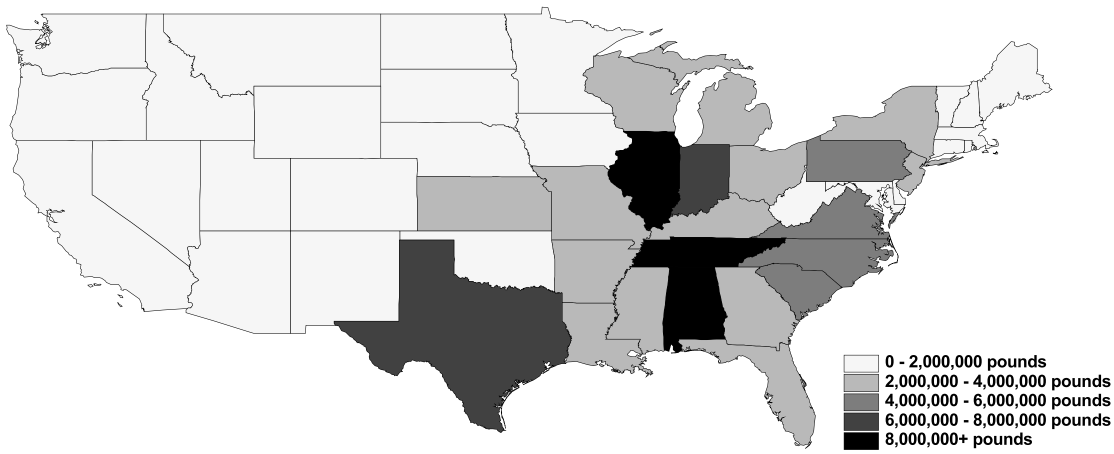
share of total releases. The Lenzing Fibers Corp. facility in zip code 37778 in Lowland, Tennessee helped propel that zip code to the top of the list for developmental toxicants, followed by zip codes in Axis, Alabama and Danville, Illinois. The same three zip codes also ranked first through third for releases of reproductive toxicants.

Over the 1987 to 2000 period, more than 4.2 billion pounds of developmental toxicants were released to the nation's air and surface water. Zip code 36505 in Axis, Alabama ranked first for developmental toxicant releases, followed by zip codes in Lowland, Tennessee and Front Royal, Virginia. In

Table 9: Top 20 U.S. Zip Codes for Releases of Reproductive Toxicants, 2000 (pounds)

| City | State | Zip | Air | Water | Total |
|---|---|---|---|---|---|
| LOWLAND | TN | 37778 | 16,959,784 | 750 | 16,960,534 |
| AXIS | AL | 36505 | 11,308,000 | 981 | 11,308,981 |
| DANVILLE | IL | 61832 | 3,229,146 | 0 | 3,229,146 |
| LOUDON | TN | 37774 | 2,115,000 | 0 | 2,115,000 |
| OSCEOLA | AR | 72370 | 1,315,004 | 250 | 1,315,254 |
| TECUMSEH | KS | 66542 | 1,023,140 | 0 | 1,023,140 |
| COLUMBIA | TN | 38402 | 836,367 | 164 | 836,531 |
| TONAWANDA | NY | 14150 | 748,021 | 1 | 748,022 |
| PROCTOR | WV | 26055 | 650,000 | 0 | 650,000 |
| SANDERSVILLE | GA | 31082 | 430,800 | 0 | 430,800 |
| ULYSSES | KS | 67880 | 420,000 | 0 | 420,000 |
| PRAIRIE DU CHIEN | WI | 53821 | 381,000 | 0 | 381,000 |
| HAMPTON | SC | 29924 | 325,300 | 0 | 325,300 |
| BRYANT | FL | 33439 | 314,220 | 0 | 314,220 |
| ROXANA | IL | 62084 | 296,002 | 0 | 296,002 |
| PAMPA | TX | 79066 | 284,890 | 0 | 284,890 |
| HERCULANEUM | MO | 63048 | 284,390 | 293 | 284,683 |
| GEISMAR | LA | 70734 | 270,496 | 786 | 271,282 |
| DEER PARK | TX | 77536 | 270,344 | 252 | 270,596 |
| WESTVILLE | NJ | 08093 | 216,441 | 50 | 216,491 |

**Fig. 2 Developmental Toxicant Releases by State, 2000**

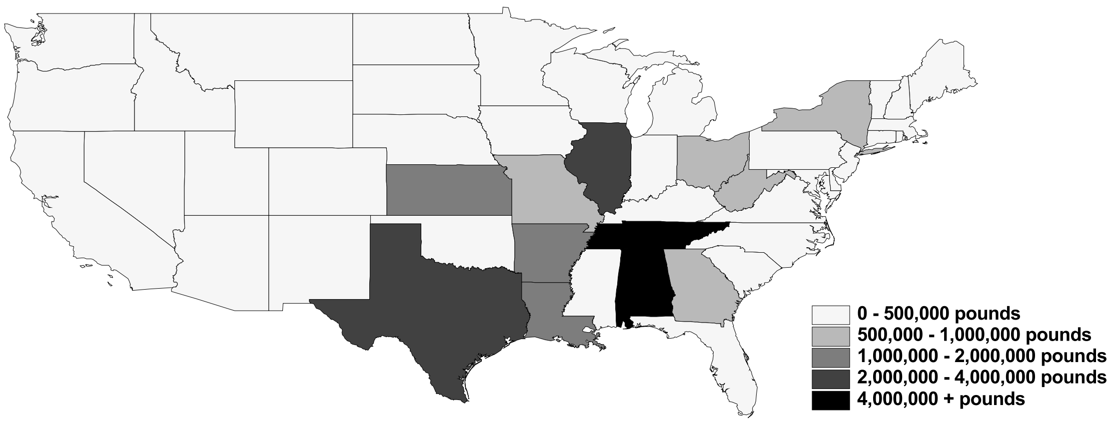



Front Royal, the vast majority of TRI releases were made by Avtex Fibers in 1987 and 1988—the last year for which the facility reported developmental toxicant releases to TRI. The Avtex facility was added to EPA's Superfund list of priority toxic waste sites in 1986 and all manufacturing at the facility ceased in 1989.[12]

**Table 10. Top 20 U.S. Zip Codes for Developmental Toxicant Releases, 1987-2000 (pounds)**

| City | State | Zip | Air | Water | Total |
|---|---|---|---|---|---|
| AXIS | AL | 36505 | 448,146,948 | 91,464 | 448,238,412 |
| LOWLAND | TN | 37778 | 266,138,799 | 1,005 | 266,139,804 |
| FRONT ROYAL | VA | 22630 | 84,245,813 | 0 | 84,245,813 |
| DANVILLE | IL | 61832 | 45,598,596 | 552 | 45,599,148 |
| LOUISVILLE | KY | 40216 | 43,948,352 | 7,000 | 43,955,352 |
| COLUMBIA | SC | 29201 | 43,665,983 | 0 | 43,665,983 |
| ELIZABETHTON | TN | 37643 | 38,557,050 | 121,200 | 38,678,250 |
| HUTCHINSON | MN | 55350 | 37,197,736 | 5 | 37,197,741 |
| MARYSVILLE | MI | 48040 | 36,858,260 | 725 | 36,858,985 |
| LOUISA | LA | 70538 | 33,486,164 | 0 | 33,486,164 |
| CORINTH | MS | 38834 | 31,582,678 | 0 | 31,582,678 |
| LOUDON | TN | 37774 | 29,343,296 | 25 | 29,343,321 |
| WARSAW | IN | 46580 | 29,265,294 | 666 | 29,265,960 |
| CHURCH HILL | TN | 37642 | 28,381,181 | 0 | 28,381,181 |
| HICKORY | NC | 28601 | 26,693,015 | 0 | 26,693,015 |
| COVINGTON | IN | 47932 | 25,545,317 | 0 | 25,545,317 |
| LINCOLN | NE | 68504 | 24,994,104 | 11,646 | 25,005,750 |
| DICKSON | TN | 37055 | 22,865,736 | 0 | 22,865,736 |
| COLUMBIA | TN | 38402 | 21,772,791 | 2,656 | 21,775,447 |
| GALLATIN | TN | 37066 | 21,414,363 | 5,216 | 21,419,579 |

**Fig. 3. Reproductive Toxicant Releases by State, 2000**




From 1987 to 2000, approximately 1.5 billion pounds of reproductive toxicants were released to air and water nationwide. As is the case with developmental toxicants, zip codes in Axis, Alabama, Lowland, Tennessee and Front Royal, Virginia ranked first through third in releases of reproductive toxicants.

**Table 11. Top 20 U.S. Zip Codes for Reproductive Toxicant Releases, 1987-2000 (pounds)**

| City | State | Zip | Air | Water | Total |
|---|---|---|---|---|---|
| AXIS | AL | 36505 | 447,991,153 | 89,469 | 448,080,622 |
| LOWLAND | TN | 37778 | 266,138,784 | 1,005 | 266,139,789 |
| FRONT ROYAL | VA | 22630 | 83,390,833 | 0 | 83,390,833 |
| DANVILLE | IL | 61832 | 45,326,514 | 552 | 45,327,066 |
| ELIZABETHTON | TN | 37643 | 38,554,400 | 121,200 | 38,675,600 |
| LOUISA | LA | 70538 | 33,486,158 | 0 | 33,486,158 |
| LOUDON | TN | 37774 | 29,237,502 | 25 | 29,237,527 |
| COVINGTON | IN | 47932 | 22,975,831 | 0 | 22,975,831 |
| COLUMBIA | TN | 38402 | 21,772,791 | 2,656 | 21,775,447 |
| OSCEOLA | AR | 72370 | 17,339,052 | 8,300 | 17,347,352 |
| VILLE PLATTE | LA | 70586 | 16,009,309 | 0 | 16,009,309 |
| CHICAGO | IL | 60638 | 15,224,224 | 0 | 15,224,224 |
| TONAWANDA | NY | 14150 | 13,265,697 | 1,873 | 13,267,570 |
| CENTERVILLE | LA | 70522 | 12,497,022 | 0 | 12,497,022 |
| TECUMSEH | KS | 66542 | 11,725,282 | 0 | 11,725,282 |
| PROCTOR | WV | 26055 | 9,294,271 | 0 | 9,294,271 |
| FOLLANSBEE | WV | 26037 | 8,522,908 | 688 | 8,523,596 |
| BIG SPRING | TX | 79720 | 7,674,905 | 2,495 | 7,677,400 |
| EL DORADO | AR | 71730 | 7,558,068 | 1,110 | 7,559,178 |
| DEER PARK | TX | 77536 | 7,268,558 | 1,172 | 7,269,730 |

### Community Profile: Dickson County, Tennessee

Dickson County, Tennessee ranked eighth among U.S. counties for discharges of developmental toxicants in 2000. Over the entire 1987-2000 period, zip code 37055 in Dickson, Tennessee ranked 18th for releases of developmental toxicants, with a total of more than 22.8 million pounds of releases—the vast majority of them releases of toluene, all of which took place to the air. Developmental toxicant releases in Dickson County increased tenfold between 1987 and 1990 and have surpassed 1.3 million pounds each year for the last decade. Releases of developmental toxicants in the county peaked in 1995-96 and again in 1998-99, surpassing 2 million pounds in each of those four years.

In June 2000, the Tennessee Department of Health was alerted by a local early intervention center to what appeared to be a cluster of cases of cleft lip and cleft palate in Dickson County. The state eventually identified 18 infants born with clefts between 1997 and 2000—a rate significantly higher than what would have been expected. Researchers from the Centers for Disease Control interviewed 15 of the 18 mothers in an effort to determine whether the clefts had a common cause. While 13 of the 15 mothers reported using a municipal water source, no other environmental exposures (except for smoking and occupational exposure to chemicals) were evaluated. CDC concluded that no single factor appeared to be responsible for the cluster, but noted that a more formal case-control study might be warranted if more children are born with the defect.[13]

It is unknown whether exposure to toluene in the ambient air had any impact on the development of the cleft lip/cleft palate cluster, or whether residents of the county were exposed to the substance at levels that could have affected their health. Moreover, the links between low-level exposures to toluene during pregnancy and the development of birth defects are poorly understood. However, the coincidental increase in toluene emissions in Dickson County and the rise in cleft lip/cleft palate cases might have provided an opportunity to test such a hypothesis—had the resources and the willingness to explore those links existed. Such an investigation could potentially have benefited both the residents of Dickson County—who continue to be subject to large-scale air releases of toluene—and residents of many other communities experiencing similar releases.

## Releases by Industry Sector and Parent Company

The cellulosic manmade fibers industry sector—which includes the manufacture of acetate and rayon fibers for clothing—was the largest releaser of developmental and reproductive toxicants in 2000. The industry uses large amounts of carbon disulfide to treat cellulose in the manufacture of rayon. As of 1997, the U.S. Census Bureau listed six establishments nationwide in the cellulosic manmade fibers sector. In 2000, four reported releases of developmental toxicants to the air or water.

While the cellulosic manmade fibers sector was responsible for the greatest amount of developmental toxicant releases reported to TRI, other industries may have been responsible for significant amounts of unreported releases. For example, 49 facilities in the commercial gravure printing industry (which uses a specialized printing process to produce large print runs of magazines, packaging and other products) reported air or water releases of developmental toxicants to TRI in 2000—largely

**Table 12: Developmental Toxicant Releases by Industry Sector, 2000 (pounds)**

| Industry | Air | Water | Total |
|---|---|---|---|
| CELLULOSIC MANMADE FIBERS | 28,458,386 | 5,029 | 28,463,415 |
| COMMERCIAL PRINTING, GRAVURE | 12,362,520 | 35 | 12,362,555 |
| PLASTICS PRODUCTS, NEC | 9,861,579 | 419 | 9,861,998 |
| PAPER COATED AND LAMINATED, NEC | 8,656,687 | 0 | 8,656,687 |
| PETROLEUM REFINING | 7,775,942 | 44,899 | 7,820,841 |
| INDUSTRIAL ORGANIC CHEMICALS, NEC | 5,077,601 | 45,749 | 5,123,350 |
| COMMERCIAL PRINTING, LITHOGRAPHIC | 4,193,896 | 0 | 4,193,896 |
| PAPER COATED + LAMINATED, PACKAGING | 3,866,244 | 0 | 3,866,244 |
| FABRICATED RUBBER PRODUCTS, NEC | 3,479,076 | 7 | 3,479,083 |
| PLASTICS MATERIALS AND RESINS | 3,294,242 | 20,181 | 3,314,423 |

NEC= Not Elsewhere Classified

**Table 13: Reproductive Toxicant Releases by Industry Sector, 2000 (pounds)**

| Industry | Air | Water | Total |
|---|---|---|---|
| CELLULOSIC MANMADE FIBERS | 28,226,229 | 4,131 | 28,230,360 |
| PLASTICS PRODUCTS, NEC | 7,625,365 | 414 | 7,625,779 |
| PETROLEUM REFINING | 2,451,558 | 17,513 | 2,469,071 |
| CARBON BLACK | 2,020,946 | 0 | 2,020,946 |
| INDUSTRIAL ORGANIC CHEMICALS, NEC | 1,631,429 | 9,563 | 1,640,992 |
| PLASTICS MATERIALS AND RESINS | 1,604,565 | 19,102 | 1,623,667 |
| PAPER COATED + LAMINATED, PACKAGING | 1,024,605 | 0 | 1,024,605 |
| BLAST FURNACES AND STEEL MILLS | 736,723 | 22,841 | 759,564 |
| CYCLIC CRUDES AND INTERMEDIATES | 460,862 | 244 | 461,106 |
| MINERALS, GROUND OR TREATED | 434,940 | 0 | 434,940 |

NEC= Not Elsewhere Classified

releases of toluene. However, as of 1997, there were a total of 453 facilities in the industry in the U.S., of which the vast majority (354) employed less than 20 full-time employees. Because TRI reporting is limited to facilities with 10 or more full-time employees that also meet other criteria, there is a good possibility that at least some of the facilities within the industry are releasing developmental toxicants that are not reportable to TRI.

Among parent companies, Lenzing Fibers Corp., a manufacturer of viscose rayon fibers, ranked first for releases of both developmental and reproductive toxicants in 2000.

## SUSPECTED NEUROLOGICAL TOXICANTS

Even less is known about the ability of many toxic substances to harm the brain or the central nervous system. While some substances—such as lead and mercury—have long been known to affect central nervous system function, many other substances have not been fully tested for their neurological effects. There is no authoritative list of substances that are known to cause neurological problems. However, the nonprofit environmental organization, Environmental Defense has compiled a comprehensive list of substances suspected by government or academic researchers to cause neurological problems. (See "Methodology")

**Table 14: Developmental Toxicant Releases by Parent Company, 2000 (pounds)**

| Parent Company | Total |
|---|---|
| LENZING FIBERS CORP. | 16,960,549 |
| ACORDIS US HOLDING INC. | 11,257,980 |
| QUEBECOR WORLD | 11,213,550 |
| R. R. DONNELLEY & SONS CO. | 3,822,346 |
| INTERTAPE POLYMER GROUP INC. | 3,485,833 |
| VISKASE COS. INC. | 3,430,250 |
| 3M CO. INC. | 3,362,792 |
| DEVRO-TEEPAK | 3,229,146 |
| STM INC. | 1,776,218 |
| EXXON MOBIL CORP. | 1,603,240 |

**Table 15: Reproductive Toxicant Releases by Parent Company, 2000 (pounds)**

| Parent Company | Total |
|---|---|
| LENZING FIBERS CORP. | 16,960,534 |
| ACORDIS US HOLDING INC. | 11,257,980 |
| VISKASE COS. INC. | 3,430,250 |
| DEVRO-TEEPAK | 3,229,146 |
| 3M | 1,147,389 |
| PHELPS DODGE CORP. | 1,110,676 |
| UCB INC. | 1,023,140 |
| HUTCHISON CORP. | 836,531 |
| CABOT CORP. | 519,951 |
| RENCO GROUP INC. | 487,712 |

### Releases by Chemical

In 2000, more than 1 billion pounds of suspected neurotoxicants were released directly to the air and to surface water. Among suspected neurological toxicants, methanol was released in the greatest quantities in 2000, followed by ammonia and tolu-

**Table 16: Suspected Neurological Toxicant Releases, 2000 (pounds)**

| Chemical | Air | Water | Total |
|---|---|---|---|
| METHANOL | 183,176,226 | 3,753,931 | 186,930,157 |
| AMMONIA | 139,047,851 | 7,549,766 | 146,597,617 |
| TOLUENE | 81,257,581 | 40,497 | 81,298,078 |
| HYDROGEN FLUORIDE | 70,790,856 | 26,458 | 70,817,314 |
| XYLENE (MIXED ISOMERS) | 57,731,714 | 82,464 | 57,814,178 |
| STYRENE | 57,162,866 | 3,366 | 57,166,232 |
| N-HEXANE | 53,861,576 | 16,901 | 53,878,477 |
| CHLORINE | 45,598,134 | 281,508 | 45,879,642 |
| CARBON DISULFIDE | 40,584,960 | 3,704 | 40,588,664 |
| METHYL ETHYL KETONE | 34,051,889 | 40,693 | 34,092,582 |

**Community Profile: El Paso, Texas**

While heavy metals such as lead, mercury and their compounds do not show up among the most frequently released suspected neurotoxicants under TRI, the more than 1.5 million pounds of lead and lead compounds and 166,000 pounds of mercury and mercury compounds emitted in 2000 are significant. Lead and mercury have long been known for their potent effects on the brain and nervous system as well as for their persistence in the environment and the body.

Exposure to heavy metals has also lately been suspected as a potential trigger for the development of multiple sclerosis (MS). While the cause of MS is unknown, some suspect that environmental factors may play a role in development of the disease. A series of studies over the last half-century have suggested—though not proven—that exposure to a variety of metals may have been linked to the development of MS clusters in the U.S. and other countries.

Since the late 19th century, El Paso, Texas had been home to an ASARCO lead and copper smelter that also processed zinc and cadmium. During the early 1970s, public health officials documented extremely high levels of lead in the blood of area residents. In 1994, a former El Paso resident contacted state health officials with concerns about an apparent cluster of cases of multiple sclerosis among people who grew up in one neighborhood of the city from the 1940s through the 1960s.

A study of the El Paso cluster conducted by the Texas Department of Health and the ATSDR found that MS rates among graduates of one local elementary school appeared to be significantly elevated. While the study did not identify metals exposure as the cause of the MS cluster, it did cite biological evidence of high levels of metals exposure. The study was burdened by the lack of good data on the rate of MS that would be expected among a population similar to that in El Paso and by the difficulty of locating and gaining participation from many former students. The study concluded that more studies are needed of the role metals exposure may play as a risk factor for MS.[15]

The good news for El Paso residents is that the flow of metals into the region's air from the ASARCO facility has subsided. During the late 1980s and early 1990s, the facility released approximately 40,000 pounds of lead and lead compounds to the air per year. However, the plant ceased active operations in 1999, and air emissions of lead and lead compounds had dropped to approximately 1,500 pounds per year by 2000. But with emissions of lead, lead compounds and other metals continuing across the country, research into the links between metals exposure and multiple sclerosis is extremely important.

ene. Methanol is used as a solvent in adhesives, cleaners and inks, results from the combustion of plastics and other wastes, and is a product of wood pulping. At high levels of exposure, methanol can cause headaches, loss of muscle coordination, vision problems, blindness or death. Exposure to methanol can also result in nerve damage, and because the chemical is only slowly eliminated from the body, repeated low-level exposures can have severe effects.[14]

## Releases by Location

The states of Texas, Tennessee and Louisiana ranked first through third for overall neurotoxicant releases. Zip code 84074 in Rowley, Utah—home to a Magnesium Corporation of America facility—ranked first in overall releases, followed by zip codes in Lowland, Tennessee and Axis, Alabama.

From 1987 to 2000, approximately 23.1 billion pounds of suspected neurotoxicants were released nationwide. Zip code 84074 in Rowley, Utah again ranked first for suspected neurotoxicant releases, followed by zip codes in Axis, Alabama and Lowland, Tennessee. In the case of Rowley, home to the Magnesium Corporation of America, reported releases have declined steadily from a 1989 peak of 110 million pounds to a 2000 level of 42 million pounds. However, Magnesium Corporation's releases were still large enough to help make its Rowley zip code first in the nation for suspected neurotoxicant releases in 2000. (See Table 18, next page.)

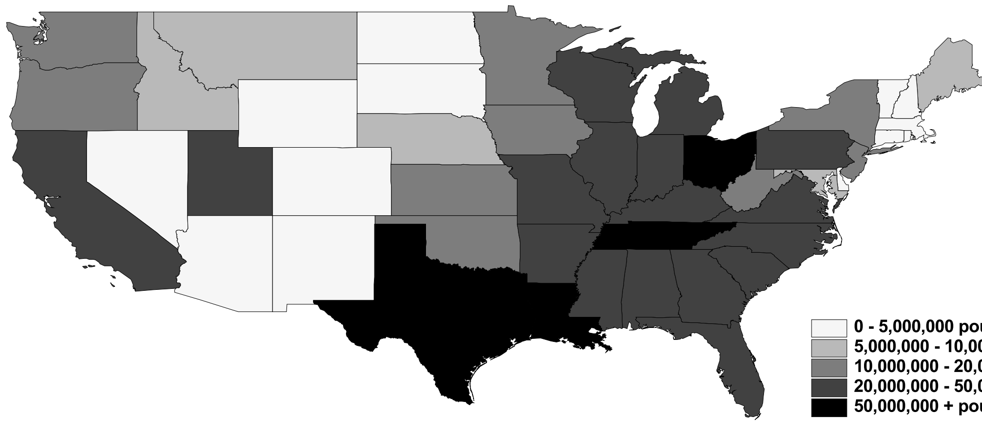
**Table 17. Top 20 U.S. Zip Codes for Releases of Suspected Neurotoxicants, 2000 (pounds)**

| City | State | Zip | Air | Water | Total |
|---|---|---|---|---|---|
| ROWLEY | UT | 84074 | 42,154,522 | 0 | 42,154,522 |
| LOWLAND | TN | 37778 | 17,004,727 | 13,480 | 17,018,207 |
| AXIS | AL | 36505 | 11,404,211 | 2,683 | 11,406,894 |
| DONALDSONVILLE | LA | 70346 | 8,835,530 | 117,965 | 8,953,495 |
| GEISMAR | LA | 70734 | 7,960,054 | 132,351 | 8,092,405 |
| ASHTABULA | OH | 44004 | 7,015,377 | 3,500 | 7,018,877 |
| HOPEWELL | VA | 23860 | 6,795,417 | 72,725 | 6,868,142 |
| DANVILLE | IL | 61832 | 5,562,440 | 6,271 | 5,568,711 |
| PORT NECHES | TX | 77651 | 4,444,547 | 60,197 | 4,504,744 |
| LOUISVILLE | KY | 40216 | 4,410,452 | 1,401 | 4,411,853 |
| BATON ROUGE | LA | 70805 | 4,346,044 | 61,634 | 4,407,678 |
| DECATUR | IL | 62526 | 4,353,467 | 0 | 4,353,467 |
| TEXAS CITY | TX | 77590 | 4,139,663 | 70,803 | 4,210,466 |
| GEORGETOWN | SC | 29440 | 4,029,426 | 39,615 | 4,069,041 |
| ROME | GA | 30165 | 3,955,201 | 29,238 | 3,984,438 |
| COVINGTON | VA | 24426 | 3,785,333 | 22,390 | 3,807,723 |
| CAMDEN | AR | 71701 | 3,741,494 | 28,403 | 3,769,897 |
| HAMPTON | SC | 29924 | 3,748,756 | 0 | 3,748,756 |
| MARIETTA | OH | 45750 | 3,179,623 | 551,207 | 3,730,830 |
| FERNANDINA BEACH | FL | 32034 | 3,634,433 | 89,880 | 3,724,313 |

**Table 18. Top 20 U.S. Zip Codes for Suspected Neurotoxicant Releases, 1987-2000 (pounds)**

| City | State | Zip | Air | Water | Total |
|---|---|---|---|---|---|
| ROWLEY | UT | 84074 | 939,705,213 | 0 | 939,705,213 |
| AXIS | AL | 36505 | 451,000,594 | 429,087 | 451,429,681 |
| LOWLAND | TN | 37778 | 267,351,207 | 191,295 | 267,542,502 |
| DONALDSONVILLE | LA | 70346 | 239,983,714 | 6,360,895 | 246,344,609 |
| KENAI | AK | 99611 | 131,693,769 | 2,200,760 | 133,894,529 |
| SAINT JAMES | LA | 70086 | 125,729,071 | 1,678,705 | 127,407,776 |
| ROCHESTER | NY | 14652 | 113,410,106 | 4,382,175 | 117,792,281 |
| HUTCHINSON | MN | 55350 | 109,189,499 | 10 | 109,189,509 |
| GEISMAR | LA | 70734 | 106,114,477 | 2,720,023 | 108,834,500 |
| COVINGTON | VA | 24426 | 96,454,139 | 1,007,282 | 97,461,421 |
| MARIETTA | OH | 45750 | 69,183,819 | 25,785,260 | 94,969,079 |
| YAZOO CITY | MS | 39194 | 90,290,686 | 109,439 | 90,400,125 |
| FRONT ROYAL | VA | 22630 | 87,463,385 | 68,200 | 87,531,585 |
| DEER PARK | TX | 77536 | 79,212,088 | 1,910,237 | 81,122,325 |
| HAMPTON | SC | 29924 | 80,201,112 | 2,052 | 80,203,164 |
| LOUISVILLE | KY | 40216 | 78,936,019 | 41,392 | 78,977,411 |
| FREEPORT | TX | 77541 | 72,861,136 | 6,105,287 | 78,966,423 |
| NEW JOHNSONVILLE | TN | 37134 | 75,338,495 | 2,977,326 | 78,315,821 |
| CALVERT CITY | KY | 42029 | 71,595,141 | 3,152,148 | 74,747,289 |
| SAVANNAH | GA | 31408 | 71,788,478 | 2,609,144 | 74,397,622 |

Fig. 4. Suspected Neurological Toxicant Releases by State, 2000




## Releases by Industry Sector and Parent Company

For releases of suspected neurological toxicants, pulp mills, electric services providers and industrial organic chemicals facilities ranked first, second and third in 2000. A total of 81 pulp mills reported releases of suspected neurotoxicants to TRI in 2000, but due to inconsistencies in the identification of industry sectors, no comparison is possible with the number of facilities reported to exist nationwide by the Census Bureau.[16]

Methanol was the primary suspected neurotoxicant released by pulp mills. Hydrogen fluoride was the leading suspected neurotoxicant released by electric power plants, while facilities in the industrial organic chemicals sector released large amounts of ethylene, ammonia and toluene.

International Paper Co. led all parent companies for releases of suspected neurological toxicants in 2000, releasing large amounts of methanol. International Paper was followed by Renco Group Inc. (parent of Magnesium Corporation of America and other companies in the metals industry), which released large amounts of chlorine, and Georgia-Pacific Corp., which released large amounts of methanol.

Table 19: Suspected Neurological Toxicant Releases by Industry Sector, 2000 (pounds)

| Industry | Air | Water | Total |
|---|---|---|---|
| PULP MILLS | 75,256,626 | 6,812,285 | 82,068,912 |
| ELECTRIC SERVICES | 65,199,476 | 965,827 | 66,165,303 |
| INDUSTRIAL ORGANIC CHEMICALS, NEC | 50,817,506 | 1,600,853 | 52,418,359 |
| PRIMARY NONFERROUS METALS, NEC | 47,210,612 | 167,685 | 47,378,297 |
| PAPERBOARD MILLS | 44,932,457 | 1,299,062 | 46,231,519 |
| NITROGENOUS FERTILIZERS | 42,871,641 | 554,015 | 43,425,656 |
| PETROLEUM REFINING | 38,837,160 | 1,067,728 | 39,904,888 |
| PAPER MILLS | 35,252,953 | 2,160,067 | 37,413,020 |
| MOTOR VEHICLES AND CAR BODIES | 32,390,187 | 1,798 | 32,391,985 |
| CELLULOSIC MANMADE FIBERS | 31,269,004 | 250,383 | 31,519,387 |

NEC= Not Elsewhere Classified

Table 20: Suspected Neurotoxicant Releases by Parent Company, 2000 (pounds)

| Parent Company | Total |
|---|---|
| INTERNATIONAL PAPER CO. | 44,435,541 |
| RENCO GROUP INC. | 42,734,708 |
| GEORGIA-PACIFIC CORP. | 27,016,251 |
| SMURFIT-STONE CONTAINER CORP. | 17,098,371 |
| LENZING FIBERS CORP. | 17,018,207 |
| WEYERHAEUSER CO. | 13,977,796 |
| E. I. DU PONT DE NEMOURS & CO. INC. | 13,590,317 |
| GMC | 12,778,689 |
| QUEBECOR WORLD | 11,882,738 |
| PCS NITROGEN INC. | 11,620,291 |

## SUSPECTED RESPIRATORY TOXICANTS

The link between exposures to toxicants such as asbestos fibers and cigarette smoke and disorders such as lung cancer and emphysema has long been recognized. In addition, exposure to air pollution has been linked to the onset of asthma attacks and, in one recent study, to the development of asthma itself.[17] As is the case with neurological disorders, the respiratory impacts of various toxic exposures have been subject to less study, although again, Environmental Defense has compiled a list of suspected respiratory toxicants based on a variety of sources.

### Releases by Chemical

In 2000, more than 1.7 billion pounds of suspected respiratory toxicants were released directly to the air by facilities that report to TRI. Acid aerosols of hydrochloric acid were released in the greatest quantities, representing one of every three pounds of suspected respiratory toxicants released in 2000. Hydrochloric acid is released to the air in large quantities by electric power plants and is also used in various disinfection products. Hydrochloric acid is highly corrosive and irritating to the eyes and the respiratory tract. Chronic occupational exposure has been linked to gastritis, chronic bronchitis and dermatitis in workers, while long-term, low-level exposure has been linked to dental erosion. Little to no information exists on any links between hydrochloric acid and developmental, reproductive or carcinogenic effects in humans.

### Releases by Location

The states of Ohio, North Carolina and Georgia ranked first through third in respiratory toxicant releases. Zip code 84074 in Rowley, Utah ranked first in the nation for air releases of suspected respiratory toxicants, followed by zip codes in Semora, North Carolina and Shelocta, Pennsylvania.

Since the inception of the TRI program, approximately 23.5 billion pounds of suspected respiratory toxicants have been released into the nation's air. Zip code 84074 in Rowley, Utah ranks first by far for respiratory toxicant releases (mostly air emissions of chlorine), followed by zip codes in Donaldsonville, Louisiana and Rochester, New York. It is important to note that, had electric power plants been included in TRI prior to 1998, communities with electric power plants would likely rate near the top of this list. (See Table 23, next page)

**Table 21: Suspected Respiratory Toxicant Releases, 2000 (pounds)**

| Chemical | Air Emissions |
|---|---|
| HYDROCHLORIC ACID (ACID AEROSOLS) | 645,632,582 |
| METHANOL | 183,176,226 |
| SULFURIC ACID (ACID AEROSOLS) | 148,795,976 |
| AMMONIA | 139,047,851 |
| TOLUENE | 81,257,581 |
| HYDROGEN FLUORIDE | 70,790,856 |
| XYLENE (MIXED ISOMERS) | 57,731,714 |
| STYRENE | 57,162,866 |
| N-HEXANE | 53,861,576 |
| CHLORINE | 45,598,134 |

**Table 22. Top 20 U.S. Zip Codes for Air Emissions of Suspected Respiratory Toxicants, 2000 (pounds)**

| City | State | Zip | Air Emissions |
|---|---|---|---|
| ROWLEY | UT | 84074 | 43,936,667 |
| SEMORA | NC | 27343 | 19,217,246 |
| SHELOCTA | PA | 15774 | 18,439,349 |
| MANCHESTER | OH | 45144 | 18,408,178 |
| CARTERSVILLE | GA | 30120 | 17,828,862 |
| PENSACOLA | FL | 32514 | 16,635,858 |
| NEW JOHNSONVILLE | TN | 37134 | 15,508,636 |
| MOUNDSVILLE | WV | 26041 | 14,582,839 |
| TERRELL | NC | 28682 | 14,546,965 |
| WINFIELD | WV | 25213 | 14,526,137 |
| BALTIMORE | MD | 21226 | 12,635,407 |
| BELEWS CREEK | NC | 27009 | 11,360,090 |
| NEW HAVEN | WV | 25265 | 10,994,190 |
| MONROE | MI | 48161 | 10,788,407 |
| DEMOPOLIS | AL | 36732 | 10,203,258 |
| GULFPORT | MS | 39502 | 9,965,445 |
| ROXBORO | NC | 27573 | 9,591,406 |
| BRILLIANT | OH | 43913 | 9,584,560 |
| DONALDSONVILLE | LA | 70346 | 8,840,440 |
| MASONTOWN | PA | 15461 | 8,777,480 |

Fig. 5. Suspected Respiratory Toxicant Releases by State, 2000

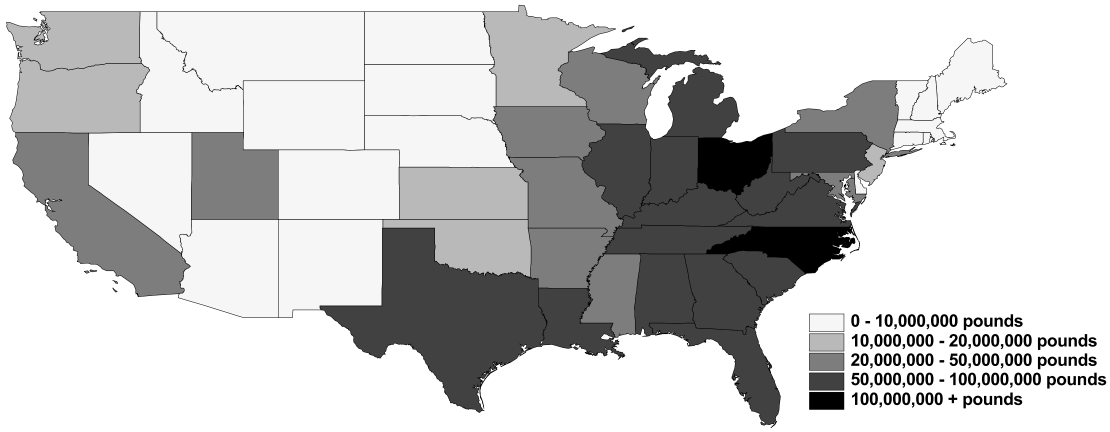



**Table 23. Top 20 U.S. Zip Codes for Suspected Respiratory Toxicant Releases, 1987-2000 (pounds)**

| City | State | Zip | Air Emissions |
|---|---|---|---|
| ROWLEY | UT | 84074 | 1,012,784,992 |
| DONALDSONVILLE | LA | 70346 | 240,025,193 |
| ROCHESTER | NY | 14652 | 145,654,705 |
| KENAI | AK | 99611 | 131,397,184 |
| SAINT JAMES | LA | 70086 | 126,894,402 |
| COVINGTON | VA | 24426 | 113,875,976 |
| HUTCHINSON | MN | 55350 | 108,445,309 |
| KINGSPORT | TN | 37662 | 97,256,136 |
| GEISMAR | LA | 70734 | 93,497,637 |
| YAZOO CITY | MS | 39194 | 90,290,686 |
| LOUISVILLE | KY | 40216 | 84,880,480 |
| HAMPTON | SC | 29924 | 80,576,776 |
| SAVANNAH | GA | 31408 | 80,089,863 |
| DEER PARK | TX | 77536 | 75,405,958 |
| FREEPORT | TX | 77541 | 72,660,174 |
| LELAND | NC | 28451 | 71,829,525 |
| BLYTHEVILLE | AR | 72315 | 70,058,787 |
| WILMINGTON | NC | 28401 | 68,225,666 |
| SHELOCTA | PA | 15774 | 67,158,125 |
| BATON ROUGE | LA | 70805 | 66,163,263 |

## Releases by Industry Sector and Parent Company

The electric services industry sector, which includes electric power plants, was far and away responsible for the greatest releases of suspected respiratory toxicants in 2000. A total of 612 facilities in the electric services sector reported air releases of suspected respiratory toxicants in 2000. In 1997, the U.S. Census Bureau counted 6,212 facilities in the sector, of which 834 were engaged in the generation of electricity from fossil fuels, which appears to be responsible for the majority of respiratory toxicant releases from the sector. The pulp and paper industries also ranked high for respiratory toxicant releases to the nation's air.

**Table 24: Suspected Respiratory Toxicant Releases by Industry Sector, 2000 (pounds)**

| Industry | Air Emissions |
|---|---|
| ELECTRIC SERVICES | 773,948,940 |
| PULP MILLS | 87,076,027 |
| PAPERBOARD MILLS | 51,247,786 |
| PRIMARY NONFERROUS METALS, NEC | 49,308,665 |
| INDUSTRIAL ORGANIC CHEMICALS, NEC | 46,648,437 |
| PAPER MILLS | 46,111,887 |
| PETROLEUM REFINING | 44,310,309 |
| NITROGENOUS FERTILIZERS | 43,631,655 |
| MOTOR VEHICLES AND CAR BODIES | 36,010,314 |
| PLASTICS MATERIALS AND RESINS | 26,852,371 |

NEC= Not Elsewhere Classified

Electric utilities—Southern Co., American Electric Power and Progress Energy—led all parent companies in emissions of suspected respiratory toxicants, with the Tennessee Valley Authority, a public agency involved in electricity generation, ranking fourth.

**Table 25: Suspected Respiratory Toxicant Releases by Parent Company, 2000 (pounds)**

| Parent Company | Total |
|---|---|
| SOUTHERN CO. | 91,964,317 |
| AMERICAN ELECTRIC POWER | 75,971,190 |
| PROGRESS ENERGY | 53,267,446 |
| U.S. TENNESSEE VALLEY AUTHORITY | 51,436,265 |
| INTERNATIONAL PAPER CO. | 49,524,101 |
| RENCO GROUP INC. | 44,055,761 |
| DUKE ENERGY CORP. | 43,634,338 |
| CINERGY CORP. | 30,032,920 |
| RELIANT ENERGY INC. | 29,156,177 |
| GEORGIA-PACIFIC CORP. | 29,539,458 |

## DIOXINS

The chemical class known as dioxins was added to the Toxics Release Inventory beginning in the 2000 reporting year. Long regarded as among the most toxic chemicals known to science, dioxins have been the subject of a decade-long "reassessment" of their toxicity by EPA. Drafts of the EPA's reassessment have reaffirmed the conclusion that dioxins are potent toxicants and may cause cancer, developmental and reproductive impacts. In fact, the EPA estimates that the cancer risk from dioxin in levels already present in the general public is approximately 1-per-1,000.[18] Other sources have identified at least one member of the dioxin family as a potential neurological and respiratory toxicant, making it one of the few substances thought to be tied to all five health impacts studied in this report.

Dioxins are treated separately from other chemicals in this report because the quantities of dioxins that are thought to be dangerous to human health are extremely minute. As a result, EPA requires facilities to report their dioxin releases to TRI in units of grams, as opposed to pounds. Including dioxins with other toxicants would tend to downplay the severe consequences that even small releases of dioxins can have on human health.

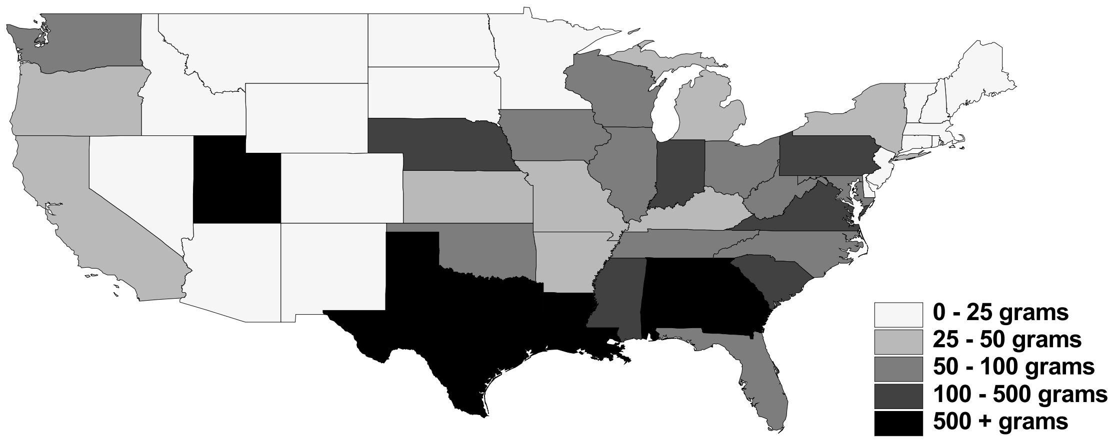
### Releases by Location

Facilities nationwide reported releasing more than 7,000 grams of dioxin to the air and water during 2000. Zip code 30119 in Carrollton, Georgia

**Table 26. Top 20 U.S. Zip Codes for Dioxin Releases, 2000 (grams)**

| City | State | Zip | Air | Water | Total |
|---|---|---|---|---|---|
| CARROLLTON | GA | 30119 | 965 | 0 | 965 |
| DECATUR | AL | 35609 | 807 | 0 | 807 |
| PLAQUEMINE | LA | 70765 | 3 | 746 | 749 |
| FREEPORT | TX | 77541 | 141 | 562 | 703 |
| ROWLEY | UT | 84074 | 623 | 0 | 623 |
| FREMONT | NE | 68025 | 429 | 0 | 429 |
| NEW BRAUNFELS | TX | 78132 | 147 | 0 | 147 |
| GRENADA | MS | 38960 | 0 | 117 | 117 |
| TELL CITY | IN | 47586 | 107 | 0 | 107 |
| DRAVOSBURG | PA | 15034 | 103 | 0 | 103 |
| GREGORY | TX | 78359 | 100 | 2 | 101 |
| PLAQUEMINE | LA | 70764 | 9 | 83 | 91 |
| DEER PARK | TX | 77536 | 52 | 33 | 85 |
| RICHMOND | VA | 23234 | 80 | 0 | 80 |
| LAKE CHARLES | LA | 70601 | 2 | 75 | 77 |
| HOLLY HILL | SC | 29059 | 75 | 0 | 75 |
| BATON ROUGE | LA | 70805 | 62 | 0 | 62 |
| ARDMORE | OK | 73401 | 56 | 0 | 56 |
| FRIENDLY | WV | 26146 | 51 | 0 | 51 |
| SCOOBA | MS | 39358 | 0 | 50 | 50 |

Fig. 6. Dioxin Releases by State, 2000




(home of Southwire Co., a cable and wire manufacturer) saw the greatest releases of dioxins, followed by zip codes in Decatur, Alabama and Plaquemine, Louisiana. It is noteworthy that a second zip code in Plaquemine ranks 12th in dioxin releases—combining the two zip codes would increase the town's ranking to second overall. Texas led all states for dioxin releases in 2000, followed by Louisiana and Alabama.

## Releases by Industry Sector and Parent Company

The chlorine and alkali industry sector ranked first overall in dioxin releases to air and water, followed by the secondary metals industry and the noncellulosic organic fibers industry, which manufactures nylon and polyester fibers and filaments. Electric power plants were also a major source of dioxins. Eleven facilities within the alkalies and chlorine manufacturing sector reported releases of dioxin to TRI in 2000, compared with 39 facilities listed within the industry sector in the 1997 Economic Census.

Dow Chemical led all parent companies for releases of dioxins, emitting more than 1.4 kilograms of dioxin to the air and surface water, followed by Southwire Co. and Solutia Inc. (formerly Monsanto).

**Table 27: Dioxin Releases by Industry Sector, 2000 (grams)**

| Industry | Air | Water | Total |
|---|---|---|---|
| ALKALIES AND CHLORINE | 162 | 1,422 | 1,583 |
| SECONDARY NONFERROUS METALS | 1,098 | 0 | 1,098 |
| ORGANIC FIBERS, NONCELLULOSIC | 808 | 0 | 808 |
| ELECTRIC SERVICES | 677 | 0 | 677 |
| PRIMARY NONFERROUS METALS, NEC | 624 | 0 | 624 |
| ELECTRIC AND OTHER SERVICES COMBINED | 470 | 0 | 470 |
| CEMENT, HYDRAULIC | 447 | 1 | 448 |
| WOOD PRESERVING | 12 | 357 | 369 |
| INDUSTRIAL ORGANIC CHEMICALS, NEC | 186 | 87 | 272 |
| PULP MILLS | 60 | 115 | 175 |

NEC= Not Elsewhere Classified

**Table 28: Dioxin Releases by Parent Company, 2000 (grams)**

| Parent Company | Total |
|---|---|
| DOW CHEMICAL CO. | 1457 |
| SOUTHWIRE CO. | 965 |
| SOLUTIA INC. | 807 |
| RENCO GROUP INC. | 628 |
| CITY OF FREMONT DEPARTMENT OF UTILITIES | 429 |
| KOPPERS INDS. INC. | 163 |
| TXI OPS. L.P. | 146 |
| OCCIDENTAL PETROLEUM CORP. | 140 |
| COGENTRIX ENERGY INC. | 127 |
| BUDD CO. | 107 |

**Community Profile: Calcasieu Parish, Louisiana**

In the first year of TRI reporting of dioxin releases, Calcasieu Parish, Louisiana ranked 13th among U.S. counties for releases to air and water. Nine facilities within the parish reported releases of dioxin, with the majority of releases coming from the PPG Industries facility in Lake Charles. Yet, long before the release of the 2000 TRI data, residents of the parish were already aware of the potential impact of dioxin releases on their health.

In 1997, lawyers gathering information for a class action lawsuit against the former owner of a chemical plant in the area tested the blood of 11 people in the parish. Three of the samples came back with unusually high levels of dioxin. To confirm the results, the lawyers tested a pooled blood sample taken from a local hospital. That sample, too, found levels of dioxin that were either above or at the high end of the national average.[19]

In late 1998, the ATSDR confirmed the earlier test results, and a year later, released the results of follow-up blood testing that found average levels of dioxin three times the national average. The levels were among the highest ever reported in the U.S. for a non-occupational exposure.[20] While a subsequent study by Louisiana state officials did not find overall elevated rates of cancer in the parish, it did note significantly elevated levels of lung cancer and soft tissue cancers, both of which have been linked to dioxin exposure.[21]

The situation in Calcasieu Parish is unusual in that exposure to dioxin has been confirmed through biological monitoring—demonstrating the potential usefulness of biological monitoring in making connections between industrial releases of toxic chemicals and the potential for future health effects.

## MANY TOXIC RELEASES GO UNREPORTED

The Toxics Release Inventory provides the best source of information on the release of toxic chemicals nationwide. However, TRI does not provide a complete picture of toxic releases to the environment. Until the mid-1990s, TRI tracked only the release of approximately 300 toxic substances. That list was expanded to more than 600 chemicals in 1994 and several classes of industries—such as electric utilities and solid waste incinerators—that had previously been exempt from reporting were added to the program beginning in the 1998 reporting year. The late 1990s also saw the closing of loopholes that had allowed many releases of persistent bioaccumulative substances and dioxins—which can be extremely toxic at low levels of exposure—to escape reporting.

Yet many chemicals and some industries remain exempt from the requirements of TRI. Major sources of pollution, such as airports, oil wells and medical waste incinerators, remain exempt from reporting under the law. And despite the recent expansion in the number of chemicals covered by the program, TRI still covers less than one percent of the estimated 80,000 chemicals in commerce today.

TRI also requires reporting only by facilities with 10 or more full-time employees. In addition, with the exception of persistent bioaccumulative toxics (PBTs), reporting is limited to those facilities that "manufacture or process" more than 25,000 pounds of a given chemical per year, or those that "otherwise use" more than 10,000 pounds of a chemical during a single year. The result is that many smaller-scale users of toxic chemicals—such as print shops and dry cleaners—are exempt from reporting. In addition, there is no federal program for reporting of toxic chemicals included in consumer products—another potential source of exposure for citizens.

The figures on toxic releases presented above, therefore, underestimate the potential health threats posed by toxic chemicals in the United States. Indeed, the releases reported above represent only the tip of the iceberg.

# Trends and Lessons from the Data

## TRENDS IN TOXIC RELEASES

While a detailed evaluation of trends in TRI is both difficult (due to changes in reporting rules over time) and beyond the scope of this report, two major trends are apparent in the data—a decline in the amount of toxic releases reported to TRI and an overall shift in the geographical distribution of toxic releases within the U.S.

### Decline in Toxic Releases Shows Impact of TRI Reporting

Trends in the release of toxic chemicals by TRI facilities appear to be headed in the right direction: down. Between 1995 and 2000, releases to air and water by original TRI industries of carcinogenic chemicals listed over that entire period declined by 41 percent. Developmental toxicant releases were down by 47 percent; reproductive toxicant releases by 49 percent, releases of suspected neurological toxicants by 31 percent and releases of suspected respiratory toxicants by 23 percent.

While the exact reason for this decline is unknown, several factors are likely at play. First is an apparent reduction in the number of facilities reporting to TRI. Between 1995 and 1998, for example, the number of companies reporting releases to TRI declined by nearly 6 percent.[22] Second, since the inception of TRI in 1987, many companies have bowed to public concern by reducing their toxic emissions. Finally, regulatory action may have played a role in some companies' reductions in toxic releases.

Toxic releases have also declined steadily in many communities that rank near the top of the 1987-2000 list, but the quantity of such releases remains significant. And in some communities, toxic releases have remained largely the same—or have even increased—over the last 14 years.

Yet the downward trend in toxic releases under TRI—while promising—should not be cause for complacency, mainly because releases are still very high and TRI captures so little of the picture. For example, as noted above, the commercial printing sector ranks high for releases of developmental toxicants. Yet, within just one sector of the industry—the gravure printing sector—as much as 80 percent of all establishments nationwide may not be reporting their toxic releases to TRI either because they are too small or their use or discharge of toxic substances does not meet TRI reporting thresholds. Without a solid awareness of how these local industries are performing, it is difficult to say with certainty whether communities generally face more or less jeopardy from developmental toxicants than they did several years ago.

Even for those industries and chemicals covered by TRI, the downward trend in direct water and air releases does not necessarily mean that the quantity of toxic chemicals ultimately finding their way into the environment has decreased. In fact, while direct releases of toxic chemicals declined 8.4 percent between 1999 and 2000, the amount of toxic waste generated by industry actually *increased* by more than 25 percent.[23] These toxic materials must be disposed of somehow, but it appears that "somehow" is increasingly in the form of on-site "treatment" or "recycling." The effectiveness of these measures in preventing exposure likely varies widely and cannot be ascertained from a simple review of the data.

Moreover, there is no way to know whether some industries have chosen to replace certain chemicals that are reportable to TRI with others that are not, or with new substances that may not only not be reportable, but whose health effects have not been thoroughly studied. While this substitution effect seems unlikely to have a major impact on overall toxic releases, the desire to escape public pressure due to TRI reporting or the desire to adopt new technologies could both be significant motivating factors.

Finally, despite the recent decline in toxic emissions, millions of pounds of toxic substances continue to be discharged into the nation's air and water, with little clear understanding of how those substances might affect our health. And because substances such as lead, mercury and dioxin can persist for long periods in the environment and in the body, releases that occurred long ago remain a matter of public health concern today. Until emissions of these substances are dramatically reduced across the country, the potential impact on health remains significant.

## Geographic Distribution

While industries across the country have reduced their TRI-reportable releases of toxic chemicals, progress appears to be stronger in some regions of the country than in others. An analysis of carcinogen releases to air and water by original TRI industries (those covered by the program since 1987) shows a relative increase in the percentage of total TRI releases in some regions—particularly the "Sunbelt"—with a corresponding decline in older, northern industrial states.

Among the 10 EPA regions (which closely correspond to geographic regions of the country), Region 4 (the Southeast) posed the greatest relative gain in carcinogen releases, increasing from 18.7 percent of all TRI carcinogen releases to air and water in 1987 to nearly one-third of all releases in 2000. The Southcentral region, the Northwest, and the Mid-Atlantic region also saw significant relative gains. By contrast, the Northeastern states (including New England and the New York/New Jersey region), the Plains states, the Midwest and the Southwest/Pacific region all saw stronger downward trends in carcinogen releases.[24]

To paint the picture even more clearly, carcinogen releases from original TRI industries in what could roughly be termed the "Rust Belt" (including regions 1, 2, 3 and 5) declined from 52.4 percent of the total in 1987 to 40.8 percent of the national total in 2000. Meanwhile, releases in the "Sunbelt" (regions 4 and 6) increased from 32.6 percent of the total in 1987 to 47.6 percent in 2000.

The trend is even more pronounced with regard to other categories of toxicants. In 1987, original TRI industries in the Southeast and Southcentral regions accounted for 41 percent of all developmental toxicant releases nationwide. By 2000, releases by original industries in these regions made up 59 percent of the national total. A similar trend can be seen in these two regions for releases of reproductive toxicants (from 51 percent of the national total in 1987 to 78 percent in 2000), suspected neurological toxicants (from 41 percent to 50 percent), and suspected respiratory toxicants (from 40 percent to 48 percent). While an historical comparison for dioxin releases is impossible, the Sunbelt dominates in current releases, accounting for 67 percent of all air and water dioxin releases in 2000.

**Table 29. Carcinogen Releases by EPA Region for Original TRI Industries, 1987 vs. 2000**

| EPA Region | Description | Percent of Total 1987 | Percent of Total 2000 |
|---|---|---|---|
| 1 | New England (CT, MA, ME, NH, RI, VT) | 6.5% | 2.8% |
| 2 | New York/New Jersey/Other (NY, NJ, PR, VI) | 10.0% | 5.6% |
| 3 | Mid-Atlantic (DE, MD, PA, VA, WV) | 10.8% | 11.3% |
| 4 | Southeast (AL, FL, GA, KY, MS, NC, SC, TN) | 18.7% | 32.1% |
| 5 | Midwest (IL, IN, MI, MN, OH, WI) | 25.0% | 21.1% |
| 6 | Southcentral (AR, LA, OK, NM, TX) | 13.9% | 15.5% |
| 7 | Plains (IA, KS, MO, NE) | 6.2% | 3.8% |
| 8 | Upper Plains/Mtn. West (CO, MT, ND, SD, UT, WY) | 1.0% | 1.2% |
| 9 | Southwest/Pacific (AZ, CA, HI, NV and Pacific territories) | 4.6% | 2.3% |
| 10 | Northwest (AK, ID, OR, WA) | 3.4% | 4.3% |

The good news is that toxic releases in all 10 EPA regions were lower in 2000 than they were in 1987, despite the addition of a substantial number of chemicals to TRI reporting. The geographical analysis shows, however, that the decline in carcinogen releases was much slower in the 13 Southeastern and Southcentral states than it was in other regions of the country.

This trend comports with the well-known movement of manufacturing activity from north to south over the past two decades. However, it also should be a source of concern for southern residents. Much as industrialization in the Northeast and Midwest has led to a legacy of public health and environmental problems from which the region has yet to recover, the same potential now seems to exist in the South.

## LESSONS FROM THE DATA

The data that exist on toxic releases to the environment—as reported to TRI and analyzed in this report—point to a number of conclusions.

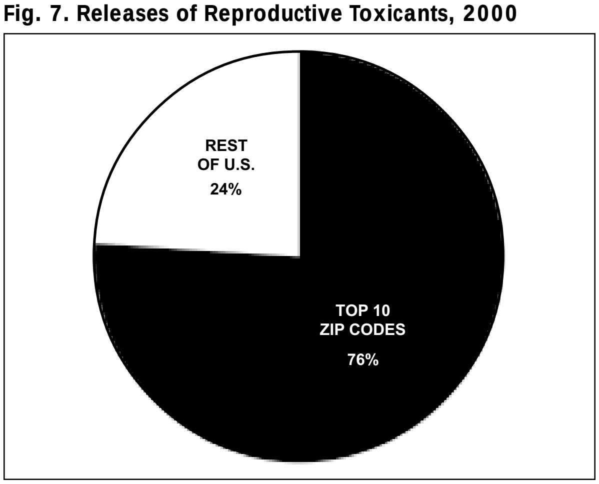
### Toxic Releases Are a Serious Problem

The 2000 TRI data show that hundreds of millions of pounds of chemicals with proven or suspected links to serious health problems continue to be released into the environment each year. In terms of sheer quantity, these releases appear to be concentrated within a relatively small number of localities.

In 2000, for example, 76 percent of all air and water releases of reproductive toxicants reported to TRI occurred within just 10 zip codes. (See Fig. 7.) The top 10 zip codes in each health-effects category received 65 percent of dioxin releases, 32 percent of developmental toxicant releases, 14 percent of all carcinogen releases, and 11 percent of national releases of suspected neurological and respiratory toxicants.

Moreover, historical TRI data show that many of these communities have been subjected to large-scale toxic releases year after year for more than a decade and a half. Over the 1987-2000 period, the top 10 zip codes in each category received 68 percent of reproductive toxicant releases, 26 percent of developmental toxicant releases, 11 percent of suspected neurotoxicant releases, 10 percent of carcinogen releases, and 9 percent of all air releases of suspected respiratory toxicants. While the impact of these continued releases varies depending on the degree of exposure, the persistence of the chemicals and the way they impact the body, the consistent release of large amounts of these substances is troubling.

**Fig. 7. Releases of Reproductive Toxicants, 2000**




Clearly, communities that experience massive discharges of substances like dichloromethane, toluene, carbon disulfide and methanol have every right to be concerned about how those emissions might impact their health. And our public health system owes it to these communities to investigate those links vigorously.

Yet, it is not only communities that receive high-volume releases of toxic chemicals that have reason for concern. Equally disturbing is the continued release of lesser amounts of persistent toxicants such as lead (275,000 pounds released to air and water in 2000), lead compounds (1.3 million pounds), mercury (30,000 pounds), mercury compounds (136,000 pounds) and dioxins (7,000 grams) whose toxicity is relatively well understood. In contrast to the vast majority of toxic chemicals, about whose health effects we know little, we have ample evidence of the potential dangers posed by even small amounts of lead, mercury and dioxin in air, water, soil and food. Science has shown that substances such as mercury and dioxin can make their way into the human body from sources hundreds or thousands of miles away from the location of their release into the environment. The continued air and water releases of these substances suggest a serious and continuing threat to public health nationwide.

Also troubling is what the TRI data tell us about land disposal of these persistent substances and compounds. While land releases were not examined in this report (See "Methodology"), it is important to note that the mining industry is responsible for the land disposal of hundreds of millions of pounds of lead and arsenic compounds and other toxicants each year. These discharges may or may not have an immediate impact on public health, but their impact is almost certain to be felt in years and decades to come.

## A Few Industry Sectors Are Often Responsible for the Bulk of Toxic Releases

Within each category of toxic releases, a small number of industry sectors are generally responsible for the bulk of releases. The plastic foam products industry sector was responsible for 19 percent of all air and water releases of cancer-causing chemicals in 2000. The cellulosic manmade fibers sector accounted for 21 percent of developmental and more than half of all reproductive toxicant releases. The electric services industry (which includes power plants) released 46 percent of all suspected respiratory toxicants while the chlorine and alkali industry sector was responsible for 23 percent of all dioxin releases. Pulp mills were responsible for the greatest releases of suspected neurological toxicants.

These data suggest that a regulatory approach that focuses on improving environmental peformance by industry sectors—especially through toxics use reduction—could reap great dividends in reducing toxic emissions. Second, they may provide clues about the toxic burden faced by communities in the vicinity of smaller facilities in those industry sectors that are not required to report to TRI.

As noted earlier, TRI covers only a small fraction of total toxic releases into the environment. For many industry sectors—such as dry cleaning and commercial printing—in which activity is dispersed among thousands of facilities, each with only a few full-time employees, the percentage of releases reported to TRI is small. Knowing which industry sectors are responsible for large-scale toxic releases could help communities determine which facilities in their communities could be responsible for smaller-scale releases that are not reportable to TRI.

## Toxic Chemical Disposal Practices Are Changing

An analysis of historical TRI data shows that patterns in the disposal of toxic chemicals are changing. There has been a substantial and undeniable drop over time in the amount of direct toxic releases to air and water by industries covered by TRI.

Unfortunately, however, the generation of toxic waste appears to be increasing. From 1998 to 2000, the total amount of production-related waste generated by TRI facilities increased more than 25 percent, from 29.3 billion pounds in 1998 to 37.9 billion pounds in 2000. EPA reports that the bulk of the increase was in the amount of waste "treated" or "recycled" on-site with most of that increase coming at two chemical manufacturing facilities, one in Louisiana and one in Alabama.[25]

Worth noting is that the EPA has not produced final guidance and definitions of what constitutes "recycling" and other recovery methods. Recycling can include recovering metals, solvents, acids, and energy. Such recovery operations are a source of pollution and contamination in many American communities. It is important to remember that reducing the amount of toxic waste created at the source means less waste that must be treated, burned, disposed, or recycled—and less pollution and contamination that invariably accompanies these recycling and recovery activities.

Clearly, the most effective way to prevent toxic waste from making its way into the air and water is to not create it in the first place. American industry, taken as a whole, appears to be failing in that task. As a result, citizens must trust industry to properly manage and dispose of the toxic wastes created—a trust that has not always been upheld in the past, as evidenced by the tens of thousands of toxic waste sites nationwide.

Equally important is the shift in the geographic distribution of toxic releases nationwide. Over the last decade and a half, the "center of gravity" for toxic releases has shifted dramatically from the Northeast and Midwest to the Sunbelt. While overall toxic releases to air and water have declined in all regions, the southern states have seen the smallest declines. It is beyond the scope of this report to speculate as to why southern states may be having a more difficult time reducing toxic releases, but it is imperative that southern policy-makers investigate and address the issue.

# Making the Link Between Toxics and Health

In recent years, both the general public and the scientific community have become increasingly aware of the role environmental factors—including exposure to toxic substances—can have on health. Yet, in many important respects, our understanding of how the release of toxic substances into our environment can affect human health is inadequate.

Nearly 90 percent of Americans believe that environmental factors such as pollution can cause disease or health problems.[26] These concerns are evidenced in the more than 1,000 calls that are placed to public health officials each year regarding suspected clusters of disease. In most cases in which a cause is initially suspected by the public, local industrial contamination, or air, water or agricultural pollution are thought to be to blame.[27]

Even as well-publicized incidents like those in Love Canal, N.Y., and Woburn, Mass. have raised public fears about the impacts of toxic contamination, scientists have worked to better define the role toxic exposures may play in the development of chronic disease. In many cases, current science suggests that both genetics and environmental exposures (including lifestyle choices such as diet and tobacco use) play important roles in the development of a variety of diseases.

For example, a 2000 study published in the New England Journal of Medicine found that environmental and lifestyle factors appear to play a greater role in the development of most cancers than genetics.[28] Scientists now estimate that about three percent of all developmental defects can be attributed exclusively to toxic exposures.[29] A recent California government study found that children who play sports and are exposed to high levels of ozone may be more likely to develop asthma, while another study has linked maternal exposure to certain air pollutants with increased rates of some birth defects.[30]

Other recent studies have attempted to quantify the risks posed by levels of various toxic substances to which Americans have been exposed. The EPA's National Air Toxics Assessment, released in 2002, found that the average cancer risk due to lifetime exposure to 33 toxic pollutants in the outdoor air was 1-in-2,600—500 times higher than the EPA's benchmark acceptable risk of 1-in-1,000,000.[31] More than 200 million people, according to the EPA study, lived in census tracts where the lifetime cancer risk from exposure to air toxics exceeded 1-in-100,000 in 1996, while nearly the entire U.S. population may have faced an elevated risk of respiratory irritation.[32] Similarly, the EPA's draft dioxin reassessment estimates that the cancer risk from dioxin in levels already present in the general public is approximately 1-in-1,000.[33]

These recent studies have added to a longstanding body of evidence that has linked exposure to lead, asbestos, mercury, vinyl chloride, PCBs and a host of other substances with severe health problems. But a lack of complete information about the toxicity of thousands of chemical substances—combined with poor tracking of human exposure to those substances and inconsistent tracking of chronic disease incidence—suggests that the health effects that have been already identified by scientists may represent only the tip of the iceberg.

## MANY CHEMICALS LACK PUBLICLY AVAILABLE TOXICITY DATA

Public information on the toxicity of chemicals—even those used and released in the greatest amounts—is scarce. In 1998, EPA reported that, of the 2,800 chemicals that are produced or imported to the U.S. in volumes of 1 million pounds or more annually, 43 percent had no publicly available screening-level toxicity data at all. Only seven percent of these "high production volume" chemicals had a complete set of publicly available basic screening data that evaluated acute toxicity, chronic toxicity, developmental and reproductive toxicity, mutagenicity, environmental toxicity and environmental fate.[34]

Even those chemicals whose releases are most agressively monitored—those for which reporting of releases is required under the EPA's Toxics Release Inventory—crucial pieces of the testing picture are unavailable to the public. Of 91 high production volume chemicals with 1995 TRI releases of 1 million pounds or more, 26 percent were missing at least one of the six basic screening-level tests thought to be needed to evaluate toxicity.

Moreover, screening-level data on toxicity represents only the bare minimum of information that is needed to gauge the real-world impact of toxic exposures on health. In addition, because the effects of toxic substances on the body are complex and influenced by such questions as level of exposure, route of exposure and timing of exposure, EPA acknowledged that "these tests do not fully measure a chemical's toxicity."[35]

The lack of public information on high production volume chemicals is in part due to EPA's lack of authority to compel testing of chemical substances. Under the Toxic Substances Control Act of 1976 (TSCA), EPA must make several findings before it can require testing of a chemical that was already in use before the law took effect. EPA must find that the chemical "may present an unreasonable risk of injury to health or the environment," that the chemical is produced or imported in substantial quantities and either enters the environment or results in human exposure, that existing data are inadequate for risk assessment, and that testing is necessary.[36] The policy represents a "Catch-22" in which the EPA must simultaneously determine that existing data are inadequate and that those data demonstrate a potential hazard. Another fundamental problem with this policy approach is that the burden rests on EPA to make the findings, and with 80,000 chemicals on the market, the agency does not have the time or resources to do so. Instead, industry should be required to submit testing data for any chemical on the market, as is required for pharmaceutical products.

The lack of testing information—combined with flaws in TSCA itself—makes it difficult for EPA to ban or restrict the use of a chemical that poses hazards to the public. In order to regulate a toxic chemical under TSCA, EPA must show that the chemical poses an "unreasonable risk" of human or environmental harm, and that other federal regulations are inadequate to protect the public. EPA must also consider whether the benefits of regulating the chemical exceed the costs to the economy.[37]

In practice, these provisions set an almost impossibly high legal bar for EPA to meet. A 1994 General Accounting Office report found that, as of that time, EPA had used its authority under TSCA to regulate only nine toxic chemicals. GAO's reviewers found that "TSCA's unique authorities to limit the manufacturing, distribution and use of toxic chemicals could be important tools in a comprehensive program for these chemicals. However, the act's legal standards are so high that they have usually discouraged EPA from using these authorities."[38]

## DEGREE OF HUMAN EXPOSURE UNKNOWN

The data collected through the Toxics Release Inventory and the research that has been done to identify the health threats posed by various toxic substances are enough to identify facilities whose releases to the environment pose a potential danger to public health. However, they are not enough to demonstrate that a particular toxic emission can cause—or has caused—a specific health impact, or to adequately assess human exposure to TRI chemicals.

For communities to get the full picture of how toxic emissions may impact their health, they need to also have access to information on exposure patterns.

### Routes of Exposure

Unfortunately, while TRI data give us an idea of the amount of various toxicants that are released into the environment, they do not tell us where those substances end up, or which of those substances might find their way into our bodies.

Humans are potentially exposed to toxic chemicals in a variety of ways—through air, water and food; through environmental exposures, consumer products and exposures on the job. When looking at data from TRI, it is important to remember that what goes up does not necessarily come down in the same place; that chemicals emitted to the air may cause health effects in the immediate area or hundreds of miles away—or may be dispersed or broken down to the point that no health effects ensue. The same is true of discharges to surface waterbodies.

Unfortunately, efforts to identify the degree of toxic substances to which Americans have been exposed have been few. Several federal surveys conducted by the Centers for Disease Control and Prevention (CDC), the Environmental Protection Agency (EPA), and National Institute for Environmental Health Sciences (NIEHS) collect information and biological samples from a limited number of individuals and analyze them for a limited number of toxic substances, such as lead, mercury, volatile organic compounds and pesticides. However, a 2000 General Accounting Office (GAO) report found that the EPA and CDC surveys included only 6 percent of the 1,456 potentially damaging chemicals identified by GAO.[39]

In recent years, some progress has been made in monitoring toxic exposures. In 2001, the CDC released its first-ever report on the average levels of toxic substances in the bodies of Americans. For 24 of the 27 chemicals studied (the exceptions being lead, cadmium and cotinine, a breakdown product of nicotine), the CDC study was the first effort to understand levels of toxic exposure. New substances evaluated included metals, pesticide metabolites and metabolites of phthalates, compounds commonly used in consumer products such as soap, shampoo and plastics. CDC will release in early 2003 an updated exposure report with data on more than 100 chemicals.

Information such as that presented in the CDC's report is needed to assess levels of toxic chemical exposure and to evaluate the effectiveness of measures to reduce toxic exposures. For example, because the CDC has tracked levels of lead and cotinine in blood over time, the agency was able to conclude—based on the most recent round of testing—that public initiatives to reduce exposure to lead and secondhand smoke have indeed been effective.

Yet, even the studies currently being conducted by CDC are not of sufficient size to determine whether residents of particular towns, counties or states are exposed to higher or lower amounts of toxic chemicals. Thus, while these studies play an important benchmarking role, they have little to no utility in measuring local toxic exposures.

## TRACKING OF CHRONIC DISEASE IS LIMITED

Among the information needed to gauge the impact of toxics on health is a detailed understanding of rates of chronic disease in a community. Without understanding of rates of cancer, birth defects, asthma and other chronic disorders, it is extremely difficult and costly to investigate how toxic exposures may be affecting a community's health.

Unfortunately, states vary widely in their ability to monitor rates of even the most aggressively tracked diseases—such as cancer—while most states have no system at all to monitor cases of diseases such as Alzheimer's, autism, multiple sclerosis and lupus. Only three states—California, Iowa and Massachusetts—possess tracking systems for cancer and birth defects that meet the highest standards of quality as well as any system at all for the tracking of asthma. Only 36 states have cancer registries that meet minimum federal criteria for data quality, while only 34 states have systems for the tracking of birth defects and 23 track asthma.[40]

Particularly troubling is the lack of disease tracking capability in the states that now experience the majority of toxic releases. While there is great variation in the public health capacities of the 13 states in the Southeast and Southcentral regions, most do not have a strong public health infrastructure with which to examine the health impacts of local toxic exposures. For example, only three of the 13 states in the two regions have statewide cancer registries that meet the highest standards for data quality as judged by the North American Association of Central Cancer Registries (NAACCR).[41] Cancer registries in six of the 13 states do not meet even the most basic federal standards for data quality. Only five of the states have any tracking system at all for asthma, according to data reported to the Centers for Disease Control and Prevention.[42] Such a lack of basic data on the incidence of chronic disease in these states can make it difficult for researchers to trace the links between the development of these diseases and environmental exposures.

In sum, the data collected under TRI do not capture all toxic emissions that can be dangerous to health. Existing science does not paint a clear picture of how a large number of potentially dangerous substances can impact human health. And the lack of human exposure data makes it extremely difficult to determine how much of what is emitted into the environment actually ends up in our bodies.

But the widespread release of carcinogenic, developmental, reproductive, neurological and respiratory toxicants documented through TRI is evidence enough that citizens should be concerned about how these substances may be affecting their health. Investigating the potential links between these releases and the incidence of chronic disease in our communities should be a national public health priority.

# Protecting Public Health from Toxic Chemicals

Americans know far more about the potential threats posed by toxic releases in their communities than they did two decades ago. Yet the data on toxic releases reviewed in this report show that many communities still face large-scale releases of substances that may be damaging to health. Moreover, crucial gaps remain in our understanding of how those releases may affect our health and well-being.

A comprehensive response to the toxic threat to health will require action in three areas: tracking the links between toxic releases and health problems in our communities, expanding citizens' right to know about toxic substances and their release to the environment, and reducing the severity and magnitude of toxic releases.

## TRACKING THE LINK BETWEEN TOXICS AND HEALTH

Investigations of the links between environmental factors and chronic disease incidence have long been hamstrung by a lack of information on the rates of chronic disease affecting communities and the levels of toxic substances to which residents have been exposed. In addition, these investigations—which tend to be costly and complex—are often limited by a severe lack of financial and staffing resources among the public health departments that are called upon to conduct them.

One approach to bolstering the ability of public health officials to conduct such investigations would be the creation of a nationwide environmental health tracking network. Such a network would include several components:

- Expanded monitoring of human exposure to toxic chemicals, so that public health officials have a clearer understanding of the levels of toxicants to which Americans are actually exposed.
- An early warning system that would alert communities to immediate health crises such as heavy metal and pesticide poisonings.
- Rapid response teams to quickly evaluate disease clusters and other health threats thought to be linked to specific toxic exposures.
- Enhanced tracking of the incidence of chronic diseases—such as asthma, cancer, birth defects and Alzheimer's—in order to help evaluate the potential links between these diseases and toxic exposures.

In recent years, the federal government, through the CDC, has taken the first steps toward the goal of nationwide health tracking, supporting pilot programs in a number of states to improve monitoring of chronic disease and environmental conditions. These steps must continue and be expanded upon to ensure that America's public health system can respond appropriately to environmental health threats.

Finally, researchers should be encouraged to use existing tools to investigate the links between toxic exposures and health. In recent years, studies have combined environmental monitoring data—such as data from air pollution monitors and information on contaminants in drinking water—with information from disease registries to develop new hypotheses about how toxic substances can impact health. Such efforts can play an important role in protecting public health even as new sources of data on human exposure to toxic substances are being developed.

Better tracking of chemical exposures and potentially related disease rates will have many major benefits—among them, improving communities' understanding of the health impacts of pollution and ensuring that health problems are identified quickly and addressed immediately. But public policies to protect public health should not wait for proof that harm is occurring, or even that exposure is occurring. Sound public policy would work to reduce and ultimately eliminate the use of known toxic chemicals in order to prevent toxic impacts on health, rather than wait for conclusive proof that may come too late.

## EXPANDING CITIZENS' RIGHT TO KNOW

For citizens' right to know about toxic releases to have real meaning, citizens must be able to find out how the chemicals released in their communities can potentially affect their health.

The lack of complete and accurate information about the toxicity of many commonly used chemicals is nothing short of scandalous. EPA efforts in the late 1990s to encourage producers to complete toxicity studies for their "high production volume" chemicals continue to move ahead, but at an extremely slow pace. Even the basic "screening level" data the EPA is seeking for high production volume chemicals may not provide sufficient information about the synergistic effects of chemicals in the environment or the complex issues related to timing of exposure that are so important in evaluating developmental toxicity.

Action must be taken to require testing of existing and new chemical substances for their full range of health impacts, including neurological and respiratory toxicity. In its 1998 review of high production volume chemicals, EPA estimated the cost for a full round of basic screening tests, including for reproductive and developmental toxicity, at about $205,000 per chemical.[43] This is a small price to pay for industries that have benefited for years—sometimes decades—from the manufacture and sale of these substances.

In addition, this review of TRI data suggests that many industrial toxic releases nationwide are not reported to the program. Expansion of TRI reporting requirements—or supplementing of TRI through the creation of more state-level programs to track toxic releases—would help fill these data gaps and ensure that citizens have a clearer picture of the toxic releases to which they may be exposed.

Citizens also need better information about exposure to chemicals through routes other than direct environmental releases. Provisions such as California's Proposition 65, which guarantees citizens the right to know about toxic substances in consumer products, can also be helpful in filling the knowledge gap. There should be a national reporting system for toxic chemicals contained in consumer products. Massachusetts and New Jersey both require chemical use reporting—facilities report the total amount of each chemical used during the year and where it ended up; not only environmental releases and wastes, but also the quantity used in the factory and the quantity that is shipped out in products.

Government must also change the burden of proof in approving new chemicals for the market and new practices that may result in increased toxic releases in communities. For too long, government policy has held toxic chemicals "innocent until proven guilty," reserving judgment about the ultimate use of such chemicals until health problems have already occurred. Instead, chemicals should be demonstrated to be safe before they are permitted to be released into the environment in large quantities. Such an approach puts the needs of public health first, and could forestall many future health crises resulting from toxic releases.

## REDUCING TOXIC RELEASES

The data reported to TRI demonstrate that toxic chemicals are released to the environment in significant quantities nationwide. While the links between many of these chemicals and health problems are unproven, common sense and the weight of available evidence suggest that prudent steps be taken to reduce the use and release of toxic chemicals nationwide.

The first step in such a program would be to prevent rollbacks of existing laws that limit toxic releases. Proposals by the Bush administration to weaken "New Source Review" restrictions on older electric power plants (many of which are substantial sources of mercury and respiratory toxicants) and to loosen regulations on the dumping of mining wastes into waterways are extremely troubling in this regard. Also troubling is the administration's refusal to implement important provisions of the Stockholm Convention, which calls for the phase-out of 12 persistent toxicants and provides for an international science-based process for addressing additional chemicals.

On the positive side, state and federal governments can play a direct role in reducing toxic emissions to the air and water by more fully implementing and enforcing basic pollution laws such as the Clean Air Act and Clean Water Act. Policy-makers at all levels of government should strive toward the long-term goal of eliminating toxic discharges to water and reducing the cancer risk posed by air toxics to less than the EPA's 1-in-a-million additional cancer case benchmark.

Ultimately, however, state and federal governments must address the issue of preventing pollution by encouraging reductions in the use of toxic chemicals and the substitution of safer alternatives. While several states—including Massachusetts, New Jersey and Oregon—have taken steps in this direction, momentum toward toxics use reduction has slowed in recent years. Recent increases in the generation of toxic waste by industrial facilities nationwide suggest that pollution prevention techniques have not been aggressively applied by many sectors of industry. In contrast, Massachusetts—whose Toxics Use Reduction Act of 1989 requires reporting of toxic chemical use and the development of plans for use reduction by industry—has seen a 58 percent drop in the generation of toxic waste per unit of production since 1990, along with a 90 percent drop in TRI releases per unit of production.[44]

Revitalizing pollution prevention efforts—particularly in the southern states that now account for the majority of toxic releases—should be a top policy priority.

# METHODOLOGY

All data analyzed for this report are from the EPA's Toxics Release Inventory. TRI data for 1987 through 2000 were provided by EPA on compact disc. Subsequent amendments to TRI reports made by industry following EPA's release of the 2000 reporting year data are not reflected in this analysis. All data analysis was done by combining reports for all years of the program into a single Visual Foxpro database.

### Releases Covered

TRI reporting by industry provides hundreds of pieces of information on the disposal of toxic substances. In addition to releases to air and water, TRI reporting tracks releases to land—both on-site and off-site—releases to underground injection wells and publicly owned treatment works (POTWs), and materials transported off-site for recycling or other disposal.

Because the primary purpose of this report is to highlight the connection between toxic emissions and health, only those releases with the most immediate routes of exposure were included. Also, because we focus primarily on local health threats, we limited analysis to those releases that could, in theory, result in exposures near a facility within a relatively short period of time. In practice, these factors caused us to limit our analysis to toxic releases to air and surface water.

This narrow focus means that some serious pollution problems are excluded from consideration. For example, discharges of toxic chemicals to publicly owned treatment works are a major water quality problem, since sewage treatment plants are frequently incapable of properly treating the chemicals before they are discharged to surface water. But because the point of surface water discharge can be far distant from the facility in question (and because POTWs' degree of success in managing toxic discharges varies widely), these important releases were excluded.

An even larger exclusion is that of on-site releases to land. Over the years since its inclusion in TRI in 1998, the mining industry has come to dominate TRI discharges of carcinogens, developmental and reproductive toxicants, and suspected neurological toxicants—largely due to the on-site land disposal of hundreds of millions of pounds of compounds including lead, arsenic and chromium. A strong case could be made for the inclusion of these releases in any analysis of toxic threats, since significant amounts of these compounds will eventually make their way into waterways. However, on-site land releases are excluded from this analysis for two reasons. First, while the long-term threat posed by mining releases is indisputable, the potential for near-term damage to public health is more questionable and depends on the particular circumstances of the release. Second, many mining facilities are in remote locations and the number of individuals that could potentially be subjected to near-term exposures is small. Including the massive releases of toxic substances to land could have served to deemphasize threats posed by less voluminous air and water discharges nationwide.

### Chemical Lists

Lists of carcinogenic, developmental and reproductive toxicants are based on the state of California's Proposition 65 list. Lists of suspected neurological and respiratory toxicants are based on lists compiled by Environmental Defense's Scorecard.org Web site. Environmental Defense's lists are based primarily on information compiled by the EPA, the National Institute for Occupational Safety and Health, the states of California, Massachusetts and New Jersey, and European government agencies, as well as toxicological studies published in scientific journals. In a small number of cases, Environmental Defense conducted its own supplementary review to identify any remaining potential human health hazards. A complete list of sources and methodologies on which Environmental Defense's listings are based can be found at *www.scorecard.org/health-effects/*.

In cases in which a single chemical was listed, but TRI reports only releases by chemical class, the entire class was assumed to cause the listed health effect. (For example, releases of polycyclic aromatic compounds are reported to TRI as a class, even though they are listed separately on California's Prop 65 list.) Also, some chemicals are listed as toxic in certain forms on the Prop 65 list, but their releases are reported to TRI in the aggregate. (For example, several "technical grade" chemicals are listed as carcinogens under Prop 65, but TRI does not make a similar qualification.) Because there is no way to resolve this inconsistency, all substances reported to TRI that are listed on Prop 65 are assumed to cause the listed health effect, whatever their form.

In cases in which an elemental form of a substance was present on the Prop 65 list, compounds including the substance were assumed to also cause the listed health effect. Two specific examples bear mentioning. California's Prop 65 list includes lead and cadmium as developmental and reproductive toxicants, but not compounds of those substances. Environmental Defense lists lead compounds as recognized developmental and reproductive toxicants and cadmium compounds as suspected developmental and reproductive toxicants based on the inclusion of their elemental forms on the Prop 65 list. This analysis includes both lead compounds and cadmium compounds in our list of developmental and reproductive toxicants.

Further, the category "reproductive toxicants" in this analysis includes some substances that have been listed by Prop 65 as impairing only the male or female reproductive system. A complete list of reproductive toxicants based on gender can be found in the Prop 65 list at *www.oehha.ca.gov/prop65/prop65_list/Newlist.html*.

### Geographic Analysis

All listings of zip codes, cities, counties and states are based on the locations reported by the facilities to TRI. In some instances, the geographic coordinates reported to TRI by facilities do not correspond to a location within the state in which the facility resides. These facilities were excluded from the maps of toxic releases that accompany this report.

### Industry Analysis

Industry analysis is based on the primary, four-digit Standard Industrial Classification (SIC) codes reported by the facilities to TRI. Facilities listing more than one SIC code were grouped based on their primary SIC code. Industry names were derived from SIC codes based on the 1987 listing of SIC codes from the U.S. Census Bureau, obtained from *www.census.gov/epcd/oei/view/sic-sht2.txt*. Lists of "original industry" and "new industry" SIC codes covered by TRI were obtained from U.S. EPA, Standard Industrial Classification (SIC) Codes in TRI Reporting, downloaded from *www.epa.gov/tri/report/siccode.html*, 8 October 2002.

### Parent Company Analysis

Facilities reporting to TRI may also include the name of their parent companies. However, the reporting of parent company names is extremely inconsistent. In instances in which no parent company was listed, the name of the facility was assumed to also be the name of the parent company. In identifying the top 10 parent companies for each emissions category, an effort was made to combine entries with minor spelling variations (e.g. "3M Co." versus "3M Co., Inc."). Companies with the same name, or divisions of companies with the same primary name, were assumed to be controlled by the same parent company. In instances in which releases were reported by a merged company (e.g. "ExxonMobil"), efforts were made to include releases reported by their constituent companies ("Exxon" and "Mobil"). However, the limited and inconsistent reporting of parent company names to TRI makes it impossible to assert the complete accuracy of this analysis.

### Handling of Historical TRI Data

Because the rules for reporting to TRI have changed many times since 1987, it is difficult to create an "apples-to-apples" comparison of toxic releases over time. The following procedures were used in handling historical TRI data.

- **Cumulative Toxic Releases—**Cumulative releases were based on the sum of all TRI releases reported by a given facility over the entire 1987 to 2000 period. This method will skew the rankings of the highest-releasing facilities toward those that have been covered by the program since its inception, however, it provides the best possible view of the total toxic releases to which a community has been subjected over time.

- **Comparisons Over Time—**Comparisons between current and past-year toxic releases were based only on emissions by original industries (those covered by the program prior to 1998) and chemicals included in the program as of the 1995 reporting year. As a result, total toxic releases compiled by this method do not match the cumulative toxic releases derived as described above and are not presented in this report.

  One exception to this method is in the comparison of toxic releases by EPA region over the 1987 to 2000 period. For this analysis, all toxic releases by original TRI industries were included. Because the goal of this comparison was to gauge changes in the distribution of toxic releases across the country—and not the change in quantities of substances released—this method provides a more accurate picture of how toxic releases are distributed nationwide.

- **Delisted Chemicals—**Chemicals that have been removed from TRI reporting since 1987 were not included in this analysis. However, reported releases for earlier years of the program may not take into account changes in how releases of certain substances must be reported. (For example, the 1994 change that limited reporting of sulfuric acid releases to "acid aerosols only.") For these substances, reported releases for early years of the program may overstate or understate the amount of releases that would be reported to TRI under current rules.

# Notes

1. National Toxicology Program, *The Report on Carcinogens—9th Edition* (press release), May 2000.

2. This estimate includes individual chemicals whose emissions are reported to TRI as a class. For example, this figure includes 17 separate polycyclic aromatic compounds, whose emissions are reported to TRI as a class.

3. U.S. Agency for Toxic Substances and Disease Registry, *ToxFAQs for Methylene Chloride*, February 2001.

4. B.P. Bell, P. Franks, N. Hildreth, J. Melius, "Methylene Chloride Exposure and Birthweight in Monroe County, New York" [Abstract], *Environmental Research*, 55(1):31-9, June 1991.

5. Citizens' Environmental Coalition, *Kodak's Toxic Colors: Emissions and Health Problems*, downloaded from *www.kodakstoxiccolors.org/health/health.html*, 25 October, 2002; Corydon Ireland, "Activists Urge New Reviews at Kodak Park," *Rochester Democrat and Chronicle*, 20 March 2002.

6. Number of facilities within industry sector from U.S. Census Bureau, *1997 Economic Census: Bridge Between SIC and NAICS SIC: Manufacturing*, downloaded from *www.census.gov/epcd/ec97brdg/E97B2_30.HTM#D3086*, 25 October 2002.

7. U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics, *Chemical Hazard Data Availability Study*, April 1998.

8. See note 9.

9. Lead compounds are not specifically identified as developmental or reproductive toxicants under Proposition 65. However, Environmental Defense, in its Scorecard.org Web site, classifies lead compounds as "recognized" developmental and reproductive toxicants. The TOXNET database of the National Library of Medicine cites several studies suggesting that exposure to inorganic lead compounds can lead to reproductive problems and impaired neurological development in children. As a result, lead compounds are included in these categories for purposes of this study. A similar determination was made to include cadmium compounds in this category, despite Prop 65's listing of only elemental cadmium as a developmental and reproductive toxicant. Environmental Defense lists cadmium compounds as suspected developmental and reproductive toxicants based on its extension of the Prop 65 list and other sources. SOURCES: Environmental Defense, Scorecard, *www.scorecard.org*, accessed 11 October 2002. U.S. National Library of Medicine, TOXNET database, Lead Compounds, *toxnet.nlm.nih.gov/cgi-bin/sis/search/f?./temp/~AAA_PaGFi:1*, accessed 11 October 2002.

10. U.S. Agency for Toxic Substances and Disease Registry, *ToxFAQs for Toluene*, February 2001.

11. U.S. Agency for Toxic Substances and Disease Registry, *ToxFAQs for Carbon Disulfide*, September 1997.

12. U.S. EPA, Region 3, Mid-Atlantic Hazardous Site Cleanup Division, *Current Site Information: Avtex Fibers, Inc.*, updated August 2002.

13. Dana C. Crawford, *Memorandum: Epi-Aid Trip Report: Possible Cluster of Orofacial Clefts*, Centers for Disease Control and Prevention, 24 January 2000 (sic).

14. California Environmental Protection Agency, Air Resources Board, *Toxic Air Contaminant Identification List Summaries: Methanol*, September 1997.

15. U.S. Agency for Toxic Substances and Disease Registry, *El Paso Multiple Sclerosis Cluster Investigation, El Paso, El Paso County, Texas* [Public Review Draft], August 2001.

16. The 1997 Economic Census identifies only 39 pulp mill establishments in the U.S., as opposed to the 81 facilities in the category reporting to TRI in 2000. The Census Bureau classifies pulp mills that are also involved in the production of paper, paperboard and other materials under codes for those industries, not the code for pulp mills. More than half of the pulp mills reporting to TRI listed secondary or tertiary Standard Industrial Classifications (SICs) in the paper or paperboard industry sectors. As a result of these differences in classification, it is difficult to ascertain how much of the pulp manufacturing industry reports to TRI.

17. Rob McConnell, et al, "Asthma in Exercising Children Exposed to Ozone: A Cohort Study," *The Lancet*, 2 February 2002.

18. U.S. Environmental Protection Agency, Office of Research and Development, *Information Sheet 1: Dioxin: Summary of the Dioxin Reassessment Science*, 25 May 2001.

19. John McQuaid, "A Health Risk," *New Orleans Times-Picayune*, 23 May 2000.

20. U.S. Agency for Toxic Substances and Disease Registry, *Health Consultation: Exposure Investigation Report: Calcasieu Estuary, Lake Charles, Calcasieu Parish, Louisiana*, 19 November 1999.

21. Kimberly Gallo, Jessica King, Joseph Sejud, *Cancer in Calcasieu Parish, Louisiana, 1988-1997*, Louisiana Department of Health and Hospitals, January 2002.

22. Decline in facilities reporting from U.S. Environmental Protection Agency, *Summary of 1998 Toxics Release Inventory Data*, downloaded from *www.epa.gov/tri/tridata/tri98/data/1998datasumm.pdf*, 15 October 2002.

23. Jeremiah Baumann, U.S. PIRG, *Toxic Threats: An Analysis of the 2000 Toxics Release Inventory Data* (press release) 23 May 2002.

24. The downward trend in Region 2 would have been even more pronounced were it not for the inclusion of Puerto Rico.

25. U.S. Environmental Protection Agency, *2000 Toxics Release Inventory (TRI) Public Data Release Report* (Executive Summary), May 2002.

26. The Pew Charitable Trusts, *Public Opinion Research on Public Health, Environmental Health, and the Country's Public Health Capacity to Adequately Address Environmental Health Problems*, May 1999. Survey conducted March 1999.

27. C.W. Trumbo, "Public Requests for Cancer Cluster Investigations: A Survey of State Health Departments," *American Journal of Public Health*, Vol. 90, No. 8, 1300-1303.

28. CNN.com, "Environment More Important than Heredity to Cancer Risk, Study Suggests," 13 July 2000.

29. National Academy of Sciences, *Scientific Frontiers in Developmental Toxicology and Risk Assessment*, June 2000, 1.

30. California Environmental Protection Agency, Air Resources Board, *Study Links Air Pollution and Asthma* [Press Release], 31 January 2002; Boate Ritz, Fei Yu, Scott Fruin, Guadalupe Chapa, Gary M. Shaw and John A. Harris, "Ambient Air Pollution and Risk of Birth Defects in Southern California," *American Journal of Epidemiology*, vol. 155, no. 1 (2002), 17.

31. Emily Figdor, U.S. PIRG Education Fund, *Dangers of Diesel: How Diesel Soot and Other Air Toxics Increase Americans' Risk of Cancer*, October 2002.

32. U.S. Environmental Protection Agency, *National Air Toxics Assessment, Summary of Results*, downloaded from *www.epa.gov/ttn/atw/nata/risksum.html*, 14 October 2002.

33. U.S. Environmental Protection Agency, Office of Research and Development, *Information Sheet 1: Dioxin: Summary of the Dioxin Reassessment Science*, 25 May 2001.

34. U.S. Environmental Protection Agency, Chemical Information Collection and Data Development (Testing), *Chemical Hazard Data Availability Study*, downloaded from *www.epa.gov/opptintr/chemtest/hazchem.htm*, 14 October 2002.

35. Ibid.

36. U.S. Environmental Protection Agency, *TSCA Chemical Testing Policy*, downloaded from *www.epa.gov/opptintr/chemtest/sct4main.htm*, 7 October 2002.

37. 15 U.S.C. Sec. 2605

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# APPENDIX A: GLOSSARY OF ABBREVIATIONS

**ATSDR:** U.S. Agency for Toxic Substances and Disease Registry

**CDC:** U.S. Centers for Disease Control and Prevention

**EPA:** U.S. Environmental Protection Agency

**FDA:** U.S. Food and Drug Administration

**GAO:** U.S. General Accounting Office

**MS:** Multiple sclerosis

**NAACCR:** North American Association of Central Cancer Registries

**NEC:** Not elsewhere classified

**NIEHS:** National Institute for Environmental Health Sciences

**NIH:** National Institutes of Health

**POTW:** Publicly owned treatment works

**SIC:** Standard Industrial Classification

**TRI:** Toxics Release Inventory

**TSCA:** Toxic Substances Control Act

# APPENDIX B: CHEMICALS AND HEALTH EFFECTS

| CHEMICAL | CAS Number or TRI Class | Cancer | Developmental | Neurological | Reproductive | Respiratory |
|---|---|---|---|---|---|---|
| FORMALDEHYDE | 50000 | X | | S | | S |
| PIPERONYL BUTOXIDE | 51036 | | | S | | |
| FLUOROURACIL | 51218 | | X | S | | |
| 2,4-DINITROPHENOL | 51285 | | | S | | |
| MECHLORETHAMINE | 51752 | X | X | | | |
| URETHANE | 51796 | X | X | | | S |
| FAMPHUR | 52857 | | | S | | |
| 2-ACETYLAMINOFLUORENE | 53963 | X | | | | |
| N-NITROSODIETHYLAMINE | 55185 | X | | | | S |
| FENTHION | 55389 | | | S | | S |
| NITROGLYCERIN | 55630 | | | S | | S |
| CARBON TETRACHLORIDE | 56235 | X | | S | | S |
| BIS(TRIBUTYLTIN) OXIDE | 56359 | | | S | | S |
| PARATHION | 56382 | | | S | | S |
| 1,1-DIMETHYL HYDRAZINE | 57147 | X | | S | | S |
| PENTOBARBITAL SODIUM | 57330 | | X | S | | |
| PHENYTOIN | 57410 | X | X | S | | S |
| BETA-PROPIOLACTONE | 57578 | X | | | | S |
| CHLORDANE | 57749 | X | | S | | S |
| GAMMA-LINDANE | 58899 | X | | S | | S |
| N-NITROSOMORPHOLINE | 59892 | X | | | | S |
| 4-AMINOAZOBENZENE | 60093 | X | | | | |
| 4-DIMETHYLAMINOAZOBENZENE | 60117 | X | | | | |
| METHYL HYDRAZINE | 60344 | X | | S | | S |
| ACETAMIDE | 60355 | X | | | | |
| DIMETHOATE | 60515 | | | S | | S |
| AMITROLE | 61825 | X | | | | |
| ANILINE | 62533 | X | | S | | S |
| THIOACETAMIDE | 62555 | X | | | | |
| THIOUREA | 62566 | X | | | | |
| DICHLORVOS | 62737 | X | | S | | |
| FLUOROACETIC ACID, SODIUM SALT | 62748 | | | S | X | S |
| N-NITROSODIMETHYLAMINE | 62759 | X | | S | | S |
| CARBARYL | 63252 | | | S | | |
| FORMIC ACID | 64186 | | | S | | S |
| DIETHYL SULFATE | 64675 | X | | | | |
| METHANOL | 67561 | | | S | | S |
| ISOPROPYL ALCOHOL | 67630 | | | S | | S |
| CHLOROFORM | 67663 | X | | S | | S |
| HEXACHLOROETHANE | 67721 | X | | S | | S |

| CHEMICAL | CAS Number or TRI Class | Cancer | Developmental | Neurological | Reproductive | Respiratory |
|---|---|---|---|---|---|---|
| N,N-DIMETHYLFORMAMIDE | 68122 | | | S | | S |
| TRIAZIQUONE | 68768 | X | | | | |
| HEXACHLOROPHENE (HCP) | 70304 | | | S | | S |
| N-BUTYL ALCOHOL | 71363 | | | | | S |
| BENZENE | 71432 | X | X | S | X | S |
| 1,1,1-TRICHLOROETHANE | 71556 | | | S | | |
| METHOXYCHLOR | 72435 | | | S | | S |
| TRYPAN BLUE | 72571 | X | | | | |
| METHYL BROMIDE | 74839 | | X | S | | S |
| ETHYLENE | 74851 | | | S | | |
| CHLOROMETHANE | 74873 | | X | S | | S |
| METHYL IODIDE | 74884 | X | | S | | S |
| HYDROGEN CYANIDE | 74908 | | | S | | S |
| METHYLENE BROMIDE | 74953 | | | S | | |
| CHLOROETHANE | 75003 | X | | S | | S |
| VINYL CHLORIDE | 75014 | X | | S | | S |
| ACETONITRILE | 75058 | | | S | | S |
| ACETALDEHYDE | 75070 | X | | S | | S |
| DICHLOROMETHANE | 75092 | X | | S | | S |
| CARBON DISULFIDE | 75150 | | X | S | X | |
| ETHYLENE OXIDE | 75218 | X | | S | X | S |
| TRIBROMOMETHANE | 75252 | X | | S | | S |
| DICHLOROBROMOMETHANE | 75274 | X | | S | | |
| 1,1-DICHLOROETHANE | 75343 | X | | S | | |
| 1,1-DICHLOROETHYLENE | 75354 | | | S | | S |
| PHOSGENE | 75445 | | | | | S |
| CHLORODIFLUOROMETHANE | 75456 | | | S | | S |
| PROPYLENEIMINE | 75558 | X | | | | S |
| PROPYLENE OXIDE | 75569 | X | | S | | S |
| BROMOTRIFLUOROMETHANE | 75638 | | | S | | |
| TERT-BUTYL ALCOHOL | 75650 | | | S | | |
| TRICHLOROFLUOROMETHANE (CFC-11) | 75694 | | | S | | S |
| DICHLORODIFLUOROMETHANE (CFC-12) | 75718 | | | S | | S |
| 2-METHYLLACTONITRILE | 75865 | | | S | | S |
| PENTACHLOROETHANE | 76017 | | | S | | |
| CHLOROPICRIN | 76062 | | | S | | S |
| FREON 113 | 76131 | | | S | | S |
| DICHLOROTETRAFLUOROETHANE (CFC-114) | 76142 | | | S | | |
| MONOCHLOROPENTAFLUOROETHANE (CFC-115) | 76153 | | | S | | |
| HEPTACHLOR | 76448 | X | X | S | | |

| CHEMICAL | CAS Number or TRI Class | Cancer | Developmental | Neurological | Reproductive | Respiratory |
|---|---|---|---|---|---|---|
| TRIPHENYLTIN HYDROXIDE | 76879 | X | X | | | |
| HEXACHLOROCYCLOPENTADIENE | 77474 | | | S | | S |
| DICYCLOPENTADIENE | 77736 | | | S | | |
| DIMETHYL SULFATE | 77781 | X | | S | | S |
| S,S,S-TRIBUTYLTRITHIOPHOSPHATE | 78488 | | | S | | |
| ISOBUTYRALDEHYDE | 78842 | | | | | S |
| 1,2-DICHLOROPROPANE | 78875 | X | | S | | S |
| SEC-BUTYL ALCOHOL | 78922 | | | | | S |
| METHYL ETHYL KETONE | 78933 | | | S | | S |
| 1,1,2-TRICHLOROETHANE | 79005 | X | | S | | |
| TRICHLOROETHYLENE | 79016 | X | | S | | S |
| ACRYLAMIDE | 79061 | X | | S | | |
| ACRYLIC ACID | 79107 | | | | | S |
| CHLOROACETIC ACID | 79118 | | | | | S |
| METHYL CHLOROCARBONATE | 79221 | | | | | S |
| 1,1,2,2-TETRACHLOROETHANE | 79345 | X | | S | | S |
| DIMETHYLCARBAMOYL CHLORIDE | 79447 | X | | | | S |
| 2-NITROPROPANE | 79469 | X | | S | | S |
| 4,4'-ISOPROPYLIDENEDIPHENOL | 80057 | | | S | | |
| CUMENE HYDROPEROXIDE | 80159 | | | | | S |
| METHYL METHACRYLATE | 80626 | | | S | | S |
| WARFARIN | 81812 | | X | S | | |
| C.I. FOOD RED 15 | 81889 | X | | | | |
| 1-AMINO-2-METHYLANTHRAQUINONE | 82280 | X | | | | |
| DIBUTYL PHTHALATE | 84742 | | | S | | |
| PHENANTHRENE | 85018 | | | | | S |
| PHTHALIC ANHYDRIDE | 85449 | | | S | | S |
| N-NITROSODIPHENYLAMINE | 86306 | X | | | | S |
| 2,6-XYLIDINE | 87627 | X | | | | |
| HEXACHLORO-1,3-BUTADIENE | 87683 | | | S | | |
| PENTACHLOROPHENOL | 87865 | X | | S | | S |
| 2,4,5-TRICHLOROPHENOL | 95954 | | | | | S |
| STYRENE OXIDE | 96093 | X | | S | | S |
| 1,2-DIBROMO-3-CHLOROPROPANE (DBCP) | 96128 | X | | S | X | S |
| 1,2,3-TRICHLOROPROPANE | 96184 | X | | S | | S |
| METHYL ACRYLATE | 96333 | | | S | | S |
| ETHYLENE THIOUREA | 96457 | X | X | | | |
| DICHLOROPHENE | 97234 | | X | | | |
| C.I. SOLVENT YELLOW 3 | 97563 | X | | | | |
| BENZOIC TRICHLORIDE | 98077 | X | | S | | S |

| CHEMICAL | CAS Number or TRI Class | Cancer | Developmental | Neurological | Reproductive | Respiratory |
|---|---|---|---|---|---|---|
| CUMENE | 98828 | | | S | | |
| BENZAL CHLORIDE | 98873 | | | S | | S |
| BENZOYL CHLORIDE | 98884 | | | | | S |
| NITROBENZENE | 98953 | X | | S | | S |
| 5-NITRO-O-ANISIDINE | 99592 | X | | | | |
| M-DINITROBENZENE | 99650 | | | S | X | S |
| P-NITROANILINE | 100016 | | | S | | |
| 4-NITROPHENOL | 100027 | | | S | | |
| P-DINITROBENZENE | 100254 | | | S | X | |
| ETHYLBENZENE | 100414 | | | S | | S |
| STYRENE | 100425 | | | S | | S |
| BENZYL CHLORIDE | 100447 | X | | S | | S |
| N-NITROSOPIPERIDINE | 100754 | X | | | | S |
| 4,4'-METHYLENEBIS(2-CHLOROANILINE) | 101144 | X | | S | | S |
| 4,4'-METHYLENEBIS(N,N-DIMETHYL)BENZENAMINE | 101611 | X | | | | |
| 4,4'-METHYLENEDIANILINE | 101779 | X | | S | | |
| 4,4'-DIAMINODIPHENYL ETHER | 101804 | X | | | | |
| DIGLYCIDYL RESORCINOL ETHER (DGRE) | 101906 | X | | S | | |
| P-CHLOROPHENYL ISOCYANATE | 104121 | | | | | S |
| 2,4-DIMETHYLPHENOL | 105679 | | | S | | |
| P-XYLENE | 106423 | | | S | | S |
| P-CRESOL | 106445 | | | S | | S |
| 1,4-DICHLOROBENZENE | 106467 | X | | S | | S |
| P-CHLOROANILINE | 106478 | X | | | | |
| P-PHENYLENEDIAMINE | 106503 | | | S | | S |
| QUINONE | 106514 | | | S | | |
| 1,2-BUTYLENE OXIDE | 106887 | | | | | S |
| EPICHLOROHYDRIN | 106898 | X | | S | X | S |
| 1,2-DIBROMOETHANE | 106934 | X | X | S | X | S |
| 1,3-BUTADIENE | 106990 | X | | S | | S |
| ACROLEIN | 107028 | | | S | | S |
| ALLYL CHLORIDE | 107051 | | | S | | S |
| 1,2-DICHLOROETHANE | 107062 | X | | S | | S |
| ALLYL AMINE | 107119 | | | | | S |
| ACRYLONITRILE | 107131 | X | | S | | S |
| ALLYL ALCOHOL | 107186 | | | S | | S |
| PROPARGYL ALCOHOL | 107197 | | | S | | |
| ETHYLENE GLYCOL | 107211 | | | S | | S |
| CHLOROMETHYL METHYL ETHER | 107302 | X | | | | S |
| VINYL ACETATE | 108054 | | | S | | S |

| CHEMICAL | CAS Number or TRI Class | Cancer | Developmental | Neurological | Reproductive | Respiratory |
|---|---|---|---|---|---|---|
| METHYL ISOBUTYL KETONE | 108101 | | | S | | S |
| MALEIC ANHYDRIDE | 108316 | | | | | S |
| M-XYLENE | 108383 | | | S | | S |
| M-CRESOL | 108394 | | | S | | S |
| BIS(2-CHLORO-1-METHYLETHYL) ETHER | 108601 | X | | S | | |
| TOLUENE | 108883 | | X | S | | S |
| CHLOROBENZENE | 108907 | | | S | | |
| CYCLOHEXANOL | 108930 | | | S | | S |
| PHENOL | 108952 | | | S | | S |
| 2-METHYLPYRIDINE | 109068 | | | S | | |
| ETHYLENE GLYCOL MONOMETHYL ETHER | 109864 | | X | S | X | S |
| N-HEXANE | 110543 | | | S | | S |
| ETHYLENE GLYCOL MONOETHYL ETHER | 110805 | | X | S | X | S |
| CYCLOHEXANE | 110827 | | | S | | |
| PYRIDINE | 110861 | X | | S | | S |
| DIETHANOLAMINE | 111422 | | | S | | |
| BIS(2-CHLOROETHYL) ETHER | 111444 | X | | | | S |
| PROPOXUR | 114261 | | | S | | |
| PROPYLENE | 115071 | | | | | S |
| CHLORENDIC ACID | 115286 | X | | | | |
| DICOFOL | 115322 | | | S | | |
| ALDICARB | 116063 | | | S | | |
| 2-AMINOANTHRAQUINONE | 117793 | X | | | | |
| BIS(2-ETHYLHEXYL)PHTHALATE | 117817 | X | | | | S |
| HEXACHLOROBENZENE | 118741 | X | X | S | | |
| 3,3'-DIMETHOXYBENZIDINE | 119904 | X | | | | |
| 3,3'-DIMETHYLBENZIDINE | 119937 | X | | | | |
| 2,4-DP | 120365 | | | S | | |
| ISOSAFROLE | 120581 | X | | | | |
| P-CRESIDINE | 120718 | X | | | | |
| CATECHOL | 120809 | | | S | | |
| 1,2,4-TRICHLOROBENZENE | 120821 | | | S | | S |
| 2,4-DINITROTOLUENE | 121142 | X | | S | X | |
| TRIETHYLAMINE | 121448 | | | S | | S |
| N,N-DIMETHYLANILINE | 121697 | | | S | | |
| MALATHION | 121755 | | | S | | S |
| SIMAZINE | 122349 | | | S | | |
| DIPHENYLAMINE | 122394 | | | S | | S |
| 1,2-DIPHENYLHYDRAZINE | 122667 | X | | | | |
| HYDROQUINONE | 123319 | | | S | | S |

| CHEMICAL | CAS Number or TRI Class | Cancer | Developmental | Neurological | Reproductive | Respiratory |
|---|---|---|---|---|---|---|
| PROPIONALDEHYDE | 123386 | | | S | | |
| PARALDEHYDE | 123637 | | | S | | |
| BUTYRALDEHYDE | 123728 | | | | | S |
| 1,4-DIOXANE | 123911 | X | | S | | S |
| DIMETHYLAMINE | 124403 | | | S | | S |
| TRIS(2,3-DIBROMOPROPYL) PHOSPHATE | 126727 | X | | S | | |
| METHACRYLONITRILE | 126987 | | | S | | |
| 2-CHLOR-1,3-BUTADIENE | 126998 | X | | S | | S |
| TETRACHLOROETHYLENE | 127184 | X | | S | | S |
| POTASSIUM DIMETHYLDITHIO-CARBAMATE | 128030 | | X | | | |
| SODIUM DIMETHYLDITHIOCARBAMATE | 128041 | | X | | | |
| DIMETHYL PHTHALATE | 131113 | | | S | | S |
| O-PHENYLPHENATE, SODIUM | 132274 | X | | | | |
| CAPTAN | 133062 | X | | S | | |
| FOLPET | 133073 | X | | | | |
| O-ANISIDINE HYDROCHLORIDE | 134292 | X | | S | | |
| ALPHA-NAPHTHYLAMINE | 134327 | X | | | | |
| CUPFERRON | 135206 | X | | | | |
| DIPROPYL ISOCINCHOMERONATE | 136458 | X | | | | |
| THIRAM | 137268 | | | S | | S |
| METHAM SODIUM | 137428 | X | X | | | |
| DISODIUM CYANODITHIO-IMIDOCARBONATE | 138932 | | X | | | |
| NITRILOTRIACETIC ACID | 139139 | X | | | | |
| 4,4'-DIAMINODIPHENYL SULFIDE | 139651 | X | | | | S |
| ETHYL ACRYLATE | 140885 | X | | S | | S |
| BUTYL ACRYLATE | 141322 | | | | | S |
| NABAM | 142596 | | X | | | |
| THIABENDAZOLE | 148798 | | | S | | |
| 2-MERCAPTOBENZOTHIAZOLE | 149304 | | | S | | |
| MERPHOS | 150505 | | | S | | |
| MONURON | 150685 | | | | | S |
| ETHYLENEIMINE | 151564 | X | | S | | S |
| P-NITROSODIPHENYLAMINE | 156105 | X | | | | |
| CALCIUM CYANAMIDE | 156627 | | | | | S |
| METHYL PARATHION | 298000 | | | S | | S |
| NALED | 300765 | | | S | | |
| OXYDEMETON METHYL | 301122 | | | S | X | |
| HYDRAZINE | 302012 | X | | S | | S |
| ALDRIN | 309002 | X | | S | | S |
| ALPHA-LINDANE | 319846 | X | | | | |

| CHEMICAL | CAS Number or TRI Class | Cancer | Developmental | Neurological | Reproductive | Respiratory |
|---|---|---|---|---|---|---|
| DIURON | 330541 | X | | | | |
| DIAZINON | 333415 | | | S | | |
| DIAZOMETHANE | 334883 | | | S | | S |
| BROMOCHLORODIFLUOROMETHANE | 353593 | | | S | | |
| 3-CHLORO-1,1,1-TRIFLUOROPROPANE | 460355 | | | S | | |
| CARBONYL SULFIDE | 463581 | | | S | | |
| AURAMINE | 492808 | X | | | | |
| MUSTARD GAS | 505602 | X | | S | | S |
| CHLOROBENZILATE | 510156 | X | | | | |
| O-DINITROBENZENE | 528290 | | | S | X | |
| 2-CHLOROACETOPHENONE | 532274 | | | S | | S |
| DAZOMET | 533744 | | | S | | S |
| 4,6-DINITRO-O-CRESOL | 534521 | | | S | | |
| 1,2-DICHLOROETHYLENE | 540590 | | | | | S |
| ETHYL CHLOROFORMATE | 541413 | | | | | S |
| DITHIOBIURET | 541537 | | | S | | |
| 1,3-DICHLOROBENZENE | 541731 | | | | | S |
| 1,3-DICHLOROPROPENE (MIXED ISOMERS) | 542756 | X | | S | | S |
| 3-CHLOROPROPIONITRILE | 542767 | | | S | | |
| BIS(CHLOROMETHYL) ETHER | 542881 | X | | | | S |
| LITHIUM CARBONATE | 554132 | | X | S | | |
| METHYL ISOTHIOCYANATE | 556616 | | | S | | |
| 3-CHLORO-2-METHYL-1-PROPENE | 563473 | X | | | | |
| TOLUENE-2,4-DIISOCYANATE | 584849 | | | S | | S |
| VINYL BROMIDE | 593602 | X | | S | | |
| PERCHLOROMETHYL MERCAPTAN | 594423 | | | | | S |
| 2,6-DINITROTOLUENE | 606202 | X | | S | X | |
| PENTACHLOROBENZENE | 608935 | | | S | | |
| 3,3'-DIMETHYLBENSIDINE DIHYDROCHLORIDE | 612828 | X | | | | |
| 3,3'-DICHLOROBENZIDINE DIHYDROCHLORIDE | 612839 | X | | | | |
| 2,4-DIAMINOANISOLE | 615054 | X | | | | |
| DI-N-PROPYLNITROSAMINE | 621647 | X | | | | S |
| METHYL ISOCYANATE | 624839 | | | | | S |
| O-TOLUIDINE HYDROCHLORIDE | 636215 | X | | | | |
| HEXAMETHYLPHOSPHORAMIDE | 680319 | X | | S | X | S |
| N-NITROSO-N-METHYLUREA | 684935 | X | | | | |
| PROPANIL | 709988 | | | S | | S |
| N-ETHYL-N-NITROSOUREA | 759739 | X | | S | | |
| ETHYL DIPROPYLTHIOCARBAMATE | 759944 | | X | S | | |
| 1,4-DICHLORO-2-BUTENE | 764410 | X | | S | | S |

| CHEMICAL | CAS Number or TRI Class | Cancer | Developmental | Neurological | Reproductive | Respiratory |
|---|---|---|---|---|---|---|
| AMETRYN | 834128 | | | S | | |
| C.I. SOLVENT YELLOW 14 | 842079 | X | | | | |
| N-METHYL-2-PYRROLIDONE | 872504 | | X | S | | |
| N-NITROSODI-N-BUTYLAMINE | 924163 | X | | | | S |
| N-METHYLOLACRYLAMIDE | 924425 | X | | S | | |
| PEBULATE | 1114712 | | | | | |
| PROPANE SULTONE | 1120714 | X | | S | | S |
| CYCLOATE | 1134232 | | | S | | |
| MOLYBDENUM TRIOXIDE | 1313275 | | | S | | S |
| THORIUM DIOXIDE | 1314201 | X | | | | |
| CRESOL (MIXED ISOMERS) | 1319773 | | | S | | S |
| 2,4-D PROPYLENE GLYCOL BUTYL ETHER ESTER | 1320189 | | | S | | |
| XYLENE (MIXED ISOMERS) | 1330207 | | | S | | S |
| ASBESTOS (FRIABLE) | 1332214 | X | | | | S |
| POLYCHLORINATED BIPHENYLS | 1336363 | X | X | S | | S |
| ALUMINUM OXIDE (FIBROUS FORMS) | 1344281 | | | S | | |
| 1,1'-BI(ETHYLENE OXIDE) | 1464535 | X | | | | S |
| CARBOFURAN | 1563662 | | | S | | |
| METHYL TERT-BUTYL ETHER | 1634044 | | | S | | |
| BROMOXYNIL | 1689845 | | X | | | |
| BROMOXYNIL OCTANOATE | 1689992 | | X | | | |
| 1,1-DICHLORO-1-FLUOROETHANE | 1717006 | | | S | | |
| NITROFEN | 1836755 | X | | S | | S |
| CHLOROTHALONIL | 1897456 | X | | S | | |
| PARAQUAT | 1910425 | | | S | | S |
| ATRAZINE | 1912249 | | | S | | |
| PROPACHLOR | 1918167 | X | | S | | S |
| 2,4-D 2-ETHYLHEXYL ESTER | 1928434 | | | S | | |
| 2,4-D BUTOXYETHYL ESTER | 1929733 | | | S | | |
| NITRAPYRIN | 1929824 | | X | | | |
| DIRECT BLACK 38 | 1937377 | X | | | | |
| MERCAPTODIMETHUR | 2032657 | | | S | | |
| TRIBUTYLTIN METHACRYLATE | 2155706 | | | S | | |
| MOLINATE | 2212671 | | | S | | |
| TRIALLATE | 2303175 | | | S | | |
| PROPARGITE | 2312358 | X | X | | | |
| CHINOMETHIONAT | 2439012 | X | X | | | |
| DIRECT BLUE 6 | 2602462 | X | | | | |
| 2,3,5-TRIMETHYLPHENYL METHYLCARBAMATE | 2655154 | | | S | | |
| SULFURYL FLUORIDE | 2699798 | | | S | | S |

| CHEMICAL | CAS Number or TRI Class | Cancer | Developmental | Neurological | Reproductive | Respiratory |
|---|---|---|---|---|---|---|
| 2,4-D SODIUM SALT | 2702729 | | | S | | |
| 2,4-D CHLOROCROTYL ESTER | 2971382 | | | S | | |
| TEMEPHOS | 3383968 | | | S | | |
| METHOXONE SODIUM SALT | 3653483 | | | S | | |
| C.I. FOOD RED 5 | 3761533 | X | | | | |
| N-NITROSOMETHYLVINYLAMINE | 4549400 | X | | | | |
| CARBOXIN | 5234684 | | | S | | |
| CHLORPYRIFOS METHYL | 5598130 | | | S | | |
| TERBACIL | 5902512 | | X | | | |
| C.I. ACID RED 114 | 6459945 | X | | | | |
| PROMETRYN | 7287196 | | | S | | S |
| ALUMINUM | 7429905 | | | S | | S |
| LEAD | 7439921 | X | X | S | X | S |
| MANGANESE | 7439965 | | | S | | S |
| MERCURY | 7439976 | | X | S | | S |
| NICKEL | 7440020 | X | | S | | S |
| THALLIUM | 7440280 | | | S | | |
| ANTIMONY | 7440360 | | | S | | S |
| ARSENIC | 7440382 | X | X | S | | S |
| BARIUM | 7440393 | | | S | | S |
| BERYLLIUM | 7440417 | X | | | | S |
| CADMIUM | 7440439 | X | X | S | X | S |
| CHROMIUM (CR6+) | 7440473 | X | | | | S |
| CHROMIUM | 7440473 | | | | | S |
| COBALT | 7440484 | X | | S | | S |
| COPPER | 7440508 | | | | | S |
| VANADIUM | 7440622 | | | | | S |
| ZINC | 7440666 | | | | | S |
| TITANIUM TETRACHLORIDE | 7550450 | | | | | S |
| SODIUM NITRITE | 7632000 | | | S | | S |
| BORON TRIFLUORIDE | 7637072 | | | S | | S |
| HYDROCHLORIC ACID | 7647010 | | | | | S |
| HYDROFLUORIC ACID | 7664393 | | | S | | S |
| AMMONIA | 7664417 | | | S | | S |
| SULFURIC ACID | 7664939 | | | | | S |
| TETRAMETHRIN | 7696120 | | | S | | |
| NITRIC ACID | 7697372 | | | | | S |
| PHOSPHORUS (YELLOW OR WHITE) | 7723140 | | | S | | S |
| BROMINE | 7726956 | | | S | | S |
| POTASSIUM BROMATE | 7758012 | X | | | | |

| CHEMICAL | CAS Number or TRI Class | Cancer | Developmental | Neurological | Reproductive | Respiratory |
|---|---|---|---|---|---|---|
| FLUORINE | 7782414 | | | | | S |
| SELENIUM | 7782492 | | | S | | S |
| CHLORINE | 7782505 | | | S | | S |
| MEVINPHOS | 7786347 | | | S | | S |
| PHOSPHINE | 7803512 | | | S | | S |
| CAMPHECHLOR | 8001352 | X | | S | | S |
| CREOSOTES | 8001589 | X | | S | | |
| METIRAM | 9006422 | X | X | | | |
| OZONE | 10028156 | | | S | | S |
| HYDRAZINE SULFATE | 10034932 | X | | S | | S |
| CHLORINE DIOXIDE | 10049044 | | | | | S |
| TRANS-1,3-DICHLOROPROPENE | 10061026 | | | | | |
| RESMETHRIN | 10453868 | | | S | | |
| ZINEB | 12122677 | | | S | | |
| MANEB | 12427382 | X | | S | | |
| ETHOPROP | 13194484 | X | | S | | |
| IRON PENTACARBONYL | 13463406 | | | S | | S |
| FERBAM | 14484641 | | | S | | |
| ALACHLOR | 15972608 | X | | | | |
| C.I. DIRECT BROWN 95 | 16071866 | X | | | | |
| N-NITROSONORNICOTINE | 16543558 | X | | | | S |
| BENOMYL | 17804352 | X | | S | X | |
| OXYDIAZON | 19666309 | X | X | | | |
| 3,3'-DIMETHOXYBENZIDINE DIHYDROCHLORIDE | 20325400 | X | | | | |
| METHAZOLE | 20354261 | | X | | | |
| OSMIUM OXIDE OSO4 (T-4) | 20816120 | | | | | S |
| ALUMINUM PHOSPHIDE | 20859738 | | | S | | S |
| CYANAZINE | 21725462 | | X | S | | S |
| BENDIOCARB | 22781233 | | | S | | |
| THIOPHANATE-METHYL | 23564058 | | | S | X | |
| PRONAMIDE | 23950585 | X | | | | |
| ISOFENPHOS | 25311711 | | | S | | |
| DINITROTOLUENE (MIXED ISOMERS) | 25321146 | X | | S | X | S |
| DIAMINOTOLUENE (MIXED ISOMERS) | 25376458 | X | | | | |
| PHENOTHRIN | 26002802 | | | S | | |
| TOLUENE DIISOCYANATE (MIXED ISOMERS) | 26471625 | X | | S | | S |
| SODIUM AZIDE | 26628228 | | | S | | S |
| C.I. DIRECT BLUE 218 | 28407376 | X | | | | |
| PIRIMIPHOS METHYL | 29232937 | | | S | | |
| ACEPHATE | 30560191 | | | S | | |

| CHEMICAL | CAS Number or TRI Class | Cancer | Developmental | Neurological | Reproductive | Respiratory |
|---|---|---|---|---|---|---|
| PROPETAMPHOS | 31218834 | | | S | | |
| AMITRAZ | 33089611 | | | S | | |
| TEBUTHIURON | 34014181 | | | S | | |
| SULPROFOS | 35400432 | | | S | | |
| IMAZALIL | 35554440 | | | S | | |
| 2,4-DIAMINOANISOLE SULFATE | 39156417 | X | | | | |
| DINOCAP | 39300453 | | X | | | |
| FENPROPATHRIN | 39515418 | | | S | | |
| PROFENOFOS | 41198087 | | | S | | |
| TRIADIMEFON | 43121433 | | X | S | X | |
| VINCLOZOLIN | 50471448 | X | X | | | |
| DICLOFOP METHYL | 51338273 | | X | | | |
| FENVALERATE | 51630581 | | | S | | |
| BROMACIL LITHIUM SALT | 53404196 | | X | | | |
| 2,4-D 2-ETHYL-4-METHYLPENTYL ESTER | 53404378 | | | S | | |
| THIODICARB | 59669260 | X | | S | | |
| ACIFLUORFEN, SODIUM SALT | 62476599 | X | | | | |
| CHLORSULFURON | 64902723 | | X | | X | |
| FENOXAPROP ETHYL | 66441234 | | X | | | |
| HYDRAMETHYLNON | 67485294 | | X | | X | |
| CYHALOTHRIN | 68085858 | | | S | | |
| CYFLUTHRIN | 68359375 | | | S | | |
| FLUVALINATE | 69409945 | | X | | | |
| FLUAZIFOP BUTYL | 69806504 | | X | | | |
| FENOXYCARB | 72490018 | X | | | | |
| QUIZALOFOP-ETHYL | 76578148 | | | | X | |
| LACTOFEN | 77501634 | X | | | | |
| BIFENTHRIN | 82657043 | | | S | | |
| MYCLOBUTANIL | 88671890 | | X | | X | |
| ANTIMONY COMPOUNDS | N010 | | | | | S |
| ARSENIC (ORGANIC OR INORGANIC COMPOUNDS) | N020 | X | X | S | | S |
| BERYLLIUM COMPOUNDS | N050 | X | | | | S |
| CADMIUM COMPOUNDS | N078 | X | | | X | S |
| CHROMIUM COMPOUNDS | N090 | X | | | | S |
| COBALT COMPOUNDS | N096 | | | | | S |
| COPPER COMPOUNDS | N100 | | | | | S |
| 1,3-BIS(METHYLISOCYANATE) CYCLOHEXANE | N120 | | | | | S |
| 1,4-BIS(METHYLISOCYANATE) CYCLOHEXANE | N120 | | | | | S |
| 1,4-CYCLOHEXANE DIISOCYANATE | N120 | | | | | S |
| DIETHYLDIISOCYANATOBENZENE | N120 | | | | | S |

| CHEMICAL | CAS Number or TRI Class | Cancer | Developmental | Neurological | Reproductive | Respiratory |
|---|---|---|---|---|---|---|
| 4,4'-DIISOCYANATODIPHENYL ETHER | N120 | | | | | S |
| 2,4'-DIISOCYANATODIPHENYL SULFIDE | N120 | | | | | S |
| 3,3'-DIMETHOXYBENZIDINE-4,4'-DIISOCYANATE | N120 | | | | | S |
| 3,3'-DIMETHYL-4,4'-DIPHENYLENE DIISOCYANATE | N120 | | | | | S |
| 3,3'-DIMETHYLDIPHENYL METHANE-4,4'-DIISOCYANATE | N120 | | | | | S |
| HEXAMETHYLENE-1,6-DIISOCYANATE | N120 | | | | | S |
| ISOPHORONE DIISOCYANATE | N120 | | | | | S |
| 4-METHYLDIPHNEYLMETHANE-3,4-DIISOCYANATE | N120 | | | | | S |
| 1,1-METHYLENEBIS(4-ISOCYANATOCYCLOHEXANE) | N120 | | | | | S |
| METHYLENEBIS(PHENYLISOCYANATE) | N120 | | | | | S |
| 1,5-NAPHTHALENE DIISOCYANATE | N120 | | | | | S |
| 1,3-PHENYLENE DIISOCYANATE | N120 | | | | | S |
| 1,4-PHENYLENE DIISOCYANATE | N120 | | | | | S |
| 4-METHYLDIPHENYLMETHANE-3,4-DIISOCYANATE | N120 | | | | | S |
| POLYMERIC DIPHENYLMETHANE DIISOCYANATE | N120 | | | | | S |
| 2,2,4-TRIMETHYLHEXAMETHYLENE DIISOCYANATE | N120 | | | | | S |
| 2,4,4-TRIMETHYLHEXAMETHYLENE DIISOCYANATE | N120 | | | | | S |
| 1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-P-DIOXIN | N150 | * | | | | |
| 1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN | N150 | * | | | | |
| 1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN | N150 | * | | | | |
| 1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN | N150 | * | | | | |
| 1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN | N150 | * | | | | |
| 1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN | N150 | * | | | | |
| 2,3,7,8-TETRACHLORODIBENZOFURAN | N150 | * | | | | |
| 1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN | N150 | * | | | | |
| 2,3,4,7,8-PENTACHLORODIBENZOFURAN | N150 | * | | | | |
| 1,2,3,7,8-PENTACHLORODIBENZOFURAN | N150 | * | | | | |
| 1,2,3,6,7,8-HEXACHLORODIBENZOFURAN | N150 | * | | | | |
| 1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN | N150 | * | | | | |
| 1,2,3,4,5,8-HEXACHLORODIBENZOFURAN | N150 | * | | | | |
| 1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN | N150 | * | | | | |
| 1,2,3,7,8,9-HEXACHLORODIBENZO FURAN | N150 | * | | | | |
| 2,3,4,6,7,8-HEXACHLORODIBENZOFURAN | N150 | * | | | | |
| 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN | N150 | * | | | | |
| GLYCOL ETHERS | N230 | | | S | | S |
| LEAD COMPOUNDS | N420 | X | X | S | X | |
| MANGANESE COMPOUNDS | N450 | | | S | | S |
| MERCURY COMPOUNDS | N458 | | X | S | | S |
| NICKEL COMPOUNDS | N495 | X | | | | S |
| POLYBROMINATED BIPHENYLS | N575 | X | X | S | | |

| CHEMICAL | CAS Number or TRI Class | Cancer | Developmental | Neurological | Reproductive | Respiratory |
|---|---|---|---|---|---|---|
| BENZO(A)PYRENE | N590 | X | | | | S |
| BENZ(A)ANTHRACENE | N590 | X | | | | S |
| BENZO[J]FLUORANTHENE | N590 | X | | | | S |
| BENZO(K)FLUORANTHENE | N590 | X | | | | S |
| CHRYSENE | N590 | X | | | | S |
| DIBENZ[A,J]ACRIDINE | N590 | X | | | | S |
| DIBENZ[A,H]ACRIDINE | N590 | X | | | | S |
| DIBENZO[A,I]PYRENE | N590 | X | | | | S |
| BENZO(B)FLUORANTHENE | N590 | X | | | | S |
| THALLIUM COMPOUNDS | N760 | | | S | | |
| VANADIUM COMPOUNDS | N770 | | | | | S |
| WARFARIN AND SALTS | N874 | | X | S | | |

X = Chemical or chemical class listed on California's Proposition 65 list of carcinogenic, developmental and reproductive toxicants, plus certain chemical classes listed based on an extension of the Prop 65 list. (See "Methodology")

S = Chemical or chemical class listed on the Scorecard.org list of suspected neurological or respiratory toxicants. Sourcing information for these chemicals can be found at *www.scorecard.org/health-effects/*.

* = Dioxin. Dioxin is not included in releases of any of the five categories of toxic compounds in this report. At least one member of the dioxin family—2,3,7,8-tetrachlorodibenzo-p-dioxin—has been identified by the state of California as a carcinogenic and developmental toxicant and by Environmental Defense as a suspected neurological and respiratory toxicant.

# APPENDIX C: NATIONAL TOXIC RELEASE RANKINGS

## C.1 RELEASES BY STATE

**Table C.1.1 Cancer-Causing Chemical Releases by State, 2000 (pounds)**

| State | Air | Water | Total | Rank |
|---|---|---|---|---|
| TX | 8,644,611 | 69,057 | 8,713,668 | 1 |
| PA | 6,232,498 | 43,262 | 6,275,761 | 2 |
| IN | 6,214,965 | 50,150 | 6,265,116 | 3 |
| OH | 5,778,617 | 58,989 | 5,837,606 | 4 |
| TN | 4,935,687 | 99,043 | 5,034,730 | 5 |
| MS | 4,901,334 | 22,077 | 4,923,411 | 6 |
| SC | 4,221,542 | 101,150 | 4,322,692 | 7 |
| NC | 4,191,609 | 102,167 | 4,293,776 | 8 |
| LA | 4,162,329 | 87,161 | 4,249,490 | 9 |
| FL | 4,162,021 | 33,670 | 4,195,690 | 10 |
| IL | 3,904,543 | 13,923 | 3,918,466 | 11 |
| GA | 3,259,232 | 65,823 | 3,325,055 | 12 |
| AL | 3,122,108 | 121,474 | 3,243,582 | 13 |
| VA | 3,086,556 | 28,859 | 3,115,415 | 14 |
| KY | 2,479,622 | 109,236 | 2,588,859 | 15 |
| PR | 2,507,549 | 9,084 | 2,516,633 | 16 |
| NY | 2,202,428 | 156,361 | 2,358,789 | 17 |
| OR | 2,275,604 | 10,470 | 2,286,074 | 18 |
| WI | 2,163,656 | 21,667 | 2,185,323 | 19 |
| CA | 2,025,868 | 82,225 | 2,108,093 | 20 |
| MO | 1,873,458 | 20,144 | 1,893,602 | 21 |
| MI | 1,747,061 | 20,697 | 1,767,758 | 22 |
| WA | 1,627,993 | 94,558 | 1,722,551 | 23 |
| CT | 1,407,135 | 6,565 | 1,413,701 | 24 |
| AR | 1,225,154 | 49,708 | 1,274,862 | 25 |
| NJ | 1,101,762 | 48,508 | 1,150,270 | 26 |
| WV | 1,039,441 | 110,478 | 1,149,920 | 27 |
| KS | 1,072,749 | 1,884 | 1,074,633 | 28 |
| OK | 927,285 | 2,923 | 930,209 | 29 |
| IA | 884,978 | 21,567 | 906,545 | 30 |
| MN | 888,773 | 12,248 | 901,021 | 31 |
| MT | 740,649 | 770 | 741,418 | 32 |
| MD | 628,605 | 22,293 | 650,898 | 33 |
| ME | 560,063 | 21,154 | 581,217 | 34 |
| MA | 514,781 | 61,368 | 576,149 | 35 |
| UT | 301,404 | 4,992 | 306,397 | 36 |
| DE | 295,281 | 4,633 | 299,915 | 37 |
| AZ | 189,174 | 531 | 189,705 | 38 |
| NH | 183,629 | 3,444 | 187,073 | 39 |
| NE | 147,890 | 1,510 | 149,400 | 40 |
| RI | 112,666 | 341 | 113,006 | 41 |
| NV | 107,078 | 5,277 | 112,355 | 42 |
| ID | 86,343 | 12,084 | 98,427 | 43 |
| ND | 70,101 | 23,156 | 93,257 | 44 |
| HI | 87,368 | 64 | 87,432 | 45 |
| CO | 80,737 | 819 | 81,557 | 46 |
| NM | 65,958 | 337 | 66,295 | 47 |
| WY | 56,979 | 466 | 57,445 | 48 |
| AK | 40,225 | 594 | 40,819 | 49 |
| VI | 32,540 | 3 | 32,543 | 50 |
| SD | 17,450 | 801 | 18,251 | 51 |
| GU | 3,913 | 0 | 3,913 | 52 |
| VT | 1,493 | 9 | 1,502 | 53 |
| MP | 1,240 | 0 | 1,240 | 54 |
| DC | 8 | 0 | 8 | 55 |

**Table C.1.2 Developmental Toxicant Releases by State, 2000 (pounds)**

| State | Air | Water | Total | Rank |
|---|---|---|---|---|
| TN | 27,926,717 | 21,448 | 27,948,165 | 1 |
| AL | 13,678,522 | 49,641 | 13,728,163 | 2 |
| IL | 8,095,783 | 3,842 | 8,099,625 | 3 |
| TX | 7,493,649 | 32,506 | 7,526,155 | 4 |
| IN | 6,484,257 | 19,762 | 6,504,019 | 5 |
| NC | 4,923,452 | 20,550 | 4,944,002 | 6 |
| SC | 4,634,688 | 30,741 | 4,665,429 | 7 |
| PA | 4,542,023 | 10,182 | 4,552,206 | 8 |
| VA | 4,455,462 | 21,358 | 4,476,820 | 9 |
| MI | 3,993,947 | 3,823 | 3,997,770 | 10 |
| KY | 3,831,755 | 47,303 | 3,879,058 | 11 |
| LA | 3,653,721 | 9,280 | 3,663,001 | 12 |
| OH | 3,626,791 | 20,757 | 3,647,548 | 13 |
| MS | 3,588,857 | 1,337 | 3,590,194 | 14 |
| NY | 3,138,210 | 10,906 | 3,149,116 | 15 |
| AR | 2,985,826 | 8,403 | 2,994,228 | 16 |
| GA | 2,932,112 | 6,677 | 2,938,788 | 17 |
| WI | 2,806,119 | 1,563 | 2,807,682 | 18 |
| KS | 2,773,414 | 950 | 2,774,364 | 19 |
| FL | 2,410,250 | 1,880 | 2,412,130 | 20 |
| MO | 2,347,132 | 8,150 | 2,355,282 | 21 |
| NJ | 2,011,500 | 31,712 | 2,043,212 | 22 |
| WV | 1,773,792 | 8,523 | 1,782,314 | 23 |
| OK | 1,703,977 | 904 | 1,704,881 | 24 |
| IA | 1,698,113 | 2,297 | 1,700,410 | 25 |
| MN | 1,689,479 | 75 | 1,689,554 | 26 |
| MA | 1,143,186 | 687 | 1,143,873 | 27 |
| CA | 953,797 | 1,683 | 955,480 | 28 |
| CT | 857,722 | 330 | 858,052 | 29 |
| WA | 754,340 | 1,126 | 755,466 | 30 |
| PR | 539,390 | 48 | 539,438 | 31 |
| NE | 472,533 | 105 | 472,638 | 32 |
| NV | 450,478 | 3,856 | 454,334 | 33 |
| OR | 401,012 | 1,771 | 402,783 | 34 |
| UT | 294,791 | 1,747 | 296,538 | 35 |
| ID | 283,198 | 1,152 | 284,350 | 36 |
| MD | 277,128 | 5,267 | 282,395 | 37 |
| ME | 265,417 | 49 | 265,466 | 38 |
| CO | 247,446 | 125 | 247,571 | 39 |
| NH | 198,372 | 276 | 198,648 | 40 |
| RI | 182,875 | 32 | 182,907 | 41 |
| NM | 181,460 | 4 | 181,464 | 42 |
| AZ | 153,316 | 17 | 153,333 | 43 |
| SD | 146,415 | 574 | 146,989 | 44 |
| ND | 116,689 | 20,965 | 137,654 | 45 |
| WY | 108,180 | 522 | 108,702 | 46 |
| MT | 89,981 | 50 | 90,030 | 47 |
| VI | 78,958 | 1 | 78,959 | 48 |
| DE | 73,112 | 230 | 73,341 | 49 |
| AK | 64,392 | 698 | 65,090 | 50 |
| HI | 60,122 | 44 | 60,166 | 51 |
| VT | 21,028 | 229 | 21,257 | 52 |
| GU | 9,006 | 0 | 9,006 | 53 |
| MP | 3,986 | 0 | 3,986 | 54 |
| DC | 8 | 0 | 8 | 55 |

**Table C.1.3 Reproductive Toxicant Releases by State, 2000 (pounds)**

| State | Air | Water | Total | Rank | State | Air | Water | Total | Rank |
|---|---|---|---|---|---|---|---|---|---|
| TN | 20,069,429 | 9,052 | 20,078,481 | 1 | ND | 41,406 | 17,337 | 58,743 | 28 |
| AL | 11,588,394 | 4,532 | 11,592,926 | 2 | NC | 49,975 | 6,871 | 56,846 | 29 |
| IL | 3,873,457 | 3,002 | 3,876,459 | 3 | AZ | 52,150 | 16 | 52,166 | 30 |
| TX | 2,977,191 | 6,823 | 2,984,014 | 4 | MN | 49,626 | 67 | 49,693 | 31 |
| KS | 1,565,398 | 828 | 1,566,226 | 5 | NM | 43,470 | 3 | 43,473 | 32 |
| AR | 1,414,650 | 7,999 | 1,422,649 | 6 | NV | 41,086 | 60 | 41,146 | 33 |
| LA | 1,210,565 | 3,801 | 1,214,366 | 7 | MT | 41,053 | 11 | 41,064 | 34 |
| WV | 832,455 | 3,901 | 836,356 | 8 | WY | 40,212 | 262 | 40,474 | 35 |
| NY | 819,735 | 3,638 | 823,373 | 9 | AK | 38,400 | 435 | 38,835 | 36 |
| OH | 686,001 | 8,242 | 694,243 | 10 | VI | 36,097 | 1 | 36,098 | 37 |
| GA | 562,845 | 1,199 | 564,044 | 11 | IA | 31,977 | 220 | 32,197 | 38 |
| MO | 533,282 | 6,945 | 540,227 | 12 | NH | 31,393 | 262 | 31,655 | 39 |
| PA | 463,497 | 13,463 | 476,960 | 13 | MA | 29,409 | 314 | 29,723 | 40 |
| FL | 469,594 | 978 | 470,572 | 14 | DE | 28,193 | 162 | 28,355 | 41 |
| WI | 464,212 | 909 | 465,121 | 15 | HI | 27,411 | 20 | 27,431 | 42 |
| SC | 432,339 | 19,778 | 452,117 | 16 | CT | 25,640 | 328 | 25,968 | 43 |
| IN | 314,311 | 7,190 | 321,501 | 17 | MD | 21,305 | 4,082 | 25,387 | 44 |
| NJ | 303,106 | 1,658 | 304,764 | 18 | OR | 21,826 | 935 | 22,761 | 45 |
| MI | 292,117 | 632 | 292,749 | 19 | CO | 17,643 | 103 | 17,746 | 46 |
| VA | 241,630 | 10,663 | 252,293 | 20 | NE | 14,560 | 105 | 14,665 | 47 |
| KY | 220,942 | 9,557 | 230,499 | 21 | ID | 8,836 | 839 | 9,675 | 48 |
| UT | 119,403 | 1,488 | 120,891 | 22 | RI | 8,469 | 12 | 8,481 | 49 |
| WA | 119,066 | 700 | 119,766 | 23 | ME | 6,093 | 18 | 6,111 | 50 |
| OK | 115,794 | 605 | 116,399 | 24 | GU | 3,440 | 0 | 3,440 | 51 |
| CA | 89,246 | 1,235 | 90,481 | 25 | MP | 1,240 | 0 | 1,240 | 52 |
| MS | 85,385 | 483 | 85,868 | 26 | SD | 1,104 | 5 | 1,109 | 53 |
| PR | 80,575 | 16 | 80,591 | 27 | VT | 5 | 9 | 14 | 54 |

**Table C.1.4 Suspected Neurological Toxicant Releases by State, 2000 (pounds)**

| State | Air | Water | Total | Rank | State | Air | Water | Total | Rank |
|---|---|---|---|---|---|---|---|---|---|
| TX | 84,468,530 | 1,373,996 | 85,842,526 | 1 | MN | 13,136,134 | 232,186 | 13,368,320 | 29 |
| TN | 65,817,360 | 1,007,192 | 66,824,552 | 2 | NJ | 9,745,876 | 472,832 | 10,218,708 | 30 |
| LA | 60,398,444 | 1,555,113 | 61,953,557 | 3 | MD | 7,738,537 | 487,961 | 8,226,498 | 31 |
| OH | 55,784,338 | 876,221 | 56,660,560 | 4 | PR | 7,969,851 | 6,915 | 7,976,766 | 32 |
| AL | 45,713,387 | 1,342,420 | 47,055,808 | 5 | NE | 5,654,542 | 218,857 | 5,873,399 | 33 |
| IN | 45,618,603 | 602,140 | 46,220,743 | 6 | ME | 5,071,827 | 418,533 | 5,490,360 | 34 |
| GA | 45,302,599 | 848,937 | 46,151,535 | 7 | MT | 5,145,185 | 46,466 | 5,191,650 | 35 |
| UT | 44,618,462 | 13,045 | 44,631,507 | 8 | ID | 4,992,830 | 163,727 | 5,156,557 | 36 |
| IL | 40,808,804 | 217,056 | 41,025,861 | 9 | MA | 4,037,791 | 99,493 | 4,137,283 | 37 |
| NC | 39,384,934 | 1,112,336 | 40,497,270 | 10 | CT | 3,633,571 | 40,483 | 3,674,054 | 38 |
| SC | 36,354,427 | 812,973 | 37,167,399 | 11 | AZ | 3,043,629 | 5,351 | 3,048,980 | 39 |
| VA | 36,009,751 | 453,560 | 36,463,311 | 12 | CO | 2,731,928 | 46,320 | 2,778,248 | 40 |
| FL | 33,063,688 | 320,614 | 33,384,302 | 13 | ND | 2,473,726 | 49,850 | 2,523,576 | 41 |
| MI | 31,718,810 | 450,592 | 32,169,402 | 14 | AK | 2,435,819 | 67,481 | 2,503,300 | 42 |
| PA | 30,449,939 | 401,136 | 30,851,075 | 15 | NH | 2,316,348 | 95,038 | 2,411,386 | 43 |
| MS | 29,025,929 | 518,363 | 29,544,292 | 16 | DE | 2,330,439 | 65,682 | 2,396,121 | 44 |
| KY | 26,533,313 | 349,999 | 26,883,312 | 17 | SD | 1,956,317 | 6,783 | 1,963,100 | 45 |
| MO | 25,501,624 | 417,054 | 25,918,678 | 18 | NV | 1,936,881 | 22,107 | 1,958,988 | 46 |
| AR | 23,175,171 | 882,166 | 24,057,336 | 19 | WY | 1,416,988 | 16,049 | 1,433,037 | 47 |
| CA | 20,403,394 | 2,145,839 | 22,549,233 | 20 | RI | 926,538 | 755 | 927,293 | 48 |
| WI | 19,911,101 | 293,232 | 20,204,333 | 21 | NM | 730,514 | 699 | 731,213 | 49 |
| IA | 18,812,556 | 399,056 | 19,211,612 | 22 | VI | 508,830 | 38,403 | 547,233 | 50 |
| OK | 17,040,928 | 140,013 | 17,180,941 | 23 | HI | 269,742 | 1,204 | 270,946 | 51 |
| WA | 15,577,240 | 1,037,113 | 16,614,353 | 24 | VT | 116,682 | 7,867 | 124,549 | 52 |
| OR | 15,751,540 | 191,101 | 15,942,641 | 25 | GU | 19,087 | 0 | 19,087 | 53 |
| KS | 14,640,883 | 115,038 | 14,755,921 | 26 | AS | 16,780 | 0 | 16,780 | 54 |
| WV | 12,877,644 | 1,206,421 | 14,084,064 | 27 | MP | 7,990 | 0 | 7,990 | 55 |
| NY | 13,559,157 | 494,293 | 14,053,450 | 28 | DC | 8 | 74 | 82 | 56 |

**Table C.1.5 Suspected Respiratory Toxicant Releases by State, 2000 (pounds)**

| State | Air Emissions | Rank | State | Air Emissions | Rank |
|---|---|---|---|---|---|
| OH | 133,325,669 | 1 | NJ | 15,904,089 | 29 |
| NC | 124,650,411 | 2 | OR | 15,832,450 | 30 |
| GA | 94,612,247 | 3 | KS | 14,882,875 | 31 |
| PA | 92,996,650 | 4 | MN | 14,148,060 | 32 |
| FL | 86,318,614 | 5 | MA | 9,079,875 | 33 |
| IN | 85,218,750 | 6 | NE | 7,792,084 | 34 |
| TX | 82,916,656 | 7 | DE | 7,242,927 | 35 |
| TN | 80,682,391 | 8 | ME | 6,322,936 | 36 |
| WV | 71,799,135 | 9 | MT | 6,050,295 | 37 |
| MI | 68,359,686 | 10 | NH | 5,376,767 | 38 |
| AL | 67,878,236 | 11 | ID | 5,270,149 | 39 |
| KY | 66,327,729 | 12 | AZ | 4,904,689 | 40 |
| LA | 63,850,151 | 13 | CT | 4,736,345 | 41 |
| IL | 60,512,782 | 14 | CO | 3,613,635 | 42 |
| VA | 57,126,815 | 15 | ND | 3,145,916 | 43 |
| SC | 53,744,745 | 16 | NV | 2,958,964 | 44 |
| UT | 48,912,957 | 17 | AK | 2,693,469 | 45 |
| MS | 42,551,517 | 18 | SD | 2,027,682 | 46 |
| MO | 35,903,445 | 19 | WY | 1,907,549 | 47 |
| MD | 33,860,843 | 20 | NM | 1,159,072 | 48 |
| NY | 31,470,735 | 21 | HI | 1,022,580 | 49 |
| WI | 28,319,232 | 22 | RI | 944,788 | 50 |
| AR | 23,887,688 | 23 | VI | 460,180 | 51 |
| CA | 21,723,478 | 24 | GU | 223,797 | 52 |
| IA | 21,522,805 | 25 | VT | 117,713 | 53 |
| OK | 18,363,490 | 26 | DC | 53,008 | 54 |
| WA | 17,442,906 | 27 | AS | 16,780 | 55 |
| PR | 17,237,508 | 28 | MP | 7,990 | 56 |

**Table C.1.6 Dioxin Releases by State, 2000 (grams)**

| State | Air | Water | Total | Rank | State | Air | Water | Total | Rank |
|---|---|---|---|---|---|---|---|---|---|
| TX | 528.5 | 602.3 | 1,130.8 | 1 | OR | 8.8 | 24.6 | 33.3 | 28 |
| LA | 103.5 | 934.7 | 1,038.2 | 2 | MI | 25.2 | 5.8 | 31.1 | 29 |
| AL | 902.3 | 130.7 | 1,032.9 | 3 | MO | 27.2 | 2.9 | 30.2 | 30 |
| GA | 994.6 | 19.6 | 1,014.2 | 4 | DE | 5.0 | 14.0 | 19.0 | 31 |
| UT | 658.4 | 0.0 | 658.4 | 5 | PR | 16.5 | 0.0 | 16.5 | 32 |
| NE | 432.2 | 0.0 | 432.2 | 6 | MT | 16.1 | 0.2 | 16.3 | 33 |
| MS | 20.4 | 176.2 | 196.6 | 7 | WY | 15.2 | 0.0 | 15.2 | 34 |
| IN | 190.7 | 0.0 | 190.8 | 8 | ME | 8.7 | 6.2 | 14.9 | 35 |
| PA | 173.2 | 4.5 | 177.7 | 9 | AZ | 14.2 | 0.0 | 14.2 | 36 |
| VA | 104.3 | 6.7 | 111.0 | 10 | SD | 1.1 | 12.6 | 13.7 | 37 |
| SC | 98.4 | 5.7 | 104.0 | 11 | MA | 11.7 | 0.1 | 11.7 | 38 |
| WA | 40.3 | 44.3 | 84.6 | 12 | NV | 10.9 | 0.0 | 10.9 | 39 |
| FL | 70.6 | 4.4 | 75.0 | 13 | CT | 7.6 | 3.0 | 10.6 | 40 |
| NC | 69.0 | 3.5 | 72.4 | 14 | NJ | 8.0 | 0.5 | 8.6 | 41 |
| WV | 66.6 | 2.8 | 69.4 | 15 | MN | 8.3 | 0.0 | 8.3 | 42 |
| OK | 67.9 | 0.2 | 68.1 | 16 | CO | 8.3 | 0.1 | 8.3 | 43 |
| TN | 49.6 | 16.1 | 65.7 | 17 | NM | 8.0 | 0.0 | 8.0 | 44 |
| WI | 62.0 | 0.8 | 62.8 | 18 | ND | 7.7 | 0.0 | 7.7 | 45 |
| OH | 53.4 | 2.78 | 56.2 | 19 | ID | 1.9 | 5.1 | 7.0 | 46 |
| IA | 51.0 | 0.0 | 51.0 | 20 | HI | 4.9 | 0.0 | 4.9 | 47 |
| MD | 34.1 | 16.3 | 50.4 | 21 | NH | 1.4 | 0.7 | 2.1 | 48 |
| IL | 50.0 | 0.0 | 50.0 | 22 | VT | 1.1 | 0.0 | 1.1 | 49 |
| KS | 46.1 | 0.7 | 46.8 | 23 | VI | 1.0 | 0.1 | 1.1 | 50 |
| AR | 29.1 | 12.1 | 41.2 | 24 | AK | 0.5 | 0.0 | 0.5 | 51 |
| KY | 35.2 | 5.1 | 40.3 | 25 | DC | 0.1 | 0.0 | 0.1 | 52 |
| NY | 32.6 | 6.3 | 38.9 | 26 | RI | 0.0 | 0.0 | 0.0 | 53 |
| CA | 34.6 | 4.1 | 38.7 | 27 | | | | | |

## C.2 RELEASES BY COUNTY

**Table C.2.1 Top 50 U.S. Counties for Cancer-Causing Chemical Releases, 2000 (pounds)**

| County | State | Air | Water | Total |
|---|---|---|---|---|
| LEE | MS | 3,093,345 | 0 | 3,093,345 |
| HARRIS | TX | 2,805,967 | 12,984 | 2,818,951 |
| ELKHART | IN | 2,709,800 | 2 | 2,709,802 |
| ERIE | PA | 1,909,971 | 20 | 1,909,991 |
| MONROE | NY | 1,380,681 | 8,933 | 1,389,613 |
| BARCELONETA | PR | 1,366,418 | 0 | 1,366,418 |
| GEORGETOWN | SC | 1,347,491 | 5,215 | 1,352,706 |
| GIBSON | TN | 1,306,181 | 0 | 1,306,181 |
| JEFFERSON | KY | 1,238,215 | 18,622 | 1,256,837 |
| ALLEN | OH | 1,157,769 | 0 | 1,157,769 |
| LUZERNE | PA | 1,108,196 | 7 | 1,108,203 |
| BRAZORIA | TX | 824,415 | 12,830 | 837,245 |
| HAMBLEN | TN | 792,549 | 5 | 792,554 |
| PALM BEACH | FL | 791,921 | 0 | 791,921 |
| LINN | OR | 788,791 | 2,568 | 791,359 |
| ASCENSION | LA | 768,619 | 19,652 | 788,271 |
| COWLITZ | WA | 768,637 | 13,938 | 782,575 |
| JEFFERSON | TX | 772,611 | 5,231 | 777,842 |
| MONROE | OH | 763,500 | 0 | 763,500 |
| MONTGOMERY | PA | 744,355 | 279 | 744,634 |
| MIAMI-DADE | FL | 744,586 | 0 | 744,586 |
| JEFFERSON | MO | 718,336 | 5,760 | 724,096 |
| SAN JOAQUIN | CA | 712,801 | 22 | 712,823 |
| CUYAHOGA | OH | 686,688 | 1,021 | 687,709 |
| COOK | IL | 617,610 | 1,723 | 619,333 |
| HAMILTON | TN | 615,327 | 23 | 615,350 |
| ORANGE | FL | 594,485 | 0 | 594,485 |
| HARRISON | IN | 579,495 | 0 | 579,495 |
| ANGELINA | TX | 567,122 | 8,993 | 576,115 |
| ORANGEBURG | SC | 545,356 | 6,593 | 551,949 |
| LANE | OR | 547,940 | 857 | 548,796 |
| DU PAGE | IL | 527,748 | 29 | 527,777 |
| EAST BATON ROUGE | LA | 501,146 | 8,786 | 509,932 |
| GALVESTON | TX | 503,448 | 3,156 | 506,604 |
| SEDGWICK | KS | 494,247 | 1,026 | 495,273 |
| MORGAN | AL | 479,426 | 2,063 | 481,489 |
| NEW HAVEN | CT | 461,062 | 3,708 | 464,770 |
| MADISON | IL | 440,185 | 2,878 | 443,063 |
| FREDERICK | VA | 439,007 | 0 | 439,007 |
| NUECES | TX | 433,331 | 4,119 | 437,450 |
| GASTON | NC | 428,205 | 5,133 | 433,338 |
| MECKLENBURG | NC | 427,021 | 5,625 | 432,646 |
| ST JOHN THE BAPTIST | LA | 431,261 | 5 | 431,266 |
| TATE | MS | 419,457 | 0 | 419,457 |
| GUILFORD | NC | 413,102 | 0 | 413,102 |
| DEFIANCE | OH | 411,858 | 982 | 412,840 |
| LAS PIEDRAS | PR | 406,883 | 0 | 406,883 |
| BEDFORD | VA | 399,400 | 1,100 | 400,500 |
| LINCOLN | TN | 396,553 | 0 | 396,553 |
| CALHOUN | TX | 390,021 | 2,800 | 392,821 |
| RANDOLPH | NC | 388,779 | 5 | 388,784 |

**Table C.2.2 Top 50 U.S. Counties for Developmental Toxicant Releases, 2000 (pounds)**

| County | State | Air | Water | Total |
|---|---|---|---|---|
| HAMBLEN | TN | 17,365,941 | 750 | 17,366,691 |
| MOBILE | AL | 11,401,214 | 6,972 | 11,408,186 |
| VERMILION | IL | 3,292,172 | 0 | 3,292,172 |
| RICHLAND | SC | 2,413,249 | 5 | 2,413,254 |
| LOUDON | TN | 2,115,017 | 3 | 2,115,020 |
| HARRIS | TX | 1,892,573 | 22,544 | 1,915,117 |
| CATAWBA | NC | 1,861,454 | 197 | 1,861,651 |
| DICKSON | TN | 1,782,322 | 0 | 1,782,322 |
| SHELBY | TN | 1,729,098 | 16 | 1,729,114 |
| ALCORN | MS | 1,458,743 | 0 | 1,458,743 |
| MISSISSIPPI | AR | 1,355,911 | 256 | 1,356,167 |
| JEFFERSON | KY | 1,303,786 | 9,371 | 1,313,157 |
| SHAWNEE | KS | 1,281,839 | 0 | 1,281,839 |
| SIMPSON | KY | 1,240,434 | 0 | 1,240,434 |
| HENRICO | VA | 1,207,298 | 5 | 1,207,303 |
| ERIE | NY | 1,139,621 | 572 | 1,140,193 |
| JOHNSON | IN | 1,031,125 | 0 | 1,031,125 |
| CHESTER | PA | 1,014,135 | 8 | 1,014,143 |
| GLOUCESTER | NJ | 922,173 | 98 | 922,270 |
| DODGE | WI | 914,200 | 0 | 914,200 |
| OSAGE | OK | 914,084 | 0 | 914,084 |
| JEFFERSON | TX | 901,589 | 1,429 | 903,018 |
| MIAMI-DADE | FL | 897,425 | 0 | 897,425 |
| MAURY | TN | 885,676 | 164 | 885,840 |
| COLES | IL | 880,158 | 0 | 880,158 |
| OGLE | IL | 847,708 | 0 | 847,708 |
| ST CLAIR | MI | 835,202 | 1,324 | 836,526 |
| FORREST | MS | 824,918 | 0 | 824,918 |
| LYNCHBURG CITY | VA | 796,574 | 0 | 796,574 |
| MARSHALL | WV | 722,034 | 899 | 722,933 |
| DYER | TN | 705,411 | 0 | 705,411 |
| COOK | IL | 667,602 | 306 | 667,908 |
| WICHITA | TX | 645,702 | 0 | 645,702 |
| KOSCIUSKO | IN | 632,594 | 30 | 632,624 |
| DALLAS | TX | 597,114 | 17 | 597,131 |
| ASCENSION | LA | 585,890 | 23 | 585,913 |
| HENRY | VA | 578,829 | 0 | 578,829 |
| COLUMBIA | GA | 575,481 | 0 | 575,481 |
| IBERVILLE | LA | 570,770 | 297 | 571,068 |
| LOS ANGELES | CA | 567,713 | 699 | 568,412 |
| MADISON | IL | 563,702 | 550 | 564,252 |
| SPARTANBURG | SC | 548,642 | 0 | 548,642 |
| EAST BATON ROUGE | LA | 541,643 | 930 | 542,573 |
| WAYNE | MI | 535,421 | 683 | 536,105 |
| SUMNER | TN | 519,576 | 2,858 | 522,434 |
| CALDWELL | NC | 521,056 | 0 | 521,056 |
| BUCKS | PA | 515,653 | 6 | 515,659 |
| LANCASTER | PA | 505,629 | 288 | 505,917 |
| MARION | IL | 476,236 | 0 | 476,236 |
| ELKHART | IN | 472,190 | 0 | 472,190 |

**Table C.2.3 Top 50 U.S. Counties for Reproductive Toxicant Releases, 2000 (pounds)**

| County | State | Air | Water | Total |
|---|---|---|---|---|
| HAMBLEN | TN | 16,959,784 | 750 | 16,960,534 |
| MOBILE | AL | 11,319,808 | 1,410 | 11,321,218 |
| VERMILION | IL | 3,264,587 | 0 | 3,264,587 |
| LOUDON | TN | 2,115,010 | 3 | 2,115,013 |
| MISSISSIPPI | AR | 1,317,363 | 256 | 1,317,619 |
| SHAWNEE | KS | 1,023,140 | 0 | 1,023,140 |
| HARRIS | TX | 983,950 | 2,723 | 986,673 |
| MAURY | TN | 841,119 | 164 | 841,283 |
| ERIE | NY | 768,964 | 529 | 769,493 |
| MARSHALL | WV | 658,954 | 69 | 659,023 |
| WASHINGTON | GA | 430,800 | 0 | 430,800 |
| GRANT | KS | 420,000 | 0 | 420,000 |
| CRAWFORD | WI | 381,000 | 0 | 381,000 |
| BRAZORIA | TX | 373,025 | 66 | 373,091 |
| MADISON | IL | 342,341 | 443 | 342,784 |
| HAMPTON | SC | 325,300 | 0 | 325,300 |
| JEFFERSON | MO | 317,405 | 293 | 317,698 |
| PALM BEACH | FL | 314,220 | 0 | 314,220 |
| GRAY | TX | 284,890 | 0 | 284,890 |
| ASCENSION | LA | 270,496 | 786 | 271,282 |
| GALVESTON | TX | 247,431 | 19 | 247,450 |
| GLOUCESTER | NJ | 226,705 | 57 | 226,762 |
| JEFFERSON | TX | 200,173 | 943 | 201,116 |
| ST MARY | LA | 186,777 | 0 | 186,777 |
| NUECES | TX | 181,031 | 139 | 181,170 |
| HUTCHINSON | TX | 167,889 | 855 | 168,744 |
| BEDFORD | VA | 167,000 | 0 | 167,000 |
| ST CHARLES | LA | 139,705 | 1,793 | 141,498 |
| ALLEGHENY | PA | 137,413 | 2,318 | 139,731 |
| IRON | MO | 134,932 | 4,340 | 139,272 |
| LORAIN | OH | 130,287 | 2,801 | 133,088 |
| JEFFERSON | AL | 129,945 | 570 | 130,515 |
| CALHOUN | TX | 121,068 | 75 | 121,143 |
| CALCASIEU | LA | 116,852 | 45 | 116,897 |
| HENDRY | FL | 113,460 | 0 | 113,460 |
| BROOKE | WV | 111,140 | 21 | 111,161 |
| WAYNE | MI | 108,828 | 421 | 109,249 |
| DAVIDSON | TN | 104,245 | 1,794 | 106,039 |
| EVANGELINE | LA | 97,171 | 0 | 97,171 |
| COOK | IL | 92,182 | 293 | 92,475 |
| WEST BATON ROUGE | LA | 89,879 | 3 | 89,882 |
| EAST BATON ROUGE | LA | 87,680 | 477 | 88,157 |
| WASHINGTON | PA | 85,485 | 31 | 85,516 |
| MONTGOMERY | KY | 85,220 | 0 | 85,220 |
| COSHOCTON | OH | 84,735 | 7 | 84,742 |
| LAKE | IN | 77,768 | 3,568 | 81,336 |
| IBERVILLE | LA | 74,469 | 121 | 74,590 |
| CUYAHOGA | OH | 73,357 | 749 | 74,106 |
| WOOD | OH | 71,482 | 0 | 71,482 |
| SALT LAKE | UT | 68,175 | 1,265 | 69,440 |

**Table C.2.4 Top 50 U.S. Counties for Suspected Neurological Toxicant Releases, 2000 (pounds)**

| County | State | Air | Water | Total |
|---|---|---|---|---|
| TOOELE | UT | 42,159,216 | 0 | 42,159,216 |
| HARRIS | TX | 18,430,921 | 371,343 | 18,802,264 |
| HAMBLEN | TN | 18,467,033 | 13,480 | 18,480,513 |
| ASCENSION | LA | 16,877,660 | 250,571 | 17,128,231 |
| MOBILE | AL | 13,268,294 | 173,754 | 13,442,048 |
| JEFFERSON | TX | 10,492,523 | 108,900 | 10,601,423 |
| EAST BATON ROUGE | LA | 8,251,701 | 217,882 | 8,469,583 |
| JEFFERSON | KY | 8,100,779 | 19,398 | 8,120,177 |
| SHELBY | TN | 8,019,277 | 9,618 | 8,028,895 |
| ASHTABULA | OH | 7,300,941 | 4,025 | 7,304,966 |
| LOS ANGELES | CA | 7,005,252 | 91,925 | 7,097,177 |
| HOPEWELL CITY | VA | 6,795,417 | 72,725 | 6,868,142 |
| COOK | IL | 6,287,437 | 7,425 | 6,294,862 |
| GALVESTON | TX | 6,042,293 | 82,716 | 6,125,009 |
| ELKHART | IN | 6,075,703 | 15 | 6,075,718 |
| VERMILION | IL | 5,809,119 | 7,020 | 5,816,139 |
| WAYNE | MI | 5,165,672 | 36,823 | 5,202,495 |
| ALLEN | OH | 4,861,953 | 9,215 | 4,871,168 |
| CALCASIEU | LA | 4,574,471 | 262,697 | 4,837,168 |
| BRAZORIA | TX | 4,693,155 | 134,457 | 4,827,612 |
| WASHINGTON | OH | 4,247,144 | 554,537 | 4,801,681 |
| OAKLAND | MI | 4,729,371 | 113 | 4,729,484 |
| MACON | IL | 4,637,685 | 32 | 4,637,717 |
| HUMPHREYS | TN | 4,030,433 | 449,102 | 4,479,535 |
| WOOD | WI | 4,301,593 | 136,416 | 4,438,008 |
| FLOYD | GA | 4,365,308 | 29,388 | 4,394,696 |
| ORANGE | TX | 4,171,535 | 43,522 | 4,215,057 |
| RICHLAND | SC | 4,120,467 | 79,890 | 4,200,357 |
| GEORGETOWN | SC | 4,031,379 | 39,875 | 4,071,254 |
| MORGAN | AL | 3,962,236 | 97,404 | 4,059,640 |
| ALLEGHANY | VA | 3,857,772 | 22,390 | 3,880,162 |
| HAMPTON | SC | 3,873,306 | 0 | 3,873,306 |
| RICHMOND | GA | 3,619,364 | 252,607 | 3,871,971 |
| COWLITZ | WA | 3,747,367 | 109,019 | 3,856,385 |
| ST JAMES | LA | 3,752,455 | 53,582 | 3,806,037 |
| ERIE | PA | 3,772,748 | 520 | 3,773,268 |
| NASSAU | FL | 3,634,433 | 89,880 | 3,724,313 |
| OUACHITA | AR | 3,668,494 | 28,403 | 3,696,897 |
| LICKING | OH | 3,618,120 | 0 | 3,618,120 |
| JEFFERSON | AL | 3,554,839 | 11,469 | 3,566,308 |
| HARRISON | TX | 3,551,061 | 5,435 | 3,556,496 |
| MONROE | MI | 3,455,834 | 10,196 | 3,466,030 |
| DE SOTO | LA | 3,378,231 | 67,396 | 3,445,627 |
| ARECIBO | PR | 3,445,380 | 0 | 3,445,380 |
| CHATHAM | GA | 3,398,435 | 46,507 | 3,444,942 |
| LEE | MS | 3,408,078 | 0 | 3,408,078 |
| LINN | OR | 3,285,373 | 78,692 | 3,364,065 |
| ROGERS | OK | 3,328,740 | 6,625 | 3,335,365 |
| SULLIVAN | TN | 3,016,018 | 274,023 | 3,290,041 |
| MISSOULA | MT | 3,233,778 | 37,211 | 3,270,989 |

**Table C.2.5 Top 50 U.S. Counties for Suspected Respiratory Toxicant Releases, 2000 (pounds)**

| County | State | Air Emissions | County | State | Air Emissions |
|---|---|---|---|---|---|
| TOOELE | UT | 43,949,102 | WAYNE | MI | 9,186,193 |
| PERSON | NC | 28,808,652 | GALLIA | OH | 9,070,416 |
| ARMSTRONG | PA | 21,854,560 | SHELBY | TN | 9,065,212 |
| ESCAMBIA | FL | 18,824,444 | GREENE | PA | 8,821,612 |
| ADAMS | OH | 18,412,745 | MUHLENBERG | KY | 8,469,805 |
| BARTOW | GA | 17,835,545 | HAMILTON | OH | 8,403,221 |
| HARRIS | TX | 17,816,017 | CITRUS | FL | 8,319,068 |
| CATAWBA | NC | 16,919,941 | MONROE | GA | 8,212,763 |
| ASCENSION | LA | 16,748,004 | EAST BATON ROUGE | LA | 8,071,700 |
| JEFFERSON | OH | 16,542,003 | MONONGALIA | WV | 7,978,712 |
| HUMPHREYS | TN | 16,383,097 | COSHOCTON | OH | 7,852,091 |
| MARSHALL | WV | 15,065,624 | PUTNAM | GA | 7,736,707 |
| PUTNAM | WV | 14,705,309 | COOK | IL | 7,731,541 |
| MONROE | MI | 13,778,579 | RICHLAND | SC | 7,673,553 |
| ANNE ARUNDEL | MD | 12,648,885 | GIBSON | IN | 7,469,506 |
| WASHINGTON | OH | 12,483,275 | CHARLES | MD | 7,343,707 |
| HILLSBOROUGH | FL | 11,629,242 | HOPEWELL CITY | VA | 7,139,728 |
| STOKES | NC | 11,364,373 | LOS ANGELES | CA | 7,026,180 |
| MASON | WV | 11,286,999 | MOBILE | AL | 6,953,225 |
| HARRISON | MS | 10,906,883 | CARROLL | KY | 6,900,323 |
| JEFFERSON | KY | 10,303,894 | YORK | PA | 6,856,902 |
| GASTON | NC | 9,992,871 | COLBERT | AL | 6,682,980 |
| JEFFERSON | TX | 9,657,819 | BAY | FL | 6,604,921 |
| OTTAWA | MI | 9,564,851 | CLERMONT | OH | 6,515,264 |
| GREENE | AL | 9,535,035 | GALVESTON | TX | 6,243,285 |

**Table C.2.6 Top 50 U.S. Counties for Dioxin Releases, 2000 (grams)**

| County | State | Air | Water | Total | County | State | Air | Water | Total |
|---|---|---|---|---|---|---|---|---|---|
| CARROLL | GA | 965 | 0 | 965 | SNOHOMISH | WA | 0 | 24 | 24 |
| IBERVILLE | LA | 11 | 829 | 840 | ANNE ARUNDEL | MD | 21 | 0 | 21 |
| MORGAN | AL | 807 | 0 | 807 | LEWIS | WA | 20 | 0 | 20 |
| BRAZORIA | TX | 141 | 562 | 703 | YAMHILL | OR | 0 | 19 | 20 |
| TOOELE | UT | 642 | 0 | 642 | HUMPHREYS | TN | 5 | 14 | 19 |
| DODGE | NE | 429 | 0 | 429 | TUSCALOOSA | AL | 0 | 19 | 19 |
| COMAL | TX | 147 | 0 | 147 | CASS | IN | 19 | 0 | 19 |
| GRENADA | MS | 0 | 117 | 118 | PORTER | IN | 18 | 0 | 18 |
| PERRY | IN | 107 | 0 | 107 | SEDGWICK | KS | 18 | 0 | 18 |
| ALLEGHENY | PA | 106 | 0 | 106 | NEW CASTLE | DE | 3 | 14 | 17 |
| SAN PATRICIO | TX | 100 | 2 | 101 | BALTIMORE CITY | MD | 0 | 16 | 17 |
| HARRIS | TX | 61 | 36 | 97 | LITTLE RIVER | AR | 13 | 2 | 15 |
| CALCASIEU | LA | 7 | 76 | 82 | ROSEBUD | MT | 14 | 0 | 14 |
| RICHMOND CITY | VA | 80 | 0 | 80 | MADISON | IL | 14 | 0 | 14 |
| ORANGEBURG | SC | 75 | 0 | 75 | NORTHAMPTON | PA | 14 | 0 | 14 |
| EAST BATON ROUGE | LA | 64 | 3 | 67 | LAKE | IN | 14 | 0 | 14 |
| CARTER | OK | 56 | 0 | 56 | HANCOCK | KY | 9 | 5 | 14 |
| ESCAMBIA | AL | 1 | 52 | 54 | ALLEN | KS | 13 | 0 | 13 |
| TYLER | WV | 51 | 0 | 51 | PIERCE | WA | 12 | 2 | 13 |
| KEMPER | MS | 0 | 50 | 50 | DUBUQUE | IA | 13 | 0 | 13 |
| ST CLAIR | AL | 48 | 0 | 48 | LAWRENCE | SD | 0 | 13 | 13 |
| EDGECOMBE | NC | 46 | 0 | 46 | HILLSBOROUGH | FL | 12 | 0 | 12 |
| MONTGOMERY | AL | 0 | 45 | 45 | SAN BERNARDINO | CA | 12 | 0 | 12 |
| LA CROSSE | WI | 28 | 0 | 28 | MASSAC | IL | 12 | 0 | 12 |
| RAPIDES | LA | 1 | 24 | 25 | MOBILE | AL | 11 | 0 | 11 |

# C.3 RELEASES BY FACILITY

## Table C.3.1 Top 50 Facilities for Cancer-Causing Chemical Releases, 2000 (pounds)

| Facility | City | State | Industry | Air | Water | Total |
|---|---|---|---|---|---|---|
| CARPENTER CO. TUPELO DIV. | VERONA | MS | Plastics foam products | 1,929,108 | 0 | 1,929,108 |
| FOAMEX L.P. | CORRY | PA | Plastics foam products | 1,779,547 | 0 | 1,779,547 |
| ABBOTT HEALTH PRODS. INC. | BARCELONETA | PR | Pharmaceutical preparations | 1,322,387 | 0 | 1,322,387 |
| EASTMAN KODAK CO. KODAK PARK | ROCHESTER | NY | Photographic equipment and supplies | 1,308,713 | 8,933 | 1,317,646 |
| FOAMEX INTL. INC. | MILAN | TN | Plastics foam products | 1,306,181 | 0 | 1,306,181 |
| 3V INC. | GEORGETOWN | SC | Industrial organic chemicals, nec | 1,133,346 | 0 | 1,133,346 |
| CARPENTER CO. ELKHART DIV. | ELKHART | IN | Plastics foam products | 1,113,538 | 0 | 1,113,538 |
| GFC FOAM L.L.C. | WEST HAZLETON | PA | Plastics foam products | 1,078,441 | 0 | 1,078,441 |
| VITAFOAM INC. | TUPELO | MS | Plastics foam products | 1,056,116 | 0 | 1,056,116 |
| FLEXIBLE FOAM PRODS. INC. | SPENCERVILLE | OH | Plastics foam products | 1,020,618 | 0 | 1,020,618 |
| FOAMEX L.P. | MORRISTOWN | TN | Plastics foam products | 792,259 | 0 | 792,259 |
| U.S. SUGAR CORP.,BRYANT MILL | BRYANT | FL | Raw cane sugar | 791,520 | 0 | 791,520 |
| ORMET PRIMARY ALUMINUM CORP. | HANNIBAL | OH | Primary aluminum | 763,500 | 0 | 763,500 |
| CARPENTER CO. | LATHROP | CA | Plastics foam products | 711,095 | 0 | 711,095 |
| FLEXIBLE FOAM PRODS. | ELKHART | IN | Plastics foam products | 686,133 | 0 | 686,133 |
| FOAMEX L.P. | ELKHART | IN | Plastics foam products | 684,255 | 0 | 684,255 |
| FLEXIBLE FOAM PRODS. INC. | MIAMI | FL | Plastics foam products | 665,504 | 0 | 665,504 |
| WEYERHAEUSER CO. | LONGVIEW | WA | Paper mills | 621,509 | 12,836 | 634,345 |
| FOAMEX L.P. | ORLANDO | FL | Plastics foam products | 591,884 | 0 | 591,884 |
| DARAMIC INC. | CORYDON | IN | Plastics products, nec | 579,495 | 0 | 579,495 |
| DDE LOUISVILLE | LOUISVILLE | KY | Synthetic rubber | 579,431 | 0 | 579,431 |
| NU-FOAM PRODS. INC. | CHATTANOOGA | TN | Plastics foam products | 551,826 | 0 | 551,826 |
| DONOHUE INDS. INC. LUFKIN MILL | LUFKIN | TX | Paper mills | 488,619 | 8,983 | 497,602 |
| PACTIV CORP. | WINCHESTER | VA | Plastics foam products | 436,000 | 0 | 436,000 |
| NO-SAG FOAM PRODS. CORP. FOAM OPS. | WEST CHICAGO | IL | Plastics foam products | 432,423 | 0 | 432,423 |
| ALBEMARLE CORP. | ORANGEBURG | SC | Industrial organic chemicals, nec | 414,447 | 6,518 | 420,965 |
| MPI INC. | COLDWATER | MS | Plastics foam products | 419,457 | 0 | 419,457 |
| DUPONT DOW ELASTOMERS L.L.C. PONTCHARTRAIN SITE | LA PLACE | LA | Synthetic rubber | 407,294 | 0 | 407,294 |
| GEORGIA-PACIFIC CORP. | BIG ISLAND | VA | Pulp mills | 399,400 | 1,100 | 400,500 |
| FRANKE CONTRACT GROUP | FAYETTEVILLE | TN | Service industry machinery, nec | 396,553 | 0 | 396,553 |
| DOW CHEMICAL CO. FREEPORT | FREEPORT | TX | Alkalies and chlorine | 387,356 | 8,540 | 395,896 |
| DOW CHEMICAL CO. RIVERSIDE SITE | PEVELY | MO | Plastics foam products | 390,000 | 0 | 390,000 |
| SCHERING-PLOUGH PRODS. L.L.C. | LAS PIEDRAS | PR | Pharmaceutical preparations | 386,366 | 0 | 386,366 |
| POPE & TALBOT INC. HALSEY PULP MILL | HALSEY | OR | Pulp mills | 376,213 | 1,257 | 377,470 |
| FOAMEX L.P. | CORNELIUS | NC | Plastics foam products | 374,894 | 0 | 374,894 |
| GEORGIA-PACIFIC CORP. | PALATKA | FL | Pulp mills | 364,633 | 5,229 | 369,862 |
| VITAFOAM INC. PLEASANT GARDEN PLANT | GREENSBORO | NC | Plastics foam products | 355,696 | 0 | 355,696 |
| U.S. SUGAR CORP. CLEWISTON MILL | CLEWISTON | FL | Raw cane sugar | 355,480 | 0 | 355,480 |
| FUTURE FOAM INC. | MIDDLETON | WI | Plastics foam products | 350,964 | 0 | 350,964 |
| EQUISTAR CHEMICALS L.P. | CHANNELVIEW | TX | Industrial organic chemicals, nec | 348,511 | 13 | 348,524 |
| WEYERHAEUSER CO. | SPRINGFIELD | OR | Paperboard mills | 347,275 | 750 | 348,024 |
| PLUM CREEK MDF INC. | COLUMBIA FALL | MT | Reconstituted wood products | 347,250 | 0 | 347,250 |
| UNION CARBIDE CORP. SEADRIFT PLANT | SEADRIFT | TX | Industrial organic chemicals, nec | 339,795 | 2,692 | 342,487 |
| CLINTON LABS. | CLINTON | IN | Medicinals and botanicals | 338,775 | 270 | 339,045 |
| BOEING CO. WICHITA DIV. | WICHITA | KS | Aircraft parts and equipment, nec | 334,955 | 510 | 335,465 |
| PHARMACIA & UPJOHN CARIBE INC. | ARECIBO | PR | Pharmaceutical preparations | 329,532 | 0 | 329,532 |
| AMERICAN & EFIRD INC. PLANTS 05 13 & 15 | MOUNT HOLLY | NC | Thread mills | 328,228 | 0 | 328,228 |
| VITAFOAM INC. | HIGH POINT | NC | Plastics foam products | 317,294 | 0 | 317,294 |
| DOW CHEMICAL USA HANGING ROCK PLANT | IRONTON | OH | Plastics foam products | 316,764 | 0 | 316,764 |
| SIERRAPINE LTD. MONCURE DIV. | MONCURE | NC | Reconstituted wood products | 308,489 | 341 | 308,830 |

## Table C.3.2 Top 50 Facilities for Developmental Toxicant Releases, 2000 (pounds)

| Facility | City | State | Industry | Air | Water | Total |
|---|---|---|---|---|---|---|
| LENZING FIBERS CORP. | LOWLAND | TN | Cellulosic manmade fibers | 16,959,799 | 750 | 16,960,549 |
| ACORDIS CELLULOSIC FIBERS INC. | AXIS | AL | Cellulosic manmade fibers | 11,257,000 | 980 | 11,257,980 |
| DEVRO-TEEPAK | DANVILLE | IL | Plastics products, nec | 3,229,146 | 0 | 3,229,146 |
| INTERTAPE POLYMER GROUP COLUMBIA DIV. | COLUMBIA | SC | Paper coated and laminated, nec | 2,404,000 | 0 | 2,404,000 |
| VISKASE CORP. | LOUDON | TN | Plastics products, nec | 2,115,000 | 0 | 2,115,000 |
| QUEBECOR WORLD | DICKSON | TN | Commercial printing, gravure | 1,767,732 | 0 | 1,767,732 |
| SHURTAPE TECHS. INC. HICKORY TAPE PLANT | HICKORY | NC | Paper coated and laminated, nec | 1,661,498 | 0 | 1,661,498 |
| QUEBECOR WORLD CORINTH | CORINTH | MS | Commercial printing, gravure | 1,430,126 | 0 | 1,430,126 |
| QP MEMPHIS CORP. | MEMPHIS | TN | Commercial printing, gravure | 1,420,632 | 0 | 1,420,632 |
| VISKASE CORP. | OSCEOLA | AR | Plastics products, nec | 1,315,000 | 250 | 1,315,250 |
| UCB FILMS INC. | TECUMSEH | KS | Paper coated + laminated, packaging | 1,281,773 | 0 | 1,281,773 |
| QUEBECOR PRINTING FRANKLIN | FRANKLIN | KY | Commercial printing, gravure | 1,212,000 | 0 | 1,212,000 |
| QUEBECOR WORLD RICHMOND INC. | RICHMOND | VA | Commercial printing, gravure | 1,204,862 | 0 | 1,204,862 |
| SONOCO FLEXIBLE PACKAGING | EDINBURGH | IN | Paper coated + laminated, packaging | 1,000,310 | 0 | 1,000,310 |
| QUEBECOR WORLD ATGLEN DIV. | ATGLEN | PA | Commercial printing, gravure | 935,451 | 0 | 935,451 |
| BAKER PETROLITE CORP. | BARNSDALL | OK | Industrial organic chemicals, nec | 911,700 | 0 | 911,700 |
| AMERICAN SYNTHETIC RUBBER CO. L.L.C. | LOUISVILLE | KY | Synthetic rubber | 910,034 | 0 | 910,034 |
| QUAD/GRAPHICS INC. | LOMIRA | WI | Commercial printing, lithographic | 904,200 | 0 | 904,200 |
| R. R. DONNELLEY & SONS CO. | MATTOON | IL | Commercial printing, lithographic | 868,880 | 0 | 868,880 |
| NAILITE INTL. INC. | MIAMI | FL | Plastics products, nec | 853,400 | 0 | 853,400 |
| QUEBECOR WORLD MT. MORRIS INC. | MOUNT MORRIS | IL | Commercial printing, lithographic | 840,996 | 0 | 840,996 |
| SPONTEX INC. | COLUMBIA | TN | Plastics products, nec | 836,367 | 164 | 836,531 |
| INTERTAPE POLYMER GROUP | MARYSVILLE | MI | Paper coated + laminated, packaging | 829,490 | 0 | 829,490 |
| EAGLE POINT COGENERATION PTNR. (EPCP) | WESTVILLE | NJ | Electric services | 810,231 | 0 | 810,231 |
| R. R. DONNELLEY PRINTING CO. | LYNCHBURG | VA | Commercial printing, gravure | 756,000 | 0 | 756,000 |
| 3M TONAWANDA | TONAWANDA | NY | Plastics materials and resins | 740,000 | 0 | 740,000 |
| QUEBECOR WORLD DYERSBURG DIV. | DYERSBURG | TN | Commercial printing, lithographic | 705,411 | 0 | 705,411 |
| COLUMBIAN CHEMICALS CO. | PROCTOR | WV | Carbon black | 650,000 | 0 | 650,000 |
| TEXAS RECREATION CORP. | WICHITA FALLS | TX | Plastics foam products | 638,894 | 0 | 638,894 |
| HERCULES INC. | HATTIESBURG | MS | Gum and wood chemicals | 632,455 | 0 | 632,455 |
| QUEBECOR WORLD (USA) INC. | EVANS | GA | Commercial printing, gravure | 575,226 | 0 | 575,226 |
| EXXONMOBIL OIL BEAUMONT REFY. | BEAUMONT | TX | Petroleum refining | 548,211 | 0 | 548,211 |
| R. R. DONNELLEY & SONS CO. | WARSAW | IN | Commercial printing, gravure | 532,600 | 30 | 532,630 |
| 3M CO. | BRISTOL | PA | Paper coated and laminated, nec | 493,440 | 0 | 493,440 |
| R. R. DONNELLEY & SONS CO. | GALLATIN | TN | Commercial printing, gravure | 468,673 | 0 | 468,673 |
| INTERNATIONAL PAPER | HAMPTON | SC | Laminated plastics plate + sheet | 467,471 | 0 | 467,471 |
| QUEBECOR WORLD SALEM DIV. SALEM GRAVURE | SALEM | IL | Commercial printing, lithographic | 454,100 | 0 | 454,100 |
| TOSCO WOOD RIVER REFY. | ROXANA | IL | Petroleum refining | 449,010 | 0 | 449,010 |
| BURGESS PIGMENT CO. | SANDERSVILLE | GA | Minerals, ground or treated | 430,800 | 0 | 430,800 |
| NOVARTIS CROP PROTECTION INC. ST. GABRIEL FACILITY | SAINT GABRIEL | LA | Agricultural chemicals, nec | 428,790 | 18 | 428,808 |
| HOLLISTON MILLS INC. | CHURCH HILL | TN | Coated fabrics, not rubberized | 420,508 | 0 | 420,508 |
| COLUMBIAN CHEMICALS CO. | ULYSSES | KS | Carbon black | 420,001 | 0 | 420,001 |
| 3M PRAIRIE DU CHIEN BLDG. 1 | PRAIRIE DU CHIEN | WI | Plastics materials and resins | 381,000 | 0 | 381,000 |
| QUEBECOR WORLD DALLAS INC. | FARMERS BRANC | TX | Commercial printing, gravure | 369,593 | 0 | 369,593 |
| TESA TAPE INC. | MIDDLETOWN | NY | Paper coated and laminated, nec | 368,000 | 0 | 368,000 |
| R. R. DONNELLEY PRINTING CO. L.P. | DES MOINES | IA | Commercial printing, lithographic | 350,489 | 0 | 350,489 |
| U.S. SUGAR CORP.,BRYANT MILL | BRYANT | FL | Raw cane sugar | 344,220 | 0 | 344,220 |
| MACDERMID GRAPHIC ARTS | MORRISTOWN | TN | Fabricated rubber products, nec | 341,200 | 0 | 341,200 |
| DAY INTL. DAVID M FACILITY | LONGWOOD | FL | Fabricated rubber products, nec | 340,135 | 0 | 340,135 |
| GLOBE MFG. CORP. | FALL RIVER | MA | Organic fibers, noncellulosic | 335,720 | 0 | 335,720 |

## Table C.3.3 Top 50 Facilities for Reproductive Toxicant Releases, 2000 (pounds)

| Facility | City | State | Industry | Air | Water | Total |
|---|---|---|---|---|---|---|
| LENZING FIBERS CORP. | LOWLAND | TN | Cellulosic manmade fibers | 16,959,784 | 750 | 16,960,534 |
| ACORDIS CELLULOSIC FIBERS INC. | AXIS | AL | Cellulosic manmade fibers | 11,257,000 | 980 | 11,257,980 |
| DEVRO-TEEPAK | DANVILLE | IL | Plastics products, nec | 3,229,146 | 0 | 3,229,146 |
| VISKASE CORP. | LOUDON | TN | Plastics products, nec | 2,115,000 | 0 | 2,115,000 |
| VISKASE CORP. | OSCEOLA | AR | Plastics products, nec | 1,315,000 | 250 | 1,315,250 |
| UCB FILMS INC. | TECUMSEH | KS | Paper coated + laminated, packaging | 1,023,140 | 0 | 1,023,140 |
| SPONTEX INC. | COLUMBIA | TN | Plastics products, nec | 836,367 | 164 | 836,531 |
| 3M TONAWANDA | TONAWANDA | NY | Plastics materials and resins | 740,000 | 0 | 740,000 |
| COLUMBIAN CHEMICALS CO. | PROCTOR | WV | Carbon black | 650,000 | 0 | 650,000 |
| BURGESS PIGMENT CO. | SANDERSVILLE | GA | Minerals, ground or treated | 430,800 | 0 | 430,800 |
| COLUMBIAN CHEMICALS CO. | ULYSSES | KS | Carbon black | 420,000 | 0 | 420,000 |
| 3M PRAIRIE DU CHIEN BLDG. 1 | PRAIRIE DU CHIEN | WI | Plastics materials and resins | 381,000 | 0 | 381,000 |
| INTERNATIONAL PAPER | HAMPTON | SC | Laminated plastics plate + sheet | 325,300 | 0 | 325,300 |
| U.S. SUGAR CORP.,BRYANT MILL | BRYANT | FL | Raw cane sugar | 314,220 | 0 | 314,220 |
| TOSCO WOOD RIVER REFY. | ROXANA | IL | Petroleum refining | 296,002 | 0 | 296,002 |
| CABOT CORP. PAMPA PLANT | PAMPA | TX | Carbon black | 284,890 | 0 | 284,890 |
| DOE RUN CO. HERCULANEUM SMELTER | HERCULANEUM | MO | Primary nonferrous metals, nec | 284,390 | 293 | 284,683 |
| EAGLE POINT COGENERATION PTNR. (EPCP) | WESTVILLE | NJ | Electric services | 192,912 | 0 | 192,912 |
| DOW CHEMICAL CO. FREEPORT | FREEPORT | TX | Alkalies and chlorine | 174,578 | 66 | 174,644 |
| SHELL CHEMICAL CO. DEER PARK | DEER PARK | TX | Plastics materials and resins | 170,000 | 0 | 170,000 |
| GEORGIA-PACIFIC CORP. | BIG ISLAND | VA | Pulp mills | 167,000 | 0 | 167,000 |
| BORDEN CHEMICALS & PLASTICS OPERATING L.P. | GEISMAR | LA | Plastics materials and resins | 127,011 | 0 | 127,011 |
| NYLONGE CO. | ELYRIA | OH | Plastics products, nec | 127,000 | 0 | 127,000 |
| CABOT CORP. CANAL PLANT | FRANKLIN | LA | Carbon black | 121,510 | 0 | 121,510 |
| LYONDELL CHEMICAL CO. | CHANNELVIEW | TX | Cyclic crudes and intermediates | 114,270 | 38 | 114,308 |
| U.S. SUGAR CORP. CLEWISTON MILL | CLEWISTON | FL | Raw cane sugar | 113,460 | 0 | 113,460 |
| UNION CARBIDE CORP. SEADRIFT PLANT | SEADRIFT | TX | Industrial organic chemicals, nec | 112,442 | 75 | 112,517 |
| BP AMOCO TEXAS CITY BUSINESS UNIT | TEXAS CITY | TX | Petroleum refining | 108,000 | 0 | 108,000 |
| ENGINEERED CARBONS INC. BORGER CARBON BLACK PLANT | BORGER | TX | Carbon black | 106,501 | 0 | 106,501 |
| LYONDELL-CITGO REFINING L.P. | HOUSTON | TX | Petroleum refining | 104,541 | 1,833 | 106,374 |
| DU PONT OLD HICKORY PLANT | OLD HICKORY | TN | Industrial organic chemicals, nec | 103,303 | 1,790 | 105,093 |
| WHEELING-PITTSBURGH STEEL CORP. STEUBENVILLE EAST | FOLLANSBEE | WV | Blast furnaces and steel mills | 102,700 | 19 | 102,719 |
| CABOT CORP. VILLE PLATTE PLANT | VILLE PLATTE | LA | Carbon black | 97,171 | 0 | 97,171 |
| EQUISTAR CHEMICALS L.P. | ALVIN | TX | Industrial organic chemicals, nec | 93,200 | 0 | 93,200 |
| SID RICHARDSON CARBON CO. | ADDIS | LA | Carbon black | 85,270 | 0 | 85,270 |
| COOPER TIRE & RUBBER CO. | MOUNT STERLIN | KY | Rubber + plastics hose + belting | 85,220 | 0 | 85,220 |
| FLEXSYS AMERICA L.P. | MONONGAHELA | PA | Industrial inorganic chemicals, nec | 83,398 | 29 | 83,427 |
| STONE CONTAINER CORP. | COSHOCTON | OH | Paperboard mills | 83,130 | 0 | 83,130 |
| HUNTSMAN CORP. C4/O&O PLANT | PORT NECHES | TX | Industrial organic chemicals, nec | 80,969 | 0 | 80,969 |
| SHELL CHEMICAL L.P. | GEISMAR | LA | Industrial organic chemicals, nec | 72,377 | 780 | 73,157 |
| COOPER STANDARD AUTOMOTIVE | BOWLING GREEN | OH | Rubber + plastics hose + belting | 71,250 | 0 | 71,250 |
| SHELL NORCO CHEMICAL PLANT EAST SITE | NORCO | LA | Industrial organic chemicals, nec | 70,000 | 0 | 70,000 |
| EXXONMOBIL REFINING & SUPPLY BAYTOWN REFY. | BAYTOWN | TX | Petroleum refining | 61,881 | 143 | 62,024 |
| EQUISTAR CHEMICALS L.P. | CHANNELVIEW | TX | Industrial organic chemicals, nec | 62,000 | 0 | 62,000 |
| GMC POWERTRAIN DEFIANCE | DEFIANCE | OH | Gray and ductile iron foundries | 61,950 | 11 | 61,961 |
| PHILLIPS 66 CO. | BORGER | TX | Petroleum refining | 61,101 | 855 | 61,956 |
| ROHM & HAAS TEXAS INC. | DEER PARK | TX | Industrial organic chemicals, nec | 61,421 | 0 | 61,421 |
| FORD MOTOR CO. CLEVELAND CASTING | BROOK PARK | OH | Gray and ductile iron foundries | 60,000 | 0 | 60,000 |
| BETHLEHEM STEEL CORP. BURNS HARBOR DIV. | BURNS HARBOR | IN | Blast furnaces and steel mills | 59,250 | 0 | 59,250 |
| KENNECOTT UTAH COPPER SMELTER & REFY. | MAGNA | UT | Primary copper | 57,905 | 500 | 58,405 |

## Table C.3.4 Top 50 Facilities for Suspected Neurological Toxicant Releases, 2000

| Facility | City | State | Industry | Air | Water | Total |
|---|---|---|---|---|---|---|
| MAGNESIUM CORP. OF AMERICA | ROWLEY | UT | Primary nonferrous metals, nec | 42,150,000 | 0 | 42,150,000 |
| LENZING FIBERS CORP. | LOWLAND | TN | Cellulosic manmade fibers | 17,004,727 | 13,480 | 17,018,207 |
| ACORDIS CELLULOSIC FIBERS INC. | AXIS | AL | Cellulosic manmade fibers | 11,257,000 | 980 | 11,257,980 |
| CF INDS. INC. | DONALDSONVILLE | LA | Nitrogenous fertilizers | 5,353,530 | 48,600 | 5,402,130 |
| MILLENNIUM CHEMICALS ASHTABULA PLANT 2 | ASHTABULA | OH | Inorganic pigments | 5,002,217 | 0 | 5,002,217 |
| HONEYWELL INTL. INC. HOPEWELL PLANT | HOPEWELL | VA | Industrial organic chemicals, nec | 4,590,710 | 69,865 | 4,660,575 |
| INLAND PAPERBOARD & PACKAGING INC. | ROME | GA | Pulp mills | 3,914,006 | 29,238 | 3,943,243 |
| INTERNATIONAL PAPER | HAMPTON | SC | Laminated plastics plate + sheet | 3,727,668 | 0 | 3,727,668 |
| BP AMOCO TEXAS CITY BUSINESS UNIT | TEXAS CITY | TX | Petroleum refining | 3,671,158 | 39,722 | 3,710,880 |
| AMERIPOL SYNPOL CORP. | PORT NECHES | TX | Synthetic rubber | 3,699,356 | 0 | 3,699,356 |
| INTERNATIONAL PAPER CAMDEN MILL | CAMDEN | AR | Pulp mills | 3,668,494 | 28,403 | 3,696,897 |
| WESTVACO OF VIRGINIA. INC. | COVINGTON | VA | Paperboard mills | 3,556,111 | 22,389 | 3,578,500 |
| PCS NITROGEN FERTILIZER L.P. | GEISMAR | LA | Nitrogenous fertilizers | 3,512,285 | 54,099 | 3,566,384 |
| DEVRO-TEEPAK | DANVILLE | IL | Plastics products, nec | 3,399,483 | 0 | 3,399,483 |
| IMC PHOSPHATES MP INC. FAUSTINA PLANT | SAINT JAMES | LA | Nitrogenous fertilizers | 3,323,126 | 42,217 | 3,365,343 |
| INTERNATIONAL PAPER | MANSFIELD | LA | Paperboard mills | 3,272,351 | 46,750 | 3,319,101 |
| PCS NITROGEN FERTILIZER L.P. | MILLINGTON | TN | Nitrogenous fertilizers | 3,227,075 | 5,000 | 3,232,075 |
| TRIAD NITROGEN L.L.C. | DONALDSONVILL | LA | Nitrogenous fertilizers | 3,133,801 | 49,762 | 3,183,563 |
| PCS NITROGEN OF OHIO L.P. | LIMA | OH | Nitrogenous fertilizers | 3,141,605 | 8,625 | 3,150,230 |
| TERRA NITROGEN LTD. L.P. | CLAREMORE | OK | Nitrogenous fertilizers | 3,106,500 | 6,550 | 3,113,050 |
| ERAMET MARIETTA INC. | MARIETTA | OH | Electrometallurgical products | 2,550,483 | 548,000 | 3,098,483 |
| ROYAL OAK ENTERPRISES INC. ELLSINORE MO. | ELLSINORE | MO | Gum and wood chemicals | 3,082,896 | 0 | 3,082,896 |
| STONE CONTAINER CORP. | MISSOULA | MT | Paperboard mills | 3,007,854 | 37,211 | 3,045,065 |
| PREPA CAMBALACHE COMBUSTION TURBINE PLANT | ARECIBO | PR | Electric services | 2,990,951 | 0 | 2,990,951 |
| GEORGIA-PACIFIC CORP. PORT HUDSON OPS. | ZACHARY | LA | Pulp mills | 2,794,774 | 144,141 | 2,938,915 |
| EASTMAN CHEMICAL CO. TX OPS. | LONGVIEW | TX | Industrial organic chemicals, nec | 2,926,260 | 5,336 | 2,931,596 |
| STORA ENSO N.A. WISCONSIN RAPIDS PULP MILL | WISCONSIN RAPIDS | WI | Pulp mills | 2,923,410 | 1,000 | 2,924,410 |
| WEYERHAEUSER CO. | VALLIANT | OK | Paperboard mills | 2,863,484 | 35,140 | 2,898,624 |
| ENGELHARD CORP. ATTAPULGUS OPS. | ATTAPULGUS | GA | Minerals, ground or treated | 2,896,418 | 0 | 2,896,418 |
| CRAIG IND. LEASED TO ROYAL OAK ENTS. | SUMMERSVILLE | MO | Gum and wood chemicals | 2,870,640 | 0 | 2,870,640 |
| EASTMAN CHEMICAL CO. TENNESSEE OPS. | KINGSPORT | TN | Cellulosic manmade fibers | 2,584,587 | 224,268 | 2,808,855 |
| INTERNATIONAL PAPER | RIEGELWOOD | NC | Pulp mills | 2,585,562 | 98,938 | 2,684,500 |
| INTERNATIONAL PAPER GEORGETOWN MILL | GEORGETOWN | SC | Pulp mills | 2,637,225 | 32,305 | 2,669,530 |
| JEFFERSON SMURFIT CORP. | FERNANDINA BEACH | FL | Paperboard mills | 2,567,700 | 12,007 | 2,579,707 |
| BLUE RIDGE PAPER PRODS. INC. | CANTON | NC | Paper mills | 2,470,871 | 108,250 | 2,579,121 |
| WEYERHAEUSER CO. | LONGVIEW | WA | Paper mills | 2,478,050 | 96,397 | 2,574,447 |
| WESTVACO CORP. PACKAGING RESOURCES GROUP | NORTH CHARLESTON | SC | Pulp mills | 2,496,009 | 27,043 | 2,523,052 |
| GEORGIA-PACIFIC CORP. | MONTICELLO | MS | Paperboard mills | 2,325,350 | 115,693 | 2,441,043 |
| PACKAGING CORP. OF AMERICA | COUNCE | TN | Paperboard mills | 2,409,934 | 17,191 | 2,427,125 |
| GREAT SOUTHERN PAPER CO. | CEDAR SPRINGS | GA | Paperboard mills | 2,356,007 | 65,818 | 2,421,825 |
| INTERTAPE POLYMER GROUP COLUMBIA DIV. | COLUMBIA | SC | Paper coated and laminated, nec | 2,404,000 | 0 | 2,404,000 |
| FARMLAND INDS. INC. | ENID | OK | Nitrogenous fertilizers | 2,395,010 | 5,510 | 2,400,520 |
| CLIMAX MOLYBDENUM CO. | FORT MADISON | IA | Primary nonferrous metals, nec | 2,395,000 | 4,250 | 2,399,250 |
| TEXAS RECREATION CORP. | WICHITA FALLS | TX | Plastics foam products | 2,395,678 | 0 | 2,395,678 |
| HOLNAM INC. DUNDEE PLANT | DUNDEE | MI | Cement, hydraulic | 2,361,792 | 1,497 | 2,363,289 |
| DOW CHEMICAL CO. FREEPORT | FREEPORT | TX | Alkalies and chlorine | 2,236,144 | 87,545 | 2,323,689 |
| INTERNATIONAL PAPER CO. SAVANNAH COMPLEX | SAVANNAH | GA | Pulp mills | 2,291,022 | 13,230 | 2,304,252 |
| STONE CONTAINER CORP. | PANAMA CITY | FL | Pulp mills | 2,296,933 | 0 | 2,296,933 |
| EASTMAN KODAK CO. KODAK PARK | ROCHESTER | NY | Photographic equipment and supplies | 2,213,914 | 81,062 | 2,294,976 |
| RIVERWOOD INTL. CORP. | WEST MONROE | LA | Pulp mills | 2,265,030 | 3,841 | 2,268,871 |

## Table C.3.5 Top 50 Facilities for Suspected Respiratory Toxicant Releases, 2000 (pounds)

| Facility | City | State | Industry | Air Emissions |
|---|---|---|---|---|
| MAGNESIUM CORP. OF AMERICA | ROWLEY | UT | Primary nonferrous metals, nec | 43,932,000 |
| CP&L ROXBORO STEAM ELECTRIC PLANT | SEMORA | NC | Electric services | 19,217,246 |
| RELIANT ENERGIES INC. KEYSTONE POWER PLANT | SHELOCTA | PA | Electric services | 18,439,349 |
| BOWEN STEAM ELECTRIC GENERATING PLANT | CARTERSVILLE | GA | Electric services | 17,755,948 |
| GULF POWER CO. PLANT CRIST | PENSACOLA | FL | Electric services | 16,610,923 |
| DUKE ENERGY MARSHALL STEAM STATION | TERRELL | NC | Electric services | 14,546,965 |
| JOHN E. AMOS POWER PLANT | WINFIELD | WV | Electric services | 14,526,137 |
| J. M. STUART STATION | MANCHESTER | OH | Electric services | 14,167,140 |
| U.S. TVA JOHNSONVILLE FOSSIL PLANT | NEW JOHNSONVILLE | TN | Electric services | 14,012,152 |
| BRANDON SHORES & WAGNER COMPLEX | BALTIMORE | MD | Electric services | 12,359,982 |
| DUKE ENERGY BELEWS CREEK STEAM STATION | BELEWS CREEK | NC | Electric services | 11,360,090 |
| DETROIT EDISON MONROE POWER PLANT | MONROE | MI | Electric services | 10,788,141 |
| MISSISSIPPI POWER CO. PLANT WATSON | GULFPORT | MS | Electric services | 9,965,445 |
| AMERICAN ELECTRIC POWER MITCHELL PLANT | MOUNDSVILLE | WV | Electric services | 9,721,964 |
| AMERICAN ELECTRIC POWER CARDINAL PLANT | BRILLIANT | OH | Electric services | 9,584,560 |
| ALABAMA POWER CO. PLANT GREENE COUNTY | FORKLAND | AL | Electric services | 9,535,035 |
| CP&L MAYO ELECTRIC GENERATING PLANT | ROXBORO | NC | Electric services | 9,357,060 |
| ALLEGHENY ENERGY INC. HATFIELD POWER STATION | MASONTOWN | PA | Electric services | 8,777,480 |
| TAMPA ELECTRIC CO. GANNON STATION | TAMPA | FL | Electric services | 8,311,883 |
| SCHERER STEAM ELECTRIC GENERATING PLANT | JULIETTE | GA | Electric services | 8,212,763 |
| FLORIDA POWER CRYSTAL RIVER ENERGY COMPLEX | CRYSTAL RIVER | FL | Electric services | 8,058,058 |
| U.S. TVA PARADISE FOSSIL PLANT | DRAKESBORO | KY | Electric services | 8,041,845 |
| ALLEGHENY ENERGY INC. FORT MARTIN POWER STATION | MAIDSVILLE | WV | Electric services | 7,879,310 |
| AMERICAN ELECTRIC POWER MUSKINGUM RIVER PLANT | BEVERLY | OH | Electric services | 7,794,678 |
| BRANCH STEAM ELECTRIC GENERATING PLANT | MILLEDGEVILLE | GA | Electric services | 7,604,488 |
| MORGANTOWN GENERATING STATION | NEWBURG | MD | Electric services | 7,342,284 |
| PSI ENERGY GIBSON GENERATING STATION | PRINCETON | IN | Electric services | 7,277,778 |
| KYGER CREEK STATION | GALLIPOLIS | OH | Electric services | 7,132,568 |
| CG&E MIAMI FORT GENERATING STATION | NORTH BEND | OH | Electric services | 6,883,611 |
| KENTUCKY UTILITIES CO. GHENT STATION | GHENT | KY | Electric services | 6,771,001 |
| FIRSTENERGY W.H. SAMMIS PLANT | STRATTON | OH | Electric services | 6,766,550 |
| AMERICAN ELECTRIC POWER CONESVILLE PLANT | CONESVILLE | OH | Electric services | 6,512,898 |
| AMERICAN ELECTRIC POWER MOUNTAINEER PLANT | NEW HAVEN | WV | Electric services | 6,412,005 |
| BIG SANDY POWER PLANT | LOUISA | KY | Electric services | 5,994,399 |
| DUKE ENERGY PLANT ALLEN | BELMONT | NC | Electric services | 5,985,365 |
| J. H. CAMPBELL GENERATING PLANT | WEST OLIVE | MI | Electric services | 5,689,380 |
| U.S. TVA KINGSTON FOSSIL PLANT | HARRIMAN | TN | Electric services | 5,583,830 |
| CG&E BECKJORD GENERATING STATION | NEW RICHMOND | OH | Electric services | 5,543,053 |
| CF INDS. INC. | DONALDSONVILLE | LA | Nitrogenous fertilizers | 5,358,440 |
| MT. STORM POWER STATION | MOUNT STORM | WV | Electric services | 5,256,113 |
| ST. JOHNS RIVER POWER PARK/NORTHSIDE GENERATING ST | JACKSONVILLE | FL | Electric services | 5,249,131 |
| U.S. TVA COLBERT FOSSIL PLANT | TUSCUMBIA | AL | Electric services | 5,243,804 |
| PP&L MONTOUR STEAM ELECTRIC STATION | DANVILLE | PA | Electric services | 5,238,682 |
| AMERICAN ELECTRIC POWER TANNERS CREEK PLANT | LAWRENCEBURG | IN | Electric services | 5,051,560 |
| U.S. TVA GALLATIN FOSSIL PLANT | GALLATIN | TN | Electric services | 4,936,195 |
| SPURLOCK POWER STATION | MAYSVILLE | KY | Electric services | 4,922,879 |
| AMERICAN ELECTRIC POWER KAMMER PLANT | MOUNDSVILLE | WV | Electric services | 4,860,875 |
| ALABAMA POWER CO. PLANT BARRY | BUCKS | AL | Electric services | 4,835,239 |
| AMEREN CORP. COFFEEN POWER STATION | COFFEEN | IL | Electric services | 4,802,505 |
| HONEYWELL INTL. INC. HOPEWELL PLANT | HOPEWELL | VA | Industrial organic chemicals, nec | 4,704,525 |

### Table C.3.6 Top 50 Facilities for Dioxin Releases, 2000 (grams)

| Facility | City | State | Industry | Air | Water | Total |
|---|---|---|---|---|---|---|
| SOUTHWIRE CO. | CARROLLTON | GA | Secondary nonferrous metals | 965.0 | 0.0 | 965.0 |
| SOLUTIA INC. | DECATUR | AL | Organic fibers, noncellulosic | 807.4 | 0.0 | 807.4 |
| DOW CHEMICAL CO. LOUISIANA DIV. | PLAQUEMINE | LA | Alkalies and chlorine | 2.6 | 746.0 | 748.6 |
| DOW CHEMICAL CO. FREEPORT | FREEPORT | TX | Alkalies and chlorine | 139.6 | 562.2 | 701.9 |
| MAGNESIUM CORP. OF AMERICA | ROWLEY | UT | Primary nonferrous metals, nec | 623.0 | 0.0 | 623.0 |
| CITY OF FREMONT DEPARTMENT OF UTILITIES LON D. WRI | FREMONT | NE | Electric and other services combined | 429.0 | 0.0 | 429.0 |
| TXI OPS. L.P. HUNTER CEMENT PLANT | NEW BRAUNFELS | TX | Cement, hydraulic | 145.5 | 0.0 | 145.5 |
| KOPPERS INDS. INC. | GRENADA | MS | Wood preserving | 0.0 | 117.4 | 117.4 |
| WAUPACA FNDY. INC. PLANT 5 | TELL CITY | IN | Gray and ductile iron foundries | 106.7 | 0.0 | 106.7 |
| BOSWELL OIL CO. | DRAVOSBURG | PA | Petroleum bulk stations + terminals | 102.8 | 0.0 | 102.8 |
| OCCIDENTAL CHEMICAL CORP. | GREGORY | TX | Industrial organic chemicals, nec | 99.7 | 1.6 | 101.3 |
| GEORGIA GULF CHEMICALS & VINYLS L.L.C. | PLAQUEMINE | LA | Industrial organic chemicals, nec | 8.5 | 82.8 | 91.3 |
| COGENTRIX OF RICHMOND INC. | RICHMOND | VA | Electric services | 80.0 | 0.0 | 80.0 |
| PPG INDS. INC. | LAKE CHARLES | LA | Alkalies and chlorine | 1.3 | 74.8 | 76.1 |
| HOLNAM INC. | HOLLY HILL | SC | Cement, hydraulic | 75.0 | 0.0 | 75.0 |
| FORMOSA PLASTICS CORP. LOUISIANA | BATON ROUGE | LA | Plastics materials and resins | 61.0 | 0.0 | 61.0 |
| TPI PETROLEUM INC. | ARDMORE | OK | Petroleum refining | 55.8 | 0.0 | 55.8 |
| OXY VINYLS L.P. DEER PARK VCM PLANT | DEER PARK | TX | Industrial organic chemicals, nec | 51.9 | 0.0 | 51.9 |
| ORMET ALUMINUM MILL PRODS. CORP. | FRIENDLY | WV | Secondary nonferrous metals | 51.4 | 0.0 | 51.4 |
| ELECTRIC MILLS WOOD PRESERVING L.L.C. | SCOOBA | MS | Wood preserving | 0.0 | 49.9 | 49.9 |
| NATIONAL CEMENT CO. OF ALABAMA INC. | RAGLAND | AL | Cement, hydraulic | 47.5 | 0.0 | 47.5 |
| COGENTRIX OF ROCKY MOUNT | BATTLEBORO | NC | Electric services | 46.0 | 0.0 | 46.0 |
| KOPPERS INDS. INC. | MONTGOMERY | AL | Wood preserving | 0.0 | 45.4 | 45.4 |
| HUXFORD POLE & TIMBER CO. INC. | HUXFORD | AL | Wood preserving | 0.5 | 43.0 | 43.5 |
| OXY VINYLS L.P. - DEER PARK C/A | DEER PARK | TX | Alkalies and chlorine | 0.0 | 33.3 | 33.3 |
| NORTHERN STATES POWER CO. WI FRENCH ISLAND | LA CROSSE | WI | Electric and other services combined | 28.0 | 0.0 | 28.0 |
| KIMBERLY-CLARK TISSUE CO. | EVERETT | WA | Pulp mills | 0.1 | 23.6 | 23.7 |
| BRANDON SHORES & WAGNER COMPLEX | BALTIMORE | MD | Electric services | 21.0 | 0.0 | 21.0 |
| TRANSALTA CENTRALIA GENERATION / MINING | CENTRALIA | WA | Electric services | 20.1 | 0.0 | 20.1 |
| TAYLOR LUMBER & TREATING INC. | SHERIDAN | OR | Wood preserving | 0.0 | 19.4 | 19.4 |
| DIS-TRAN WOOD PRODS. INC. | PINEVILLE | LA | Wood preserving | 0.0 | 19.2 | 19.2 |
| SAFETY-KLEEN (ARAGONITE) INC. | ARAGONITE | UT | Refuse systems | 19.1 | 0.0 | 19.1 |
| BROWN WOOD PRESERVING CO. INC. | NORTHPORT | AL | Wood preserving | 0.0 | 19.0 | 19.0 |
| ESSROC CEMENT CORP. | LOGANSPORT | IN | Cement, hydraulic | 18.6 | 0.0 | 18.6 |
| BETHLEHEM STEEL CORP. BURNS HARBOR DIV. | BURNS HARBOR | IN | Blast furnaces and steel mills | 18.0 | 0.0 | 18.0 |
| VULCAN CHEMICALS | WICHITA | KS | Alkalies and chlorine | 17.2 | 0.0 | 17.2 |
| MILLENNIUM INORGANIC CHEMICALS INC. HAWKINS POINT | BALTIMORE | MD | Inorganic pigments | 0.3 | 16.3 | 16.5 |
| DU PONT JOHNSONVILLE PLANT | NEW JOHNSONVILLE | TN | Inorganic pigments | 0.1 | 14.3 | 14.4 |
| DU PONT EDGE MOOR | EDGEMOOR | DE | Inorganic pigments | 0.1 | 14.0 | 14.1 |
| PP&L MONTANA COLSTRIP STEAM ELECTRIC STATION | COLSTRIP | MT | Electric services | 14.0 | 0.0 | 14.0 |
| CHEMETCO INC. | HARTFORD | IL | Secondary nonferrous metals | 14.0 | 0.0 | 14.0 |
| MONARCH CEMENT CO. | HUMBOLDT | KS | Cement, hydraulic | 13.3 | 0.0 | 13.3 |
| WHEELER LUMBER L.L.C. | WHITEWOOD | SD | Wood preserving | 0.0 | 12.6 | 12.6 |
| JOHN DEERE DUBUQUE WORKS | DUBUQUE | IA | Construction machinery | 12.3 | 0.0 | 12.3 |
| ASH GROVE CEMENT CO. | FOREMAN | AR | Cement, hydraulic | 10.7 | 0.0 | 10.7 |
| SEALED AIR CORP. CRYOVAC DIV. | SIMPSONVILLE | SC | Unsupported plastics film + sheet | 10.5 | 0.0 | 10.5 |
| CASCADE POLE & LUMBER CO. | TACOMA | WA | Wood preserving | 8.6 | 1.5 | 10.1 |
| ROQUETTE AMERICA INC. KEOKUK PLANT | KEOKUK | IA | Wet corn milling | 9.4 | 0.0 | 9.4 |
| SOUTHDOWN CALIFORNIA CEMENT L.L.C. | VICTORVILLE | CA | Cement, hydraulic | 9.4 | 0.0 | 9.4 |
| ESSROC CEMENT CORP. | NAZARETH | PA | Cement, hydraulic | 9.3 | 0.0 | 9.3 |

## C.4 CUMULATIVE (1987-2000) RELEASES BY STATE

**Table C.4.1 Cancer-Causing Chemical Releases by State, 1987-2000 (pounds)**

| State | Air | Water | Total | Rank | State | Air | Water | Total | Rank |
|---|---|---|---|---|---|---|---|---|---|
| TX | 242,263,513 | 2,720,989 | 244,984,502 | 1 | NJ | 37,552,701 | 1,014,996 | 38,567,697 | 29 |
| IN | 224,782,783 | 440,317 | 225,223,101 | 2 | OR | 36,395,603 | 312,308 | 36,707,911 | 30 |
| NY | 149,308,822 | 2,649,520 | 151,958,342 | 3 | IA | 35,955,360 | 225,086 | 36,180,446 | 31 |
| PA | 146,602,930 | 1,324,270 | 147,927,201 | 4 | OK | 29,127,341 | 38,524 | 29,165,866 | 32 |
| NC | 141,714,017 | 1,183,190 | 142,897,207 | 5 | ME | 16,552,985 | 647,122 | 17,200,107 | 33 |
| OH | 139,645,843 | 1,152,807 | 140,798,650 | 6 | MD | 16,003,433 | 350,812 | 16,354,245 | 34 |
| IL | 137,265,111 | 284,385 | 137,549,496 | 7 | UT | 15,005,768 | 56,387 | 15,062,156 | 35 |
| MI | 107,717,534 | 699,052 | 108,416,586 | 8 | NE | 13,750,562 | 67,804 | 13,818,366 | 36 |
| CA | 96,153,774 | 11,642,941 | 107,796,715 | 9 | NH | 12,734,015 | 200,432 | 12,934,447 | 37 |
| MS | 103,138,501 | 462,435 | 103,600,936 | 10 | DE | 11,670,813 | 52,176 | 11,722,990 | 38 |
| LA | 99,633,664 | 2,368,590 | 102,002,254 | 11 | AZ | 9,118,060 | 4,120 | 9,122,180 | 39 |
| AL | 94,550,984 | 2,453,765 | 97,004,749 | 12 | CO | 8,659,155 | 15,003 | 8,674,159 | 40 |
| GA | 92,125,910 | 796,368 | 92,922,278 | 13 | MT | 7,321,814 | 28,932 | 7,350,745 | 41 |
| TN | 87,257,695 | 1,002,275 | 88,259,970 | 14 | RI | 6,477,561 | 7,167 | 6,484,727 | 42 |
| SC | 81,303,219 | 1,746,662 | 83,049,881 | 15 | ID | 6,113,598 | 122,947 | 6,236,545 | 43 |
| VA | 72,793,866 | 315,810 | 73,109,676 | 16 | AK | 4,713,820 | 655,467 | 5,369,287 | 44 |
| MO | 66,119,369 | 153,317 | 66,272,686 | 17 | VI | 3,781,728 | 3,561 | 3,785,289 | 45 |
| KY | 62,297,602 | 847,429 | 63,145,032 | 18 | NM | 2,193,814 | 3,543 | 2,197,357 | 46 |
| PR | 59,853,413 | 83,554 | 59,936,967 | 19 | WY | 1,286,634 | 4,382 | 1,291,016 | 47 |
| WV | 55,038,111 | 698,646 | 55,736,758 | 20 | SD | 1,267,533 | 1,831 | 1,269,364 | 48 |
| CT | 51,015,011 | 3,425,439 | 54,440,451 | 21 | NV | 987,203 | 21,440 | 1,008,643 | 49 |
| WI | 51,049,402 | 529,726 | 51,579,128 | 22 | HI | 939,430 | 2,321 | 941,751 | 50 |
| KS | 50,207,436 | 37,147 | 50,244,583 | 23 | ND | 814,616 | 24,425 | 839,041 | 51 |
| WA | 44,400,184 | 4,288,084 | 48,688,268 | 24 | VT | 319,673 | 2,258 | 321,931 | 52 |
| FL | 47,590,590 | 233,644 | 47,824,233 | 25 | GU | 23,963 | 260 | 24,223 | 53 |
| MA | 39,352,497 | 725,963 | 40,078,460 | 26 | AS | 2,279 | 0 | 2,279 | 54 |
| MN | 39,318,556 | 519,784 | 39,838,340 | 27 | MP | 1,844 | 10 | 1,854 | 55 |
| AR | 39,047,713 | 374,687 | 39,422,400 | 28 | DC | 8 | 0 | 8 | 56 |

**Table C.4.2 Developmental Toxicant Releases by State, 1987-2000 (pounds)**

| State | Air | Water | Total | Rank | State | Air | Water | Total | Rank |
|---|---|---|---|---|---|---|---|---|---|
| TN | 532,347,219 | 1,123,762 | 533,470,981 | 1 | PR | 31,379,055 | 110,635 | 31,489,690 | 29 |
| AL | 517,742,255 | 524,267 | 518,266,522 | 2 | FL | 30,795,267 | 8,009 | 30,803,276 | 30 |
| TX | 231,058,056 | 377,891 | 231,435,947 | 3 | WA | 26,837,993 | 31,411 | 26,869,404 | 31 |
| IL | 216,157,693 | 123,114 | 216,280,807 | 4 | OR | 22,320,649 | 9,880 | 22,330,529 | 32 |
| IN | 207,078,399 | 222,905 | 207,301,304 | 5 | MD | 22,136,537 | 122,620 | 22,259,157 | 33 |
| VA | 205,237,616 | 113,731 | 205,351,347 | 6 | CT | 17,998,617 | 1,080,464 | 19,079,081 | 34 |
| PA | 179,200,904 | 343,628 | 179,544,533 | 7 | RI | 15,807,940 | 2,833 | 15,810,773 | 35 |
| NC | 170,592,353 | 81,877 | 170,674,230 | 8 | NH | 12,275,908 | 3,429 | 12,279,337 | 36 |
| MI | 161,641,328 | 113,617 | 161,754,945 | 9 | ME | 9,081,521 | 500 | 9,082,021 | 37 |
| LA | 149,857,403 | 700,876 | 150,558,279 | 10 | UT | 8,731,611 | 44,098 | 8,775,709 | 38 |
| OH | 147,908,130 | 269,519 | 148,177,649 | 11 | VI | 7,812,995 | 3,666 | 7,816,661 | 39 |
| NY | 118,405,602 | 254,657 | 118,660,259 | 12 | CO | 7,766,138 | 10,805 | 7,776,943 | 40 |
| SC | 114,460,050 | 224,381 | 114,684,431 | 13 | AZ | 7,159,121 | 1,567 | 7,160,688 | 41 |
| KY | 94,993,081 | 196,846 | 95,189,927 | 14 | NV | 5,727,485 | 15,325 | 5,742,810 | 42 |
| MN | 93,295,084 | 8,760 | 93,303,844 | 15 | NM | 4,948,090 | 1,959 | 4,950,049 | 43 |
| MS | 85,660,431 | 75,917 | 85,736,348 | 16 | SD | 4,398,437 | 1,251 | 4,399,688 | 44 |
| AR | 74,026,604 | 31,252 | 74,057,855 | 17 | WY | 4,012,017 | 10,004 | 4,022,021 | 45 |
| GA | 70,036,705 | 115,092 | 70,151,796 | 18 | DE | 3,864,884 | 25,549 | 3,890,432 | 46 |
| IA | 67,317,722 | 25,786 | 67,343,508 | 19 | MT | 3,632,885 | 8,778 | 3,641,662 | 47 |
| MO | 63,689,610 | 54,390 | 63,744,000 | 20 | VT | 2,727,049 | 1,348 | 2,728,397 | 48 |
| WI | 62,478,419 | 15,990 | 62,494,409 | 21 | ID | 2,385,739 | 7,152 | 2,392,891 | 49 |
| WV | 55,557,340 | 423,281 | 55,980,620 | 22 | ND | 2,206,344 | 21,279 | 2,227,623 | 50 |
| CA | 41,213,484 | 10,504,169 | 51,717,653 | 23 | HI | 1,325,986 | 1,741 | 1,327,727 | 51 |
| NJ | 50,768,939 | 308,914 | 51,077,853 | 24 | AK | 1,272,857 | 2,754 | 1,275,611 | 52 |
| KS | 50,638,552 | 23,239 | 50,661,791 | 25 | GU | 46,720 | 520 | 47,240 | 53 |
| MA | 46,770,097 | 17,315 | 46,787,412 | 26 | MP | 8,046 | 20 | 8,066 | 54 |
| NE | 42,985,696 | 65,456 | 43,051,152 | 27 | AS | 5,739 | 2 | 5,741 | 55 |
| OK | 38,387,433 | 13,467 | 38,400,900 | 28 | DC | 8 | 0 | 8 | 56 |

**Table C.4.3 Reproductive Toxicant Releases by State, 1987-2000 (pounds)**

| State | Air | Water | Total | Rank |
|---|---|---|---|---|
| AL | 461,101,141 | 388,096 | 461,489,237 | 1 |
| TN | 359,914,719 | 1,052,707 | 360,967,426 | 2 |
| LA | 92,525,521 | 271,874 | 92,797,395 | 3 |
| VA | 90,265,300 | 42,308 | 90,307,608 | 4 |
| TX | 85,729,585 | 266,242 | 85,995,827 | 5 |
| IL | 75,864,640 | 95,709 | 75,960,349 | 6 |
| IN | 41,110,626 | 156,939 | 41,267,565 | 7 |
| OH | 29,868,337 | 217,046 | 30,085,383 | 8 |
| PA | 29,040,544 | 224,316 | 29,264,860 | 9 |
| AR | 26,554,325 | 27,984 | 26,582,309 | 10 |
| NY | 21,528,279 | 171,499 | 21,699,778 | 11 |
| WV | 20,703,058 | 237,014 | 20,940,072 | 12 |
| KS | 19,762,205 | 12,123 | 19,774,328 | 13 |
| SC | 13,870,717 | 193,678 | 14,064,395 | 14 |
| PR | 10,320,203 | 34,066 | 10,354,269 | 15 |
| GA | 9,632,942 | 16,665 | 9,649,607 | 16 |
| MI | 8,073,683 | 94,772 | 8,168,455 | 17 |
| MO | 7,945,301 | 47,029 | 7,992,330 | 18 |
| WI | 7,687,451 | 10,611 | 7,698,062 | 19 |
| OK | 7,004,824 | 5,252 | 7,010,076 | 20 |
| KY | 5,246,442 | 74,469 | 5,320,911 | 21 |
| CA | 5,201,504 | 62,790 | 5,264,294 | 22 |
| MN | 5,120,433 | 6,218 | 5,126,651 | 23 |
| NJ | 4,004,345 | 194,540 | 4,198,885 | 24 |
| MS | 3,922,713 | 14,643 | 3,937,356 | 25 |
| VI | 3,291,494 | 2,170 | 3,293,664 | 26 |
| WA | 3,220,563 | 12,385 | 3,232,948 | 27 |
| MA | 3,138,457 | 7,602 | 3,146,059 | 28 |
| UT | 2,627,279 | 15,804 | 2,643,083 | 29 |
| NC | 2,516,534 | 30,727 | 2,547,261 | 30 |
| ME | 2,104,479 | 305 | 2,104,784 | 31 |
| FL | 1,803,395 | 6,281 | 1,809,676 | 32 |
| NH | 1,562,304 | 3,384 | 1,565,688 | 33 |
| CT | 1,505,450 | 13,820 | 1,519,270 | 34 |
| MT | 1,501,006 | 6,408 | 1,507,414 | 35 |
| AZ | 1,479,458 | 1,309 | 1,480,767 | 36 |
| NM | 1,453,919 | 2,393 | 1,456,312 | 37 |
| DE | 1,330,984 | 18,788 | 1,349,772 | 38 |
| MD | 1,192,530 | 112,119 | 1,304,649 | 39 |
| WY | 1,116,539 | 3,898 | 1,120,437 | 40 |
| NE | 720,834 | 43,808 | 764,642 | 41 |
| IA | 674,476 | 42,473 | 716,949 | 42 |
| RI | 623,249 | 1,262 | 624,511 | 43 |
| CO | 587,723 | 9,669 | 597,392 | 44 |
| AK | 574,989 | 1,720 | 576,709 | 45 |
| HI | 521,051 | 1,647 | 522,698 | 46 |
| ND | 483,834 | 17,362 | 501,196 | 47 |
| OR | 373,307 | 4,577 | 377,884 | 48 |
| ID | 201,552 | 6,572 | 208,124 | 49 |
| NV | 79,127 | 1,063 | 80,190 | 50 |
| VT | 11,457 | 338 | 11,795 | 51 |
| SD | 9,530 | 40 | 9,570 | 52 |
| GU | 5,203 | 260 | 5,463 | 53 |
| AS | 2,279 | 0 | 2,279 | 54 |
| MP | 1,844 | 10 | 1,854 | 55 |
| DC | 0 | 0 | 0 | 56 |

**Table C.4.4 Suspected Neurological Toxicant Releases by State, 1987-2000 (pounds)**

| State | Air | Water | Total | Rank |
|---|---|---|---|---|
| TX | 1,773,346,111 | 31,296,933 | 1,804,643,044 | 1 |
| LA | 1,216,079,958 | 74,551,216 | 1,290,631,174 | 2 |
| TN | 1,219,662,294 | 13,501,976 | 1,233,164,271 | 3 |
| OH | 1,162,367,003 | 46,769,900 | 1,209,136,904 | 4 |
| AL | 1,091,722,008 | 42,586,503 | 1,134,308,512 | 5 |
| IN | 1,015,827,509 | 17,854,435 | 1,033,681,944 | 6 |
| UT | 1,019,020,849 | 1,317,587 | 1,020,338,436 | 7 |
| IL | 943,205,916 | 27,149,651 | 970,355,568 | 8 |
| NC | 917,682,023 | 13,975,605 | 931,657,628 | 9 |
| MI | 792,565,683 | 9,669,007 | 802,234,690 | 10 |
| VA | 768,656,107 | 13,492,508 | 782,148,615 | 11 |
| CA | 689,541,464 | 89,061,649 | 778,603,113 | 12 |
| PA | 746,361,523 | 14,774,834 | 761,136,357 | 13 |
| GA | 709,444,966 | 16,327,711 | 725,772,676 | 14 |
| SC | 685,190,292 | 12,911,678 | 698,101,969 | 15 |
| MS | 643,971,081 | 11,422,480 | 655,393,561 | 16 |
| NY | 567,533,916 | 14,913,438 | 582,447,354 | 17 |
| MO | 504,629,627 | 6,296,583 | 510,926,210 | 18 |
| KY | 496,202,415 | 7,948,264 | 504,150,679 | 19 |
| FL | 464,424,100 | 15,680,677 | 480,104,777 | 20 |
| IA | 424,054,950 | 9,939,399 | 433,994,349 | 21 |
| AR | 420,105,895 | 13,379,012 | 433,484,906 | 22 |
| MN | 405,410,361 | 6,686,715 | 412,097,076 | 23 |
| WI | 404,201,101 | 6,633,648 | 410,834,749 | 24 |
| WA | 319,657,905 | 30,379,548 | 350,037,453 | 25 |
| OK | 319,459,063 | 3,098,731 | 322,557,794 | 26 |
| KS | 308,277,164 | 1,299,496 | 309,576,660 | 27 |
| WV | 272,131,075 | 19,579,362 | 291,710,436 | 28 |
| NJ | 238,804,823 | 21,082,516 | 259,887,339 | 29 |
| OR | 229,692,987 | 4,392,497 | 234,085,484 | 30 |
| CT | 173,298,560 | 32,545,733 | 205,844,293 | 31 |
| MA | 185,445,878 | 1,239,702 | 186,685,579 | 32 |
| MD | 155,467,369 | 8,658,149 | 164,125,518 | 33 |
| AK | 143,880,868 | 19,625,580 | 163,506,448 | 34 |
| NE | 151,068,418 | 2,513,997 | 153,582,415 | 35 |
| PR | 149,346,413 | 801,012 | 150,147,425 | 36 |
| ME | 112,128,460 | 7,967,910 | 120,096,370 | 37 |
| AZ | 86,475,114 | 39,316 | 86,514,430 | 38 |
| NH | 72,209,444 | 1,747,176 | 73,956,620 | 39 |
| ID | 66,952,572 | 2,653,091 | 69,605,663 | 40 |
| CO | 65,803,937 | 1,407,266 | 67,211,203 | 41 |
| DE | 60,393,503 | 3,629,022 | 64,022,525 | 42 |
| MT | 54,485,628 | 1,761,463 | 56,247,090 | 43 |
| RI | 48,146,931 | 675,027 | 48,821,958 | 44 |
| SD | 33,539,084 | 113,331 | 33,652,415 | 45 |
| WY | 27,178,811 | 745,059 | 27,923,870 | 46 |
| ND | 27,425,706 | 494,427 | 27,920,133 | 47 |
| VI | 21,963,390 | 1,837,418 | 23,800,808 | 48 |
| NV | 18,910,073 | 70,885 | 18,980,958 | 49 |
| NM | 16,513,174 | 15,381 | 16,528,555 | 50 |
| VT | 8,886,154 | 268,754 | 9,154,908 | 51 |
| HI | 5,727,689 | 115,410 | 5,843,099 | 52 |
| GU | 526,394 | 7,400 | 533,794 | 53 |
| AS | 237,916 | 12 | 237,928 | 54 |
| DC | 30,048 | 2,320 | 32,368 | 55 |
| MP | 14,443 | 45 | 14,488 | 56 |

**Table C.4.5 Suspected Respiratory Toxicant Releases by State, 1987-2000 (pounds)**

| State | Air Emissions | Rank | State | Air Emissions | Rank |
|---|---|---|---|---|---|
| TX | 1,561,384,551 | 1 | NJ | 265,857,572 | 29 |
| OH | 1,325,956,622 | 2 | MD | 250,791,228 | 30 |
| NC | 1,197,352,162 | 3 | OR | 232,514,579 | 31 |
| LA | 1,133,109,224 | 4 | MA | 182,055,717 | 32 |
| UT | 1,087,082,766 | 5 | PR | 181,478,727 | 33 |
| IN | 1,059,450,485 | 6 | NE | 150,858,460 | 34 |
| PA | 1,001,166,763 | 7 | AK | 150,515,577 | 35 |
| IL | 964,536,939 | 8 | ME | 143,443,873 | 36 |
| MI | 944,214,410 | 9 | CT | 123,445,578 | 37 |
| TN | 934,320,516 | 10 | AZ | 103,859,048 | 38 |
| GA | 888,267,698 | 11 | NH | 83,812,664 | 39 |
| VA | 808,923,197 | 12 | DE | 81,694,134 | 40 |
| AL | 788,493,365 | 13 | ID | 71,767,963 | 41 |
| SC | 741,280,397 | 14 | CO | 67,432,699 | 42 |
| NY | 669,984,476 | 15 | MT | 52,205,756 | 43 |
| FL | 653,924,826 | 16 | RI | 42,617,925 | 44 |
| MS | 644,494,905 | 17 | WY | 33,119,583 | 45 |
| KY | 606,535,218 | 18 | SD | 29,916,846 | 46 |
| CA | 535,867,323 | 19 | NM | 27,698,606 | 47 |
| MO | 532,929,071 | 20 | ND | 26,504,673 | 48 |
| WI | 461,087,183 | 21 | NV | 22,135,342 | 49 |
| WV | 452,172,686 | 22 | VI | 20,359,253 | 50 |
| IA | 428,879,606 | 23 | HI | 10,625,785 | 51 |
| MN | 398,689,510 | 24 | VT | 7,629,346 | 52 |
| AR | 396,835,443 | 25 | GU | 730,756 | 53 |
| OK | 319,755,920 | 26 | DC | 307,548 | 54 |
| WA | 308,097,936 | 27 | AS | 237,916 | 55 |
| KS | 291,982,714 | 28 | MP | 14,443 | 56 |