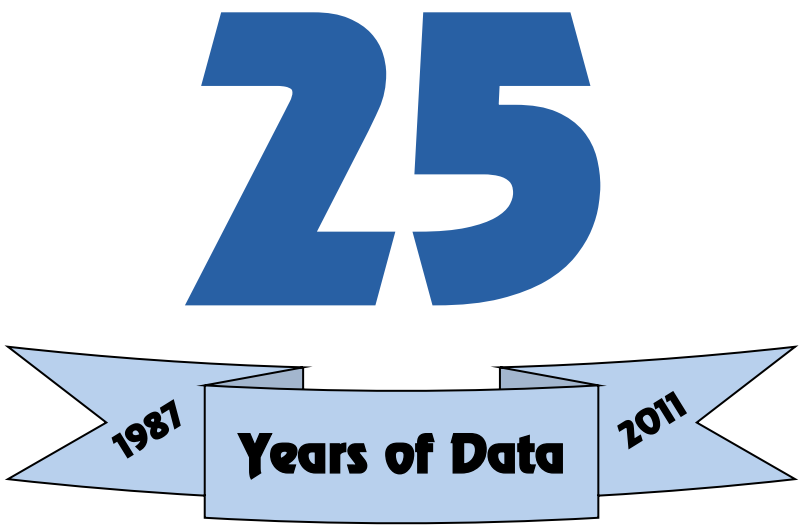
DELAWARE TOXICS RELEASE INVENTORY



2011

DATA SUMMARY

Prepared by the
Department of Natural Resources and Environmental Control
Division of Waste and Hazardous Substances

November 2012

2011 TRI DATA SUMMARY

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Front Cover: *The TRI program celebrates its 25th year of providing important chemical release and other waste management information to the public, while Delaware facilities continue to report significant reductions in releases of these chemicals to the environment.*

A Message from DNREC Secretary Collin O'Mara

The 2011 Toxics Release Inventory (TRI) data marks a banner year as we celebrate both the 25th year of TRI data's availability to the public and additional environmental progress with productivity up and emissions down. Since its inception, the TRI program has served as an easy-to-use source of important data about toxic chemicals that are released and managed as waste by the state's industrial facilities.

The TRI program does not mandate reductions in chemical releases, or control waste management activities. However, while many of the reductions in releases of TRI chemicals over the years have been the result of regulatory control programs, significant reductions have resulted solely from the public availability of the data and subsequent industry efforts to lower their TRI numbers. Delaware facilities have reduced on-site releases of original reportable chemicals by 91 percent since 1990 (typically used as a base year, since the reporting requirements were phased into TRI over the first several years). Delaware facilities have also reduced on-site releases of the original chemicals (those chemicals added to TRI reporting in 1995) and the electric generating facilities (added to TRI in 1998) by 71 percent. By any measure, TRI data facilitated by DNREC has proven to be a success.

For 2011, average production for all TRI facilities reporting in Delaware increased 31 percent. Contrary to this increase, however, total on-site releases of toxic chemicals declined an additional 9 percent compared to 2010. This is great news for Delaware – and shows that a healthy environment and strong economy are not mutually exclusive. As with last year, reductions in releases of acid gases from power plants account for a significant portion of the total reduction in TRI on-site releases. For 2011, the electric generating facilities reported 1,738,000 pounds, a significant reduction of 1,126,000 pounds (39 percent), down from the 2,864,000 pounds reported for 2010. DNREC's Regulation 1146, a two-phase air quality regulation designed to sharply reduce emissions from Delaware power plants (see page 53 of this report for details), continues to show results. Among them: NRG's Indian River power plant commissioned a major upgrade to its Unit 4 coal-powered generator; NRG in Dover will be completing a conversion to natural gas in early 2013, and the Calpine Edge Moor/Hay Road Power Plant converted from coal to natural gas in July 2010 and the Invista Seaford facility converted to natural gas in April 2009. On-site releases of Mercury to the air reported by the four power-generating facilities are down 94 percent since 2003 from 572 pounds to 33 pounds for 2011.

Total TRI waste for 2011, including on-site releases, transfers off-site, and on-site waste management, did increase by 26 percent over 2010, but this increase was less than the 31 percent increase in average production noted above for Delaware TRI facilities. Both the increase in production and the increase in total waste were due in large part to the Delaware City Refinery coming back on line in 2011, after being idled during 2010. While 2011 TRI reported releases and waste amounts for the refinery represent an increase over the idled operations in 2010, the amounts are lower than the production years immediately prior. TRI chemical releases and waste management activities reported for this and other Delaware facilities for 2011 are detailed within this report.

In Delaware, we are demonstrating that we can have a healthy environment and a strong economy – but there is still more work to do. TRI is an important scorecard for all Delawareans and I urge you to review the information in this report and use it to get involved concerning management of chemicals in and around your community. I also encourage our industrial partners to continue to reduce the releases of pollutants, making Delaware a cleaner and safer environment for everyone to enjoy.

Please see the ***For Further Information*** section of this report for details on accessing TRI data, and links to many other DNREC and EPA Internet sites devoted to Community Right-To-Know.

Sincerely,

Collin P. O'Mara, Secretary,
Department of Natural Resources and Environmental Control

INTRODUCTION

Chemicals are a part of our lives. We use chemicals in our homes, our cars, our schools, and our industries. Chemicals are used to make many things, including electricity, fuel, and consumer products, which we use, enjoy, and depend on each day.

Delaware citizens and all Americans also have a right to air that is clean, water that is safe to drink, food that is free from dangerous contaminants, and communities that are free of hazardous wastes.

In 1986, Congress created the Toxics Release Inventory (TRI) as part of the Superfund Amendments and Reauthorization Act (SARA) to ensure that toxic chemicals and their wastes are managed and used safely and responsibly by the manufacturing industries and other facilities, and to let the communities in which these facilities are located know about the disposal and waste management of these chemicals.

Recognizing the value of information and the power the public can apply through the use of the "Right-to-Know" concept, Delaware and DNREC joined with the EPA and first reported on releases and other waste management of toxic chemicals in Delaware for 1987.

This report provides a summary of the release and waste management of toxic chemicals by Delaware facilities in 2011. DNREC also publishes a second, more detailed TRI report that provides information about each TRI chemical reported by each facility in Delaware.

TRI facilities reported a decrease of 404,000 pounds (9%) in the total amount of state-wide on-site releases for 2011. Off-site waste management activities increased 3% and on-site waste management, not including releases, was higher by 37%.

In 2011, the Delaware City Refinery restarted, having been idle in 2010. The facility has returned to full production but reported lower releases and waste management amounts for 2011 compared to 2009, its last year of operation. These changes, in connection with the conversions made by the electric power plants to achieve compliance with the new regulations designed to reduce pollution and the normal year-to-year changes reported by other facilities, resulted in a decrease in on-site releases for 2011.

The on-site release trend for persistent bioaccumulative toxins (PBTs) was up by 4,600 pounds or 52%, but down 56% since 2001. The trend for cancer-causing chemicals (carcinogens) was up by 28,000 pounds, or 18%, for 2011, but down 78% since 1998.

We hope that, with the help of industry and interested citizens, reductions in the amounts of on-site releases of TRI chemicals will continue.

Delaware's Department of Natural Resources and Environmental Control (DNREC) hopes that the information presented in this report will benefit Delaware citizens by improving their awareness and promoting their involvement in environmental issues in their communities.

WHAT IS THE TOXICS RELEAESE INVENTORY?

The **Toxics Release Inventory**, or **TRI**, is a collection of data that contains information about toxic chemicals that are manufactured or used by some, but definitely not all, facilities in the United States. See the next page for details on who must report to the TRI program. This information is reported each year by the facilities to the states where they are located and to the U.S. Environmental Protection Agency (EPA). This information is made available to the public through this report and a more technical report published by Delaware's Department of Natural Resources and Environmental Control (DNREC). In addition, the EPA publishes TRI reports, and the data is available through state and federal internet sites. The TRI program was established in 1986 to provide information to the public about the presence and release of toxic chemicals in their communities. It is part of the Emergency Planning and Community Right-to-Know Act (EPCRA).

The EPCRA Reporting Programs at EPA and DNREC maintain databases that are updated as new reports are received. The databases currently contain 25 years of data. Most chemical releases reported under TRI are also regulated through Federal and/or State permits.

This report is a summary of the 2011 TRI data and revisions received as of October 1, 2012 from Delaware facilities.

WHY IS THERE A NEED FOR THIS PROGRAM?

A dramatic and fatal accident involving the release of a large quantity of methyl isocyanate gas occurred in Bhopal, India on December 3, 1984. Because of this release and similar, less tragic, accidents that occurred in the United States, Congress enacted the Emergency Planning and Community Right to Know Act (EPCRA). The purpose of this Act is to give citizens information about the chemicals present in their communities, and to improve the ability of facilities and local emergency agencies to plan for and respond to chemical emergencies. The Act established a number of reporting requirements for facilities and businesses, and reporting began in 1987. In 1991, Delaware established its own EPCRA legislation that enhanced the federal requirements.

WHAT IS A TOXIC CHEMICAL?

A toxic chemical is one that meets any one of several standards for serious or significant potential to harm human, fish, or animal life, or to be harmful to the environment. There are now 597 chemicals and an additional 30 chemical categories, such as mercury compounds, polycyclic aromatic compounds (PAC's), and Dioxin and Dioxin-like compounds, on the TRI chemical list. Of these chemicals and compounds, 89 were reported by 63 facilities in Delaware for 2011.

WHO MUST REPORT TO THE TRI PROGRAM?

Not every facility in Delaware reports to the TRI program. There are three requirements a facility must meet before reporting is required.

1. Only facilities that have 10 or more full time employees are required to report.
2. A facility must be doing business as a manufacturer or processor, generate electric power, or distribute bulk petroleum products. All federal facilities are also required to report.
3. A facility must manufacture or process one of the chemicals on the TRI list in quantities greater than a minimum threshold value. This value is generally 25,000 pounds for Manufacturing and Processing, and 10,000 pounds for the Otherwise Use category. There are lower threshold values (see Table 2 on page 8) for Bioaccumulative Toxins (PBTs). Some facilities are able to report only non-PBT chemicals on the short Form A if the reportable amount of the chemical meets certain criteria. No amounts are reported on Form A; use of the form indicates that the facility manufactured, processed, or otherwise used less than 1,000,000 pounds, and all releases and waste were less than 500 pounds of the chemical during the year.

HOW DO WE GET THE DATA?

Each year by July 1, facilities report on each chemical that meets the reporting threshold. Each chemical report is usually on a 5-page form that details the type and amount of on-site release, off-site transfer, or on-site waste management activity the chemical has experienced during the prior calendar year. The facilities report this data to DNREC and to the EPA.

DNREC and EPA check the data for completeness and accuracy, including comparing it with data reported to other programs.

DNREC also visits some of the facilities to get a better understanding about the process at the facility and the reasons for specific chemical use. In addition, DNREC and EPA may audit a facility if they suspect that reporting was not accurate. Both DNREC and the EPA publish reports on the data. TRI data and reports, such as this one, are available to the public.

TYPES OF TRI DATA

TRI chemical data is reported in several categories. Table 1 on the next page lists all the categories and amounts reported to the TRI program in 2011.

On-Site Releases: On-site releases in Delaware are to **air, water,** or **land**. **Releases to air** includes exhaust air collected by vents, ducts, or pipes, as well as air escaping into the general facility atmosphere. **Releases to water** are releases to streams or water bodies, including rivers, lakes, oceans and bays at the facility site. This includes releases from sources such as industrial process outflow or open trenches and storm water runoff. **Releases to land** go to landfills, hazardous waste landfills, surface impoundments (uncovered holding areas used to evaporate and/or settle waste materials), other land disposal such as waste piles or releases, and land application or treatment in which waste containing a TRI chemical is applied to or incorporated into soil or land at the facility.

Off-Site Transfers: Off-site transfers include transfer of chemical waste to **POTW's** (Publicly Owned Wastewater Treatment Plants), to **recycle** operations, to **energy recovery** operations, to **treatment** operations, and to **disposal.** These transfers are to other facilities that are permitted to accept the waste from the facility that generates it.

On-site waste Management:
Waste management activities at the facility generating the waste include **recycling, energy recovery, and treatment.** These are the same as described above in Off-Site Transfers, but these activities occur on-site.

2011 DATA SUMMARY

Table 1 shows statewide totals of 2011 reported TRI on-site releases, off-site transfers, and wastes managed on-site. These different categories are discussed in the previous section and below.

Sixty-three facilities submitted 243 reports on 89 different chemicals. Reports from all Delaware facilities showed an overall reduction in the total amount of state-wide on-site releases by 404,000 pounds (9%) for 2011. These facilities also reported an increase of 15,159,000 pounds (37%) in on-site waste management amounts, and an increase of 353,000 pounds (3%) in transfers off-site for disposal or treatment.

Operations have resumed at the Delaware city refinery, but on-site releases were down by 450,000 pounds for 2011 compared to 2009, as refining operations were idle during all of 2010.

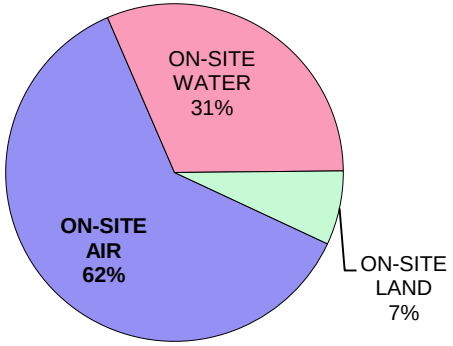
ON-SITE RELEASES

On-site releases are emissions to the air, water, or land environment at the facility site. Figure 1 shows the relative amounts of all TRI chemicals released on-site for all Delaware TRI facilities. Releases to air make up the largest portion (62% for 2011) of the total on-site release amount. The percentage released to air decreased for 2011 because of increases in releases to water and land, and decreases in releases to air.

TABLE 1
2011 TRI DATA SUMMARY
(IN POUNDS)

	2011
No. of Facilities	63
No of Form As	34
No of Form Rs	209
No. of Chemicals	89
On-Site Releases	
Air	2,417,599
Water	1,230,737
Land	278,669
Total On-Site Releases	3,927,005
Off-Site Transfers	
POTWs	1,048,588
Recycle	8,028,698
Energy Recovery	2,110,293
Treatment	274,727
Disposal	2,307,392
Total Off-Site Transfers	13,769,699
On-Site Waste Mgmt.	
Recycle	7,974,584
Energy Recovery	9,172,883
Treatment	38,585,960
Total On-Site Mgmt.	55,733,427
Total Waste	73,430,130

FIGURE 1
2011 ON-SITE RELEASES



TOTAL REPORTED
3,927,005 POUNDS

Of all the TRI chemicals released to **air**, hydrochloric acid, sulfuric acid, and hydrogen fluoride make up about 75% of the total releases to air, and 46% of the total releases to air, water, and land combined. A great portion of these acid gasses are generated

by the power plants at Indian River, the Delaware City refinery, and NRG Dover.

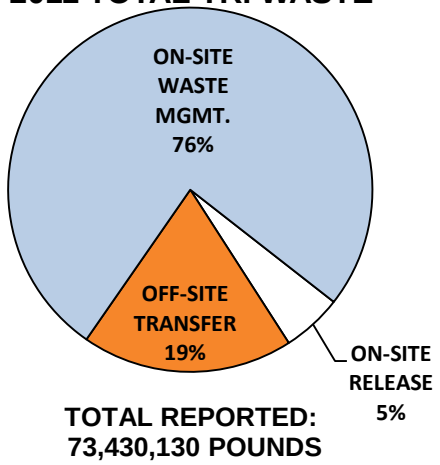
On-site releases to **water** consist mostly of nitrate compounds from the Premcor and Perdue Georgetown facilities. Although these facilities are large producers of nitrate compounds, there are several other nitrate-producing facilities in Delaware that are not subject to the TRI program.

On-site releases to **land** are mostly metallic compounds such as barium, vanadium, lead, nickel, manganese, chromium, copper, and zinc compounds. The Indian River Power Plant and Evraz Claymont Steel (ECS) generate most of these compounds from impurities in fuels (Indian River) and metals (ECS) that they process.

TOTAL WASTE

The relative amounts of all TRI chemical wastes from the three main categories in Table 1 are shown in Figure 2, where you can see the percentage contribution of the on-site releases, off-site transfers, and on-site waste management.

FIGURE 2
2011 TOTAL TRI WASTE



TOTAL REPORTED: 73,430,130 POUNDS

Table 1 and Figure 2 show that on-site releases make up only about 5% of the total TRI waste. Other data, including transfers off-site and waste managed on-site are discussed in more detail in the *2011 TRI Data Detail Report* available from DNREC.

LIMITATIONS OF TRI DATA

In addition to the fact that not all facilities in Delaware are required to report to the TRI program, there is an important thing to keep in mind:

THIS DATA DOES NOT INDICATE THE AMOUNT, IF ANY, OF HUMAN EXPOSURE OR HOW SEVERE IT MIGHT BE.

TRI data does not provide an indication of actual or potential exposure to the reported releases and cannot be used by itself to determine the impact on your health. Other factors such as the chemical's release rate, the toxicity of the chemical, where the chemical enters the environment, the direction of its path and its proximity to nearby communities must be fully considered when assessing exposure to the chemical. For example, a small release to air of a highly toxic chemical near a community may be a greater risk than a large release to land of a less toxic chemical in a remote area.

PERSISTENT, BIOACCUMULATIVE TOXIC CHEMICALS

In 2000, the EPA required reporting at much lower threshold levels on a class of chemicals known as persistent, bioaccumulative, toxics (PBTs). Table 2 shows the new thresholds. In 2001, lead and lead compounds, already on the TRI chemical list, were added to the PBT list, and their reporting thresholds were also reduced.

PBTs are receiving increased attention because we are learning that these chemicals are more toxic to humans, animals, and the environment than others. They remain in the environment for a long time and may not be readily destroyed by nature. PBTs may also move up the food chain and accumulate in bodies of humans, fish, and animals rather than being destroyed or eliminated.

If these PBT chemicals are manufactured, processed, or otherwise used above the reporting threshold amounts shown in Table 2, rather than the amounts on page 4, they are reportable to the TRI program. Because of the increased hazards associated with these substances, the thresholds for reporting PBTs to TRI are much lower than the basic thresholds applied to other, non-PBT substances. The total amounts released on-site for these PBT substances are shown in Table 3 on the next page.

TABLE 2
2011 DELAWARE PBT CHEMICALS AND REPORTING THRESHOLDS
(pounds/year)

Chemical or Chemical Category	Threshold (Pounds)	2011 REPORTS
Aldrin	100	0
Benzo[g,h,I]perylene	10	4
Chlorodane	10	0
Dioxin and dioxin-like compounds category	0.1 grams	6
Heptachlor	10	0
Hexachlorobenzene	10	1
Isodrin	10	0
Lead *	100	2
Lead and lead compounds *	100	13
Mercury	10	3
Mercury compounds	10	6
Methoxychlor	100	0
Octachlorostyrene	10	1
Pendimethalin	100	0
Pentachlorobenzene	10	1
Polychlorinated biphenyls (PCBs)	10	1
Polycyclic aromatic compounds category (PACs)	100	10
Tetrabromobisphenol A	100	0
Toxaphene	10	0
Trifluralin	100	0
* Lower Threshold For 2001 Reports	TOTAL	48

Table 3 shows the reported on-site release amounts for PBTs for 2006-2011. The PBT chemicals made up a small part, about 0.35%, of the

total TRI on-site releases for 2011. Lead and lead compounds make up a large portion, 12,606 pounds, or 93%, of PBT on-site releases for 2011. Releases from coal-burning operations at power generating facilities accounted for 10,708 pounds, or 85%, of this amount. However, the 2011 reported on-site releases of PBTs are 4,647 pounds (52%) higher compared to 2010 because of a large increase (4,928 pounds) in the amount of lead compounds released mostly to land from coal-burning power plants.

TABLE 3

2006-2011 TRI PBT DATA SUMMARY

(IN POUNDS)

	2006	2007	2008	2009	2010	2011
No. of Facilities	26	30	27	25	26	26
No. of Form A	6	4	NA	NA	NA	NA
No. of Form R	54	59	60	54	49	48
No. of Chemicals	11	11	11	11	11	11
On-Site Releases						
Air	4,075	4,172	3,716	1,568	1,768	2,253
Water	1,405	1,565	1,008	492	1,143	132
Land	25,309	15,270	28,948	18,052	6,039	11,212
Total On-Site Releases	30,789	21,008	33,673	20,112	8,949	13,596

Other PBT chemicals had smaller increases or decreases.

The Dover Air Force Base had the largest PBT release to air, 1,073 pounds. Evraz Claymont Steel had the largest PBT release to water, 63 pounds and the Indian River Power Plant had the largest PBT release to land, 10,490 pounds. All releases were lead compounds.

Over 91% of the PBT amount transferred off-site for recycle was lead compounds from Johnson Controls. The Delaware City Refinery reported the highest amount of on-site PBT chemical waste management with 313 pounds of benzo(g,h,i) perylene and 257 pounds of polycyclic aromatic compounds being treated on-site.

DIOXINS

Chemicals vary in toxicity, and dioxins are the most highly toxic class of PBTs. Because of their high toxicity, dioxins are reported in grams rather than pounds under TRI. One gram equals 0.0022 pounds. The dioxin trend for Delaware is shown in Figure 3 on the next page. The DuPont Edge Moor facility made a major process change and reduction in on-site releases starting in 2003; its reported 2002 on-site release was 13.85 grams (and higher for previous years) but its 2011 amount was only 1.47 grams.

Evraz Claymont Steel, the top reporter in Delaware for on-site release of dioxins for 2011, reported 7.05 grams, or 0.015539 pounds. Table 4 shows the amounts reported released on-site by the facilities that reported on dioxins. The total amount reported for 2011 was 11.58 grams, down from the 18.03 grams reported for 2002.

Beginning with reporting year 2008, additional information on toxicity became available to TRI for dioxin and dioxin-like compounds (DLCs). The 17 compounds that fall under the category of DLCs reportable to TRI have a wide range of toxicity; the toxicity value is called the Toxic Equivalent Factor (TEF). In order to compare the releases on an equal toxicity basis, we multiply the TEF of each dioxin by the weight reported to get the Toxic Equivalent Quantity (TEQ). The rank of facilities may change when comparing weight or TEQ amounts.

Please see the 2011 TRI Detail Report for a more technical discussion of TEQ. The discussion includes comparisons based on weight and TEQ amounts for each facility reporting dioxins.

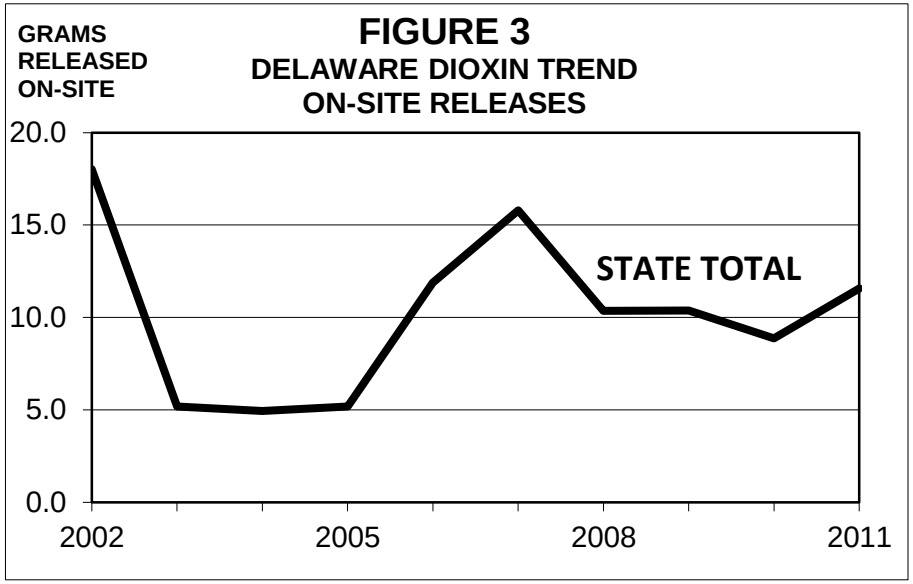


FIGURE 3
DELAWARE DIOXIN TREND
ON-SITE RELEASES

TABLE 4
FACILITIES SORTED BY DIOXIN ON-SITE RELEASE

FACILITY	TOTAL ON-SITE GMS. RELEASE	ON-SITE GMS. RANK
EVRAZ CLAYMONT STEEL	7.05	1
EDGE MOOR/HAY ROAD POWER PLANTS	2.69	2
DUPONT EDGE MOOR	1.47	3
DELAWARE CITY REFINERY	0.23	4
INDIAN RIVER POWER PLANT	0.13	5
FORMOSA PLASTICS	0.01	6
TOTAL	11.58	

Mercury and Mercury Compounds

Mercury (elemental mercury) and mercury compounds are an important part of the PBT category, and this section discusses some of the data. Control of mercury and mercury compounds is becoming increasingly important as we learn more about the serious side effects of mercury.

Figure 4 shows the trend since 2000. Total reported on-site releases of mercury in Delaware have decreased by 87% since the peak of 1,738 pounds in 2002. Reported total mercury and mercury compound on-site release amounts increased by 42 pounds (22%) compared to 2010. Evraz Claymont Steel led the changes with an increase of 25 pounds, Delaware City Refinery was second an increase of 23 pounds, and the Indian River Power plant reported a decrease of 13 pounds. The reasons for the changes are a combination of changing mercury content of materials used, such as coal or metals, and better pollution controls.

FIGURE 4
DELAWARE MERCURY TRENDS
ON-SITE RELEASE, ALL FACILITIES

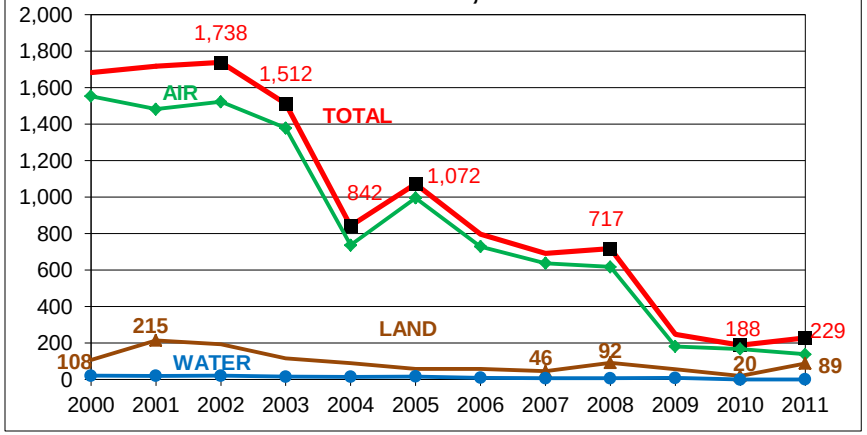
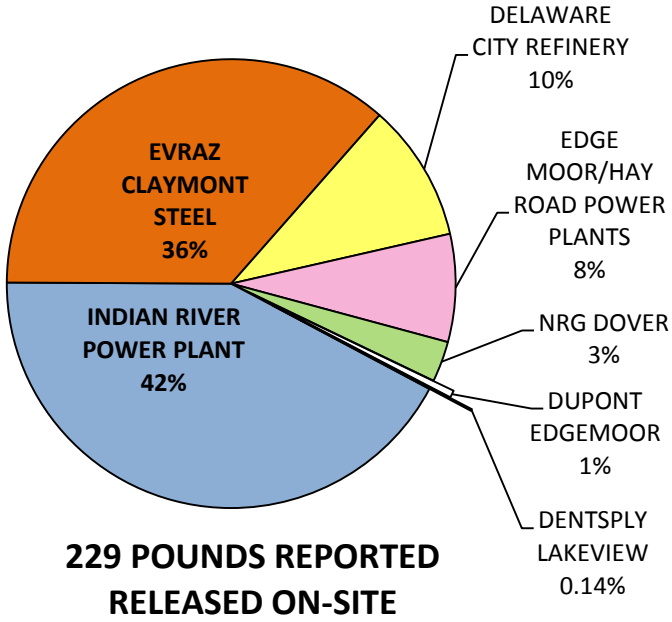


Figure 5 shows the percentage that each of the facilities that reported a mercury or mercury compound contributed to the mercury on-site release for 2011. Intervet and Occidental Chemical were required to report on mercury because of activities at the facility involving mercury, but these facilities did not report any on-site releases of mercury.

FIGURE 5
2011 ON-SITE MERCURY RELEASES
FROM DELAWARE FACILITIES



229 POUNDS REPORTED RELEASED ON-SITE

CARCINOGENIC CHEMICALS

Some chemicals are known to or suspected to cause cancer in humans. These chemicals are called carcinogens. Table 5 shows the 29 chemicals on the TRI list that are identified as carcinogens and were reported in Delaware for 2011. Table 5 also shows the number of reports (75) that were received by Delaware for each of these chemicals.

DATA FOR CARCINOGENIC CHEMICALS

Table 6 shows data for carcinogens reported to TRI in Delaware since 2005. The trend has been generally down from the 412,943 pounds reported for 2005, but recent increases were reported by Formosa Plastics for vinyl acetate (15,735 pounds) and benzene (5,668 pounds) from the Delaware City Refinery, both released to air. Additional detail can be found in the longer, more technical *2011 TRI Data Detail Report* available from DNREC. The amount of carcinogens released on-site in 2011 has increased by 18% compared to the amount released in 2010 and has decreased 55% since 2005.

TABLE 6

2005-2011 TRI CARCINOGENS

ON-SITE RELEASES IN POUNDS

	2005	2006	2007	2008	2009	2010	2011
AIR	226,188	187,836	145,637	161,821	128,593	142,210	167,047
WATER	8,062	6,770	8,094	5,627	2,586	1,761	1,468
LAND	178,694	187,366	78,238	140,976	51,417	14,862	18,572
TOTAL ON-SITE	412,943	381,972	231,970	308,424	182,596	158,832	187,087

TABLE 5

CARCINOGENS REPORTED BY DELAWARE FACILITIES FOR 2011

CHEMICAL NAME	IARC	NO. OF REPORTS
4,4'-METHYLENEBIS(2-CHLOROANILINE)	1	2
ARSENIC COMPOUNDS	1	2
ASBESTOS (FRIABLE)	1	1
BENZENE	1	2
CHROMIUM COMPOUNDS	1	5
ETHYLENE OXIDE	1	1
NICKEL COMPOUNDS	1	6
VINYL CHLORIDE	1	1
1,3-BUTADIENE	2A	1
CREOSOTE	2A	1
LEAD	2A	2
LEAD COMPOUNDS	2A	13
POLYCHLORINATED BIPHENYLS	2A	1
TRICHLOROETHYLENE	2A	1
COBALT COMPOUNDS	2B	1
DICHLOROMETHANE	2B	1
ETHYL ACRYLATE	2B	1
ETHYLBENZENE	2B	3
HEXACHLOROBENZENE	2B	1
NAPHTHALENE	2B	6
NICKEL	2B	2
NITROBENZENE	2B	1
P-CHLOROANILINE	2B	1
POLYCYCLIC AROMATIC COMPOUNDS	2B	10
PROPYLENE OXIDE	2B	1
STYRENE	2B	3
TETRACHLOROETHYLENE	2B	1
TOLUENE DIISOCYANATE (MIXED ISOMERS)	2B	3
VINYL ACETATE	2B	1
CHEMICALS = **29**	REPORTS = **75**	

Source: 2011 DNREC TRI Database, October 2012

FIGURE 6

2011 ON-SITE RELEASES BY COUNTY

NEW CASTLE

Releases to Air = 597,724 Pounds
Releases to Water = 983,474 Pounds
Releases to Land = 22,090 Pounds
Total On-Site Releases = 1,603,288 Pounds
155 Reports, 33 Facilities
40.8% of Statewide Releases

KENT

Releases to Air = 137,150 Pounds
Releases to Water = 0 Pounds
Releases to Land = 0 Pounds
Total On-Site Releases = 137,150 Pounds
32 Reports, 12 Facilities
3.5% of Statewide Releases

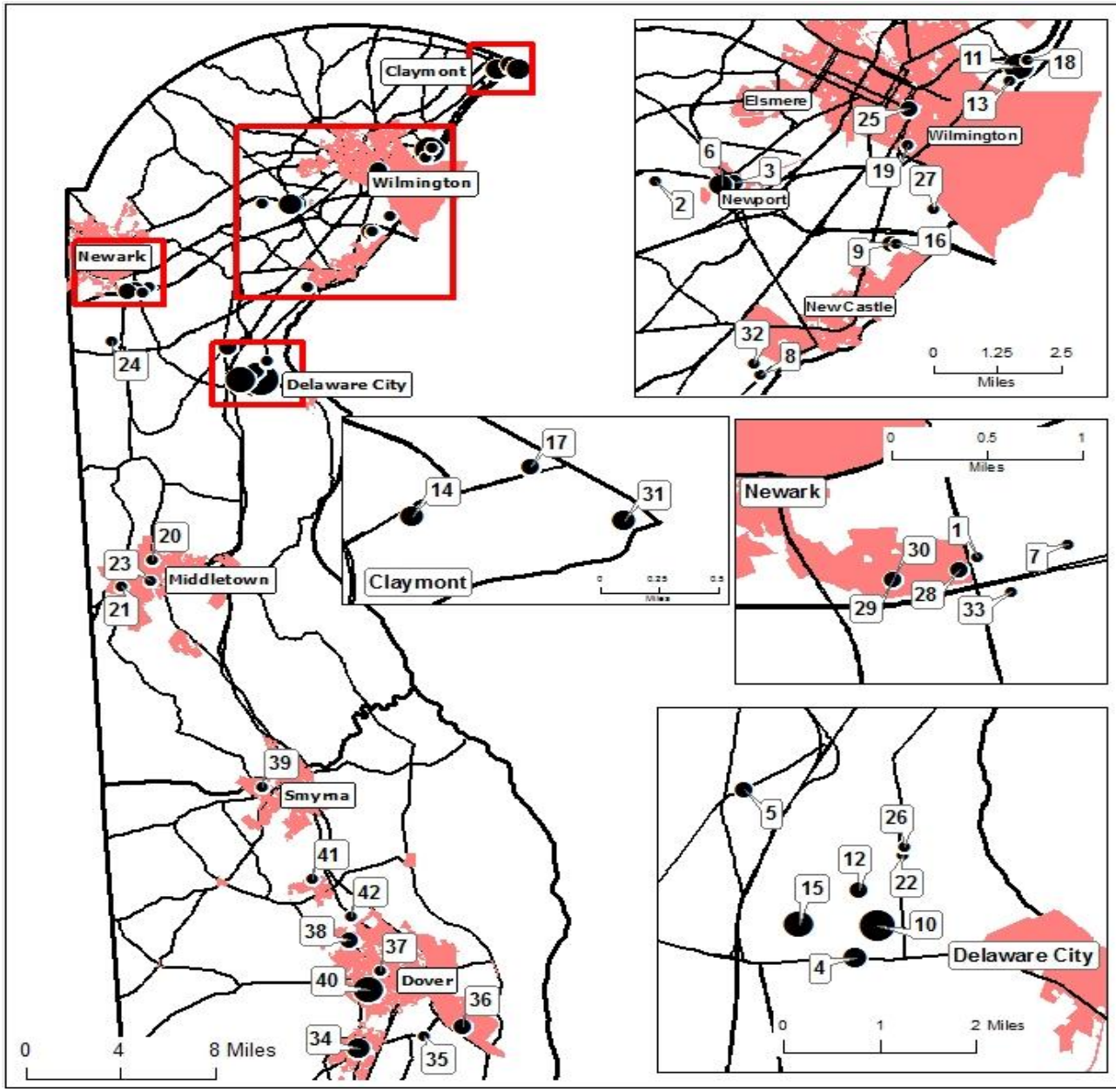
SUSSEX

Releases to Air = 1,682,725 Pounds
Releases to Water = 247,263 Pounds
Releases to Land = 256,579 Pounds
Total On-Site Releases = 2,186,567 Pounds
56 Reports, 18 Facilities
55.7% of Statewide Releases

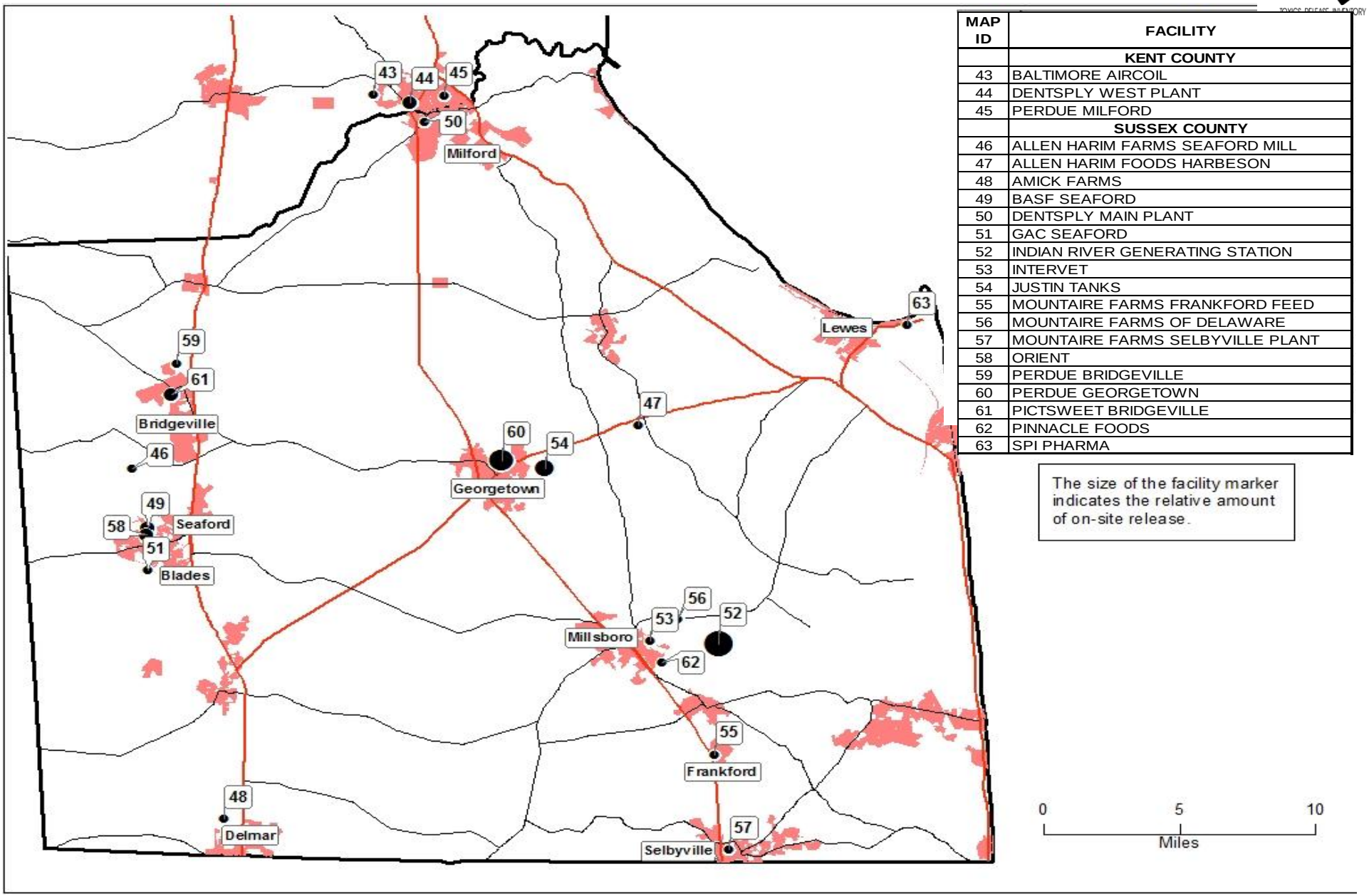
Figure 6 on this page summarizes data about the TRI releases in 2011 for each county, and the maps and indexes on the next 2 pages show where TRI facilities are located.

Source: DNREC 2011 TRI Database, 10-1-12

FIGURE 7 - TRI FACILITY LOCATOR MAP 2011



MAP ID	FACILITY
	NEW CASTLE COUNTY
1	AEARO TECHNOLOGIES
2	AGILENT TECHNOLOGIES NEWPORT
3	AIR LIQUIDE - MEDAL
4	AIR LIQUIDE INDUSTRIAL
5	ARLON
6	BASF NEWPORT
7	CHROME DEPOSIT
8	COLOR WORKS PAINTING
9	CRODA
10	DELAWARE CITY REFINERY
11	DUPONT EDGE MOOR
12	DUPONT RED LION PLANT
13	EDGE MOOR/HAY ROAD ENERGY CENTERS
14	EVRAZ CLAYMONT STEEL
15	FORMOSA PLASTICS
16	FUJIFILM IMAGING COLORANTS
17	HONEYWELL
18	IKO WILMINGTON
19	INSTEEL WIRE PRODUCTS
20	JOHNSON CONTROLS BATTERY PLANT
21	JOHNSON CONTROLS DISTRIBUTION
22	KUEHNE
23	MACDERMID
24	MOTECH AMERICAS
25	NORAMCO
26	OCCIDENTAL CHEMICAL
27	PRINCE MINERALS
28	ROHM & HAAS - B2 B3 B8
29	ROHM & HAAS - B5 B6
30	ROHM & HAAS - B7 B15
31	SUNOCO
32	V&S DELAWARE GALVANIZING
33	VP RACING FUELS
	KENT COUNTY
34	CAMDEL METALS/HANDY TUBE
35	CARL KING
36	DOVER AFB
37	HANESBRANDS
38	HIRSH INDUSTRIES
39	METAL MASTERS
40	NRG ENERGY CENTER-DOVER
41	PPG INDUSTRIES
42	SERVICE ENERGY DOVER

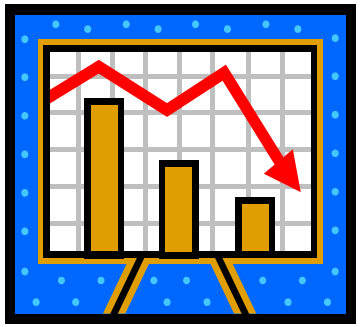


MAP ID	FACILITY
	KENT COUNTY
43	BALTIMORE AIRCOIL
44	DENTSPLY WEST PLANT
45	PERDUE MILFORD
	SUSSEX COUNTY
46	ALLEN HARIM FARMS SEAFORD MILL
47	ALLEN HARIM FOODS HARBESON
48	AMICK FARMS
49	BASF SEAFORD
50	DENTSPLY MAIN PLANT
51	GAC SEAFORD
52	INDIAN RIVER GENERATING STATION
53	INTERVET
54	JUSTIN TANKS
55	MOUNTAIRE FARMS FRANKFORD FEED
56	MOUNTAIRE FARMS OF DELAWARE
57	MOUNTAIRE FARMS SELBYVILLE PLANT
58	ORIENT
59	PERDUE BRIDGEVILLE
60	PERDUE GEORGETOWN
61	PICTSWEET BRIDGEVILLE
62	PINNACLE FOODS
63	SPI PHARMA

The size of the facility marker indicates the relative amount of on-site release.

FIGURE 7 - TRI FACILITY LOCATOR MAP 2011

TRENDS OVER TIME



In addition to the reported releases for the latest year, DNREC also looks at how the releases change over time. If a type of release is trending up or down, we will look for reasons why. It may be because a group of chemicals, such as PBTs or carcinogens, had a change in reporting requirements, or the economy changed demand for products that a facility produces. Whatever the reason, we look at trends as long-term indicators for the way activity is changing. We also look at trends for potential issues that need investigation.

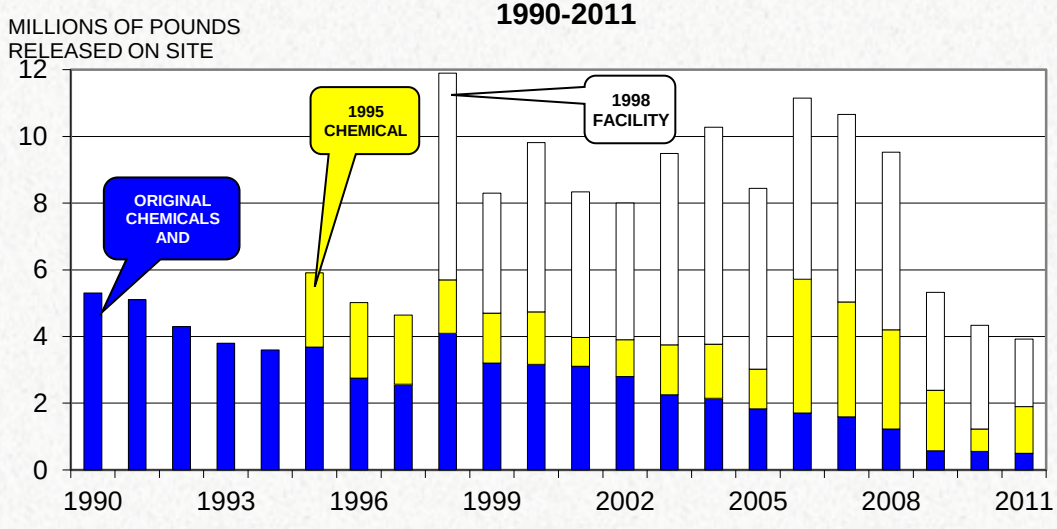
The EPA also adds chemicals and facilities to the TRI program when it discovers chemicals that are significant toxics, or that some facilities as a group tend to manufacture or use toxic chemicals. Figure 8 shows the trend of the on-site releases since 1990, and also shows the result of adding chemicals and facilities and industry efforts to reduce releases. Usually a few chemicals are added or deleted every year and they are included in the totals for that year.

Since 1990, on-site releases of the original chemicals from the original facilities in the TRI program list have trended down over time and are now 91% (4.8 million pounds) lower than the original amount reported.

In 1995, a large group of chemicals was added increasing the total number of chemicals increased to 667 from the 365 reportable in 1994. This group has trended down 37% since it was added in 1995.

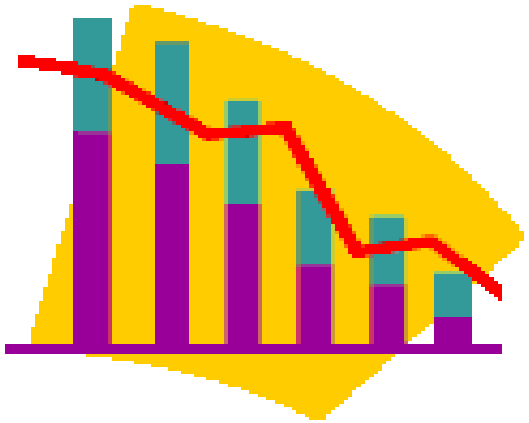
In 1998, an important group of facilities was added. This group included the electric generating facilities that use coal or oil as fuel, as well as some chemical and petroleum distribution facilities. The Indian River Power Plant and the

FIGURE 8
EFFECT OF CHEMICAL AND FACILITY GROUP ADDITIONS
1990-2011



Source: DNREC 2011 TRI Database, 10-1-12

Edge Moor/Hay Road Power Plants are significant facilities in this group. Because the electric generating facilities are starting to implement parts of the new Delaware Electric Generating Unit Multi-Pollutant Regulation, the 1998 Facility Addition group is now 67% (4,180,000 pounds) lower than its original reported



amount for 1998. To reduce pollution, the Indian River Power plant is installing more pollution controls and the Edge Moor/Hay Road Power Plant has converted to natural gas.

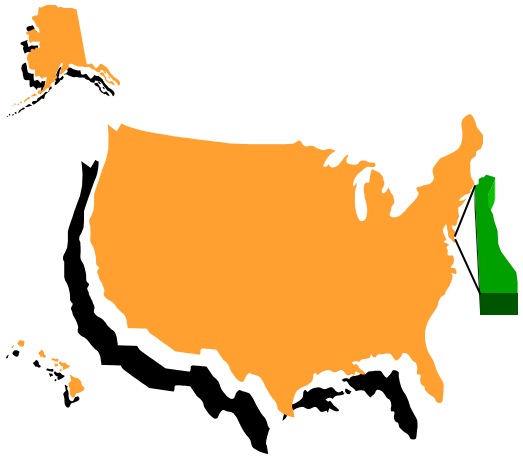
The amounts of on-site releases for the three groups are all lower than their original amounts, and the total for all three groups is lower again this year than the original amount reported in 1990. If each group had remained constant at its original reported amount, the amounts reported for 2011 would be 13.73 million pounds instead of the 3.93 million pounds reported; a reduction of 9.8 million pounds, or 71%. We hope that this downward trend will continue.

TRI, POLLUTION CONTROL, AND THE ECONOMY

The declining economy in Delaware over the last two years has influenced many facilities. Some of the changes noted in this report were the result of routine changes within the facilities, but some were the result of facility closings. Other facilities had reductions in production, and as a result, had lower releases. The Production Index (PI) that is reported along with TRI release and waste management data is one way to estimate the impact of the economy, because the PI is the level of production associated with the chemical being reported.

For the top 15 facilities, the average PI was 31% more than the 2010 value, and we expected to see an increase of 41,364 pounds in on-site releases. Instead, there was a reduction in on-site releases of 83,750 pounds for these facilities, and the total difference between expected and actual amounts is 125,114 pounds. The predicted increase represents the effect of the economy, and the reduction represents the effect of efforts by the facilities to reduce pollution. Factors such as installing pollution controls switching to alternate fuels, and the quality of coal also have changed release amounts at some facilities. For example, the Indian River Power Plant had a PI 21% less than 2010, but the actual on-site releases were 29% less. The DuPont Edge Moor facility reported a PI of 2% more than 2010, while actual on-site releases were 31% less than 2010. The Formosa Plastics facility reported a PI of 1.0 (100% of 2010) yet had an increase of 19% in on-site releases.

NATIONAL PERSPECTIVE



It may be helpful to see how Delaware compares to other states and to the nation.

At the time of this report, the EPA had released its preliminary national 2011 TRI data, so we compared our 2011 data with it. Following are some highlights from this comparison:

1. Delaware ranks 45th in the nation for total on-site releases.

2. Over 100 facilities in the nation each individually released more on-site than all the facilities in the State of Delaware combined.

3. Delaware released 0.11% of the total on-site release amounts in the nation.

4. Some reports from nearby facilities in neighboring states exceed the amounts for all Delaware reports for a specific chemical. For example, one facility in Pennsylvania released 680,600 pounds of toluene to air. The Delaware total for all facilities was 14,744 pounds. Another facility in Maryland released 214,500 pounds of hexane to air. The Delaware total for hexane was 26,978 pounds.

Some facilities in Delaware do rank at or near the top of the national rankings for specific releases.

DuPont Edge Moor ranks #5 in the nation for off-site disposal of dioxin and dioxin-like compounds and #14 for on-site release of carbonyl sulfide.

DuPont Edge Moor ranks #20 for off-site disposal of chromium compounds, #12 for off-site to disposal of vanadium compounds, and #13 for off-site disposal of manganese compounds.

Evraz Claymont Steel ranks #68 for on-site release of dioxins.

Formosa Plastics ranks #1 in the nation for on-site release of vinyl chloride and #7 in the nation for on-site release of vinyl acetate.

The **Indian River Power Plant** ranks #21 for on-site release of hydrochloric acid.

Delaware ranks #43 within the states for on-site release of mercury and mercury compounds for 2011.

No Delaware facility ranked in the top 100 facilities for on-site release of mercury.

The Delaware City Refinery ranks #55 for on-site release to water of nitrate compounds

The Dover Air force Base ranked #27 within all 79 U.S. Air Force bases for total on-site releases.

These rankings may change if revised data is received, and the new data may be greater than or less than this data for a specific chemical or facility comparison.

OTHER SOURCES OF INFORMATION

Information about TRI and related programs is available from several additional sources. Some of these sources are shown below. Other sources can be found in our DNREC *2011 TRI Data Detail Report.*

Scan this image with your smart phone to access DNREC TRI data and reports.

Access to the DNREC TRI Files - DNREC is responsible for collecting, processing, and distributing information that was submitted by Delaware facilities under the TRI program. The 1998-2011 TRI annual reports may be viewed through the DNREC link at: http://www.dnrec.delaware.gov/SERC/Pages/Reports.aspx. Additional details and information not in the reports are available to the public through the EPCRA Reporting Program located within DNREC. A searchable database is the Data Search link at: dnrec.delaware.gov/SERC/Information/Pages/DataSearch.aspx

Toxics Release Inventory National analysis - EPA's annual TRI report. It covers 2011 information nationwide and provides a good perspective on how Delaware and the companies in Delaware compare to other states http://www.epa.gov/tri/tridata/tri10/nationalanalysis/index.htm. The 2010 report is available now and the 2011 edition of this report will be available later this year. It will also be available at the DNREC office at 655 S. Bay Rd. in Dover.

Delaware's Department of Natural Resources and Environmental Control has publications, reports, and information available for a wide variety of programs at: http://www.dnrec.delaware.gov/info/pages/ELibrary.aspx. In addition to TRI reports, there are other provisions of the Emergency Planning and Community Right to Know Act (EPCRA) that provide information to the public and to local emergency planning and response organizations. For additional information, visit the Delaware EPCRA website at: http://www.serc.delaware.gov/epcra.shtml.

EPA's TRI Home Page – The EPA TRI home page provides information on the many facets of the TRI program at EPA, including an Executive Summary, Q&A's, a link now to the 2010 TRI data, and later this year to the 2011 data, a current list of reportable chemicals, reporting forms, state and federal program contacts, and various guidance documents available for downloading. This website has many links to other EPA and non-EPA sites associated with TRI. www.epa.gov/tri/.

Right-to-know Network - Searchable nationwide TRI data is available through RTKNet. The RTKNet was established by two non-profit organizations to provide access to TRI and chemical data, link TRI with other environmental data, and exchange information among public interest groups. www.rtknet.org.

Delaware Public Health Cancer Rates and Causes – This site provides data and answers to many cancer-related questions. http://dhss.delaware.gov/dhss/dph/dpc/cancer.html

OTHER SOURCES OF INFORMATION

Chemical Data Fact Sheets - A two-page fact sheet is available for most TRI chemicals reported in Delaware and contains information on chemical characteristics, health hazards, and ecological effects. The two-page fact sheets (ToxFAQs) are available upon request from DNREC's TRI program or available through the Agency for Toxic Substances and Disease Registry at: http://www.atsdr.cdc.gov/toxfaqs/index.asp

Envirofacts Electronic Warehouse - Envirofacts is an EPA-developed website that provides public access to multiple environmental databases, including TRI. Links are available to data about hazardous waste, water permits, drinking water, Superfund sites, air, water, toxics, and more. On-line queries allow the user to retrieve data and create reports, as well as generate maps: www.epa.gov/enviro.

Delaware Air Quality Report - The annual air quality report is prepared by the Air Surveillance Branch in the Air Quality Management Section of DNREC. This report presents data gathered from a statewide network of air monitoring stations, and includes analyses, trends, and other information regarding Delaware's air quality. For a copy of the report, or for more information, please call (302) 323-4542. Annual reports are available on-line at: http://www.awm.delaware.gov/AQM/Pages/AQMPublicationsandReports.aspx and air toxics information is at: http://www.awm.delaware.gov/AQM/Pages/DATAS1.aspx.

The EPA site for additional air quality information is: http://www.epa.gov/oar/oaqps/publicat.html.

The Office of Pollution Prevention & Toxics (OPPT) - http://www.epa.gov/oppt/index.htm is a part of the EPA that:

- Promotes pollution prevention as the guiding principle for controlling industrial pollution;
- Promotes safer chemicals through a combination of regulatory and voluntary efforts;
- Promotes risk reduction so as to minimize exposure to existing substances such as lead, asbestos, dioxin, and polychlorinated biphenyls; and,
- Promotes public understanding of risks by providing understandable, accessible and complete information on chemical risks to the broadest audience possible.

Risk-Screening Environmental Indicators (RSEI) - This model was developed by EPA's Office of Pollution Prevention & Toxics as a risk-screening tool that provides a relative comparison of TRI releases. This application is available on CD-ROM or through the Internet at: http://www.epa.gov/oppt/rsei/.

Questions or Comments About This Report – Please direct your comments, questions, or requests to the TRI COORDINATOR at the location on the back cover of this report.

Delaware
Toxics Release Inventory

Delaware Department of Natural Resources and Environmental Control

Emergency Planning and Community Right to Know Program
655 South Bay Road, Suite 5N
Dover, Delaware 19901
302-739-9405

Doc. No. 40-04-04/12/08/02