# 2006 Toxics Use Reduction Information Release

Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
Department of Environmental Protection

*Developed in collaboration with:*
Office of Technical Assistance and Technology
Toxics Use Reduction Institute

February 2009

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## Executive Summary

Massachusetts manufacturers and other businesses subject to the Toxics Use Reduction Act (TURA) have dramatically reduced their reliance on toxic chemicals, making Massachusetts a national leader in pollution prevention. Through toxics use reduction, Massachusetts businesses have reduced chemical transportation risks, workplace hazards, toxics in products and waste, and have saved money.

In 2006, 561 facilities reported the use of 159 listed toxic substances to the Massachusetts Department of Environmental Protection (MassDEP). These facilities fell within certain industry sectors, had ten or more full-time employee equivalents, and used listed toxic substances at or above reporting thresholds. In total (including trade secret data), these facilities reported:

- 1 billion pounds of toxic substances used (down from 1.1 billion pounds in 2005),
- 87 million pounds of toxic byproduct (or waste) generated (down from 94 million pounds in 2005),
- 342 million pounds of toxics shipped in or as products (down from 410 million pounds in 2005),
- 7 million pounds of toxics released to the environment (down from 9 million pounds in 2005), and
- 30 million pounds of toxics transferred off-site for further waste management (down from 32 million pounds in 2005).

Some of the decreases from 2005 to 2006 were due to statutory reporting changes that took effect in 2006 (see "2006 Reporting Changes" on page 4). However, even when these changes are taken into account, Massachusetts facilities continued to make progress in toxics use reduction from 2005 to 2006.

Year to year comparisons of raw TURA data do not always show actual progress in toxics use reduction since production levels and reporting requirements change over time. To account for these changes, the TURA program measures progress by using reported data (excluding trade secret data) normalized for changes in production and using a consistent set of chemicals and industries subject to reporting over a given period of time (referred to as a "Core Group"). This report highlights progress of a 2000 Core Group from 2000 to 2006.[1]

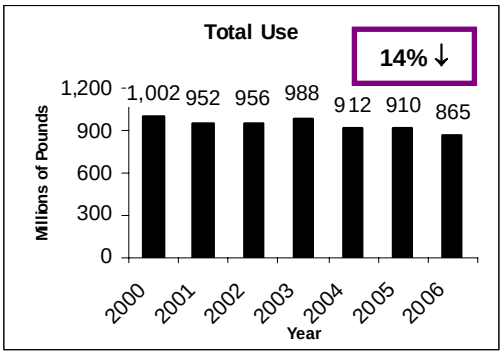
The 2000 Core Group includes only those industry categories and chemicals subject to reporting in 2000 and 2006. From 2000 to 2006, the Core Group reported a 15% decrease in production. Adjusting the data to account for this decrease, over that six-year period (see Figure 1), the 2000 Core Group facilities reduced:

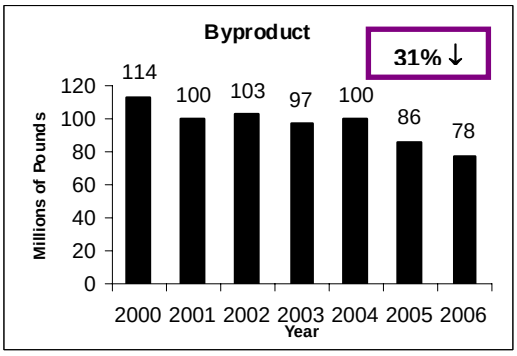
- toxic chemical use by 14%,
- toxic byproducts by 31%,
- toxics shipped in product by 16%,
- on-site releases of toxics to the environment by 39%, and
- transfers of toxics off-site for further waste management by 46%.

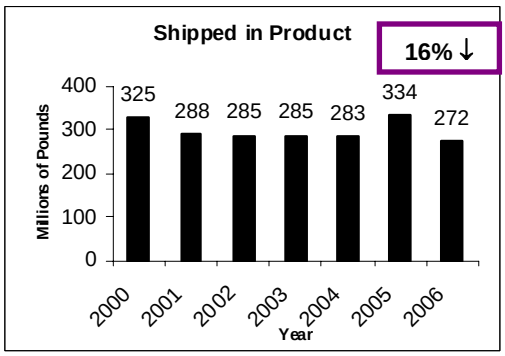
The TURA program has achieved its sustained success through the efforts of Massachusetts industry working with state government to implement the goals of the TURA program. Massachusetts facilities have reduced significant amounts of waste by implementing toxics use reduction techniques, including input substitution, production unit modernization, production unit redesign, improved operation and maintenance, and recycling and reuse of chemicals in their production processes. They have demonstrated that toxics use reduction not only reduces toxic chemical use and waste, but also saves businesses money over the long term.

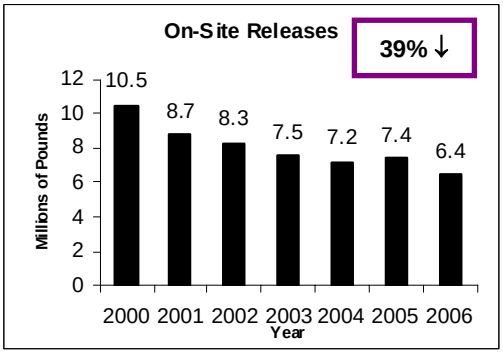
[1] In previous reports, the TURA program used a 1990 Core Group to measure progress. The 1990 Core Group facilities today represent only about half of the reported chemical use in Massachusetts. Therefore, the TURA program now uses a 2000 Core Group to measure progress. Please see previous year's reports for longer-term trends going back to 1990.

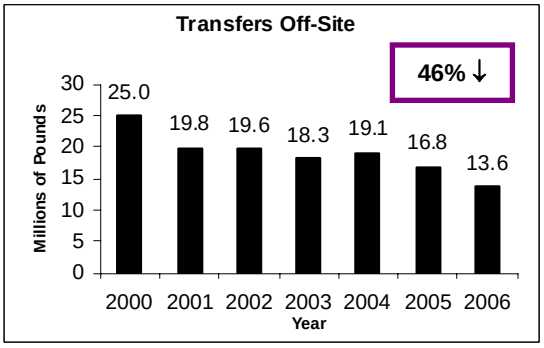
**Figure 1 – 2000 Core Group Toxics Use Reduction Progress From 2000 to 2006 (Production Adjusted)**



# I. Introduction

The Toxics Use Reduction Act (TURA) requires Massachusetts companies that fall within certain industry sectors, have ten or more full-time employee equivalents, and use listed toxic substances at or above reporting thresholds to report their chemical use annually to the Massachusetts Department of Environmental Protection (MassDEP) and pay an annual toxics use fee. TURA requires reporting facilities to develop toxics use reduction plans that identify and evaluate opportunities to reduce the use of toxics and the generation of toxic byproducts. These plans must be updated every two years and approved by a MassDEP-certified toxics use reduction planner. After several toxics use reduction planning efforts, companies have the option of developing resource conservation plans (addressing energy, water, or materials use) or implementing an environmental management system that integrates toxics use reduction planning.

In addition to MassDEP's administration of reporting and planning requirements, the TURA program is supported by the Office of Technical Assistance and Technology (OTA) and the Toxics Use Reduction Institute (TURI). OTA provides non-regulatory technical assistance to facilities seeking to reduce the use of toxics, develops fact sheets and other technical guidance documents, supports the development of technology solutions by leveraging state and federal funding, and creates market-based incentives to reduce toxics use for qualifying TURA filers. TURI provides toxics use reduction education, training, and library services; supports research on cleaner materials and processes; and operates a laboratory for testing non-toxic or less-toxic cleaning alternatives. TURI also makes TURA data available on its website in a user-friendly way that is searchable by community, chemical or company. See www.turi.org/turadata.

This 2006 Toxics Use Reduction Information Release contains important chemical information that is useful to the public, government, and industry. However, it is important to note that because the data in this report are collected only from facilities within certain industrial sectors that have ten or more full-time employees and that use certain chemicals above established reporting thresholds, this report does not provide a complete picture of the use and release of all chemicals. In addition, this report does not contain information about exposures of the public to reported chemicals.

For more information about the TURA program, please visit the following web sites:

Massachusetts Department of Environmental Protection,
Toxics Use Reduction Program: www.mass.gov/dep/toxics/toxicsus.htm

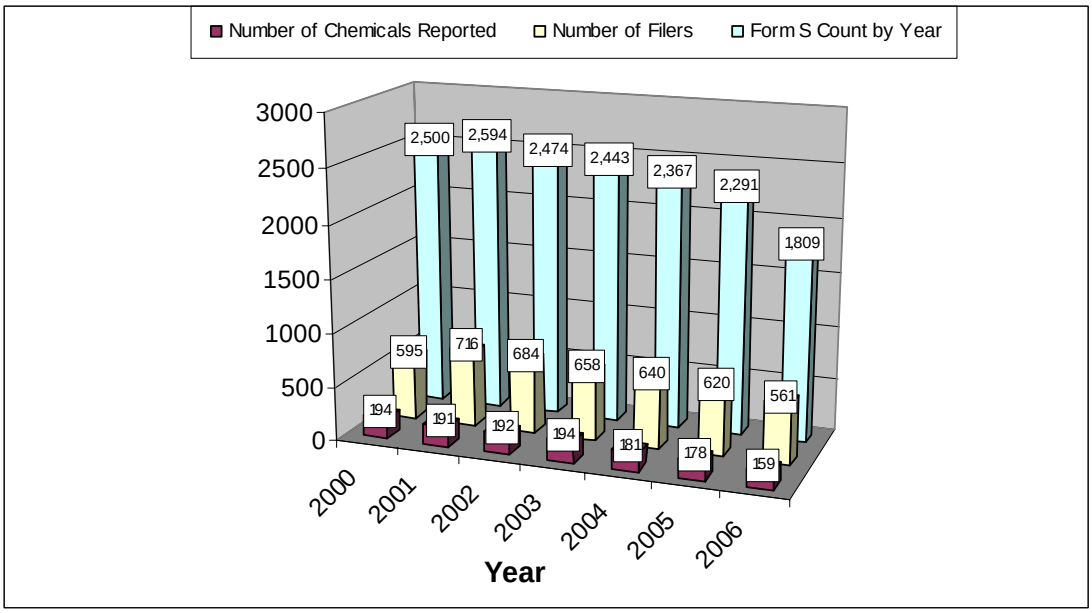
Office of Technical Assistance and Technology: www.mass.gov/envir/ota

Toxics Use Reduction Institute: www.turi.org

# II. TURA Progress 2000-2006

Figure 2 illustrates TURA filing trends since 2000. Out of 1,422 chemicals listed under TURA, 159 were reported in 2006, down from 194 in 2000. From 2000 to 2001 the number of facilities reporting under TURA rose to 716 due to new requirements to report lead and lead compounds at lower thresholds applicable to persistent bioaccumulative and toxic (PBT) chemicals, but has since declined to 561 in 2006, due to a combination of 2006 statutory changes to TURA reporting requirements, reduced chemical use, facilities closing, and reduced production due to economic conditions. Similarly, the number of individual Form Ss[2] filed followed a similar trend, decreasing from a high of 2,594 in 2001 to 1,809 in 2006, consistent with the decline in the number of TURA filers.

**Figure 2 - TURA Filer Trends 2000 – 2006**




**2006 Reporting Changes**

Statutory amendments to TURA in 2006 eliminated the reporting of toxics:

- present in fuel oil used in combustion, except for power plants; and
- manufactured or processed between 10,000 pounds and 25,000 pounds (unless they are PBT chemicals or higher hazard substances, which have lower thresholds); this change makes general TURA reporting consistent with U.S. Environmental Protection Agency Toxics Release Inventory Reporting.

These reporting changes resulted in some of the decrease in toxics use reported from 2005 to 2006. The fuel oil exemption reduced the reporting of polycyclic aromatic compounds use by about 1.7 million pounds and benzo(g,h,i)perylene by about 33,000 pounds. The change for manufactured or processed chemicals reduced reporting by 3.5 million pounds. Together these changes resulted in 394 fewer Form Ss filed.

**2000 Core Group Progress – Production Adjusted Data**

Since TURA reporting requirements have changed over time, TURA progress is best measured by using a consistent set of chemicals and industries subject to reporting over a given period of time (referred to as a "Core Group"). In order to more accurately measure progress, the TURA data are adjusted or

[2] A separate Form S is required for each chemical reported by a facility; the Form S is the form used to report chemical use information.

normalized to eliminate the effects of changes in production using production ratios reported by the Core Group facilities.

The following example illustrates how data are adjusted to reflect changes in production:

- In year 1, a facility produces 1,000 machine parts, and generates 100 lbs. of byproduct.
- In year 2, the facility produces 10% less machine parts (900). Therefore, the production ratio is .90. However, the facility only generates 80 lbs. of byproduct.
- The production adjusted byproduct for year 2 is 80 lbs./.90 = 89 lbs.
- The production adjusted percent change from year 1 to year 2 is [100-89]/100 = .11, or an 11% reduction, while its actual byproduct reduction is 20%.

In previous reports, the TURA program used a 1990 Core Group to measure progress. However, due to changes in reporting requirements over time, the 1990 Core Group facilities represent only about half of the reported chemical use in Massachusetts. Therefore, the TURA program now uses a 2000 Core Group to measure progress. The 2000 Core Group includes facility categories and chemicals that were subject to reporting in 2000 and that remained subject to reporting in 2006[3]. In 2006, the 2000 Core Group used 733 million pounds, or 88% of the toxic chemicals reported (which is 837 million pounds excluding trade secret data).

From 2000 to 2006, 2000 Core Group filers reported a 15 percent decrease in production. From 2000 to 2006 (see Figure 3), when adjusted for production, the 2000 Core Group facilities reduced:

- toxic chemical use by 14%,
- toxic byproducts by 31%,
- toxics shipped in product by 16%;
- on-site releases of toxics to the environment by 39%, and
- transfers of toxics off-site for further waste management by 46%.

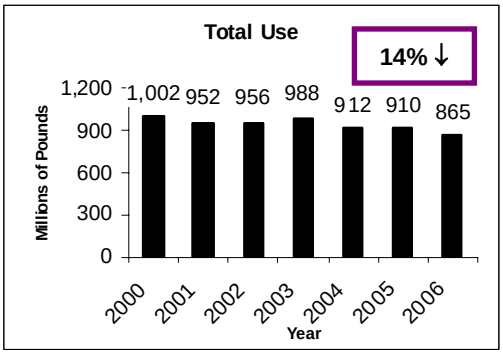
**2000 Core Group Progress – Without Adjusting for Production**

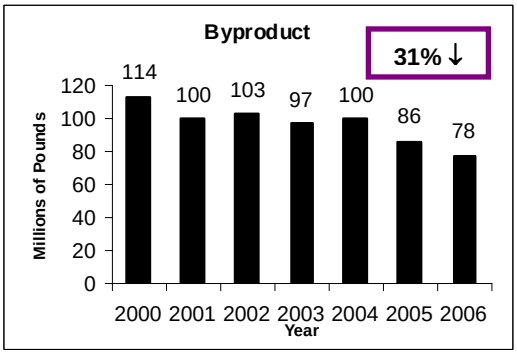
The actual quantities reported by the 2000 Core Group over the period 2000 to 2006 are shown in Figure 4. These quantities have <u>not</u> been adjusted for changes in production. From 2000 to 2006, Core Group facilities reduced:

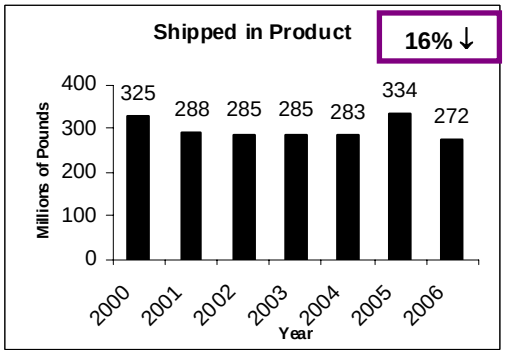
- toxic chemical use by 27% (from 1,002 million pounds in 2000 to 733 million pounds in 2006),
- toxic byproducts by 42% (from 114 million pounds in 2000 to 66 million pounds in 2006),
- toxics shipped in product by 29% (from 325 million pounds in 2000 to 231 million pounds in 2006),
- on-site releases of toxics to the environment by 48% (from 10 million pounds in 2000 to 5 million pounds in 2006), and
- transfers of toxics off-site for further waste management by 54% (from 25 million pounds in 2000 to 12 million pounds in 2006).

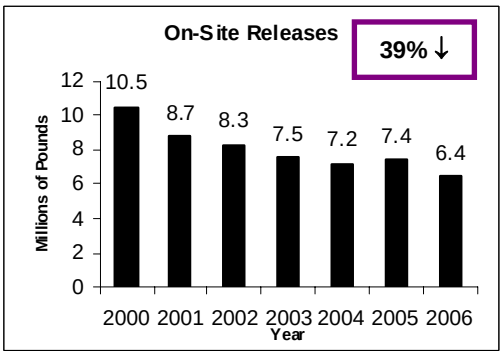
[3] The 2000 Core Group includes all industry sectors and all chemical use except for the following: use of respirable crystalline silica (which was first reportable in 2001), use of lead and lead compounds due only to the lower 100-pound thresholds for lead and lead compounds that took effect in 2001, municipal waste combustor combustion-related emissions first reportable in 2003, and use of any chemical covered by a trade secret claim.

**Figure 3 – 2000 Core Group Toxics Use Reduction Progress From 2000 to 2006 (Production Adjusted)**



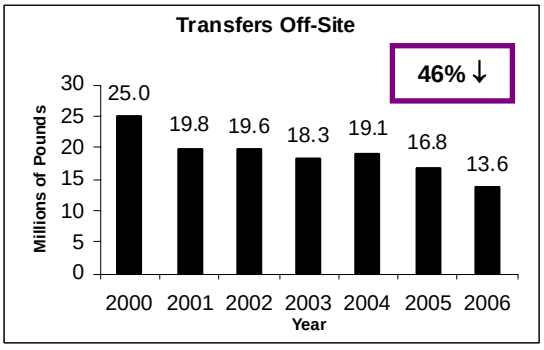
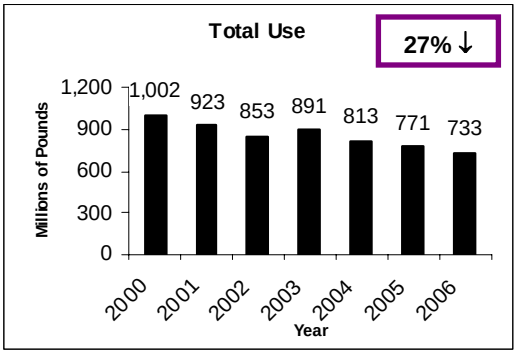
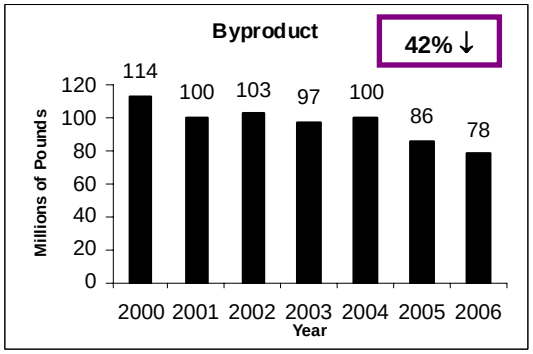
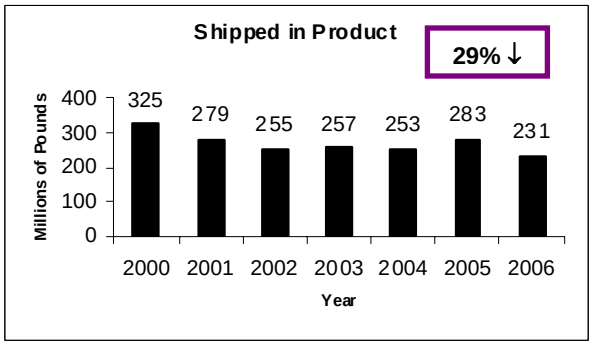
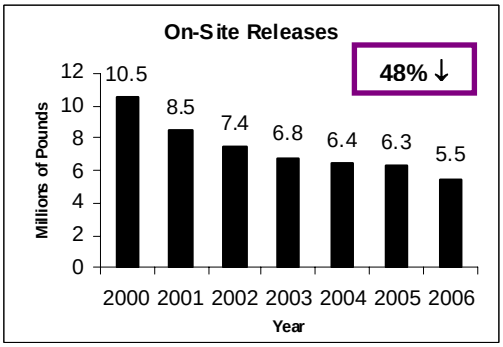



**Figure 4 – 2000 Core Group Toxics Use Reduction Progress From 2000 to 2006 (Not Production Adjusted)**



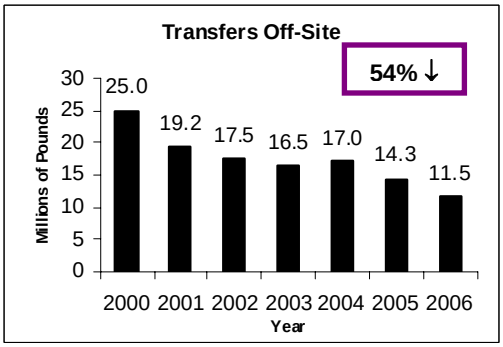



Table 1 summarizes TURA data from 2000 to 2006, showing both **reported** and **production adjusted** quantities. For each category, each year's production adjusted quantity is normalized to the base year production level, thus providing a comparison of production-adjusted quantities to base year quantities. Quantities in shaded boxes are adjusted for changes in manufacturing activity (level of production) using the facility-reported Production Ratio/Activity Index. For the 2000 Core Group, the activity index shows a decrease in production of 15 percent from 2000 to 2006.

## Table 1
## 2000 CORE GROUP DATA: 2000 - 2006 TREND SUMMARY

(Quantities are in millions of pounds and do not include trade secret quantities.
Shaded columns show production-adjusted quantities.)

| | TOTAL USE | | BYPRODUCT | | SHIPPED IN PRODUCT | | ON-SITE RELEASES | | TRANSFERS OFF-SITE | | ACTIVITY INDEX[4] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2000 | 1001.99 | 1001.99 | 113.69 | 113.69 | 325.20 | 325.20 | 10.49 | 10.49 | 24.96 | 24.96 | |
| 2001 | 923.10 | 951.65 | 97.24 | 100.25 | 279.15 | 287.78 | 8.48 | 8.74 | 19.17 | 19.76 | 0.97 |
| 2002 | 853.16 | 956.03 | 91.78 | 102.85 | 254.56 | 285.25 | 7.41 | 8.30 | 17.45 | 19.55 | 0.92 |
| 2003 | 890.50 | 987.99 | 87.70 | 97.30 | 257.17 | 285.32 | 6.78 | 7.52 | 16.45 | 18.25 | 1.01 |
| 2004 | 813.45 | 911.62 | 89.46 | 100.26 | 252.53 | 283.01 | 6.42 | 7.19 | 17.04 | 19.10 | 0.99 |
| 2005 | 771.34 | 909.93 | 73.11 | 86.25 | 282.76 | 333.56 | 6.30 | 7.43 | 14.25 | 16.81 | 0.95 |
| 2006 | 732.86 | 864.53 | 66.23 | 78.13 | 230.79 | 272.26 | 5.45 | 6.43 | 11.51 | 13.58 | 1.00 |
| Percent Change 2000-2006 | 27 % Reduction | 14% Reduction | 42% Reduction | 31% Reduction | 29% Reduction | 16 % Reduction | 48% Reduction | 39% Reduction | 54% Reduction | 46% Reduction | 15% Decrease |

4 The Production Ratio/Activity Index reported by each facility measures the change in production from the previous reporting year to the current reporting year.

# III. 2006 TURA Chemical Data

Table 2 summarizes the 2006 data for all TURA filers, including trade secret data, rounded to the nearest million pounds. These companies reported using over 1 billion pounds of chemicals and generating 87 million pounds of byproduct.

| Table 2 - 2006 Data for All TURA Filers (in pounds; includes trade secret data) | |
|---|---|
| Total Use | 1,054,000,000 |
| Generated as Byproduct | 87,000,000 |
| Shipped in Product | 342,000,000 |
| On-Site Releases | 7,000,000 |
| Transfers Off-Site | 30,000,000 |

The 1 billion pounds of chemical use occurred in three categories: manufactured, processed, or otherwise used. In TURA, these terms are defined as follows:

**Manufacture** – "to produce, prepare, import or compound a toxic or hazardous substance" (e.g., intentional manufacture of a metal compound or the unintentional manufacture of acid gases during combustion of fossil fuels).

**Process** – "the preparation of a toxic or hazardous substance, including without limitation, a toxic substance contained in a mixture or trade name product, after its manufacture, for distribution in commerce" (e.g., in the formulation of paints or coatings, any listed toxics are "processed;" in the manufacture of polystyrene, the styrene monomer is "processed").

**Otherwise Use** – "any use of a toxic substance that is not covered by the terms "manufacture" or "process" and includes use of a toxic substance contained in a mixture or trade name product" (e.g., chemicals used to clean parts, chemicals contained in fuels that are combusted).

In this Report, when total use is broken down by type of use (i.e., manufactured, processed, or otherwise used), trade secret data are not included. Thus, the total use in Figure 5 is 837 million pounds, rather than 1 billion pounds (which includes trade secret data).

**Manufactured Chemicals**

Figure 5 shows that relatively little manufacturing of TURA chemicals occurs in Massachusetts. Chemicals reported as "manufactured" accounted for 8% of the total use statewide (or 63 million pounds, down from 79 million pounds in 2005). A significant amount of the chemicals reported as manufactured are not manufactured intentionally, but are coincidentally manufactured as a result of some other activity. Examples include the creation of acid gases from fuel combustion for power generation and the production of nitrate compounds as a result of wastewater treatment.

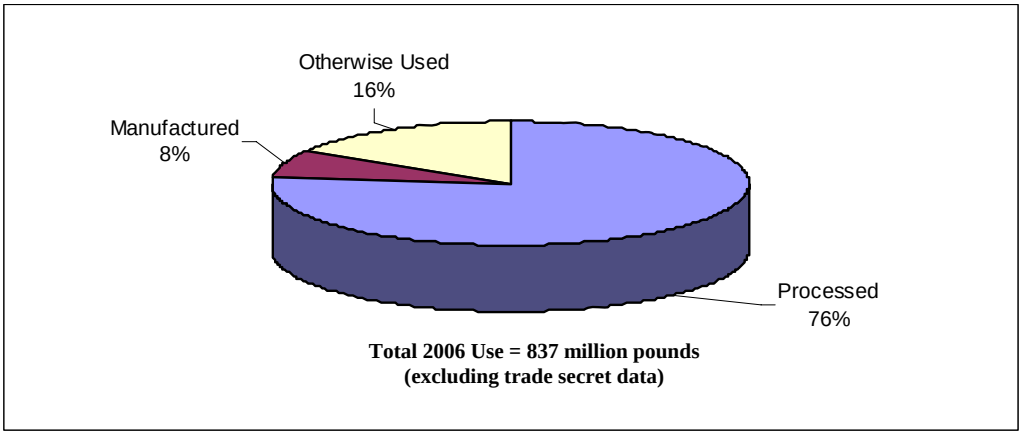
**Processed Chemicals**

In Massachusetts, the predominant chemical use is "processing," which includes incorporating a listed chemical into a product. Processing of chemicals accounted for 76% of total use (or 639 million pounds, down from 652 million pounds in 2005). Styrene, which is used in the production of plastics, accounted for 49% (or 315 million pounds) of total chemicals processed.

**Otherwise Used Chemicals**

Chemicals "otherwise used" accounted for 16% of total use (or 134 million pounds, down from 156 million pounds in 2005). Chemicals otherwise used include activities such as parts cleaning and waste treatment.

**Figure 5 – 2006 Chemical Use (does not include trade secret data)**




**Top 20 Chemicals**

In 2006, 159 chemicals out of 1,422 TURA-listed chemicals were reported. Of the 159, 20 chemicals accounted for 85%, or 711 million pounds (not including trade secret information), of total use reported statewide (see Table 3). Styrene monomer was the chemical with the largest quantity reported with 13 facilities (or 2%) reporting its use, representing 38% of total use reported (or 315 million pounds, up from 273 million pounds in 2005). Styrene monomer is the building block for various plastics.

Sodium hydroxide was the second highest used chemical with 175 facilities (or 31%) reporting its use, representing 9% of total use reported (or 75 million pounds, down from 82 million pounds in 2005). Sodium hydroxide is used to treat wastewater, neutralize acids, make sodium salts, rayon, plastics, paper and cellophane, and manufacture laundering, bleaching, and dishwashing materials.

Hydrochloric acid was the third highest used chemical with 60 facilities (or 11%) reporting its use, representing 7% of total use reported (or 62 million pounds, down from 64 million pounds in 2005). Hydrochloric acid is a byproduct of combustion, is used in chloride production, in electroplating, for cleaning metal products, in removing scale from boilers, and in neutralizing basic systems.

## Table 3 - 2006 Top 20 Chemicals: Total Use

| **Total Use**<br>***These quantities do not include Trade Secret*** | |
|---|---|
| **Chemical Name (CAS #)** | **Total Use (Lbs.)** |
| Styrene Monomer (100425) | 315,207,592 |
| Sodium Hydroxide (1310732) | 75,004,075 |
| Hydrochloric Acid (7647010) | 62,008,234 |
| Methanol (67561) | 36,434,123 |
| Toluene (108883) | 27,513,272 |
| Sulfuric Acid (7664939) | 25,988,464 |
| Sodium Hypochlorite (7681529) | 25,603,077 |
| Ammonia (7664417) | 15,780,849 |
| Potassium Hydroxide (1310583) | 15,652,032 |
| Zinc Compounds (1039) | 15,289,155 |
| Methyl Ethyl Ketone (78933) | 13,591,844 |
| Chlorine (7782505) | 12,746,820 |
| Ethyl Acetate (141786) | 11,370,279 |
| Acetone (67641) | 10,416,662 |
| Nitrate Compounds (1090) | 10,292,091 |
| Adipic Acid (124049) | 8,998,008 |
| Toluene Diisocyanate (26471625) | 8,011,317 |
| Copper Compounds (1015) | 7,492,452 |
| Methyl Methacrylate (80626) | 7,037,998 |
| Phosphoric Acid (7664382) | 6,784,191 |
| The following four chemicals would appear in the Top 20 Chemicals Total Use list if trade secret quantities were included: Butyraldehyde, Formaldehyde, Sodium Bisulfite, Vinyl Acetate. | |

Table 4 shows the Top 20 chemicals generated as byproduct in 2006, which accounted for 86% (or 75 million pounds) of total byproduct generated statewide. Table 4 also shows the Top 20 chemicals shipped in product in 2006, which accounted for 81% (or 221 million pounds) of total shipped in product (excluding trade secret data).

**Table 4 - 2006 Top 20 Chemicals: Byproduct Generation and Shipped in Product**

| **Byproduct Generation** *These quantities include Trade Secret* | | **Shipped in Product** *These quantities do not include Trade Secret* | |
|---|---|---|---|
| **Chemical Name (CAS #)** | **Byproduct Generation (Lbs.)** | **Chemical Name (CAS #)** | **Shipped in Product (Lbs.)** |
| Sodium Hydroxide (1310732) | 9,459,571 | Sodium Hydroxide (1310732) | 47,400,704 |
| Toluene (108883) | 9,353,206 | Methanol (67561) | 32,391,962 |
| Ethyl Acetate (141786) | 9,262,075 | Toluene (108883) | 17,452,280 |
| Nitrate Compounds (1090) | 7,269,243 | Sodium Hypochlorite (7681529) | 16,695,754 |
| Sulfuric Acid (7664939) | 7,115,200 | Potassium Hydroxide (1310583) | 13,026,568 |
| Methyl Ethyl Ketone (78933) | 4,474,423 | Chlorine (7782505) | 12,541,120 |
| Methanol (67561) | 4,199,583 | Ammonia (7664417) | 11,074,615 |
| Hydrochloric Acid (7647010) | 3,894,313 | Methyl Ethyl Ketone (78933) | 8,905,566 |
| Formaldehyde (50000) | 3,427,818 | Zinc Compounds (1039) | 8,399,627 |
| Acetone (67641) | 3,141,736 | Acetone (67641) | 7,042,998 |
| Lead (7439921) | 2,606,720 | Sulfuric Acid (7664939) | 6,636,040 |
| Copper Compounds (1015) | 1,944,908 | Copper Compounds (1015) | 5,653,005 |
| Nitric Acid (7697372) | 1,650,055 | Phosphoric Acid (7664382) | 5,032,172 |
| Ethylene Glycol (107211) | 1,240,010 | N-Methyl-2-Pyrrolidone (872504) | 4,894,144 |
| N-Methyl-2-Pyrrolidone (872504) | 1,139,473 | Glycol Ethers (1022) | 4,527,660 |
| Dimethylformamide (68122) | 1,085,932 | Xylene Mixed Isomer (1330207) | 4,478,640 |
| Ammonia (7664417) | 1,049,053 | Dichloromethane (75092) | 3,879,832 |
| Sodium Hypochlorite (7681529) | 975,684 | Antimony Compounds (1000) | 3,750,413 |
| Tetrahydrofuran (109999) | 906,208 | Hexane (110543) | 3,540,685 |
| Phosphoric Acid (7664382) | 827,529 | Ethylene Glycol (107211) | 3,445,508 |
| | | The following chemicals would appear in the Top 20 Chemicals Shipped in Product list if trade secret quantities were included: Ethyl Acetate and Sodium Bisulfite. | |

Table 5 shows the Top 20 chemicals reported as on-site releases in 2006, which totaled 92% (about 7 million pounds) of total on-site releases reported. Hydrochloric acid had the highest amount of on-site releases reported statewide, accounting for 33% (or 2.4 million pounds) of total on-site releases. About 1.5 million pounds of hydrochloric acid, or 61% of total on-site releases of hydrochloric acid, were attributed to power plants. Table 5 also shows the Top 20 chemicals reported as transfers off-site in 2006, which totaled 87% (or 26 million pounds) of total transfers off-site. Nitrate compounds had the highest transfers off-site reported statewide, accounting for 17% of total transfers off-site. Nitrate compounds were primarily coincidentally manufactured during neutralization of nitric acid in wastewater treatment.

**Table 5 - 2006 Top 20 Chemicals: On-Site Releases and Transfers Off-site**

| **On-Site Releases** *These quantities include Trade Secret* | | **Transfers Off-Site** *These quantities include Trade Secret* | |
|---|---|---|---|
| **Chemical Name (CAS #)** | **On-Site Releases (Lbs.)** | **Chemical Name (CAS #)** | **Transfers Off-Site (Lbs.)** |
| Hydrochloric Acid (7647010) | 2,393,206 | Nitrate Compounds (1090) | 5,024,661 |
| Ammonia (7664417) | 782,312 | Formaldehyde (50000) | 3,219,080 |
| Acetone (67641) | 446,901 | Lead (7439921) | 2,237,155 |
| Lead (7439921) | 372,629 | Toluene (108883) | 2,136,592 |
| Ethyl Acetate (141786) | 365,346 | Copper Compounds (1015) | 2,017,253 |
| Sulfuric Acid (7664939) | 343,438 | Methanol (67561) | 1,923,777 |
| Toluene (108883) | 310,783 | Ethyl Acetate (141786) | 1,892,501 |
| Glycol Ethers (1022) | 250,130 | Acetone (67641) | 1,331,930 |
| Butyl Alcohol (71363) | 241,232 | N-Methyl-2-Pyrrolidone (872504) | 959,438 |
| Barium Compounds (1002) | 234,349 | Methyl Ethyl Ketone (78933) | 912,570 |
| Methanol (67561) | 160,728 | Ethylene Glycol (107211) | 863,031 |
| Hydrogen Fluoride (7664393) | 130,779 | Sodium Hydroxide (1310732) | 653,803 |
| Silica, Crystalline (Respirable, <10 Microns) (1095) | 122,412 | Zinc Compounds (1039) | 649,600 |
| Methyl Eethyl Ketone (78933) | 113,154 | Butyraldehyde (123728) | 564,100 |
| Vanadium Compounds (1065) | 64,082 | Dichloromethane (75092) | 439,866 |
| Formaldehyde (50000) | 60,784 | Nitric Acid (7697372) | 366,595 |
| Manganese Compounds (1027) | 59,346 | Sulfuric Acid (7664939) | 300,736 |
| Xylene Mixed Isomer (1330207) | 51,732 | Ferric Chloride (7705080) | 289,033 |
| Trichloroethylene (79016) | 51,588 | Phosphoric Acid (7664382) | 256,748 |
| Styrene Monomer (100425) | 50,679 | Xylene Mixed Isomers (1330207) | 218,346 |

**Persistent Bioaccumulative Toxic (PBT) Chemicals**

Chemicals classified as persistent bio-accumulative toxic (PBT) chemicals by the U.S. Environmental Protection Agency (EPA) under the Toxics Release Inventory (TRI) Program are of particular concern because they are highly toxic, remain in the environment for long periods of time, are not readily destroyed, and build up or accumulate in body tissue. Relatively small releases of PBT chemicals can pose human and environmental health threats and, therefore, the use and release of these chemicals, even in relatively small amounts, warrant public reporting as well as efforts to reduce their use and release.

For 2006, Massachusetts facilities reported the use of nine PBT chemicals/chemical categories (see Table 6).[5] It should be noted that TURA data are collected only from facilities within certain industrial sectors that have 10 or more full-time employees, and therefore it does not provide a complete picture of the use and emissions of chemicals, whether PBT or non-PBT chemicals. For instance, TURA data do not include emissions from cars and trucks, or emissions from the majority of releases of pesticides, volatile organic compounds, fertilizers, and many other non-industrial sources. They also do not capture the use of toxic chemicals in consumer products that are not manufactured in Massachusetts.

**Table 6**
**2006 PBT Summary**
**(in pounds unless otherwise noted)**

| PBT Chemical/ Chemical Category | Reporting Threshold | Number of Facilities | Total Use | Generated as Byproduct | Shipped in Product | On-Site Releases | Transfers Off-Site |
|---|---|---|---|---|---|---|---|
| Polycyclic Aromatic Compounds (PACs) | 100 lbs. | 31 | 3,735,104 | 1,293 | 119,256 | 691 | 1,733 |
| Benzo(g,h,i) perylene | 10 lbs. | 27 | 49,376 | 113 | 10,878 | 1,982 | 94 |
| Mercury | 10 lbs. | 19 | 13,351 | 7,214 | 4,576 | 919 | 6,488 |
| Mercury Compounds | 10 lbs. | 6 | 1,011 | 315 | 218 | 248 | 65 |
| Poly-chlorinated biphenyls (PCBs) | 10 lbs. | 2 | 22,042 | 22,026 | 16 | 0 | 22,059 |
| Dioxin and Dioxin-like Compounds | 0.1 Grams | 15 | 764.26 Grams | 759.48 Grams | 0.000 Grams | 93.21 Grams | 666.25 Grams |
| Lead | 100 lbs. | 99 | 4,807,589 | 2,606,721 | 2,168,352 | 372,630 | 2,237,154 |
| Lead Compounds | 100 lbs. | 110 | 2,229,335 | 227,047 | 1,815,722 | 17,873 | 212,443 |
| Tetrabromo-bisphenol A | 100 lbs. | 1 | 220 | 0 | 220 | 0 | 0 |

[5] The amounts in all the PBT tables have been rounded to the nearest pound (to the nearest 0.001 gram for dioxin). As a consequence, the sum of the amounts may be slightly more or less than the totals due to rounding.

**Polycyclic Aromatic Compounds (PACs) and Benzo(g,h,i)perylene**

In 2006, 31 facilities reported on PACs and 27 reported on benzo(g,h,i)perylene. The primary activity that triggered reporting of these chemicals was combustion of fossil fuels. These fuels contain PACs and benzo(g,h,i)perylene (i.e., they are already in the fuel that enters a facility's boiler to be combusted to generate heat or steam). Benzo(g,h,i)perylene is an especially toxic polycyclic aromatic compound, and therefore is reported separately from the PACs category and has a lower reporting threshold of 10 pounds (versus a 100 pound reporting threshold for the PACs category).

Table 7 shows a breakdown of PACs use and Table 8 shows a breakdown of benzo(g,h,i)perylene use. The majority of PACs and benzo(g,h,i)perylene were reported by utilities due to fuel combustion. While toxics in fuel oil combusted were exempted from TURA reporting beginning in 2006, this exemption does not apply to utilities.

**Table 7**
**2006 PACs Summary**
**(in pounds)**

| Activity / Facility Type | Number of Facilities | Total Use | Byproduct | Shipped in Product | On-site Releases | Transfers Off-site |
|---|---|---|---|---|---|---|
| Power Plants | 10 | 3,585,954 | 316 | 0 | 163 | 161 |
| Petroleum and Coal Products Manufacturing | 19 | 148,234 | 973 | 119,118 | 525 | 794 |
| Other Sectors | 2 | 916 | 4 | 138 | 3 | 778 |
| **Total** | **31** | **3,735,104** | **1,293** | **119,256** | **691** | **1,733** |

**Table 8**
**2006 Benzo(g,h,i)perylene Summary**
**(in pounds)**

| Activity / Facility Type | Number of Facilities | Total Use | Byproduct | Shipped in Product | On-site Releases | Transfers Off-site |
|---|---|---|---|---|---|---|
| Power Plants | [9] | 37,680 | 2 | 0 | 1,965 | 2 |
| Petroleum and Coal Products Manufacturing | 18 | 11,696 | 111 | 10,878 | 17 | 92 |
| **Total** | **27** | **49,376** | **113** | **10,878** | **1,982** | **94** |

**Mercury and Mercury Compounds**

Nineteen facilities reported the use of mercury, and six facilities reported the use of mercury compounds. Table 9 shows a breakdown of mercury use by activity. Total use of mercury in 2006 was 13,351 pounds. Municipal waste combustors, within the waste management and remediation services sector, reported on-site mercury releases of 916 pounds, which included 368 pounds in air emissions and 548 pounds in ash disposed in lined on-site landfills. The 3,067 pounds of mercury reported as transferred off-site were in ash disposed in lined off-site landfills.

**Table 9**
**2006 Mercury Summary**
**(in pounds)**

| Activity / Facility Type | Number of Facilities | Total Use | Byproduct | Shipped in Product | On-Site Releases | Transfers Off-site |
|---|---|---|---|---|---|---|
| Municipal Waste Combustors | 7 | 3,983 | 3,983 | 0 | 916 | 3,067 |
| Nonmetallic Mineral Product Manufacturing: mercury occurs naturally in Portland cement, and is also in coal combustion fly ash that is mixed with concrete. | 6 | 89 | 2 | 87 | 2 | 0 |
| Lamp/Ballast Recyclers | 2 | 5,812 | 14 | 4,412 | 1 | 14 |
| Electrical Equipment and Computer and Electronic Product Manufacturing: incorporated mercury into products | 2 | 410 | 408 | 77 | 0 | 351 |
| Chemical Manufacturing and Transportation Equipment Manufacturing: used mercury as a processing aid | 2 | 3,057 | 2,807 | 0 | 0 | 3,056 |
| **Total** | **19** | **13,351** | **7,214** | **4,576** | **919** | **6,488** |

Table 10 shows a breakdown of mercury compounds use. Total mercury compounds use in 2006 was 1,011 pounds. All of the use was due to fuel combustion at power plants. Mercury compounds are found in fuel that is otherwise used to produce power. Mercury compounds also are coincidentally manufactured during combustion. The 218 pounds of mercury compounds shipped in product represents the amount contained in fly ash sold by two power plants.

**Table 10**
**2006 Mercury Compounds Summary**
**(in pounds)**

| Activity / Facility Type | Number of Facilities | Total Use | Byproduct | Shipped in Product | On-site Releases | Transfers Off-Site |
|---|---|---|---|---|---|---|
| Power Plants: mercury coincidentally generated via combustion | 6 | 1,011 | 315 | 218 | 248 | 65 |

**Polychlorinated Biphenyls (PCBs)**

For 2006, 2 facilities reported the use of polychlorinated biphenyls (PCBs). Table 11 shows the breakdown of PCB use. Nearly all of the total use of PCBs was attributed to one facility that recycled fluorescent light fixture ballasts and other equipment. This facility also accounted for all of the byproduct and transfers off-site of PCBs. The other facility reported the coincidental generation of PCBs in the manufacture of organic pigments, in accordance with EPA's guidance for reporting PCBs.

**Table 11**
**2006 PCBs Summary**
**(in pounds)**

| Activity / Facility Type | Number of Facilities | Total Use | Byproduct | Shipped in Product | On-site Releases | Transfers Off-site |
|---|---|---|---|---|---|---|
| Lamp/Ballast Recyclers | 1 | 22,026 | 22,026 | 0 | 0 | 22,059 |
| Chemical Manufacturing: coincidentally generates PCBs in manufacture of organic pigments | 1 | 16 | 0 | 16 | 0 | 0 |
| **Total** | **2** | **22,042** | **22,026** | **16** | **0** | **22,059** |

**Dioxin and Dioxin-like Compounds**

Dioxins are byproducts of chemical and combustion processes, often involving chlorine. Dioxins have poor solubility in water and thus accumulate in body fat and concentrate in the food chain. Because dioxin is considered extremely toxic, EPA established a very low reporting threshold of 0.01 gram.

For 2006, 15 facilities reported the use (i.e., coincidental generation) of dioxin and dioxin-like compounds, including six utilities, seven municipal waste combustors within the waste management and remediation services sector, and two facilities within the paper manufacturing sector. The municipal waste combustors accounted for 98% of total use. The combustors reported 85.064 grams of on-site releases of dioxin. Of these releases, 26.764 grams were air emissions and 59 grams were in ash disposed in on-site landfills. The 665.586 grams of dioxins reported as transferred off-site were in ash disposed in off-site landfills. Two paper manufacturers also reported dioxin, which was coincidentally generated via paper bleaching. Table 12 shows the breakdown of dioxin and dioxin-like compounds use.

**Table 12**
**2006 Dioxin and Dioxin-like Compounds Summary**
**(in grams)**

| Activity / Facility Type | Number of Facilities | Total Use | Byproduct | Shipped in Product | On-site Releases | Transfers Off-site |
|---|---|---|---|---|---|---|
| Municipal Waste Combustors | 7 | 750.650 | 750.650 | 0.000 | 85.064 | 665.586 |
| Power Plants | 6 | 12.574 | 7.794 | 0.000 | 7.952 | 0.019 |
| Paper Manufacturing | 2 | 0.836 | 0.836 | 0.000 | 0.191 | 0.646 |
| **Total** | **15** | **764.260** | **759.480** | **0.000** | **93.207** | **666.251** |

**Lead and Lead Compounds**

For 2006, 99 facilities reported the use of lead and 110 reported the use of lead compounds. The largest use of lead was reported by seven facilities, municipal waste combustors within the waste management and remediation services sector, (2,519,573 pounds or 52% of total lead use), in which case the lead results from combustion of trash and is primarily disposed of as part of ash in lined landfills.

The second largest use of lead was reported by seventeen facilities, the fabricated metal product manufacturing sector, (1,984,297 pounds or 41% of total lead use), where the metal is used in a variety of applications. This sector processes a variety of ferrous and nonferrous products, such as tools and hardware.

The largest reported use of lead compounds was reported by fifteen facilities, the chemical manufacturing sector, (641,757 pounds or 29% of total lead compounds use). In this sector, chemical manufacturers are mixing lead compounds to produce chemical and plastics products.

The primary metal manufacturing sector reported the second largest use of lead compounds, (611,077 pounds or 27% of total lead compounds use). The third largest use of lead compounds was reported by the electrical equipment sector, (273,035 pounds or 12% of total lead compounds use). In these sectors, lead compounds are mostly used as heat stabilizers in wire insulation.

| Table 13<br>2006 Lead Summary<br>(in pounds) | | | | | | |
|---|---|---|---|---|---|---|
| **Activity / Facility Type** | **Number of Facilities** | **Total Use** | **Byproduct** | **Shipped in Product** | **On-site Releases** | **Transfers Off-site** |
| Municipal Waste Combustors | 7 | 2,519,573 | 2,519,573 | 0 | 372,000 | 2,147,572 |
| Fabricated Metal Product Manufacturing | 17 | 1,984,297 | 57,294 | 1,897,986 | 369 | 59,039 |
| Primary Metal Manufacturing | 5 | 108,884 | 1,523 | 107,333 | 34 | 1,523 |
| Other Sectors | 70 | 194,835 | 28,331 | 163,033 | 227 | 29,020 |
| **Total** | **99** | **4,807,589** | **2,606,721** | **2,168,352** | **372,630** | **2,237,154** |

| Table 14<br>2006 Lead Compounds Summary<br>(in pounds) | | | | | | |
|---|---|---|---|---|---|---|
| **Activity / Facility Type** | **Number of Facilities** | **Total Use** | **Byproduct** | **Shipped in Product** | **On-site Releases** | **Transfers Off-site** |
| Chemical Manufacturing | 15 | 641,757 | 6,226 | 570,300 | 2,122 | 2,632 |
| Primary Metal Manufacturing | 9 | 611,077 | 29,627 | 527,036 | 4 | 29,957 |
| Electrical Equipment | 6 | 273,035 | 12,749 | 260,456 | 0 | 13,928 |
| Other Sectors | 80 | 703,466 | 178,445 | 457,930 | 15,747 | 165,926 |
| **Total** | **110** | **2,229,335** | **227,047** | **1,815,722** | **17,873** | **212,443** |

**Tetrabromobisphenol A**

In 2006, one facility reported the use of tetrabromobisphenol A, which is a flame retardant. That facility , a fabric coater, had a total use of 220 pounds with the same amount being shipped in product. There were no byproducts, on-site releases or off-site transfers.

# IV. 2006 Significant Industrial Sectors

Under TURA, facilities in the Manufacturing Standard Industrial Classification (SIC) codes (20-39 inclusive) and those in SIC codes 10-14, 40, 44-51, 72, 73, 75 and 76, or the corresponding NAICS code must report their chemical use if they exceed certain thresholds.

Figure 6 shows the number of TURA reporting facilities in each industry sector. The Chemical Manufacturing sector represents approximately 17% (98 facilities) of the number of TURA reporting facilities, and uses 64% of the reportable TURA chemicals (see Figure 7). This sector is a diverse group of industries, and includes companies that manufacture or formulate adhesives, paints, pharmaceuticals, and plastic materials and resins. Approximately 32% of the total chemical use for this sector was attributable to the use of styrene monomer, which is used in the manufacture of polystyrene and other plastics.

**Figure 6 - 2006 Number of Facilities By Industrial Sector**
**Total Number of Facilities = 561**

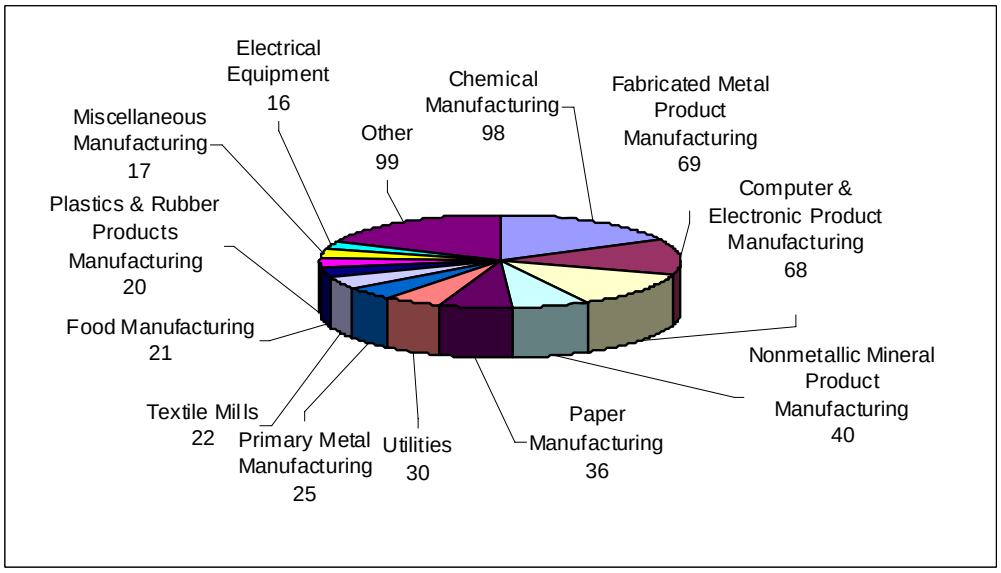
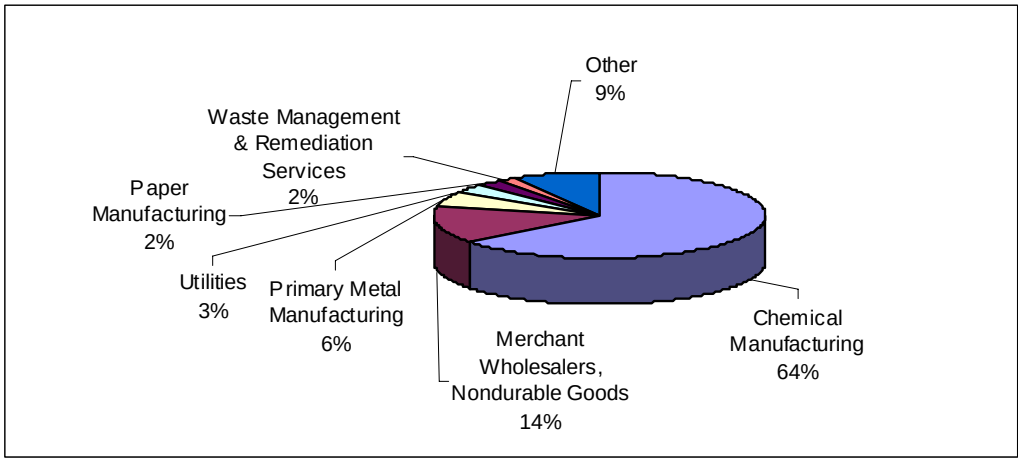



**Figure 7 - 2006 Chemical Use By Industrial Sector**
**Total Use = 1,054,000,000 Pounds**



The second largest sector, Merchant Wholesalers, Nondurable Goods accounted for 14% of total statewide use. The activities of this sector involve repackaging of chemicals for sale to other sectors. The third largest sector, the Primary Metal Manufacturing sector, accounted for 6% of chemical use, the Utilities sector accounted for 3%, and the Paper Manufacturing and Primary Metals each accounted for 2% of total statewide use, leaving the balance of statewide use (9%) to a variety of sectors.

Figure 8 shows byproduct generation by industrial sector. While the Chemical Manufacturing sector accounted for 64% of total statewide use, this sector produced 32% of the total byproduct generated in 2006. In contrast, the Paper Manufacturing sector, which accounted for 2% of total statewide chemical use, accounted for 19% of the byproduct generated.

The Utilities sector accounted for 8%, and the Textile Mills sector accounted for 7% of total byproduct generated. The Fabricated Metal Product Manufacturing, the Plastics & Rubber Products Manufacturing, and the Computer & Electronic Product Manufacturing sectors each accounted for 6% of the total byproduct generated. The remaining 16% of byproduct was attributed to a variety of sectors.

**Figure 8 - 2006 Byproduct Generation By Industrial Sector**
**Total Byproduct = 87,000,000 Pounds**

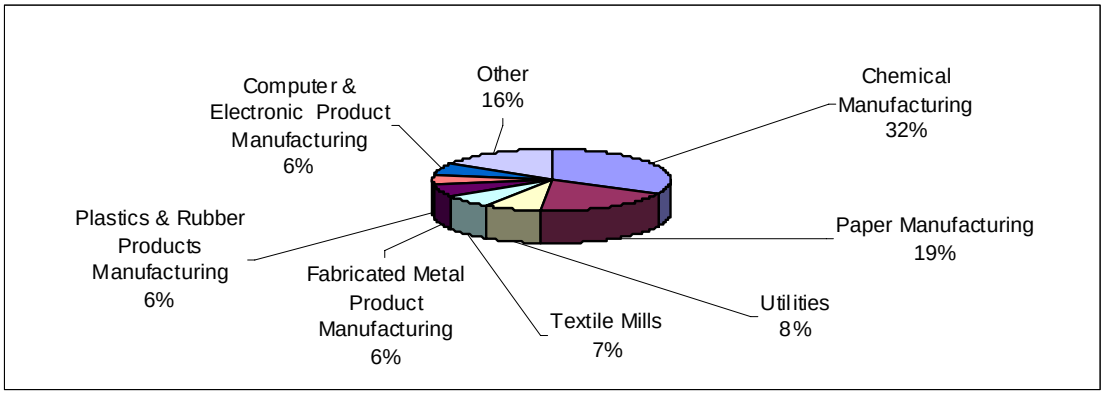



Figure 9 shows on-site releases to the environment by industrial sector. The Utilities sector, which represented 3% of total statewide use, was the largest source of on-site releases, accounting for 48% of all on-site releases. This sector provides power for Massachusetts businesses and citizens. Fifty percent of on-site releases in this sector were attributed to the coincidental manufacture of hydrochloric acid during combustion. The Chemical Manufacturing sector accounted for 64% of total chemical use and only 10% of total on-site releases to the environment. The Fabricated Metal Product Manufacturing and Waste Management and Remediation Services sectors, each accounted for 10% of total on-site releases; and the Paper Manufacturing sector accounted for 9% of total on-site releases. The remaining 13% of on-site releases was attributed to a variety of sectors.

**Figure 9 - 2006 On-Site Releases By Industrial Sector**
**Total On-Site Releases = 7,000,000 Pounds**

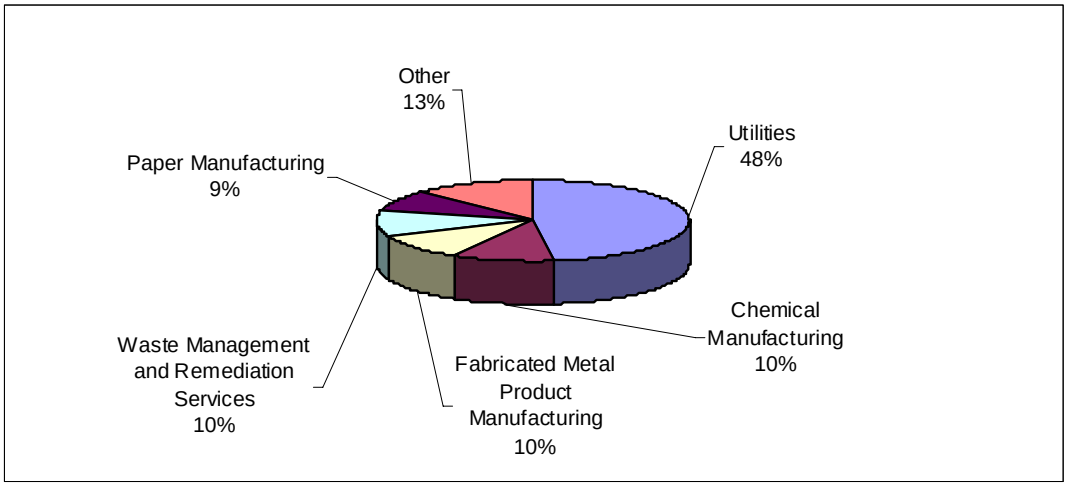
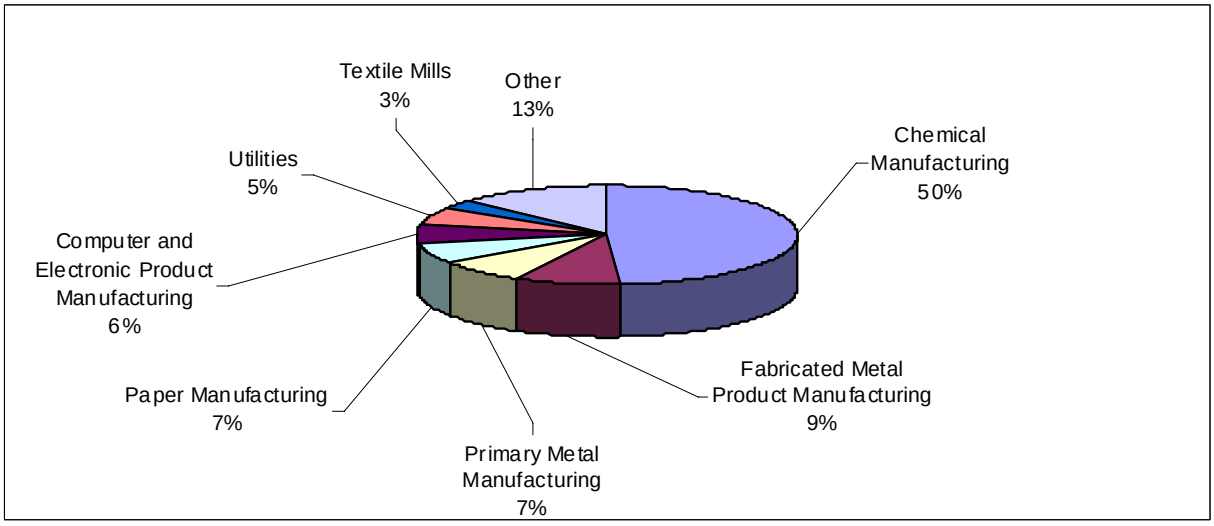



Figure 10 shows transfers off-site by industrial sector. The Chemical Manufacturing sector accounted for 50% of transfers off-site. The second largest sector in this category, the Fabricated Metal Product Manufacturing sector, accounted for 9% of total transfers off-site. The two third largest sectors in this category were the Primary Metal Manufacturing and Paper Manufacturing sectors, each accounting for 7% of total transfers off-site. The other major sectors accounting for total transfers off-site were the Computer and Electronic Product Manufacturing sector, accounting for 6% of total transfers off-site, the Utilities sector, accounting for 5% of total transfers off-site, and the Textile Mills sector, accounting for 3% of total transfers off-site. The remaining 13% of total transfers off-site was attributed to a variety of sectors.

**Figure 10 – 2006 Transfers Off-Site By Industrial Sector**
**Total Transfers Off-Site = 30,000,000 Pounds**



# V. 2006 Major TURA Facilities

**Top 20 Facility Lists**

Table 15 lists the 20 facilities that used the largest quantity of TURA chemicals. These 20 facilities used 806 million pounds, or 76% of total statewide use.

## Table 15 – 2006 Top 20 Facilities
**(Largest Quantity of Total Use)**

| **Total Use** *These quantities include Trade Secret* | | |
|---|---|---|
| **Facility Name** | **Town** | **Total Use (Lbs.)** |
| Ineos Nova LLC | Springfield | 237,802,845 |
| Solutia Inc. - Indian Orchard Plant | Springfield | 104,718,041 |
| Borden & Remington | Fall River | 89,814,303 |
| American Polymers | Oxford | 72,497,272 |
| Holland Company Inc. | Adams | 49,370,000 |
| Ineos Melamines | Springfield | 43,723,744 |
| Eastman Gelatine Corp. | Peabody | 33,040,139 |
| Astro Chemicals Inc. | Springfield | 28,479,028 |
| Ashland Distribution Co. | Tewksbury | 18,572,339 |
| Semass Partnership | Rochester | 15,510,905 |
| James Austin Co. | Ludlow | 14,994,970 |
| Cytec Industries Inc. | Springfield | 14,660,664 |
| North Win Ltd. | Leominster | 14,540,899 |
| Houghton Chemical Corp. | Boston | 13,164,152 |
| ITW TACC | Rockland | 12,381,956 |
| Hercules Inc. | Chicopee | 12,049,895 |
| Omnova Solutions Inc. | Fitchburg | 8,659,107 |
| Bostik Inc. | Middleton | 7,867,724 |
| Advanced Urethane Technologies Inc. | Newburyport | 7,832,434 |
| Webco Chemical Corp. | Dudley | 6,172,080 |

Table 16 lists the 20 facilities that generated the largest quantity of byproduct. These facilities generated 50 million pounds of byproduct, or 57% of total statewide byproduct. Table 16 also lists the 20 facilities with the largest quantity shipped in product. These facilities shipped 277 million pounds in product, or 81% of total shipped in product statewide.

## Table 16 - 2006 Top 20 Facilities
### (Largest Quantity of Byproduct Generation and Shipped in Product)

| **Byproduct Generation** *These quantities include Trade Secret* | | | **Shipped in Product** *These quantities include Trade Secret* | | |
|---|---|---|---|---|---|
| **Facility Name** | **Town** | **Byproduct Generation (Lbs.)** | **Facility Name** | **Town** | **Shipped in Product (Lbs.)** |
| Eastman Gelatine Corp. | Peabody | 6,715,063 | Borden & Remington | Fall River | 89,806,302 |
| 3m Venture Tape Corp. | Rockland | 4,831,839 | Solutia Inc. Indian Orchard Plant | Springfield | 32,012,101 |
| Flexcon Co Inc. Plant 2 | Spencer | 4,790,601 | Astro Chemicals Inc. | Springfield | 27,318,670 |
| Ineos Melamines | Springfield | 4,650,000 | Ashland Distribution Co. | Tewksbury | 18,572,339 |
| Solutia Inc. Indian Orchard Plant | Springfield | 4,600,541 | Holland Company Inc. | Adams | 15,798,000 |
| Intelicoat Technologies Inc. | South Hadley | 3,013,202 | North Win LTD | Leominster | 14,532,839 |
| Ideal Tape Co. | Lowell | 2,492,467 | Houghton Chemical Corp. | Boston | 13,137,444 |
| Bostik Inc. | Middleton | 2,082,477 | ITW TACC | Rockland | 12,210,478 |
| Intel Corp. | Hudson | 1,892,851 | James Austin Co. | Ludlow | 9,303,682 |
| Precision Lithograining Corp. | South Hadley | 1,848,104 | Cytec Industries Inc. | Springfield | 7,269,592 |
| Madico Inc. | Woburn | 1,770,691 | Webco Chemical Corp. | Dudley | 6,166,772 |
| Crane & Co Inc. Pioneer Mill | Dalton | 1,711,931 | Rohm & Haas Electronics Materials LLC | Marlborough | 5,644,164 |
| Dominion Energy BraytonPoint LLC | Somerset | 1,668,396 | ITW Devcon Plexus | Danvers | 3,488,082 |
| Belden CDT Networking Inc. DBA Mohawk CDT | Leominster | 1,326,635 | Callaway Golf Ball Operations Inc. | Chicopee | 3,453,860 |
| ITW Foilmark Inc. | Newburyport | 1,187,054 | Callahan Co. | Walpole | 3,341,153 |
| Polaroid Corp. DBA | Waltham | 1,172,891 | Camco Manufacturing Inc. | Leominster | 3,243,487 |
| Lewcott Corp. | Millbury | 1,155,253 | Advance Coatings Co. | Westminster | 3,079,380 |
| Barnhardt Manufacturing Co. | Colrain | 1,092,032 | Bostik Inc. | Middleton | 2,957,712 |
| Semass Partnership | Rochester | 1,087,969 | Alphagary | Leominster | 2,711,326 |
| Cytec Industries Inc. | Springfield | 1,067,941 | CL Hauthaway & Sons | Lynn | 2,532,268 |

Table 17 lists the 20 facilities that had the largest quantity of on-site releases and also lists the 20 facilities that had the largest quantity of transfers off-site. The 20 facilities with the largest quantity of on-site releases released over 5 million pounds, or 75% of total releases statewide. Six of these facilities were power plants, accounting for 2.8 million pounds, or 39% of total on-site releases. Almost 1.5 million pounds, or 51% of these power plants' on-site releases, were due to the coincidental manufacture of hydrochloric acid during combustion. The remainder of the power plants' on-site releases was due to the coincidental manufacture of the following chemicals during combustion: metal compounds (18%), ammonia (17%), sulfuric acid (8%), and hydrogen fluoride (4%). Five of the Top 20 facilities were municipal waste combustors (MWCs) that reported combustion-related emissions. Of the 1.1 million pounds of on-site releases reported by these MWCs, 67% of the releases was due to the coincidental

manufacture of hydrochloric acid during combustion and 33% was due to lead in ash disposed in an on-site lined landfill at one facility.

The 20 facilities with the largest quantity of transfers off-site transferred 19 million pounds, or 63% of the total transfers off-site statewide.

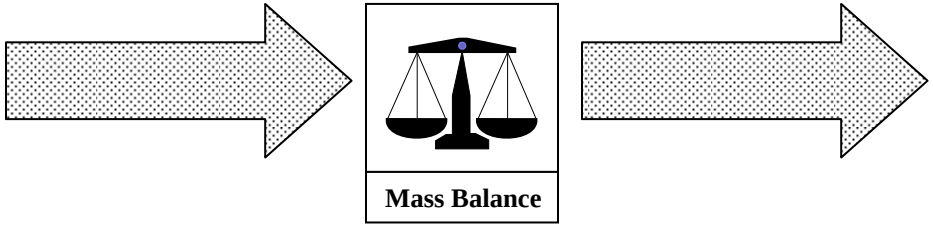
## Table 17 – 2006 Top 20 Facilities
### (Largest Quantity of On-Site Releases and Transfers Off-Site)

| **On-Site Releases** *These quantities include Trade Secret* | | | **Transfers Off-Site** *These quantities include Trade Secret* | | |
|---|---|---|---|---|---|
| **Facility Name** | **Town** | **On-Site Releases (Lbs.)** | **Facility Name** | **Town** | **Transfers Off-Site (Lbs.)** |
| Dominion Energy Brayton Point LLC | Somerset | 1,639,899 | Ineos Melamines | Springfield | 4,212,070 |
| Covanta Haverhill Inc. | Haverhill | 443,178 | Solutia Inc. Indian Orchard Plant | Springfield | 3,511,882 |
| Crown Beverage Packaging USA | Lawrence | 396,797 | Belden CDT Networking Inc. DBA Mohawk CDT | Leominster | 1,328,096 |
| Dominion Energy Salem Harbor LLC | Salem | 330,722 | Ideal Tape Co. | Lowell | 1,203,538 |
| Solutia Inc. Indian Orchard Plant | Springfield | 317,966 | Cytec Industries Inc. | Springfield | 919,508 |
| Mt. Tom Generating Company LLC | Holyoke | 305,996 | Polaroid Corp. DBA | Waltham | 845,808 |
| Boston Generating Mystic LLC | Charlestown | 281,661 | Intel Corp. | Hudson | 836,243 |
| Semass Partnership | Rochester | 271,432 | Semass Partnership | Rochester | 816,538 |
| Wheelabrator Millbury Inc. | Millbury | 179,577 | Waters Corp. | Taunton | 640,950 |
| Mirant Canal LLC | Sandwich | 164,958 | PCI Synthesis Inc. | Newburyport | 630,216 |
| Wheelabrator Saugus JV | Saugus | 131,877 | Applied Biosystems | Bedford | 500,547 |
| Alliance Leather Inc. | Peabody | 130,709 | Intelicoat Technologies Inc. | South Hadley | 444,573 |
| Ideal Tape Co. | Lowell | 130,630 | Wheelabrator Millbury Inc. | Millbury | 439,820 |
| Rodney Hunt Co. | Orange | 123,577 | Brittany Dyeing & Printing Corp. | New Bedford | 437,721 |
| Somerset Power LLC | Somerset | 115,087 | Flexcon Co. Inc. Plant 2 | Spencer | 433,867 |
| Hollingsworth & Vose Co. | West Groton | 111,850 | Wheelabrator Saugus JV | Saugus | 416,655 |
| Wheelabrator North Andover Inc. | North Andover | 97,327 | Precision Lithograining Corp. | South Hadley | 392,833 |
| Vacumet Corp. | Franklin | 96,179 | Wheelabrator North Andover Inc. | North Andover | 386,108 |
| 3M Venture Tape Corp. | Rockland | 96,057 | Interplex Etch Logic | Attleboro | 385,671 |
| Tyco Electronics Corp. | Worcester | 57,856 | Koch Membrane Systems Inc. | Wilmington | 378,005 |

This section contains definitions of key TURA terms.

**TURA** – Massachusetts Toxics Use Reduction Act of 1989 (MGL 21I)
**TRI** – federal EPA Toxics Release Inventory
**TRADE SECRET** – the information identified as confidential by TURA filers. To protect confidentiality claims by Trade Secret filers, all trade secret data in this information release are presented in aggregated form. Aggregated data do not include the names and amounts of chemicals subject to claims of confidentiality.
**2000 CORE GROUP** – includes all industry categories and chemicals that were subject to TURA reporting in 2000 and remained subject to reporting in 2006. The 2000 Core Group is used to measure progress from 2000 to 2006.

The terms and definitions below have been arranged in order of inputs and outputs. Chemicals that are used by companies are brought into the facility and are manufactured, processed or otherwise used. As a result of using these chemicals, a company has outputs that can include a product that is created for sale, or a byproduct or waste. The calculation of use and waste of chemicals is known as 'mass balance.' Generally the inputs equal the outputs, but there are circumstances where a chemical is used in ways that result in an imbalance between inputs and outputs. These circumstances are most often the result of: 1) chemicals are recycled on-site, 2) the product was held in inventory, 3) chemical is consumed or transformed, or 4) the chemical is a compound.




**TOTAL USE** – the total quantity in pounds of TURA chemicals reported as manufactured, processed and otherwise used.

**MANUFACTURE** – to produce, prepare, import or compound a toxic or hazardous substance.

**OTHERWISE USE** – any use of a toxic substance that is not covered by the terms "manufacture" or "process" and includes use of a toxic substance contained in a mixture or trade name product.

**PROCESS** – the preparation of a toxic or hazardous substance, including without limitation, a toxic substance contained in a mixture or trade name product, after its manufacture, for distribution in commerce: a) in the same form or physical state, or in a different form or physical state, from that in which it was received by the toxics user so preparing such substance; or b) as part of an article containing the toxic or hazardous substance.

**PRODUCT** – a product, a family of products, an intermediate product, family of intermediate products, or a desired result or a family of results. "Product" also means a byproduct that is used as a raw material without treatment.

**SHIPPED IN PRODUCT** – the quantity in pounds of the chemical that leaves the facility as product.

**BYPRODUCT** – all non-product outputs of reportable substances generated by a production unit prior to handling, treatment, and release.

**ON-SITE RELEASES**– all byproducts that are released to the air, discharged to surface waters, released to land and underground injection wells.

**TRANSFERS OFF-SITE** – byproducts that are transferred off-site for energy recovery, recycling, treatment and disposal.

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Deval L. Patrick, Governor

Executive Office of Energy and Environmental Affairs
Ian A. Bowles, Secretary

Department of Environmental Protection
Laurie Burt, Commissioner