



# DELAWARE 2017 TOXICS RELEASE INVENTORY REPORT



RELEASES OF  
CARCINOGENS  
DOWN 21.5%

RELEASES OF  
ALL PBT'S  
DOWN 24 %

RELEASES OF  
LEAD  
DOWN 28 %

RELEASES OF  
DIOXINS  
DOWN 8.5 %

Prepared by the EPCRA Reporting Program

Department of Natural Resources and Environmental Control

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**DNREC MISSION STATEMENT**

The mission of the Department of Natural Resources and Environmental Control is to ensure the wise management, conservation, and enhancement of the State's natural resources, protect public health and the environment, provide quality outdoor recreation, improve the quality of life, and educate the public on historic, cultural, and natural resource use, requirements and issues.

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## Executive Summary

The 2017 Toxics Release Inventory data set marks 31 years of data collected from covered facilities being made available to the public. The Toxics Release Inventory continues to strive to provide the public with information about chemical uses, releases, and waste management activities occurring at these facilities.

For 2017, 55 facilities submitted reports for 82 different chemicals. The 2017 data shows decreases in the onsite releases of carcinogens, down 21.5%, and the category of persistent bioaccumulative toxins (PBT's) that includes lead and dioxin, down 24%. These decreases continue a downward trend which has resulted in a 52.5% decrease in onsite releases of carcinogens, and a 76% decrease in onsite releases of PBT chemicals, in the last ten years. Since 2007, onsite releases of individual chemicals in the PBT category have decreased considerably: dioxins by 81%, lead and lead compounds by 76%, and mercury and mercury compounds by 72.5%. Overall for 2017, approximately 4.6 million pounds were reported as being released on-site, an increase of 1.2 million pounds or 36% compared to 2016. Of this amount, approximately 24,000 pounds were released to land, while 747,000 pounds were released to air, and approximately 3.8 million pounds were released to water. Increases were primarily due to increased releases of nitrate compounds to water, which were up about one million pounds compared to 2016. The Delaware City Refinery (DCR) and Allen Harim Harbeson reported significant increases in the release of nitrate compounds to water. Looking at other chemicals, the Delaware City Refinery had a significant increase in the on-site releases of sulfuric acid and ammonia to air.

Overall, a summary of the data shows (amounts rounded to the nearest 1,000 pounds):

- The total amount for on-site release of carcinogens decreased by 30,000 pounds (21.5%) for 2017, largely due to a 27,000 pound decrease in releases of vinyl acetate (a possible carcinogen) by Formosa Plastics. Formosa ceased operations in August of 2018; so 2018 will be the last year they will report to TRI, if they meet the reporting threshold. Carcinogen releases have declined 122,000 pounds, or 52.5%, since 2007. (See **Carcinogenic TRI Chemicals** on page 27 for additional information.)
- The total amount for on-site release of persistent bioaccumulative toxins (PBTs) decreased by 1,600 pounds (24%) for 2017. The greatest reported decrease in this category for 2017 was a 1,500 pound decrease of lead releases to land, reported by the U. S. Army's National Guard River Road Training Site Range in New Castle. Since 2007, total onsite releases of chemicals in this category have decreased by 76%: dioxins by 81%, lead and lead compounds by 76%, and mercury and mercury compounds by 72.5%. (See **Persistent Bioaccumulative Toxic (PBT) Chemicals** on page 21 for additional information.)
- The total amount released on-site to water increased by 1,011,000 pounds (36%) compared to 2016. This was largely due to an increase in releases of nitrate compounds reported by the Delaware City Refinery, due to many factors; but releases of nitrate compounds by the refinery are largely affected by changes in crude. Nitrogen in the crude forms NO<sub>x</sub>, which is scrubbed out of the refinery's air emissions and diverted to water. In 2017, the Refinery's nitrate releases to water were within permit limits. Over the last 10 years, total releases to water have increased 15%. (See **Releases to Water** on page 9 for additional information.)

- The total amount of TRI chemicals reported as released on-site to air for 2017 increased by 200,000 pounds (37%), compared to 2016. The largest increase in this category was the 253,000 pound (235%) increase in sulfuric acid aerosol releases to air from the Delaware City Refinery, due to many factors; with the largest being increased sulfur content in crude oil. When a sulfur-bearing fuel such as refinery fuel gas is burned, the sulfur is initially converted to Sulfur dioxide (SO<sub>2</sub>). Under certain conditions, a small portion of the SO<sub>2</sub> can form sulfuric acid aerosol. Another major increase in air releases was in ammonia releases reported by the Delaware City Refinery. Over the last 10 years, total releases to air have trended downward 89%. (See **Releases to Air** on page 8 for additional information.)
- The total amount released on-site to land increased by 2,000 pounds (9%) compared to 2016. This was primarily due to Honeywell reporting a one-time release of ethylene glycol as a result of a tank repair. Overall, releases to land have trended downward 94% since 2007. (See **Releases to Land** on page 10 for additional information.)
- Total TRI waste, including releases on-site, transfers off-site for treatment and disposal, and waste management on-site, increased by 9%, or 35.2 million pounds from 2016. On-site release amounts, reported above, were up 36%. Transfers off-site increased 12%, primarily the result of increases in off-site recycling. Waste managed on-site increased by 8.5%, due to increases in on-site treatment. On-site treatment accounts for 91.1% of all waste reported to TRI for 2017 (see **Total TRI Waste** on page 13 for additional information); and the on-site treatment of one chemical, hydrogen sulfide, accounts for 86% of total 2017 TRI waste. Hydrogen sulfide is a gas that is produced during the petroleum refining treatment processes that remove sulfur compounds from fuel products.

## What is the Toxics Release Inventory?

The Toxics Release Inventory, or TRI, is a publicly available data set containing information reported annually for toxic chemicals manufactured, processed, or otherwise used by certain facilities in Delaware and throughout the United States. Each year, these facilities report releases and waste management information for covered chemicals. The reportable list of toxic chemicals for 2017 included 595 individual chemicals and 32 chemical categories. October of 2017 marked the 31<sup>st</sup> anniversary of the establishment of TRI under Title III, Section 313, of the 1986 Federal Superfund Amendments and Reauthorization Act (SARA 313) to provide information to the public about the presence and release of toxic chemicals in their communities. Title III is also known as the Emergency Planning and Community Right-to-Know Act (EPCRA). See **Appendix A** for more information.

Covered facilities report TRI information to the EPA and to the state in which the facility is located. In Delaware, the EPCRA Reporting Program within the Department of Natural Resources and Environmental Control (DNREC) receives and compiles TRI data from facilities located within the State. The DNREC EPCRA Reporting Program maintains a TRI database that is updated as new reports and revisions to old reports are received. The database currently contains 31 years of reported data. Most releases reported under TRI are also regulated through Federal and/or State permits.

This report contains detail from every 2017 TRI report or report revision from Delaware facilities received by DNREC as of October 1, 2018. Facilities must submit these reports to DNREC and the EPA by July 1 of each year. Several types of analyses are presented in this report based on this data and data from prior years. See **Access to TRI Files, under For Further Information**, on page 49 for details.



## Reporting Requirements

A facility is required to submit a report for a listed toxic chemical if the facility meets all of the following criteria:

1. Employs the equivalent of 10 or more full-time employees,
2. Is a covered industry, or is a Federal facility (See Table 1 on the next page for a list of reporting industries), and,
3. Manufactures or processes more than 25,000 pounds, or otherwise uses more than 10,000 pounds, of the listed toxic chemical during the course of the calendar year. Threshold limits for specific chemicals known as PBTs (Persistent Bioaccumulative Toxics) are lower (see Table 7 on page 21).

Note that from time to time, the EPA proposes changes in reporting requirements. It gives agencies, reporting facilities, and other interested parties time to comment on these changes prior to making a final decision about the proposed change. See page 5 for more details.

Facilities that meet the criteria for reporting must submit one report for each listed toxic chemical if it was manufactured, processed, or otherwise used above threshold quantities. The reports cover releases and waste management activities during the prior calendar year.

It is important to note that a facility may need to report even if it has no releases of toxic chemicals, because reporting is based on the amount manufactured, processed, or otherwise used, and not the amount released.

**TABLE 1  
NAICS COVERED INDUSTRIES**

NAICS CODES	2017 INDUSTRY
212	Mining
221	Utilities
311	Food Manufacturing
313	Textile Products Mfg.
324	Petroleum and Coal Products Mfg.
325	Chemical Manufacturing
326	Plastics and Rubber Manufacturing
331	Primary Metal Manufacturing
332	Fabricated Metal Product Mfg.
333	Equipment Mfg.
335	Electrical Equipment Mfg.
339	Misc. Manufacturing
424	Wholesalers, Non-Durable Goods
454	Non-Store Retailers
928	National Security

Table 1 is a list of covered industries reporting to the Delaware TRI program for 2017, along with the corresponding three primary digits of the North American Industrial Classification System (NAICS) Codes. NAICS 6-digit codes are used to identify the type of activities performed at a facility. Each industry sector represented by facilities reporting in Delaware for 2017 is shown in Table 5 on page 17. NAICS codes were used in TRI starting in 2006 to provide more discrimination between the various industry sectors reporting to TRI versus the previously used SIC codes. The EPA updated the NAICS codes used for TRI reporting from the 2012 to the 2017 standard, starting with the 2017 report year.

The standard Form R report (see **Appendix K** for Form R) contains general facility information and complete data about on-site releases, off-site transfers, and on-site waste management activities. Form R can be used for all TRI reports. In lieu of Form R, the optional short Form A report (see **Appendix L** for Form A) may be used provided certain criteria are met. Form A, initiated in the 1997 reporting year, is a two-page report that



provides facility information (essentially the same as Form R) and identification of the chemical, but does not provide any release, transfer, or waste management data. In Delaware, 15% of the TRI reports were filed as Form A for 2017. After a facility determines that it must report on a given chemical, the facility is eligible to use Form A if:

**For non-PBT chemicals:**

1. The total annual reportable amount (including the sum of on and off-site releases, disposal, treatment, recovery for recycle or energy) is less than 500 pounds; and,
2. The total annual amount of the chemical manufactured, processed, or otherwise used does not exceed 1,000,000 pounds.

**For Persistent Bioaccumulative Toxic (PBT) Chemicals including dioxins:**

1. **PBTs, including dioxins and dioxin-like compounds, may not be reported on Form A.**
2. Form R, Schedule 1 is an additional form that is required for dioxins.

Because of the lack of data in the Form A reports, DNREC has been collaborating with the reporting facilities and emphasizing the importance of reporting on Form R.

**Limitations of TRI Data**

The user of TRI data should be aware of its limitations in order to interpret its significance accurately.

- **NOT ALL FACILITIES ARE REQUIRED TO REPORT.** A relatively small number of facilities in Delaware are required to report under TRI, based on the criteria listed on pages 2-3. TRI facilities are primarily industrial/manufacturing facilities and facilities report releases and other waste management activity to TRI. TRI does not account for amounts of hazardous material stored at facilities. The DNREC program addressing inventories of material stored on site, the Hazardous Chemical Reporting program known as “Tier II” (also administered under EPCRA), includes a much greater number of facilities. Facilities report amounts and the location of chemicals stored on-site to Tier II, but not releases. For further information, see *Hazardous Chemical Reporting in Appendix A*.
- **OTHER SOURCES NOT COVERED UNDER TRI ALSO RELEASE TOXIC CHEMICALS.** Other significant sources of pollution include small businesses, motor vehicles and agricultural operations. For example, on-road motor vehicles released an estimated 5,709 tons to air in Delaware just for the chemicals ammonia (NH<sub>3</sub>) and volatile organic compounds (VOCs), for 2016. NH<sub>3</sub> and many VOCs are also TRI chemicals. See page 6, which shows that total TRI on-site releases for 2017 are 4,593,879 pounds, or 2,297 tons.
- **FACILITIES ARE REQUIRED TO BASE TRI DATA ON MEASUREMENTS AND MONITORED DATA ONLY IF THESE ARE AVAILABLE AT THE FACILITY.** If such data is not available, quantities may be estimated based on published emission factors, mass balance calculations, or good engineering judgment. Additional monitoring equipment and measurements are not required. For 2017, 8% of the reports representing 9% of reported on-site release amounts were estimated using monitoring data, with the balance being split between emission factors, mass balance calculations, and other methods.
- **THE DATA ESTIMATION METHODS MAY CHANGE OR VARY.** The methods of estimating or basis of calculating data used by different facilities, or even the same facility



over time, may vary, and may result in significant changes in reporting while the actual release may remain relatively unchanged. DNREC performs cross-checks of the data with other information sources to verify its accuracy and contacts facilities concerning apparent discrepancies.

- **FACILITIES MAY REVISE FORM R DATA AT ANY TIME.** These revisions sometimes involve significant changes for data previously reported by the facility.
- **THE DATA DOES NOT INDICATE THE AMOUNT OF HUMAN EXPOSURE.** An important consideration to keep in mind is that TRI does not provide an indication of potential exposure to the reported releases and cannot be used by itself to determine the impact on public health. The chemical's release rate, toxicity, and environmental fate, as well as local weather and wind direction and the proximity of nearby communities to the release must be considered when assessing exposures. Small releases of highly toxic chemicals may pose greater risks than large releases of less toxic chemicals. The potential for exposure increases the longer the chemical remains unchanged in the environment. Some chemicals may quickly break down into less toxic forms, while others may accumulate in the environment, becoming a potential source of long-term exposure. The chemical exposure of a population depends on the environmental media (air, water, land) into which the chemical is released. The media also affect the type of exposure possible, such as inhalation, dermal exposure, or ingestion.

Despite these limitations, TRI serves as a valuable screening tool to identify areas of concern that may require further investigation.

## **Recent Developments in TRI Reporting**

The TRI reporting requirements change as the EPA seeks to improve the program through changes to the list of reportable chemicals and through program expansions. Because of these changes, considerable caution must be exercised when comparing TRI data from previous years. Notations will be made to indicate which data is presented with adjustments in order to show it on a uniform year-to-year basis.

- **Recently Added Chemicals – Hexabromocyclododecane, 1-Bromopropane, Nonylphenol, O-Nitrotoluene, Hydrogen Sulfide and PACs.** The EPA added a hexabromocyclododecane chemical category for the 2017 reporting year. Also, starting with the 2017 reporting year, nine existing TRI chemicals were added to the list of carcinogens. Of these chemicals, only cumene, a possible carcinogen, was reported by two Delaware facilities for 2017. The chemical 1-bromopropane was added to the list of TRI reportable chemicals for the 2016 reporting year, and was not reported by any Delaware facility for 2017. For the 2015 reporting year, a nonylphenol category was added to the list of reportable TRI chemicals. Nonylphenol was reported by one Delaware facility, Croda, in their 2017 TRI report.
- **Upcoming Changes –** The EPA added a nonylphenol ethoxylates (NPE's) category in June, 2018. Reports for this chemical are due July 1, 2020 for the 2019 TRI reporting year, if TRI chemical use and other thresholds are met.

# 2017 Data Summary

Delaware 2017 and 2016 TRI totals for on-site releases, off-site transfers, and wastes managed on-site are displayed in Table 2 for direct comparisons. For 2017, 55 facilities submitted 191 reports for 82 different chemicals. Total on-site releases increased by 35.9% (1,213,542 pounds). This increase was primarily driven by increases in nitrates released to water reported by the Delaware City Refinery. Off-site transfers were up 12.4%, with a large increase in off-site recycling, a smaller increase in energy recovery; and smaller decreases in transfers to POTW's, and to off-site disposal and treatment. On-site waste management

increased by 8.5% compared to 2016. There were large increases in on-site treatment, and smaller decreases in on-site recycling and energy recovery.

**TABLE 2  
2017 TRI DATA SUMMARY  
(IN POUNDS)**

	2016	2017
No. of Facilities	59	55
No of Form As	33	28
No of Form Rs	176	163
No. of Chemicals	85	82
<b>On-site Releases</b>		
Air	546,310	746,669
Water	2,812,016	3,823,135
Land	22,011	24,076
<b>Total On-Site Releases</b>	<b>3,380,338</b>	<b>4,593,879</b>
<b>Off-Site Transfers</b>		
POTW's	997,109	956,919
Recycle	7,249,685	8,876,457
Energy Recovery	1,612,951	1,679,546
Treatment	256,899	117,153
Disposal	561,263	373,297
<b>Total Off-Site Transfers</b>	<b>10,677,907</b>	<b>12,003,373</b>
<b>On-Site Waste Mgmt.</b>		
Recycle	11,859,042	9,712,512
Energy Recovery	12,727,241	12,475,029
Treatment	361,034,681	396,084,447
<b>Total On-Site Mgmt.</b>	<b>385,620,964</b>	<b>418,271,988</b>
<b>Total Waste</b>	<b>399,679,208</b>	<b>434,869,240</b>

## Types of Data

Table 2 lists the categories of data reported to Delaware and the EPA under the TRI program. Within the reports received from facilities, the data is broken down into additional sub-categories. For ease of presentation in this report, the data has been grouped into these categories as described below.

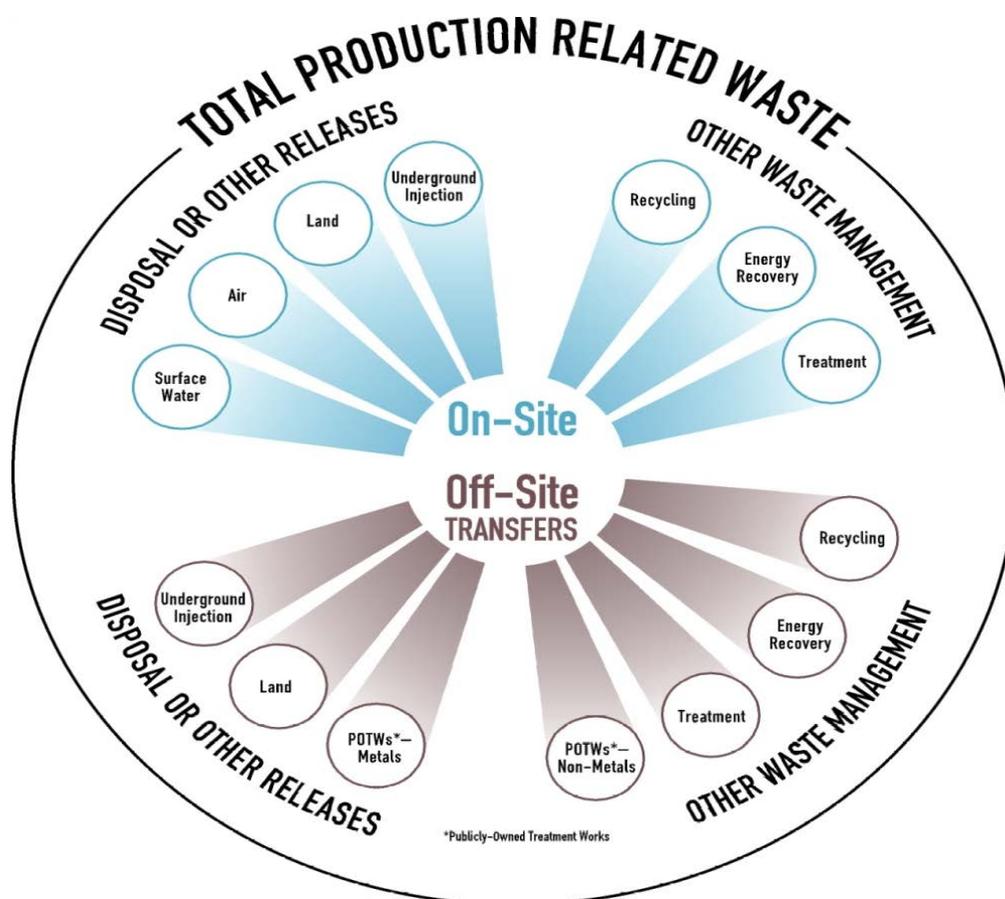
**On-Site Releases:** On-site releases in Delaware are to **air**, **water**, or **land**. There are four TRI categories, but one of these, **underground injection** of TRI chemical waste to wells, is not permitted in Delaware. The **release to air** category includes stack releases collected by mechanical means such as vents, ducts, or pipes, and fugitive

releases escaping collection, including equipment leaks and evaporation. **Releases to water** are to water bodies, including streams, rivers, lakes, bays, or oceans. This includes releases from contained sources, such as industrial process outflow or open trenches. Releases to water which result from TRI-reportable chemicals in runoff and storm water runoff are also reportable. **Releases to land** are to (1) RCRA (Resource Conservation and Recovery Act) landfills, in which wastes are buried, (2) surface impoundments, which are uncovered holding areas used to volatilize and/or settle waste materials, (3) other land disposal such as waste piles or releases to land such as spills or leaks, (4) land application/treatment in which waste containing a listed chemical is applied to or incorporated into soil, and (5) other non-RCRA landfills.

**Off-Site Transfers:** Off-site transfers include transfer of chemical waste to **POTWs** (publicly owned treatment works, typically waste water treatment plants), **recycle** operations (five types), **energy recovery** operations (two types), **treatment** operations (six types), and **disposal** (fourteen types). The receiving facilities are separate from the facility generating the waste. These five main categories of off-site transfers cover the types of final off-site management undertaken for each chemical.

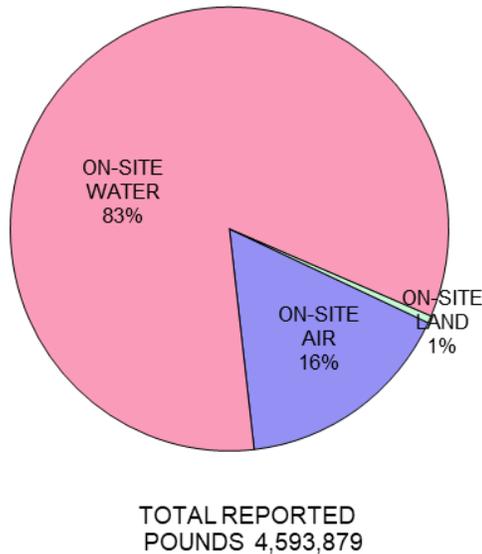
**On-Site Waste Management:** Waste management operations at the facility generating the waste are categorized to include **recycle**, **energy recovery**, and **treatment**.

The diagram below shows these types of data and how they are related to the four main categories of on- and off-site releases, disposals, and other waste management.



**Amounts Reported:** The amounts reported are in pounds per year, with a few exceptions, such as dioxins and dioxin like compounds, which are reported in grams. Certain chemical compounds have only the weight of the specific ion or elemental form reported instead of the entire compound, such as nitrate compounds or lead compounds. Also, specific chemicals are only required to be reported in certain states, such as hydrochloric and sulfuric acid, which are only required to be reported as aerosols or gases. For further information on the specific chemical reporting requirements, please refer to the TRI guidance documents at: [https://ofmpub.epa.gov/apex/quideme\\_ext/f?p=104:1](https://ofmpub.epa.gov/apex/quideme_ext/f?p=104:1).

**FIGURE 1  
2017 ON-SITE RELEASES**



## On-Site Releases

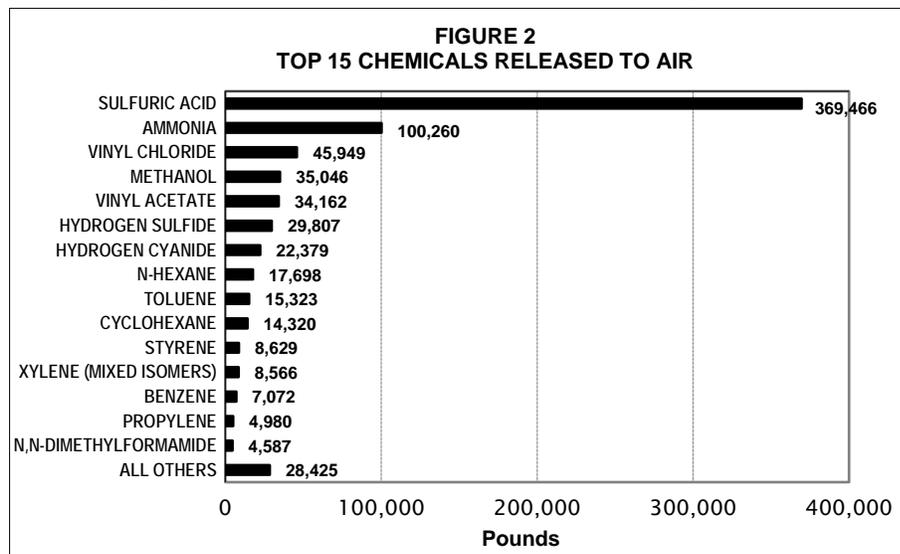
On-site TRI releases are emissions from a facility to the environment, including emissions to the air, discharges to surface water, and disposal onto or into the ground. These on-site releases to air, water, and land reported under TRI for 2017 made up about 1% of all TRI-reported waste amounts. The remaining 99% of waste is managed on or off-site as shown in the diagram on the previous page and as seen in Figure 7 on page 13.

Figure 1 shows the totals of on-site releases reported in Delaware. A large portion, 83% of the total on-site release, is to water. Additional analysis of on-site releases is presented in Figures 2, 3, and 4, which show the top 15 chemicals released to air, water, and land. A trend

graph for 2007-2017 for all reported on-site releases is on page 34, and a trend graph for the top five chemicals is on page 35. Additional detail about on-site releases can be found in Appendices C, E, F, and H.

## Releases to Air

Figure 2 depicts the on-site releases to air of the top 15 chemicals compared to the other 53



chemicals that were reported as released to air in 2017. Sulfuric Acid aerosol (gas) releases, which make up 49.5% of all on-site releases to air, are released largely in the crude oil refining process by the Delaware City Refinery. Sulfuric acid releases have increased by 218% compared to 2016, largely due to a 253,087 pound

(235%) increase in sulfuric acid aerosol releases reported by the Delaware City Refinery. This is due to many factors, with the largest being changes in crude oil. The second largest air-release, ammonia (13.4%), can be used as a refrigerant for petrochemical, food processing,

and chemical facilities and is also a by-product of air pollution control activities. Seven facilities reported releases of ammonia, with the Delaware City Refinery (62% of the total) releasing the largest amount to air. Vinyl chloride, which ranks third in releases to air, is used in the manufacture of polyvinylchloride (PVC). Formosa Plastics reported all of the releases to air of vinyl chloride and vinyl acetate, which make up 6.2% and 4.6% of air releases, respectively. Methanol releases, 4.7% of all releases to air, were reported by nine facilities with BASF Corp reporting the highest amount, 23,161 pounds, or 66% of the total. The remaining chemicals in Figure 2 were each 4% or less of the total on-site releases to air. Hydrogen sulfide, which accounted for 4% of all on-site releases to air, was predominantly released to air by Mountaire Farms of Delaware (44%), the Delaware City Refinery (40%), and Perdue Georgetown (16%). Hydrogen cyanide accounted for 3% of all releases to air, and was reported only by the Delaware City Refinery. N-hexane accounted for 2.4% of all releases to air, with the Delaware City Refinery reporting 99.9% of the total.

### Releases to Water

Releases to water made up the largest portion of on-site releases at 83%. Table 3 shows the total amount of TRI chemicals released to each water body that received a TRI chemical.

**TABLE 3**

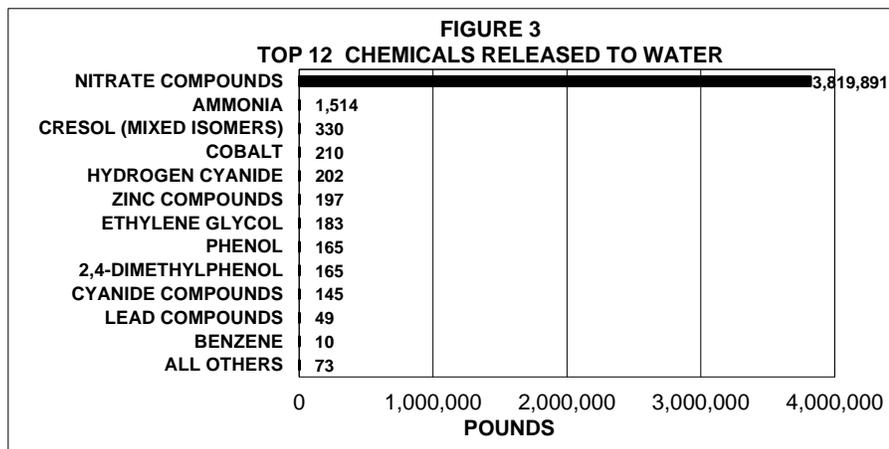
**TRI CHEMICALS RELEASED TO WATER BY WATER BODY IN 2017**

WATER BODY	NO. OF FACILITIES	NO. OF REPORTS	RELEASE (IN POUNDS)
ARMY CREEK	2	3	199
BEAVERDAM CREEK	1	1	74,690
CHRISTINA RIVER	1	3	0
DEEP CREEK	1	3	0
DELAWARE RIVER	4	40	3,475,893
DRAWYER CREEK	1	2	47
ISLAND CREEK	1	3	0
SAVANNAH DITCH	1	1	272,306
STATE TOTAL		56	3,823,135

Not every report to a water body in Table 3 shows a release quantity. In Delaware, 20 of the 56 reports listing a water body as a possible destination for a release to water did not report any quantities actually released to that water body. These facilities reporting zero for the release amount for a specific chemical met the

TRI reporting requirements and did not have an actual release to the body of water, but had the potential of a release.

The Delaware River received 91% of all releases to water, the Savannah Ditch 7%, and Beaverdam Creek 2%. Figure 3 shows the relative relationship of the top 12 TRI chemicals to all other chemicals (19) reported as released to water. This clearly shows the influence that nitrate compounds



have on the total. The nitrate compounds category was the top chemical released, (99.9% of the total release to water), followed by ammonia (0.04%). The remaining chemicals released to water were each 0.01% or less of the total releases to water. The Delaware City Refinery reported a release of 3,472,895 pounds of nitrate compounds to water for 2017, Perdue Georgetown reported 272,306 pounds, and Allen Harim Harbeson reported 74,690. The biological treatment of nitrogen-containing substances such as ammonia and animal waste is responsible for the formation of nitrate compounds, which are released to water. Metallic compounds (cobalt, cyanide, lead, and zinc) are generally products of fuel combustion, and petroleum, ore and metal refining. The Delaware City Refinery, Johnson Controls Battery Plant, and V&S Delaware Galvanizing are the facilities reporting releases of these metal compounds to water.

Table 4 shows the total amount of TRI chemicals for 2017 released to each basin in the State of Delaware. The Inland Bays include lands that drain into the Indian River Bay/Rehoboth

Bay area, then to the Atlantic Ocean. The Piedmont Basin contains lands that drain to the portion of the Delaware River above the City of New Castle. All the receiving streams, except the Island Creek, eventually feed into the Delaware Bay. Island Creek feeds into the Inland Bays and then into the Atlantic Ocean. The total amount released to water increased by 1,011,119 pounds in

**TABLE 4**  
**TRI CHEMICALS**  
**RELEASED TO WATER BY BASIN IN 2017**

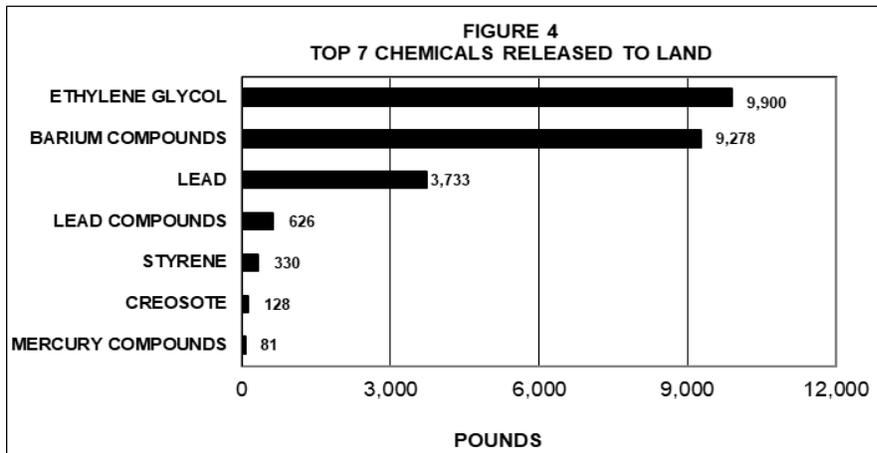
BASIN	RELEASE (IN POUNDS)	PERCENT
CHESAPEAKE	0	0.0%
DELAWARE BAY	3,823,134	100.0%
INLAND BAYS	0	0.0%
PIEDMONT	1	0.0%
STATE TOTAL	<b>3,823,135</b>	<b>100.0%</b>

2017, largely the result of an increase in the reported release of nitrate compounds by the Delaware City Refinery. Additional discussion about these releases can be found in the **Trend Analysis** section starting on page 31.

**Releases to Land**

Releases to land are shown in Table 2 on page 6. These releases are relatively small, amounting to less than 1% of total on-site releases. Figure 4 shows the contribution for the 7 chemicals reported as being released to land. The largest 2017 release to land was ethylene glycol

(41% of the total) reported by Honeywell as a one-time release of this chemical due to work on a tank (this material was later sent off site for energy recovery). Nearly all of the remaining releases to land are metals and metal compounds except for styrene, and creosote. Most of the metals and metal



compounds reported are formed during combustion from metal impurities that exist in coal or oil, deposited by ammunition use, or are contained in the base metal scrap produced in metal working processes. Barium compounds, lead, lead compounds, and mercury compounds are the top 4 metals and metal compounds reported, accounted for 56.9% of all on-site releases to land and were primarily reported by two facilities. The Indian River Generating Station reported the second largest release to land, with 9,278 pounds of barium compounds. U. S. Army's National Guard Training Site Range was third, reporting 3,733 pounds of lead released to land. Styrene accounted for approximately 1.4%, and creosote for 0.5%, of the on-site releases to land. Additional discussion about releases to land and their trends can be found in the **Trend Analysis** section starting on page 31.

Descriptions of some of the hazards that these chemicals, which were released to air, water, or land, may cause to humans, can be found in the **Chemical Data Fact Sheets** section under **For Further Information** on page 49. Facility specific information is available via the **2017 TRI Facility Profiles**, see **Access to TRI Files** under the **Further Information Section** on page 49.

## Off-Site Transfers

Off-site transfers are material transfers to off-site locations for the purpose of disposal, recycling, energy recovery, or treatment. Treatment could be at a private waste treatment facility or at a POTW, typically a city or county wastewater treatment plant. The total amounts of chemical wastes transferred off-site increased by 12.4% (1,325,466 pounds) since 2016. Off-site transfers account for 2.7% of total TRI waste and are about 2.6 times the amount released on-site. Overall increases occurred in off-site recycling and energy recovery; and small decreases occurred in off-site disposal and treatment, and transfers to POTW's. The largest increases reported were for lead compounds sent off-site for recycling by the Johnson Controls Battery Plant: 1,551,096 pounds, and the Johnson Controls Distribution Center: 462,221 pounds. Noramco reported an increase of 213,441 pounds in toluene sent off-site for energy recovery, and a decrease of 189,271 pounds in n-butyl alcohol sent off-site for energy recovery. The largest reductions also include the 275,250 pound decrease in Rohm & Haas (B2 B3 B8's) off-site recycling of n,n-dimethylformamide. Figure 5 shows the relative portions of the five off-site transfer categories. Table 2 on page 6 shows these amounts in tabular form, and **Appendices D and G** provide additional detail about transfers from each facility. TRI chemicals in wastes are

**FIGURE 5  
2017 OFF-SITE TRANSFERS**

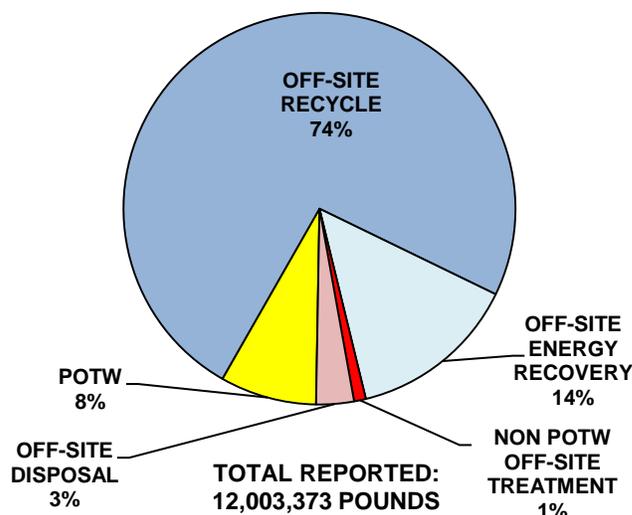
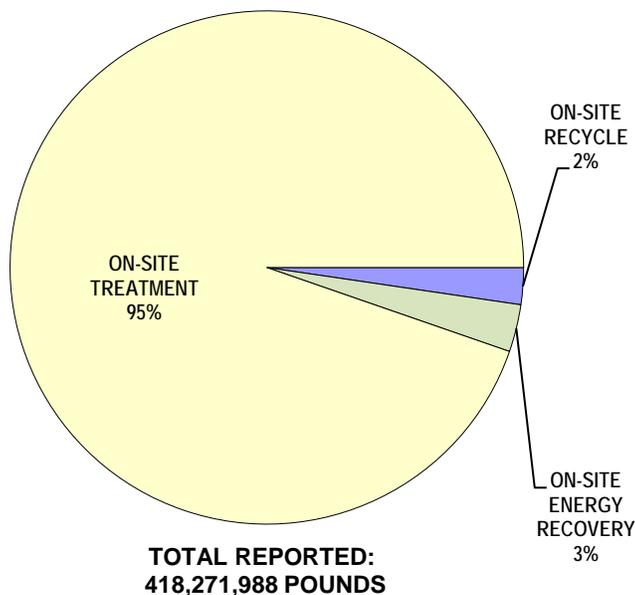


Figure 5 shows the relative portions of the five off-site transfer categories. Table 2 on page 6 shows these amounts in tabular form, and **Appendices D and G** provide additional detail about transfers from each facility. TRI chemicals in wastes are

transported by various means from Delaware to their final destinations, most of which are out-of-state. For 2017, TRI chemicals were sent from Delaware TRI reporting facilities to 20 states, some as far away as Texas and Indiana, in addition to locations in Delaware. Ninety-nine percent of TRI chemicals in all wastes shipped off-site (not including direct transfers to POTW's) were sent to out-of-state locations for further processing and/or disposal. However, almost 99.95% of transfers to POTWs generated by Delaware facilities were treated in Delaware. Off-site transfer to recycle operations accounted for 74% of the amounts within the five categories in off-site transfers, while energy recovery accounted for 14%, transfers to POTWs accounted for 8%, disposals accounted for 3% of the transfers, and non-POTW treatment was 1%. Ninety-five percent of the transfers to POTWs were to the City of Wilmington POTW, and all but 495 pounds of the 956,919 pounds treated at all POTWs were treated at Delaware POTW facilities. BASF Corp makes 74% (674,693 pounds, 90% of which is methanol) of the total TRI chemical transfers to the Wilmington POTW.

## On-Site Waste Management

**FIGURE 6  
2017 ON-SITE WASTE MANAGEMENT**



On-site waste management is the amount of waste that never leaves the facility and is managed by the facility on-site. These activities generally represent a lower risk to the environment, as the materials are typically destroyed on site, although a small fraction may escape treatment and these amounts are reported as on-site releases. The categories of **Treatment, Recycle, and Energy Recovery** are used to define on-site management activities related to TRI chemical wastes. The total amount of TRI chemicals managed on-site is 96.2% of the total TRI chemical waste. Figure 6 shows the portions of these wastes processed on-site. **Appendices D and G** provide additional detail for on-site waste management. Facility specific

information is available via the **2017 TRI Facility Profiles**, see **Access to TRI Files** under the **Further Information Section** on page 49.

**Waste Treatment** (396,084,447 pounds) includes the amount of toxic material that was destroyed in on-site waste treatment operations. The Delaware City Refinery had the highest total amount of on-site waste treatment, combining for 392,133,016 pounds (99%) of the TRI waste treated on-site. Treatment of hydrogen sulfide at the Delaware City Refinery in the

amount of 373,728,611 pounds was the highest single on-site treatment amount.

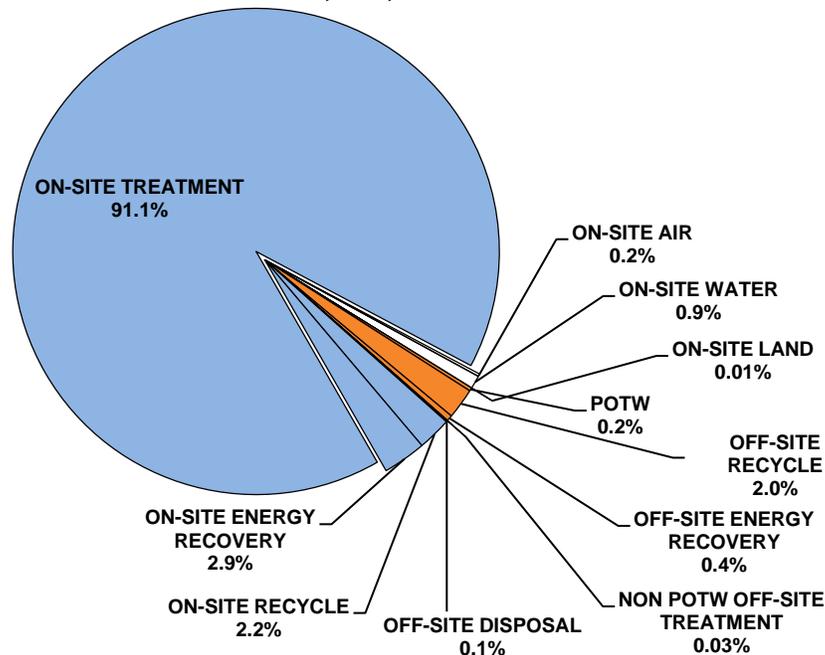
**Recycled** waste (9,712,512 pounds) is the quantity of toxic material recovered at the facility and made available for further use. Rohm & Haas (B2, B3, B8) recycled n,n-dimethylformamide, Air Liquide Advanced Separations recycled methanol and n-hexane, V&S Galvanizing recycled zinc compounds and lead, BASF recycled methanol, and Orient recycled aniline. These five facilities combined to report 99.8% of the total amount recycled on-site.

**Energy Recovery** includes the quantity of toxic material that had heat value and was combusted in some form of energy recovery device such as a heat boiler. The Delaware City Refinery was the only facility in the State to report on-site energy recovery. For 2017, the refinery reported 12,475,029 pounds of TRI chemicals processed on-site for energy recovery, with ammonia accounting for 94.7% or 11.8 million pounds.

### Total TRI Waste

Total TRI waste is the combined total of the on-site release, off-site transfer, and on-site waste management amounts in the TRI chemical reports. Figure 7 provides a perspective of the total TRI chemical waste picture in Delaware. About 1 % of the total reported TRI waste is released on-site, 2.8% is transferred off-site for treatment or disposal, and 96.2% is managed on-site through treatment, energy recovery, and recycle operations by the facilities generating the waste. Figure 7 shows the relative portions of the various sub-categories of TRI release and waste management.

**FIGURE 7  
TOTAL 2017 TRI CHEMICAL MANAGEMENT  
TOTAL REPORTED: 434,869,240 POUNDS**

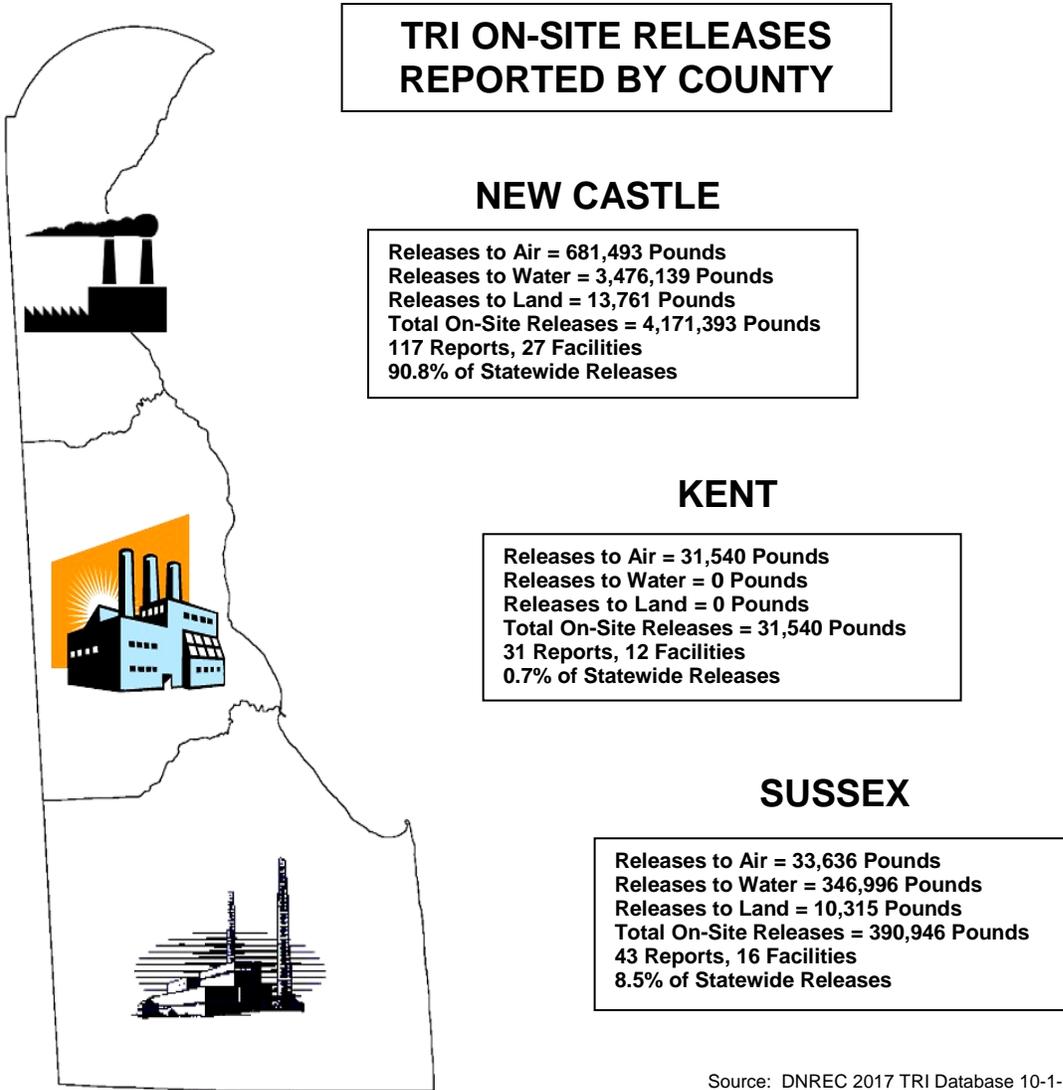


# 2017 Data Detail

## On-Site Releases by County

Figure 8 below provides basic on-site release information for each county in the State.

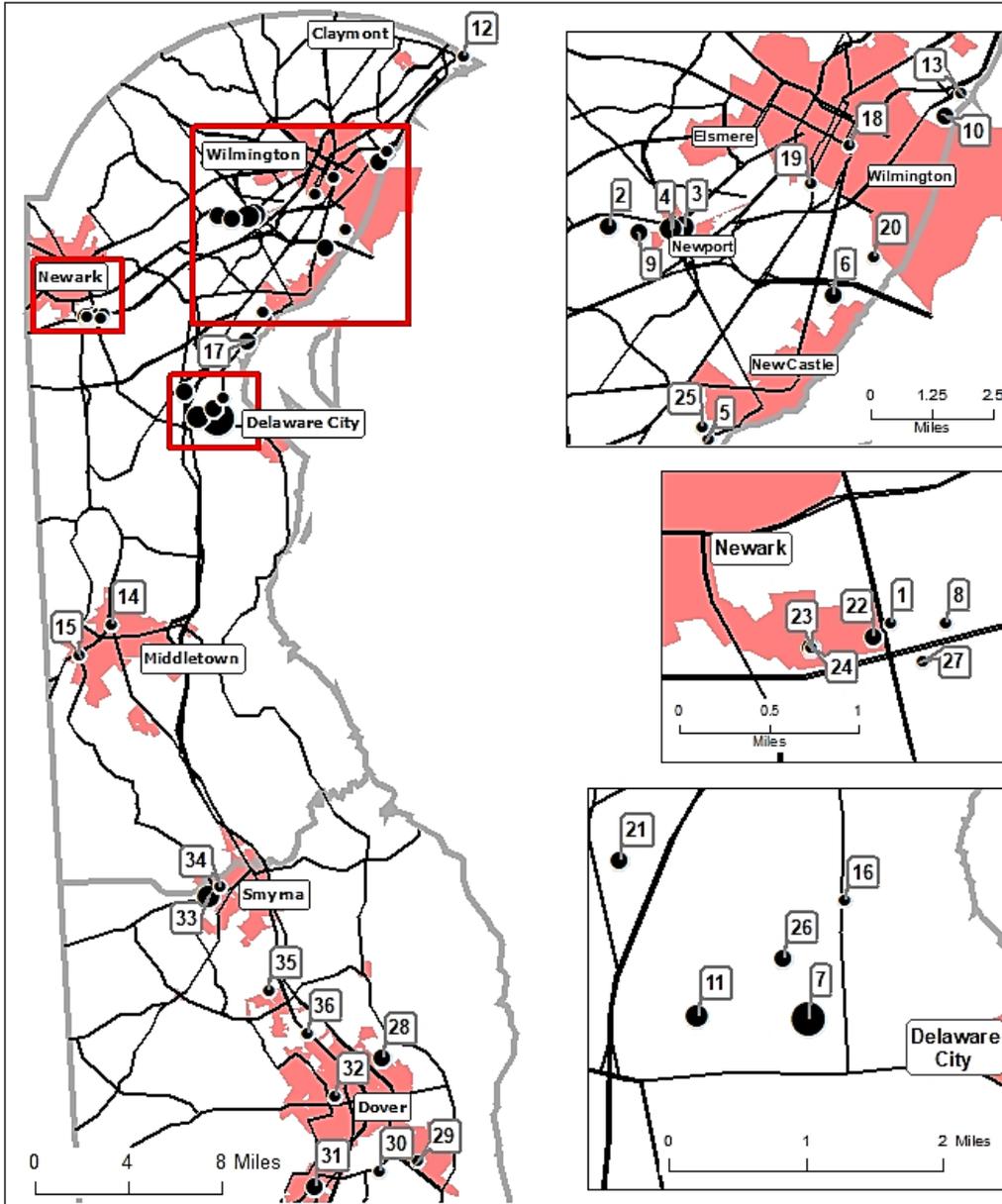
**FIGURE 8**



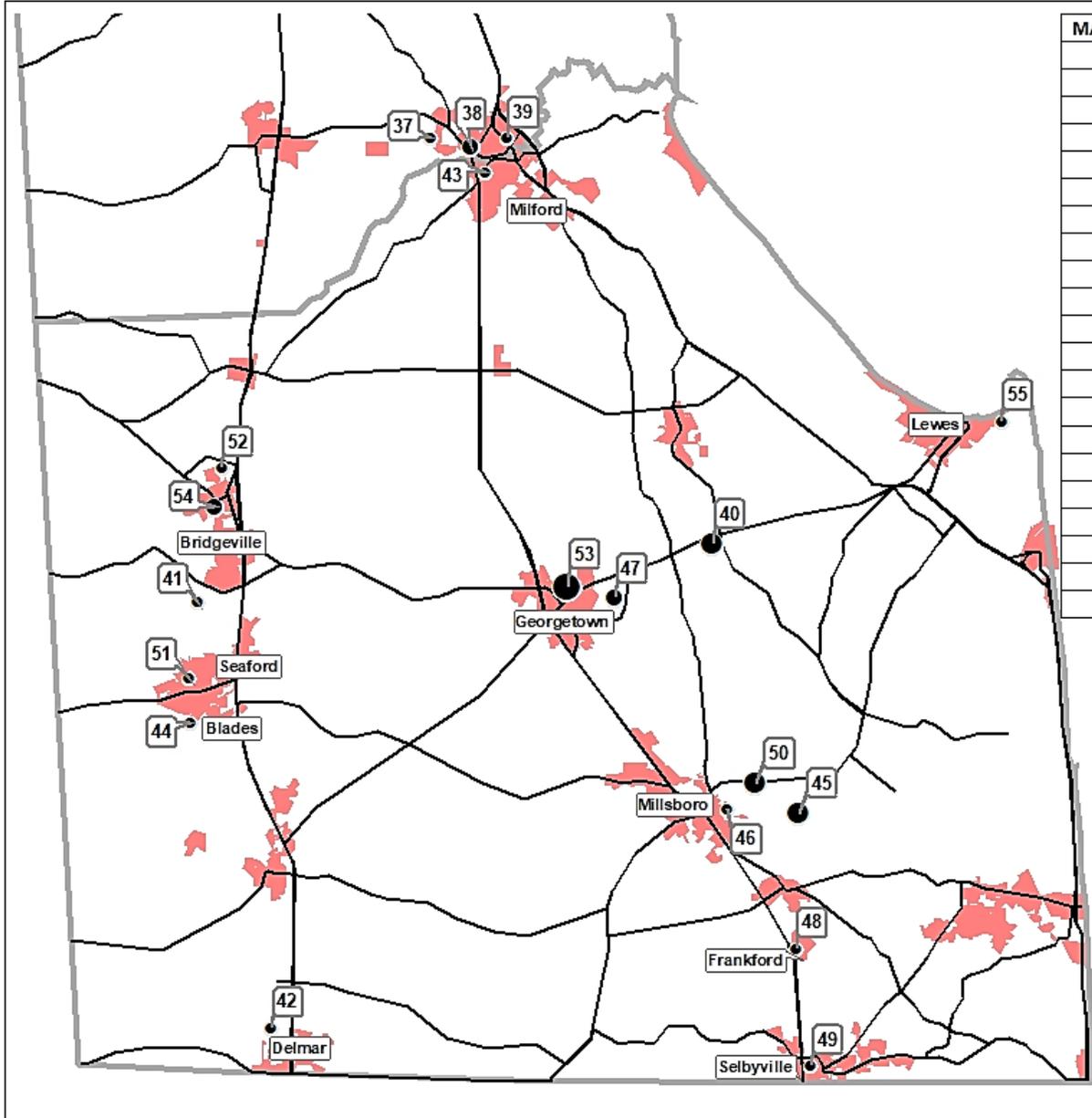
Source: DNREC 2017 TRI Database 10-1-18

## Facility Locations and Information

The map on the following two pages shows the location of each reporting facility in the State, with the facility location marker size depicting the size of its on-site release relative to other facilities in Delaware. Facility contact information is in Appendix B. The **2017 Facility Profiles** provide a facility overview (see **Access to TRI Files** under the **Further Information section** on page 49).

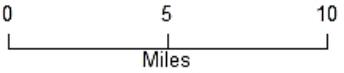


MAP ID	FACILITY
<b>New Castle County</b>	
1	AEARO TECHNOLOGIES
2	AGILENT TECHNOLOGIES
3	AIR LIQUIDE ADVANCED SEPARATIONS
4	BASF COLORS AND EFFECTS USA LLC
5	COLOR WORKS PAINTING
6	CRODA
7	DELAWARE CITY REFINERY
8	DUHADAWAY TOOL & DIE SHOP INC
9	DYK AUTOMOTIVE LLC
10	EDGE MOOR/HAY ROAD ENERGY CENTERS
11	FORMOSA PLASTICS
12	HONEYWELL
13	IKO
14	JOHNSON CONTROLS BATTERY PLANT
15	JOHNSON CONTROLS DISTRIBUTION
16	KUEHNE
17	NATIONAL GUARD TRAINING SITE RANGE
18	NORAMCO INC
19	OWEN STEEL COMPANY
20	PRINCE MINERALS LLC
21	ROGERS CORP
22	ROHM & HAAS B2 B3 B8
23	ROHM & HAAS B5 B6
24	ROHM & HAAS B7 B15
25	V&S DELAWARE GALVANIZING
26	VEOLIA - RED LION PLANT
27	VP RACING FUELS
<b>Kent County</b>	
28	CALPINE CORP - GARRISON ENERGY CENTER
29	DOVER AFB
30	GRIFFITH ENERGY - CARL KING
31	HANDYTUBE
32	HANESBRANDS
33	HANOVER FOODS
34	METAL MASTERS
35	PPG INDUSTRIES
36	SERVICE ENERGY DOVER



MAP ID	FACILITY
<b>Kent County</b>	
37	BALTIMORE AIRCOIL COMPANY
38	DENTSPLY WEST PLANT
39	PERDUE MILFORD
<b>Sussex County</b>	
40	ALLEN HARIM FOODS HARBESON
41	ALLEN HARIM FARMS SEAFORD MILL
42	AMICK FARMS
43	DENTSPLY MAIN PLANT
44	GAC SEAFORD
45	INDIAN RIVER GENERATING STATION
46	INTERVET
47	JUSTIN TANKS
48	MOUNTAIRE FARMS - FRANKFORD MILL
49	MOUNTAIRE FARMS - SELBYVILLE
50	MOUNTAIRE FARMS OF DELAWARE
51	ORIENT CORP
52	PERDUE BRIDGEVILLE
53	PERDUE GEORGETOWN
54	PICTSWEET BRIDGEVILLE
55	SPI PHARMA

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



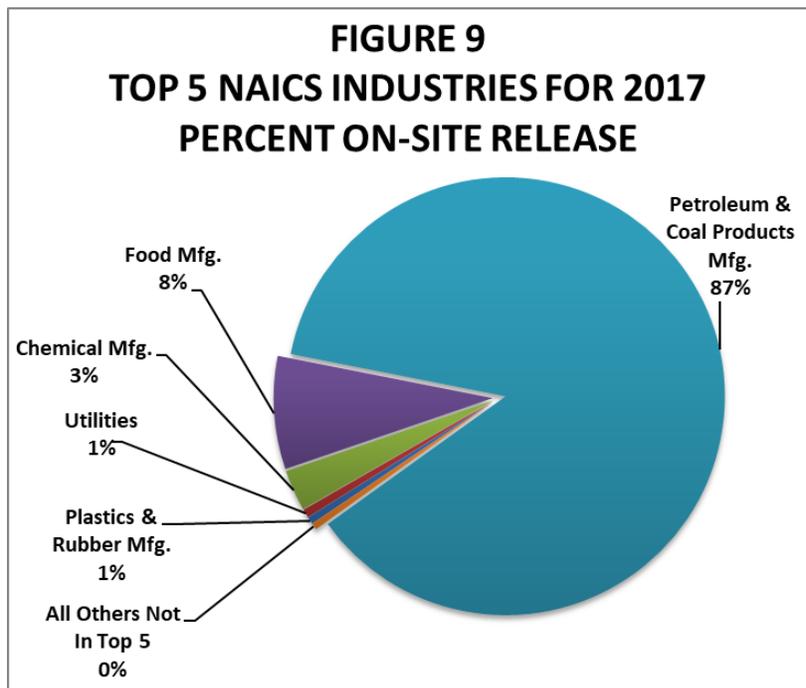
## NAICS Industry Groups

Table 5 provides a description of each North American Industrial Classification System (NAICS) industry group and the number of facilities in each group that reported in Delaware, along with the total reported amounts for each NAICS code. This table also provides on-site releases, off-site transfers, and wastes managed on-site for each group.

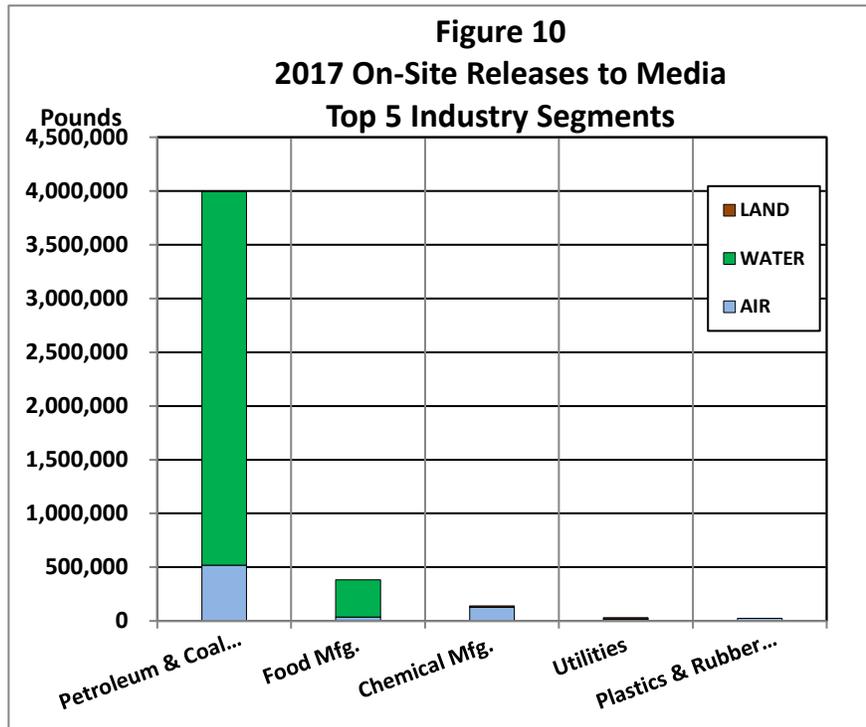
**TABLE 5**  
**2017 TRI DATA BY PRIMARY NAICS GROUP**  
 (in pounds)

NAICS CODE	INDUSTRY GROUP	REPORTS	FACILITIES	FORM A	FORM R	ON-SITE RELEASE	OFF-SITE TRANSFERS	ON-SITE WASTE MGMT.
212	Mining	3	1	1	2	11	0	0
221	Utilities	12	3	0	12	29,123	85	1,644,596
311	Food Mfg.	27	11	18	9	383,312	96	912,001
313	Textile Products Mfg.	8	4	0	8	7,372	1,150,157	4,850,816
324	Petroleum & Coal Products Mfg.	42	4	2	40	3,995,973	87,887	404,608,510
325	Chemical Mfg.	49	13	2	47	138,958	2,473,954	1,892,091
326	Plastics & Rubber Mfg.	11	4	0	11	24,628	188,153	3,487,451
331	Primary Metal Mfg.	4	1	0	4	1,275	82,240	0
332	Fabricated Metal Product Mfg.	10	5	0	10	827	548,889	876,523
333	Equipment Mfg.	5	1	0	5	15	501,907	0
335	Electrical Equipment Mfg.	5	2	0	5	99	6,955,756	0
339	Misc. Manufacturing	4	2	0	4	8,293	14,243	0
424	Wholesalers, Non-Durable Goods	2	1	2	0	0	0	0
454	Non-Store Retailers	3	1	3	0	0	0	0
928	National Security	6	2	0	6	3,993	5	0
	<b>TOTAL</b>	<b>191</b>	<b>55</b>	<b>28</b>	<b>163</b>	<b>4,593,879</b>	<b>12,003,373</b>	<b>418,271,988</b>

Figure 9 shows the percent contribution of each of the top five NAICS groups and all others not in the top five, compared to the reported total on-site releases. The top five NAICS groups 324 (Petroleum and Coal Products Mfg.), 311 (Food Manufacturing), 325 (Chemical Mfg.), 221 (Utilities), and 326 (Plastics and Rubber Mfg.), account for 99.5% of the total on-site releases within the State. Facilities not in the top five NAICS industry groups contributed only 21,885 pounds of on-site releases, less than 1% of the 2017 on-site release total.



Depending on the NAICS group, releases to air, water, and land can be very different. Figure 10 shows the top 5 NAICS groups in Delaware and to what media the releases occurred. For example, petroleum and coal products manufacturing reported 13% of their releases were to air, and 87% of their releases were to water. Food manufacturing reported 9% of their releases were to air, and 91% of their releases were to water. Chemical manufacturing reported 93% of their releases were to air, and 7% to land. Utilities reported having their releases split between air and land, with 66% of the releases to air and 34% of the releases to land. Most of the releases for plastics and rubber manufacturing were to air, 99%.



Keep in mind this is based on a small sample size due to the overall low number of facilities reporting in Delaware. Other states will have greatly different results among NAICS groups, particularly those states whose industries have little presence in Delaware, such as mining or forestry/paper products manufacturing.

## RELEASES FROM THE TOP 15 FACILITIES

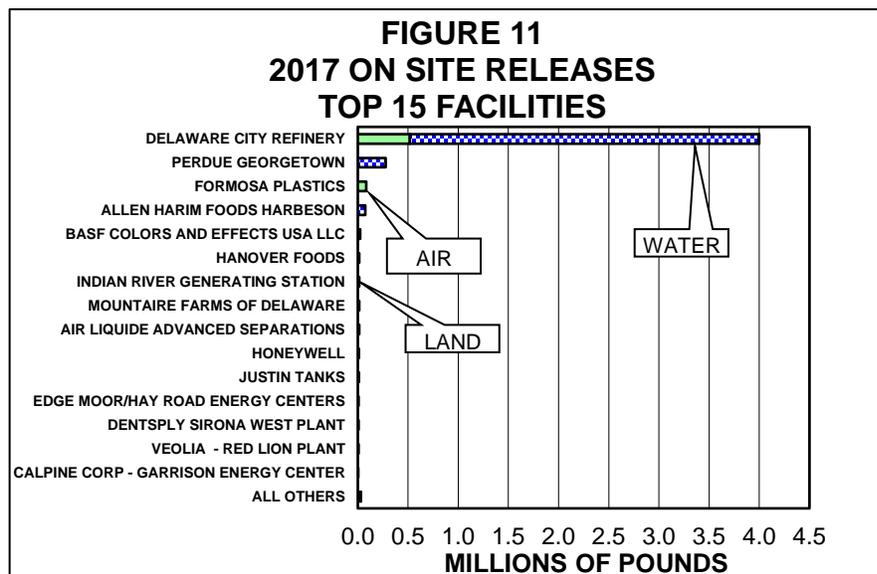


Figure 11 shows the relative contribution of each of the top 15 reporting facilities to on-site releases. The top five facilities accounted for 4,456,851 pounds, or 97% of all on-site releases. Of the 4,593,879 pounds that were reported as released on-site by all 55 facilities Statewide, the top 15 facilities accounted for total releases of 4,564,350 pounds, or 99.4% of the total on-site releases.

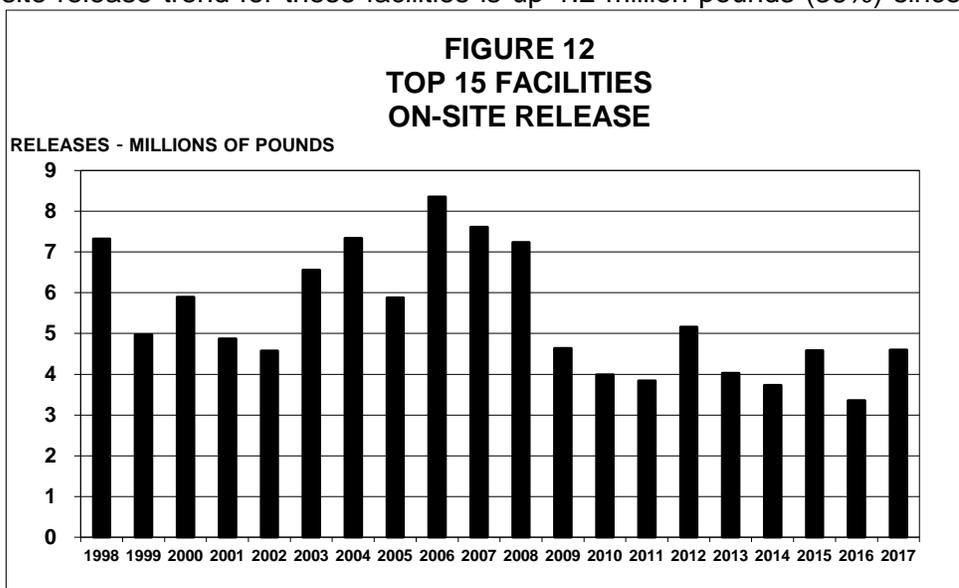
**TABLE 6**  
**TOP 15 FACILITIES 2016 AND 2017 RANKING BY ON-SITE RELEASE**  
(in pounds)

2016 RANK	2017 RANK	FACILITY	2017			2017 ON-SITE RELEASE	2016 ON-SITE RELEASE	2016 TO 2017 CHANGE IN RELEASES	
			TOTAL AIR	TOTAL WATER	TOTAL LAND				
1	1	DELAWARE CITY REFINERY	519,954	3,475,891	128	3,995,973	2,698,200	1,297,773	48%
2	2	PERDUE GEORGETOWN	4,755	272,306	-	277,061	325,950	(48,889)	-15%
3	3	FORMOSA PLASTICS	84,596	1	-	84,597	104,393	(19,796)	-19%
4	4	ALLEN HARIM FOODS HARBESON	0	74,690	-	74,690	37,529	37,161	99%
8	5	BASF COLORS AND EFFECTS USA LLC	24,530	-	-	24,530	22,139	2,391	11%
DNR	6	HANOVER FOODS	15,779	-	-	15,779	-	15,779	-
9	7	INDIAN RIVER GENERATING STATION	4,398	-	9,985	14,382	20,028	(5,646)	-28%
11	8	MOUNTAIRE FARMS OF DELAWARE	13,516	-	-	13,516	12,314	1,202	10%
10	9	AIR LIQUIDE ADVANCED SEPARATIONS	13,264	-	-	13,264	16,494	(3,230)	-20%
NR	10	HONEYWELL	908	-	9,900	10,808	909	9,899	1089%
12	11	JUSTIN TANKS	8,618	-	330	8,948	10,412	(1,464)	-14%
6	12	EDGE MOOR/HAY ROAD ENERGY CENTERS	8,857	1	-	8,858	30,992	(22,134)	-71%
NR	13	DENTSPLY SIRONA WEST PLANT	8,292	-	-	8,292	4,406	3,886	88%
13	14	VEOLIA - RED LION PLANT	7,771	-	-	7,771	7,166	605	8%
7	15	CALPINE CORP - GARRISON ENERGY CENTER	5,882	-	-	5,882	22,340	(16,458)	-74%
<b>ALL OTHERS</b>			<b>25,549</b>	<b>246</b>	<b>3,733</b>	<b>29,529</b>	<b>67,066</b>	<b>(37,537)</b>	<b>-56%</b>
<b>TOP 15</b>			<b>721,120</b>	<b>3,822,888</b>	<b>20,343</b>	<b>4,564,350</b>	<b>3,313,272</b>	<b>1,251,078</b>	<b>38%</b>
<b>STATE TOTALS, ALL FACILITIES</b>			<b>746,669</b>	<b>3,823,135</b>	<b>24,076</b>	<b>4,593,879</b>	<b>3,380,338</b>	<b>1,213,542</b>	<b>36%</b>

NR- Not ranked in the top 15 for 2016  
DNR- Did not report in 2016  
Source: 2016 and 2017 DNREC TRI Databases, October 2017

Table 6 shows the 2017 ranking of the top 15 facilities along with their 2016 ranking and the reported amounts of on-site releases for both years. Releases to the environment because of remedial actions, accidents, or one-time catastrophic events are included in these values. The percent change in total on-site releases for each of the top 15 facilities from 2016 to 2017 is also shown, and some of these changes are significant. The #5 facility from 2016's report, Hirsh, did not report to TRI for 2017, because they were below the reporting threshold.

Figure 12 shows the totals for on-site releases for the top 15 reporting facilities from 1998-2017. The total on-site release trend for these facilities is up 1.2 million pounds (36%) since 2016 and down 2.8 million pounds (38%) since 1998 after reaching a peak of 8.4 million pounds in 2006. These facilities reported 99.4% of the total on-site releases in the State for 2017, while the remaining 40 facilities reported 0.6%.



Eight facilities of the top 15 facilities reported an increase in on-site releases, while seven reported a decrease for 2017. Changes at the facility, such as the way releases are estimated, how waste is managed, changes in raw materials or processing methods, or installation of new or

improved equipment possibly used to limit or eliminate releases of specific chemicals or all chemicals, may affect reported releases. The largest change reported by the top 15 facilities in on-site releases were increases in the release of nitrate compounds to water reported by the Delaware City Refinery, up by 1,021,869 pounds. Other large changes in on-site releases reported by the top 15 were an increase in sulfuric acid released to air by the Delaware City Refinery, up by 253,087 pounds compared to 2016; and a decrease in nitrate compounds released to water by Perdue Georgetown, down by 45,635 pounds since 2016.

Although the TRI program itself does not regulate or limit emissions, other DNREC and federal programs do issue permits and limit emissions from operating facilities. TRI data is also shared with other programs within DNREC to verify data accuracy and to provide data and information to those programs.

## **Facilities No Longer Reporting to TRI**

In the normal annual cycle of TRI reporting, some facilities may fall below the reporting thresholds and some facilities may close. In recent years, this involved the annual loss of 2-4 facilities, partially offset by 1-2 new facilities that started to report each year.

Formosa Plastics ceased operations in August of 2018; so 2018 will be the last year they will report to TRI, if they meet the reporting threshold. MacDermid ceased operations in February of 2017; so they did not file 2017 TRI reports, because they fell below the reporting threshold for the year. Hirsh Industries, and HMI Heritage facilities located in Wilmington, Bear, and Cheswold also did not file 2017 TRI reports, because they fell below the reporting threshold.

Chemours Edge Moor ceased operations in September of 2015, so they did not file 2016 TRI reports. Fujifilm also did not file 2016 TRI reports, because they fell below the reporting threshold for the year. Facilities that did not file 2014 TRI reports because they closed permanently were: Evraz Claymont Steel, BASF Seaford, Motech Americas in Newark, and HMA Heritage Concrete in Frankford. Chrome Deposit ceased operations and closed in 2012, and NRG Dover converted to natural gas and ceased burning coal; so these two facilities did not file 2013 TRI reports.

## **New Facilities Reporting to TRI**

Hanover Foods filed a TRI report for 2017, for the first year since 2012; as they usually fall below the TRI reporting threshold.

Calpine Corporation's Garrison Energy Center filed TRI reports for the first time for the 2016 reporting year. This 309-megawatt natural gas-fired, combined cycle electric generating facility is located in the Garrison Oak Technological Park in Dover. DYK Automotive LLC report to TRI for the first time in 2016; and, at that time, also filed a TRI report for 2015. This facility, located in Wilmington, mixes and re-packages automotive aftermarket products. More information concerning these two facilities is contained in this report, the report **Appendices**, and the **2017 TRI Facility Profiles**.

## Persistent Bioaccumulative Toxic (PBT) Chemicals, 2007-2017

For reporting year 2000 and beyond, the EPA established substantially lower reporting thresholds for 12 existing chemicals and one chemical category that are highly persistent and bioaccumulative in the environment. Six new chemicals and one new category were also added to the PBT list for 2000. The new thresholds apply regardless of whether the PBT chemical is manufactured, processed, or otherwise used. For 2011, four of the 16 new chemicals added (see page 5) are also PACs and they are now included in the PACs category.

Table 7 provides a current list of the PBT chemicals and their thresholds, and the number of reports received for each chemical for 2017.

**TABLE 7**  
**2017 DELAWARE PBT CHEMICALS**  
**AND REPORTING THRESHOLDS**  
**(pounds/year)**

Chemical or Chemical Category	Threshold (Pounds)	2017 REPORTS
Aldrin	100	0
Benzo[g,h,i]perylene	10	1
Chlordane	10	0
Dioxin and dioxin-like compounds category	0.1 grams	3
Heptachlor	10	0
Hexachlorobenzene	10	0
Isodrin	10	0
Lead	100	2
Lead and lead compounds	100	5
Mercury	10	2
Mercury compounds	10	3
Methoxychlor	100	0
Octachlorostyrene	10	0
Pendimethalin	100	0
Pentachlorobenzene	10	0
Polychlorinated biphenyls (PCBs)	10	0
Polycyclic aromatic compounds category (PACs)	100	3
Tetrabromobisphenol A	100	0
Toxaphene	10	0
Trifluralin	100	0
TOTAL		19

PBTs are receiving increased scrutiny as we learn more about them, and reporting of PBTs is being progressively emphasized. These chemicals are of particular concern because they are not only toxic, but also because they remain in the environment for long periods of time, are not readily destroyed, and accumulate in body tissues.

In 2008, new data elements became available for dioxin and dioxin-like compounds (DLCs). The 17 compounds that fall under the TRI category of DLCs have a wide range (1.0000 to 0.0003) of toxicity; these values are called the Toxic Equivalent Factor (TEF). In order to compare them on an equal toxicity basis, we multiply the TEF by the pounds reported to get the Toxic Equivalent Quantity (TEQ). Facilities reporting on dioxins are also now required to report the amounts released or managed as waste for each of the 17 DLCs. See **Appendix M** for a copy of the DLC reporting form, Schedule 1. These amounts are provided along with the original amount reported in pounds. See pages 23-24 for additional detail on dioxins.

Table 8 shows the results of PBT reporting for 2015-2016 compared to total 2017 TRI data. The total count of PBT reports, 19, is lower than the counts of all recent years. PBT on-site releases for 2017 comprise 0.1% of the total TRI on-site releases. Total PBT wastes are 1.6% of total TRI wastes. No PBT reports can be filed on Form A. See page 3 for an explanation of PBT and non-PBT chemicals.

PBT on-site releases were lower for 2017 by 1,590 pounds (24%); with the greatest decrease coming from the U. S. Army's National Guard River Road Training Site Range in New Castle with lower releases of lead to land by 1,453 pounds. Lead and lead compounds made up 91% of the total on-site PBT releases for 2017. Since 2007, the trend of PBT on-site releases is down 76%.

**TABLE 8**  
**2017 TRI PBT DATA SUMMARY**  
**(IN POUNDS)**

	PBTs only 2015	PBTs only 2016	PBTs only 2017
No. of Facilities	18	17	12
No. of Form A's	NA	NA	NA
No. of Form R's	32	25	19
No. of Chemicals	11	7	0
On-Site Releases			
Air	626	517	517
Water	91	33	62
Land	17,647	6,058	4,440
On-Site Releases	18,364	6,608	5,018
Off-Site Transfers			
POTW's	27	2	1
Recycle	4,311,286	4,924,884	6,932,803
Energy Recovery	0	0	0
Treatment	0	0	0
Disposal	32,649	24,926	2,978
Total Transfers	4,343,962	4,949,812	6,935,781
On-Site Waste Mgmt.			
Recycle	3,224	7,123	7,873
Energy Recovery	0	0	0
Treatment	783	825	825
Total On-Site Mgmt.	4,007	7,948	8,698
Total PBT Waste	4,366,332	4,964,368	6,949,497

The total PBT waste amount increased by 1,985,111 pounds (40%) for 2017 compared to 2016. The primary reason for this increase was the increased transfers of lead compounds to off-site recycling by the Johnson Controls Battery Plant and Distribution Center.

Table 9, on page 23, shows the amounts of each PBT chemical reported as released by the TRI reporting facilities in 2017. The Delaware City Refinery reported the largest PBT release to air, 235 pounds of polycyclic aromatic compounds (PACs). The Johnson Controls Battery Plant reported the largest PBT release to water, 47 pounds of lead compounds. The U. S. Army's National Guard Training Site Range reported the largest release to land, 3,733 pounds of lead. Over 99% of the PBT amounts transferred off-site for recycle was lead compounds from Johnson Controls Battery Plant and Distribution Center. Additional detail for mercury and mercury compounds, another important PBT, is in a separate section on page 25.

Three companies (The Delaware City Refinery, IKO, and V&S Galvanizing) reported the entire amount of on-site PBT chemical waste management. The refinery treated 453 pounds of benzo(g,h,i)perylene and 372 pounds of polycyclic aromatic compounds (PACs) on-site. IKO recycled 465 pounds of PACs on-site and V&S Galvanizing recycled 7,408 pounds of lead on-site. **Appendix I** shows the PBT data detail, listing each PBT chemical and the facilities reporting on it.

**TABLE 9**  
**2017 PBT RELEASE SUMMARY**  
 (REPORTS AMOUNTS IN POUNDS)

2017 PBT CHEMICAL	FORM R REPORTS	TOTAL AIR	TOTAL WATER	TOTAL LAND	ON-SITE TOTAL	TRANSFERS OFF SITE	ON-SITE WASTE MGMT.
BENZO (G,H,I)PERYLENE	1	0.64	4.57	0.00	5.21	0.00	453.00
DIOXIN AND DIOXIN-LIKE COMPOUNDS	3	0.0066	0.0000	0.0000	0.0066	0.0002	0.0000
LEAD	2	9.60	2.20	3733.10	3744.90	6523.25	7,408.00
LEAD COMPOUNDS	5	163.71	49.50	625.70	838.91	6,928,956.80	0.00
MERCURY	2	13.88	0.0010	0.00	13.88	193.67	0.00
MERCURY COMPOUNDS	3	93.77	1.50	80.80	176.07	13.02	0.00
POLYCYCLIC AROMATIC COMPOUNDS	3	234.95	3.78	0.00	238.73	94.10	837.10
<b>TOTALS</b>	<b>19</b>	<b>517</b>	<b>62</b>	<b>4,440</b>	<b>5,018</b>	<b>6,935,781</b>	<b>8,698</b>

Source: 2017 DNREC TRI Database, October 2018

Dioxins are reportable in grams and have been converted to pounds for this report.

Four decimal places are used where small amounts are not -0-.

### Dioxin and Dioxin-Like Compounds

The term “dioxins” is used by the EPA TRI program and in this report to indicate the group of 17 dioxins and dioxin-like compounds (DLCs) reportable to TRI, out of a family of several hundred dioxins and dioxin-like compounds, including furans. These dioxins are also part of the PBT category, and you can see the totals for releases and other waste management in Table 9 above. In recent years, on-site release of DLCs has been in the range of 3-15.8 grams. For 2017, the amount was 3 grams.

On May 10, 2007, the EPA Toxics Release Inventory Program issued a final rule expanding reporting requirements for the DLCs category. The final rule requires that, in addition to the total amount released for the entire category, facilities must report the amount of each individual member for each release and waste management activity on a new form (Schedule 1). A template for the Schedule 1 form is given in **Appendix M** of this report. The reporting requirements of the final rule applied to the 2008 reporting year and to following years.

The reason for this rule is that the toxicity levels of these 17 DLCs vary greatly, and some compounds in this group have Toxic Equivalent Factors (TEF) **3,333 times less** than others. Because of this great variation, the Toxicity Equivalent Quantity (TEQ) is a way to show toxic chemical amounts on an equal toxicity basis. The EPA and DNREC use the individual mass quantity data to calculate TEQ amounts (Weight X TEF = TEQ). This data is available to the public along with the mass data. Table 10, on the following page, shows all 17 DLCs that are reportable to TRI and some basic information about them.

Among the “dioxins” included in TRI reports is the very toxic 2,3,7,8-TCDD dioxin (#1 in Table 10), which is the congener generally of most concern. All TRI “dioxins” are reportable in grams and were converted to pounds for this report since all other chemicals are reported in pounds (1 gram = 0.002205 pounds). You can see that TRI dioxin numbers 1 and 2 have the highest TEF (1.0000), and numbers 7 and 17 have the lowest (0.0003). This is a range of 3,333 to 1. In order to show the toxicity effects of the 17 dioxins on an equal basis, the amounts released in pounds are multiplied by their TEF. The resulting TEQ allows them to be compared on an equal toxicity level.

**TABLE 10**  
**DIOXIN TOXIC EQUIVALENT FACTORS (TEF)**

TRI No.	Dioxin Chemical (DLC) Name	Abbreviated Name	CAS	TEF
1	2,3,7,8-tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	1746-01-6	1.0000
2	1,2,3,7,8-pentachlorodibenzo-p-dioxin	1,2,3,7,8-PeCDD	40321-76-4	1.0000
3	1,2,3,4,7,8-hexachlorodibenzo-p-dioxin	1,2,3,4,7,8-HxCDD	39227-28-6	0.1000
4	1,2,3,6,7,8-hexachlorodibenzo-p-dioxin	1,2,3,6,7,8-HxCDD	57653-85-7	0.1000
5	1,2,3,7,8,9-hexachlorodibenzo-p-dioxin	1,2,3,7,8,9-HxCDD	19408-74-3	0.1000
6	1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin	1,2,3,4,6,7,8-HpCDD	35822-46-9	0.0100
7	1,2,3,4,6,7,8,9-octachlorodibenzo-p-dioxin	1,2,3,4,6,7,8,9-OCDD	3268-87-9	0.0003
8	2,3,7,8-tetrachlorodibenzofuran	2,3,7,8-TCDF	51207-31-9	0.1000
9	1,2,3,7,8-pentachlorodibenzofuran	1,2,3,7,8-PeCDF	57117-41-6	0.0300
10	2,3,4,7,8-pentachlorodibenzofuran	2,3,4,7,8-PeCDF	57117-31-4	0.3000
11	1,2,3,4,7,8-hexachlorodibenzofuran	1,2,3,4,7,8-HxCDF	70648-26-9	0.1000
12	1,2,3,6,7,8-hexachlorodibenzofuran	1,2,3,6,7,8-HxCDF	57117-44-9	0.1000
13	1,2,3,7,8,9-hexachlorodibenzofuran	1,2,3,7,8,9-HxCDF	72918-21-9	0.1000
14	2,3,4,6,7,8-hexachlorodibenzofuran	2,3,4,6,7,8-HxCDF	60851-34-5	0.1000
15	1,2,3,4,6,7,8-heptachlorodibenzofuran	1,2,3,4,6,7,8-HpCDF	67562-39-4	0.0100
16	1,2,3,4,7,8,9-heptachlorodibenzofuran	1,2,3,4,7,8,9-HpCDF	55673-89-7	0.0100
17	1,2,3,4,6,7,8,9-octachlorodibenzofuran	1,2,3,4,6,7,8,9-OCDF	39001-02-0	0.0003

Also, you can see how, for a dioxin like numbers 1 and 2, where the TEF is highest at 1.000, the TEQ amounts are greater than the weight percentages. Conversely, for dioxin numbers 7 and 17, where the TEF values are a low 0.003, the TEQ amounts are smaller than their weight percentages. For example, Edge Moor/Hay Road Energy Centers reported dioxin number 7 (TEF = 0.003) as 56.8% of the total weight, but this was only 0.5% of the TEQ. The total on-site release amounts in pounds and their corresponding TEQ amounts reported by the four facilities that reported on dioxins in Delaware for 2017 were calculated and are presented in the Table 11. The 2017 total of 0.006634 pounds, or 3 grams, was released on-site, which is DOWN 8.5% from the 2016 total of 0.007241 pounds, or 3.3 grams. Dioxin releases have trended downward over the last ten years, down a total of .0282 pounds (12.8 grams), or 81% since 2007. Because of the differences in distribution of individual dioxins and dioxin-like compounds, the rankings may change when comparing by pounds or by TEQ. In addition, the pounds released or managed as waste are shown in **Appendix I**.

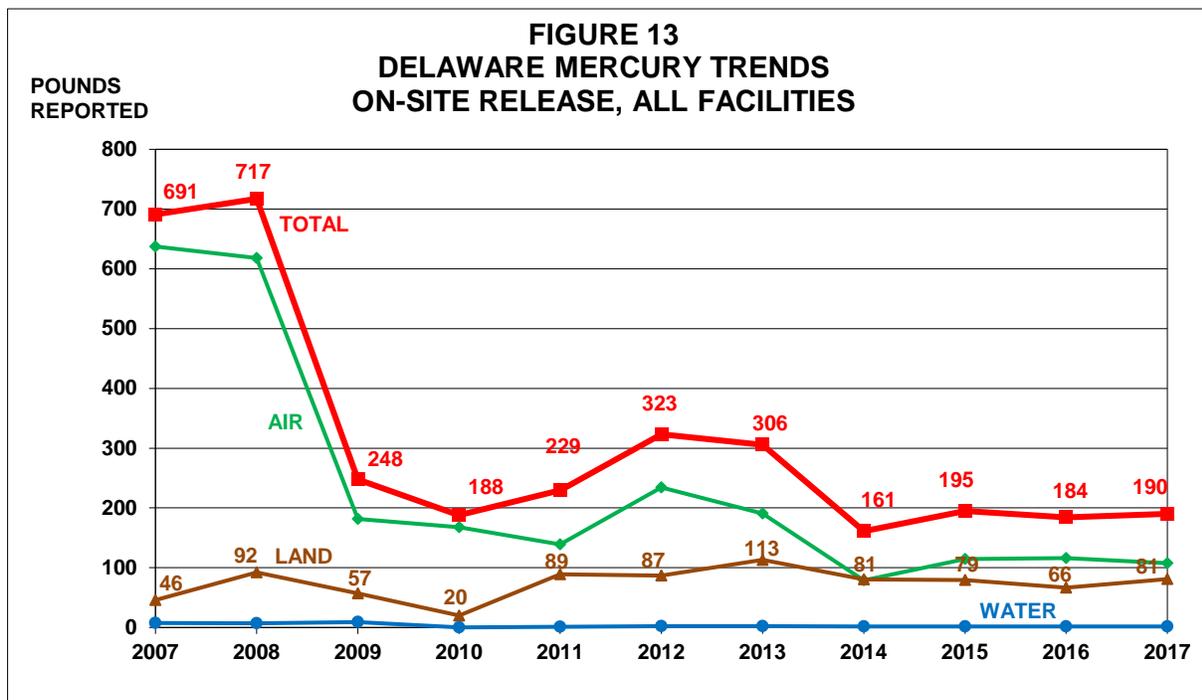
<b>SORTED BY TOTAL ON-SITE TEQ</b>	<b>TOTAL ON-SITE</b>	<b>ON-SITE</b>	<b>TOTAL ON-SITE</b>	<b>ON-SITE</b>
<b>FACILITY</b>	<b>TEQ, LBS.</b>	<b>TEQ RANK</b>	<b>LBS. RELEASE</b>	<b>LBS. RANK</b>
EDGE MOOR/HAY ROAD ENERGY CENTERS	0.0001782	1	0.005361	1
DELAWARE CITY REFINERY	0.0001549	2	0.001263	2
FORMOSA PLASTICS	0.0000004	3	0.000009	3
<b>TOTALS</b>	<b>0.0003335</b>		<b>0.006634</b>	

### 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 in these reports. Control of mercury and mercury compounds is becoming increasingly important as we learn more about mercury, and that mercury is a serious pollutant. Children, including unborn babies, exposed to mercury compounds can have impaired functions, including verbal, attention, motor control, and intelligence. Adults may be at lower risk than children, but mercury in fish consumed by adults may lead to problems similar to those found in children, as well as reproductive and cardiovascular problems. A significant source of mercury pollution comes from the air, as mercury released from power plants is deposited on water and land, where runoff may also migrate to the water. Many lakes and streams are impaired as a result of mercury releases from coal-burning power plants. As mercury makes its way into the food chain, restrictions on eating fish harvested from these water bodies are becoming more commonplace.

For 2017, total on-site releases of mercury and mercury compounds increased 6 pounds (3%) to a total of 190 pounds. This was largely the result of an increase in releases to land of 14.4 pounds by the Indian River Generating Station. On-site releases of mercury and mercury compounds on the whole are down 72.5% since 2007.

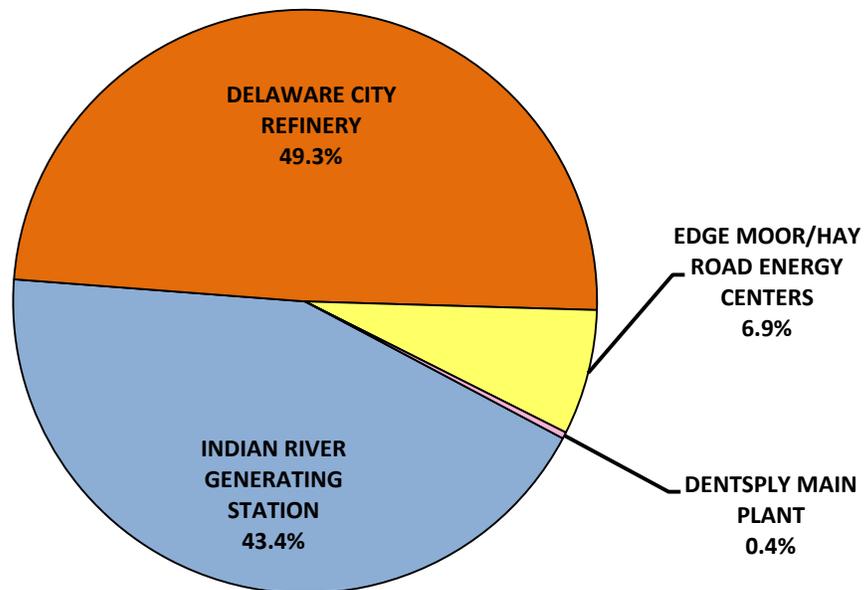
Figure 13 shows the combined trend for mercury and mercury compounds, and how the trend has been greatly influenced by on-site releases to air.



The Delaware City Refinery reported the highest on-site release amount of mercury for 2017, with the majority of releases to air. Indian River Generating was the second largest

contributor for on-site mercury releases in 2017, with the majority of releases to land. Figure 14 shows the percentage contributed by each of the facilities that reported a mercury or mercury compound release in 2017. On-site release amounts for mercury and mercury compounds can also be found in **Appendix F** on page F-7 and **Appendix I** on page I-1.

**FIGURE 14**  
**2017 ON-SITE MERCURY RELEASES**  
**FROM DELAWARE FACILITIES**



**190 POUNDS REPORTED RELEASED ON-SITE**

**TABLE 12  
CARCINOGENS REPORTED BY  
DELAWARE FACILITIES FOR 2017**

CHEMICAL NAME	IARC	NO. OF REPORTS
4,4'-METHYLENEBIS(2-CHLOROANILINE)	1	2
ARSENIC COMPOUNDS	1	1
ASBESTOS (FRIABLE)	1	1
BENZENE	1	1
CHROMIUM COMPOUNDS	1	2
ETHYLENE OXIDE	1	1
NICKEL COMPOUNDS	1	3
VINYL CHLORIDE	1	1
1,3-BUTADIENE	2A	1
CREOSOTE	2A	1
LEAD	2A	2
LEAD COMPOUNDS	2A	5
TRICHLOROETHYLENE	2A	1
COBALT COMPOUNDS	2B	1
CUMENE	2B	2
ETHYLBENZENE	2B	3
HYDRAZINE	2B	1
HYDRAZINE SULFATE	2B	1
NAPHTHALENE	2B	4
NICKEL	2B	3
NITROBENZENE	2B	1
P-CHLOROANILINE	2B	1
POLYCYCLIC AROMATIC COMPOUNDS	2B	3
PROPYLENE OXIDE	2B	1
STYRENE	2B	2
TETRACHLOROETHYLENE	2B	1
TOLUENE DIISOCYANATE (MIXED ISOMERS)	2B	1
VINYL ACETATE	2B	1
<b>CHEMICALS = 28</b>	<b>REPORTS = 48</b>	

Source: 2017 DNREC TRI Database, October 2018

Delaware City Refinery and the Dover Air Force Base. For additional information on cancer rates and causes, please go to the Division of Public Health cancer web site listed in the **“For Further Information”** section on page 49.

### **Carcinogen Trends, 2007-2017**

The number of facilities reporting on carcinogens for 2017 was 26, down from 33 facilities in 2016. The number of carcinogen reports decreased by seven to 48 in 2017; and the total number of reported carcinogenic chemicals remained the same, at 28. On-site releases of all carcinogens decreased 21.5% (30,230 pounds) compared to 2016, and have decreased 87.1% (764,762 pounds) since the peak in 1998. Releases of individual chemicals in the carcinogen category have also trended downward: over the last ten years releases of lead and lead compounds are down by 76%, and releases of polycyclic aromatic compounds (PAC's) are down by 79%. The largest 2017 decrease in on-site releases was Formosa Plastics' reported decrease in vinyl acetate releases. Other carcinogens saw smaller decreases in releases, with some facilities reporting increases. See **Appendix J** for detailed information on 2017 carcinogen releases.

## **Carcinogenic TRI Chemicals**

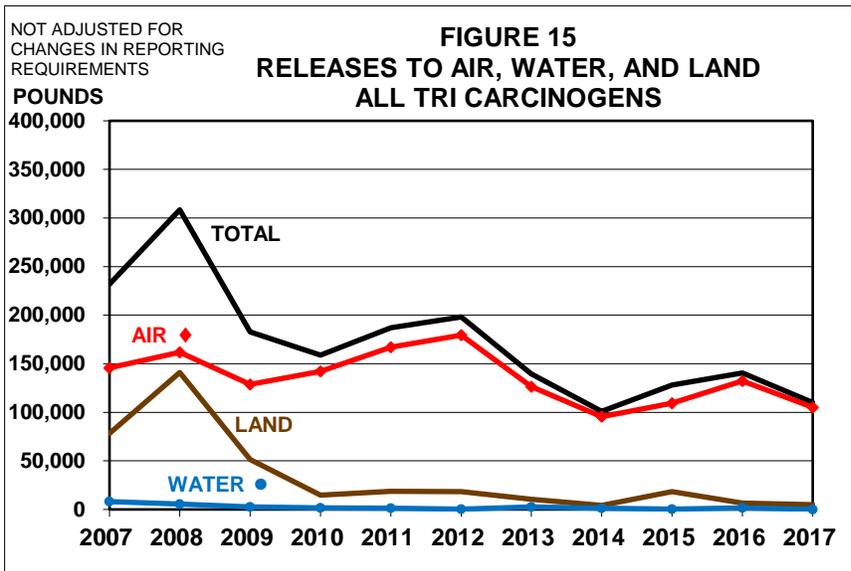
Some chemicals are reportable under TRI because they are carcinogens, and are known or suspected to cause cancer in humans. Table 12 shows those carcinogens that were reported by Delaware facilities for 2017. Each chemical is determined to be a carcinogen by either the International Agency for Research on Cancer (IARC) or the National Toxicology Program (NTP). Next to the chemical is their rating listed as: Known (1), Probable (2A), or Possible (2B) carcinogen. Of the 4.6 million pounds of TRI chemicals reported by facilities in Delaware as released on-site to the environment in 2017, 2.4% (110,149 pounds) were known or suspected carcinogens. Nine existing TRI chemicals were added to the list of carcinogens starting with the 2017 TRI reporting year. Of these chemicals, only cumene, a possible carcinogen, is reported by two Delaware facilities, the

Table 13 shows amounts released on-site for carcinogens from 2007-2017, and Figure 15 shows the trend, which has been generally downward during this time period.

**TABLE 13**  
2007-2017 TRI CARCINOGENS  
REPORTED ON-SITE RELEASES, NOT ADJUSTED

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>KNOWN</b>											
AIR	56,287	69,781	60,664	63,975	70,033	73,545	58,914	59,175	51,188	51,619	55,355
WATER	6,435	4,452	2,059	576	1,318	121	429	1,187	226	1,584	11
LAND	46,021	104,112	26,843	8,843	552	558	411	0	0	0	0
<b>KNOWN TOTAL</b>	108,743	178,345	89,567	73,394	71,903	74,224	59,753	60,362	51,413	53,203	55,366
<b>PROBABLE</b>											
AIR	18,628	14,604	11,112	15,175	16,040	7,008	7,480	7,568	4,629	4,337	1,721
WATER	4	5	5	1,146	124	58	163	97	82	23	52
LAND	8,212	8,661	7,115	5,404	17,458	17,017	8,991	3,351	17,278	6,106	4,487
<b>PROBABLE TOTAL</b>	26,845	23,270	18,232	21,725	33,623	24,083	16,633	11,016	21,989	10,466	6,260
<b>POSSIBLE</b>											
AIR	70,722	77,436	56,817	63,059	80,974	98,864	60,152	28,732	53,472	76,332	48,169
WATER	1,655	1,170	522	38	25	20	2,053	29	30	14	24
LAND	24,005	28,203	17,459	615	562	901	947	817	979	365	330
<b>POSSIBLE TOTAL</b>	96,382	106,809	74,798	63,713	81,561	99,785	63,152	29,577	54,481	76,711	48,523
<b>TOTAL AIR</b>	145,637	161,821	128,593	142,210	167,047	179,417	126,545	95,475	109,289	132,288	105,245
<b>TOTAL WATER</b>	8,094	5,627	2,586	1,761	1,468	199	2,645	1,313	337	1,620	86
<b>TOTAL LAND</b>	78,238	140,976	51,417	14,862	18,572	18,476	10,348	4,168	18,257	6,471	4,817
<b>GRAND TOTAL</b>	231,970	308,424	182,596	158,832	187,087	198,092	139,538	100,955	127,884	140,379	110,149

Source: DNREC TRI 2017 Database, October 2018



For 2017, on-site releases of all carcinogens are down 21.5%, or 30,230 pounds. Figure 15 shows a trend for each of the category releases by media and the total reported carcinogen release. The general trend has been down. In recent years, releases to air have largely influenced the total, while releases to land and water play a much smaller part.

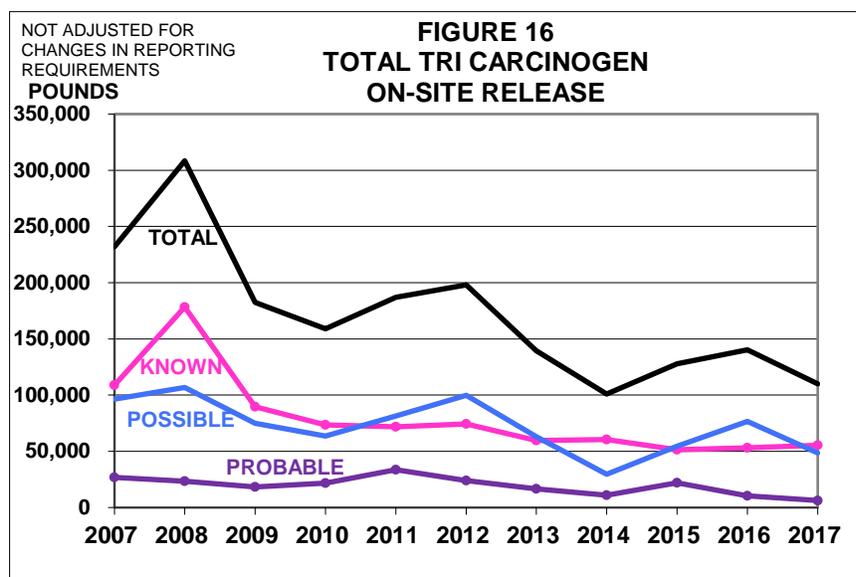
### Known Carcinogens

Known Carcinogens, although only making up one fourth of the reports, are significant because of their high toxicity classification. Known carcinogens made up 50.3% of the total on-site carcinogen releases reported for 2017. Figure 16, on the next page, shows the trend of each of the three carcinogen groups and their effect on the total on-site release. On-site releases of known carcinogens increased since 2016, up by 4.1%. On-site releases of known carcinogens are down 527,767 pounds (90.5%) since 1998.

Almost all (100%) of the total known carcinogen amount was reported released on-site to air, 0% to land, and 0% to water for 2017. Releases to air of known carcinogens are 52.6% of all carcinogen on-site releases to air. Reported releases to air of known carcinogens

increased by 7.2% (3,736 pounds) in 2017, and are down 73.5% from the amount reported in 1998.

Vinyl chloride, with a total release to air of 45,949 pounds and only reported by Formosa Plastics, is the highest (83%) of the total releases in the known carcinogen category and also the highest of all 28 carcinogens reported. Vinyl chloride contributed 83% of the known carcinogen category releases to air in 2017, 43.7% of all carcinogen releases to air, and 41.7% of carcinogen total on-site releases in 2017. The second highest known carcinogen in 2017 was benzene. Benzene, largely released to air, and all from the Delaware City Refinery, has declined 87.9% from 58,371 pounds released in 1995 (from the Delaware City Refinery and the now closed Metachem facility) to 7,082 pounds in



2017. Benzene made up 12.8% of the known carcinogen releases to air for 2017, down from 23% for 1995.

Ethylene oxide ranks third in total on-site releases in the known carcinogen category at 2,318 pounds, down from 2,654 pounds in 2016. Croda reported all of the ethylene oxide released for 2017, and releases of ethylene oxide were only to air.

Nickel compounds, all of which was released to air

(12 pounds), ranks fourth in total on-site releases in the known carcinogen category. Small amounts were reported by Baltimore Aircoil, Owen Steel, and Prince Minerals. The Delaware City Refinery reported no releases of nickel compounds on-site for 2017, down from 3,257 pounds reported for 2016.

### Probable Carcinogens

This category has the least number of chemicals (5), and the least released on-site (5.7%), but has some important chemicals in it: lead and lead compounds, trichloroethylene (TCE), creosote, and 1,3-butadiene. During 2017, 71.7% of the five probable carcinogens reported was released on-site to land, while 27.5% was released to air, and 0.8% was released to water.

Lead, 99.7% of which was reported by the U. S. Army's National Guard River Road Training Site Range, was the highest reported amount of on-site release of a probable carcinogen, with 3,733 pounds for 2017, down from 5,224 pounds reported in 2016. Of the amount released in 2017, 3,733 pounds were released to land, and 9 pounds to air, and 2 pounds to water.

Trichloroethylene (TCE) reported by HandyTube was the second highest release of a

probable carcinogen with 1,275 pounds reported as released to air. On-site releases of this chemical decreased significantly, by 2,573 pounds (66.9%) from 2016. TCE releases have trended downward, declining by 95.7% from 1995-2017, down from 29,332 pounds reported for 1995 to 1,275 pounds for 2017.

Lead compounds had the third highest reported amount of on-site release of a probable carcinogen, with 839 pounds for 2017, a decrease from 968 pounds reported in 2016. The Indian River Generating Station reported the highest release, 626 pounds to land and 11 pounds released to air, or 75.9% of total amount reported by the 5 facilities reporting lead compounds for 2017. The remaining 4 facilities had smaller amounts reported as released to air, water, or land.

The probable carcinogen on-site release total decreased by 4,206 pounds (40.2%) for 2016-2017 and is now at 6,260 pounds, 11.7% of the 1998 amount.

### **Possible Carcinogens**

This category has the most chemicals and number of reports, encompassing 44.1% of all on-site releases reported for carcinogens. About 99.3% of the total possible carcinogen amount is reported as released on-site to air, 0.7% to land, and 0% to water. The trend for 2017 is down by 36.7%, or 28,188 pounds from 2016; and down 78%, or 171,697 pounds, since 1998. The highest chemical release in this category is vinyl acetate at 34,162 pounds, all of which was reported released to air by Formosa Plastics. Vinyl acetate makes up 70.4% of all possible carcinogen on-site releases. Reported on-site releases of vinyl acetate decreased by 42,549 pounds (55.5%) for 2017.

Styrene is the second highest release in the possible carcinogen category for 2017, with reports totaling 8,964 pounds, all but 335 pounds to air. Justin Tanks reported 99.8% of the styrene releases for 2017, 8,618 pounds of styrene released to air and 330 pounds released to land, down 14% from 10,412 pounds reported for 2016. The other facility reporting styrene releases was the Delaware City Refinery with 16 pounds. Total reported styrene releases for 2017 decreased by 1,462 pounds.

As before, in *Limitations of TRI Data* on Pages 4-5, we urge caution when using this data, as **the TRI data does not indicate the amount, if any, of human exposure.**

## **Trend Analysis**

### **Effect of Chemical and Facility Group Additions, 1990-2017**

Although the TRI program began with reporting for 1987, the next two years were marked with a change each year in the manufacturing, processing, and otherwise use threshold amounts. For 1987, the thresholds were 75,000 pounds for manufacturing and processing, and 10,000 pounds for otherwise use. For 1988, the thresholds were 50,000/10,000 pounds, and for 1989 and beyond, the thresholds were 25,000/10,000 pounds. It is not possible to make a meaningful comparison of trends during this time, as the number of facilities and the number of reports varied because of the changing reporting criteria.

Significant groups of chemicals and facilities were added to the TRI program:

- **Chemical List Changes -1995**

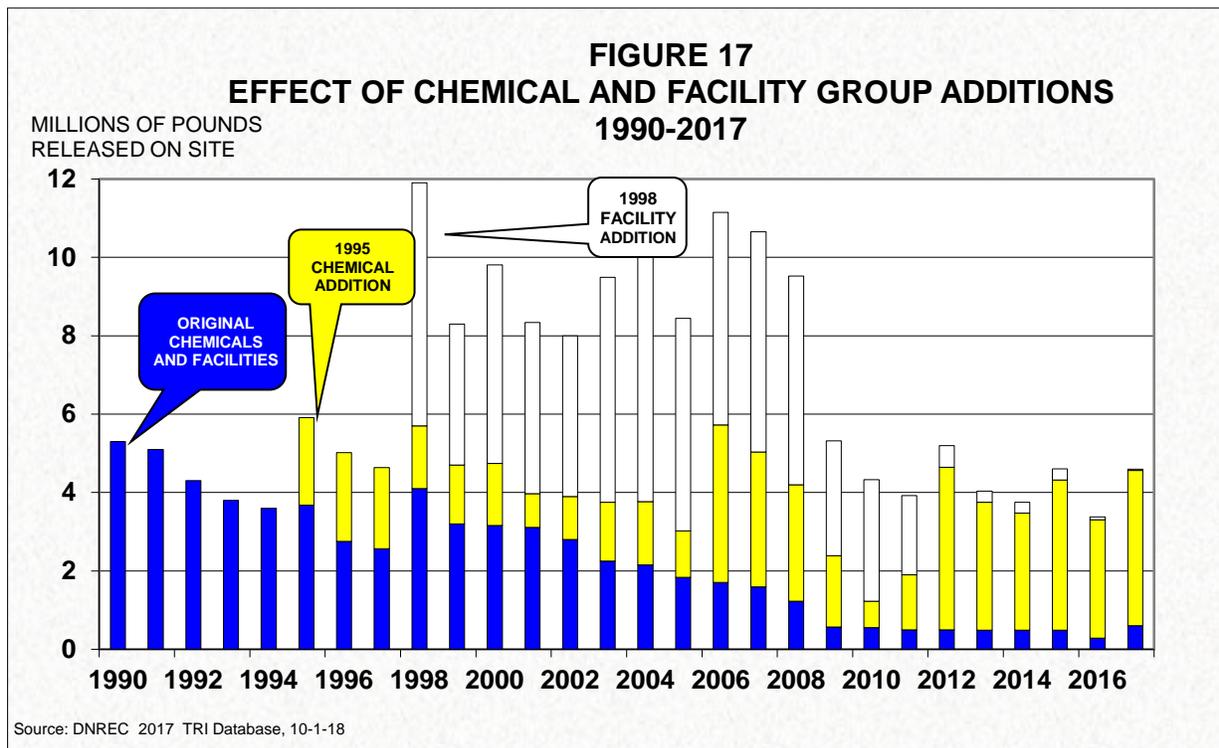
For reporting year 1995 and beyond, the EPA significantly expanded the list of chemicals. The list increased by 282 chemicals and chemical categories, added to the original list of 238 chemicals. Also during 1989-1995, other chemicals and categories were added or deleted, including chemical categories which are highly persistent and bioaccumulative in the environment (PBTs), bringing the total chemical count for 1995 to 581 and the chemical category count to 30. See details on the PBT chemical reports starting on page 21, and in Appendix I.

Other additions to the chemical list have occurred over time, including recently. In the 2011 reporting year, 16 new carcinogens, four of which are in the polycyclic aromatic compounds (PAC) category, were added to the list of reportable chemicals. For 2012, Hydrogen Sulfide was added to the list of reportable chemicals. Hydrogen Sulfide reports increased on-site treatment reported amounts by 329 million pounds in 2012 and is discussed in greater detail in ***On-site Waste Management Trends*** on page 39. For the 2014 reporting year, o-nitrotoluene was added to the list of reportable TRI chemicals. For 2015, a nonylphenol category was added to the list of reportable TRI chemicals. The EPA added the chemical 1-bromopropane to the list of TRI reportable chemicals for the 2016 reporting year. The EPA added a hexabromocyclododecane chemical category for the 2017 reporting year. These additions bring the total chemical count to 595 listed chemicals and 32 chemical categories. Also, starting with the 2017 reporting year, nine existing TRI chemicals were added to the list of carcinogens. Of these chemicals, only cumene, a possible carcinogen, is reported by two Delaware facilities, the Delaware City Refinery and the Dover Air Force Base.

- **Industry Expansion - 1998**

Beginning with the 1998 reporting year, the EPA added seven industries to the list of facilities covered under TRI. Prior to the 1998 reporting year, only manufacturers (and Federal facilities) were required to report (see Table 1 on page 3). The greatest impact to Delaware is the Electric Utilities (NAICS 221). The industry expansion significantly increased the amount of reported releases. This did not necessarily represent an increase in toxic releases in Delaware, but rather provided additional information to the public. Other smaller groups as noted above, or even individual chemicals, are also added or deleted over time.

Figure 17 shows these effects starting in 1990 and following the trend of each group since it was added to the TRI program. Data from the beginning of the TRI program in 1987-89 is excluded because reporting requirements changed significantly and a valid comparison of that data with later data is not feasible.



The trend of each group and the reports affecting the trends will be discussed in this Trend Analysis section. All groups have changed over time, with increases and decreases reflecting both changes in business conditions and improvements in analysis. Table 14 shows the amount reported in millions of pounds for each group at the time it was added, the 2017 reported amount, and the amount of change since the time it was added. If each group had remained constant at the time of its addition, amounts reported for 2017 would be 13.73 million pounds instead of the 4.59 million pounds actually reported for 2017. Due to several factors, including facility efforts to reduce pollution, increased regulation, partial or complete shutdown of facilities, and declining business conditions, the reporting facilities in Delaware have effected a reduction of 9.14 million pounds, or 75%.

**TABLE 14**  
**TREND OF ON-SITE RELEASES FOR CHEMICAL AND FACILITY ADDITIONS**

GROUP	STARTING YEAR AMOUNT Millions of Pounds	2017 AMOUNT Millions of Pounds	CHANGE SINCE STARTING Millions of Pounds	PERCENT CHANGE
Original Facilities and Chemicals	5.30	0.60	-4.70	-89%
1995 Chemical Addition	2.23	3.96	1.73	78%
1998 Facility Addition	6.20	0.03	-6.17	-100%
TOTAL	13.73	4.59	-9.14	-67%

**TABLE 15**  
**2007-2017 TRI DATA SUMMARY**  
**(IN POUNDS)**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
No. of Facilities	69	69	63	61	63	60	62	57	59	59	55
No. of Form As	44	31	29	31	34	33	33	31	31	33	28
No. of Form Rs	295	288	227	197	209	202	195	177	189	176	163
No. of Chemicals	102	100	90	79	90	88	91	88	90	85	82
<b>On-Site Releases</b>											
Air	6,920,245	5,845,072	3,194,221	3,519,986	2,416,526	1,109,209	998,934	805,127	712,043	546,310	746,669
Water	3,327,675	2,796,686	1,590,679	600,479	1,230,737	3,777,904	2,881,902	2,931,067	3,862,398	2,812,016	3,823,135
Land	406,188	885,976	537,489	210,747	278,669	306,702	151,956	17,910	29,078	22,011	24,076
<b>Unadjusted On-Site Release</b>	<b>10,654,109</b>	<b>9,527,735</b>	<b>5,322,389</b>	<b>4,331,212</b>	<b>3,925,932</b>	<b>5,193,815</b>	<b>4,032,792</b>	<b>3,754,104</b>	<b>4,603,520</b>	<b>3,380,338</b>	<b>4,593,879</b>
<b>Off-site Transfers</b>											
POTWs	1,243,125	1,117,335	636,602	996,970	1,048,588	814,866	935,842	934,025	1,035,534	997,109	956,919
Recycle	8,181,423	7,535,371	5,367,592	5,662,694	8,027,133	9,383,706	9,009,366	7,384,097	6,805,511	7,249,685	8,876,457
Energy Recovery	4,910,600	3,695,215	2,330,189	1,857,131	2,110,293	2,556,954	1,874,068	2,005,555	1,968,891	1,612,951	1,679,546
Treatment	171,044	150,297	140,248	336,190	274,727	963,123	1,112,090	314,129	229,453	256,899	117,153
Disposal	7,145,314	3,129,281	2,785,524	4,563,328	2,307,186	2,419,683	1,571,572	2,356,053	1,612,829	561,263	373,297
<b>Unadjusted Total Transfers</b>	<b>21,651,506</b>	<b>15,627,498</b>	<b>11,260,156</b>	<b>13,416,312</b>	<b>13,767,928</b>	<b>16,138,331</b>	<b>14,502,937</b>	<b>12,993,859</b>	<b>11,652,217</b>	<b>10,677,907</b>	<b>12,003,373</b>
<b>On-Site Waste Mgmt.</b>											
Recycle	10,945,896	10,870,477	5,630,119	7,678,337	7,974,584	9,326,213	11,642,121	11,636,106	10,756,074	11,859,042	9,712,512
Energy Recovery	20,387,061	20,932,200	14,670,034	-	9,172,883	16,227,012	15,659,902	15,930,970	15,963,550	12,727,241	12,475,029
Treatment	39,879,302	42,281,742	38,179,139	32,895,795	38,585,960	376,100,649	375,430,183	470,213,664	397,416,374	361,034,681	396,084,447
<b>Unadjusted Total On-Site Mgmt.</b>	<b>71,212,259</b>	<b>74,084,419</b>	<b>58,479,292</b>	<b>40,574,132</b>	<b>55,733,427</b>	<b>401,653,874</b>	<b>402,732,206</b>	<b>497,780,740</b>	<b>424,135,997</b>	<b>385,620,964</b>	<b>418,271,988</b>
<b>Total Waste</b>	<b>103,517,874</b>	<b>99,239,652</b>	<b>75,061,836</b>	<b>58,321,655</b>	<b>73,427,286</b>	<b>422,986,019</b>	<b>421,267,934</b>	<b>514,528,704</b>	<b>440,391,734</b>	<b>399,679,208</b>	<b>434,869,240</b>

NOT ADJUSTED FOR CHANGES IN REPORTING REQUIREMENTS  
SOURCE: DNREC 2017 DATABASE, OCTOBER 2018

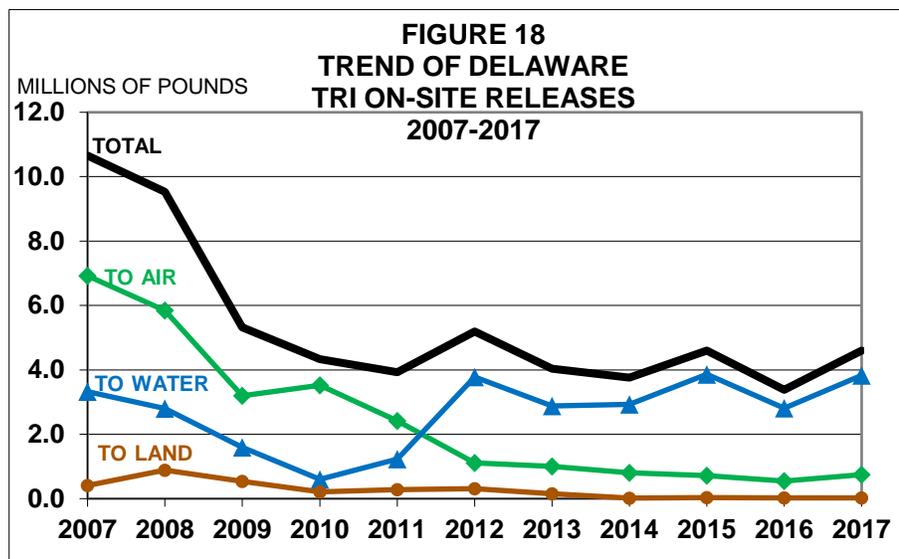
## Release and Waste Management Trends, 2007-2017

Table 15 on page 33 shows amounts reported for each of the last 10 years. Earlier data is available back to 1987, the first year of the TRI program. Changes in reporting requirements over time have caused an increase both in the total number of chemicals and in the total number industries that are subject to reporting. Significant changes to the TRI reporting requirements occurred in 1995, 1998 and 2000, when large increases in chemicals (1995), industries subject to reporting (1998), and reductions in PBT thresholds (2000) occurred. The 2012 reporting year marked the addition of hydrogen sulfide to the list of reportable chemicals. Comparison of this data with earlier data must be done carefully, as some chemicals and/or industries may not have been required to report over the entire time.

The analysis presented in this section uses 2007 as a base year for presenting trends for all reportable chemicals and facilities. Sections covering on-site releases and off-site transfers are **not adjusted** for any changes in reporting requirements. However, in the on-site releases section, further analysis is presented on on-site releases, showing the impact of the Delaware City Refinery on the overall releases using 2013 as a base year. The on-site management section discusses the impact of the addition of hydrogen sulfide to the list of reportable chemicals.

### **On-Site Releases, 2007-2017**

Figure 18 shows the on-site release trends during 2007-2017. On-site releases include emissions to the air, discharges to bodies of water and releases at the facility to land, including on-site landfills. On-site release amounts increased by 35.9% for 2017 (1,213,542 pounds) following a 26.6% decrease (1,223,182 pounds) for 2016.



Significant changes in the amounts reported for 2016-2017 include the facilities and chemicals shown in Table 16 on the next page. To put the changes in perspective for 2017, there were 70 reports with a higher amount, 51 reports with a lower amount, and 70 reports with no change from the 2016 amount. There were 5 reports with an increase greater than 10,000 pounds and 7 reports with a decrease greater than 10,000 pounds.

**TABLE 16**  
**REPORTS OF MAJOR CHANGES IN ON-SITE RELEASES FOR 2017 FROM 2016**

FACILITY	CHEMICAL	MEDIA	CHANGE IN ON-SITE RELEASES (pounds)
Perdue Georgetown	Nitrate Compounds	Water	-45,635
Allen Harim Harbeson	Nitrate Compounds	Water	+37,161
Delaware City Refinery	Ammonia	Air	+38,491
Delaware City Refinery	Sulfuric Acid	Air	+253,087
Delaware City Refinery	Nitrate Compounds	Water	+1,021,869

Some of these changes (higher or lower) may have been caused by normal year-to-year variations in production levels at the facility, or by the chemical content of raw materials. Some changes may also have been caused by improvements in the way facilities estimate amounts. These changes are the primary reasons for the reductions and increases in the totals for 2016-2017. Changes are also discussed in the **Facilities No Longer Reporting Section** on page 20. Facility specific information is available via the **2017 TRI Facility Profiles**, see **Access to TRI Files** under the **Further Information Section** on page 49. In addition, you may contact a facility for a more in-depth discussion of the reasons for specific changes, and consult the appendices in this report for the exact amounts that were reported.

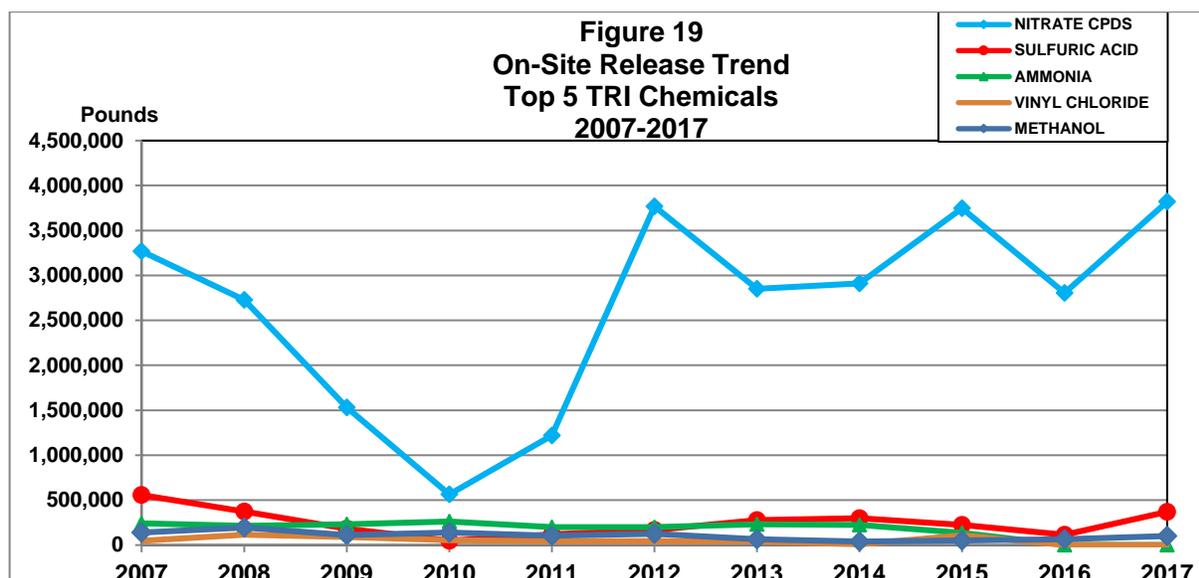
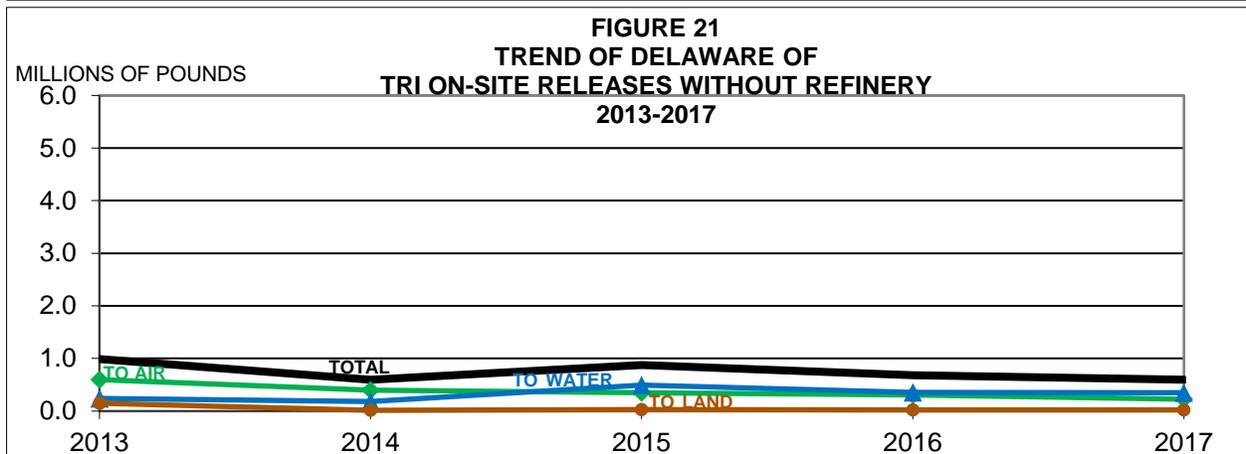
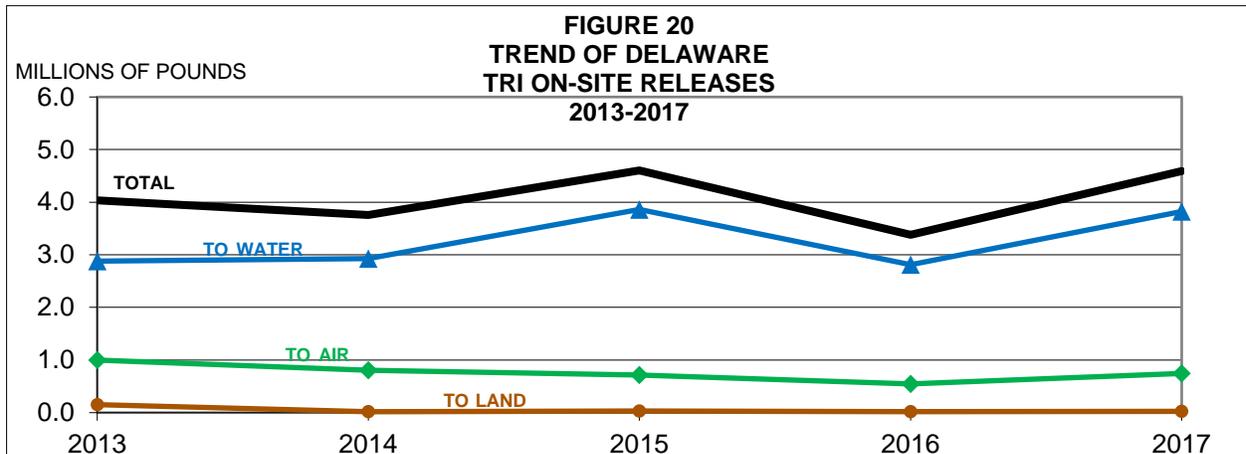


Figure 19 shows the trend since 2007 for the top five chemicals based on on-site release amounts reported for 2017 in Delaware. These five chemicals represent 95.2% of all on-site releases from the 82 chemicals reported in 2017. Nitrate compound releases trended downward from 2007 through 2010, when the Delaware City Refinery was in the process of shutting down and preparing to be sold. From 2010 through 2012, nitrate compound releases

trended upward with the refinery coming back online and being in full operation. Nitrate compound releases accounted for 83% (3.8 millions pounds) of all on-site releases in 2017. Sulfuric acid ranked second in on-site releases, accounting for 8% (369,466 pounds). Sulfuric acid releases trended downward from 2008 through 2010, then trended upward from 2010 to 2014 with the Delaware City Refinery coming back online, and have varied from year to year since 2014. Ammonia ranked third in on-site releases, accounting for 2.2% (101,774 pounds). Vinyl chloride ranked fourth in on-site releases, accounting for 1% of the total. Formosa released 100% of the vinyl chloride reported to air in 2017, up 12.2% over 2016, with past release amounts varying year to year. Methanol ranked fifth, and accounted for 0.8% of the total in on-site releases. BASF accounted for 66% of the total on-site releases for methanol, which were up 2.5% over 2016, with the total releases of methanol varying small amounts in recent years.

Figure 20 shows the on-site releases to air, water and land over the last 5 reporting years from 2013 through 2017. As the figure depicts, total releases mirror the trend of releases to water. This is due to nitrate compounds reported as released to water by the Delaware City Refinery, which accounted for 75.6% of all onsite releases in 2017. Figures 20 and 21 provide a side by side comparison showing the impact the refinery has on the overall on-site releases. Figure 21 shows all other on-site releases, with the releases of the Delaware City Refinery removed. Onsite releases reported from all other facilities have dropped by 39.6% (391,338 pounds) since 2013, while total on-site releases, including the refinery releases, are up by 13.9%



(561,087 pounds) compared to 2013. One reason for the decrease in on-site releases is the economy, which effects production at the facilities and ultimately many of their on-site releases have declined in recent years and indirectly caused part of the reduction.

### Off-Site Transfers, 2007-2017

An off-site transfer is a transfer of toxic chemicals as wastes to another facility that is physically separate from the reporting facility and may even be out-of-state (see page 11 for more information on off-site transfers). Chemicals are reported as transferred to an off-site facility when they are transported away from the reporting facility for the purposes of treatment at a publicly-owned treatment works (POTW, typically a waste water treatment plant), recycle, disposal, energy recovery, or non-POTW treatment facility. Although the off-site transfers may be of less immediate local concern than on-site releases, the transfers to POTWs, treatment, and disposal facilities still represent toxic chemicals as wastes that must be ultimately accounted for.

As noted on page 11 and seen in Table 15 on page 33, the amounts reported as transferred off-site are about 2.6 times greater than the amounts of on-site releases. Figures 22 and 23 show the trends in amounts of TRI chemicals in wastes transferred off-site for all facilities and chemicals reporting since 2007. To increase clarity, the lower portion (0 - 8 million pounds) of Figure 22 is expanded in Figure 23. For comparison, please look at the corresponding values in Table 15 on page 33. Off-site transfers increased 12.4% (1,325,466 pounds) in 2017, driven by increases in amounts sent off-site for recycling and energy recovery; and offset partially by decreases in off-site transfers for treatment and disposal, and transfers to POTW's.

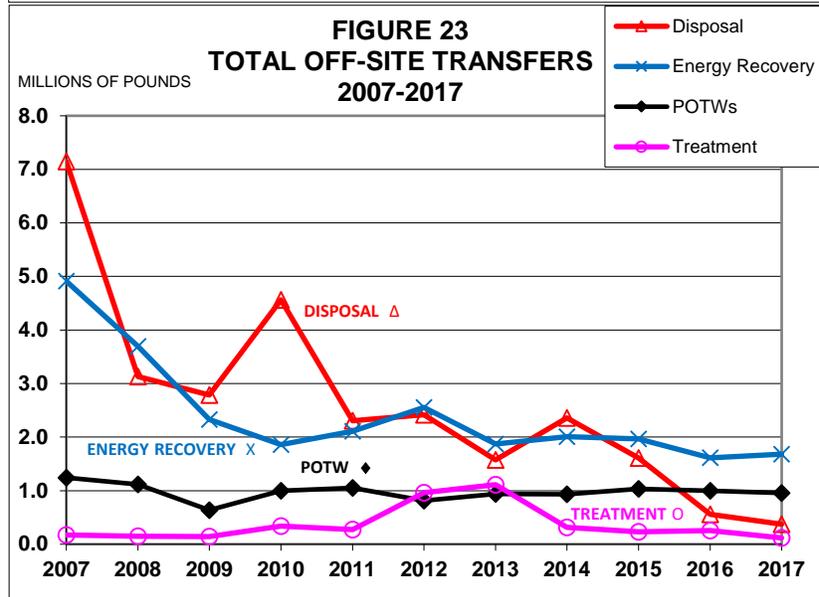
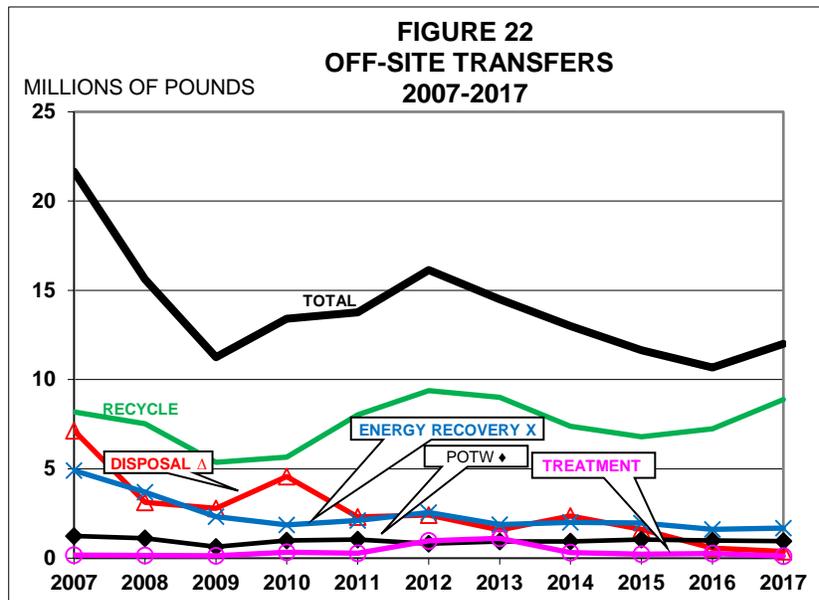


Table 17, below, shows that the largest off-site transfer increases were for lead compounds sent off-site for recycling by the Johnson Controls Battery Plant and the Johnson Controls Distribution Center. The third largest increase reported was in off-site energy recovery of toluene by Noramco. The largest decreases in off-site transfers was for N,N-dimethylformamide sent for recycling by Rohm & Haas B2, B3, B8; followed by Noramco's reported decrease in n-butyl alcohol sent off-site for energy recovery, and Prince Minerals reported decrease in manganese compounds sent off-site for disposal. Fifty-one reports showed decreases, while 60 reported increases in off-site transfers for 2017.

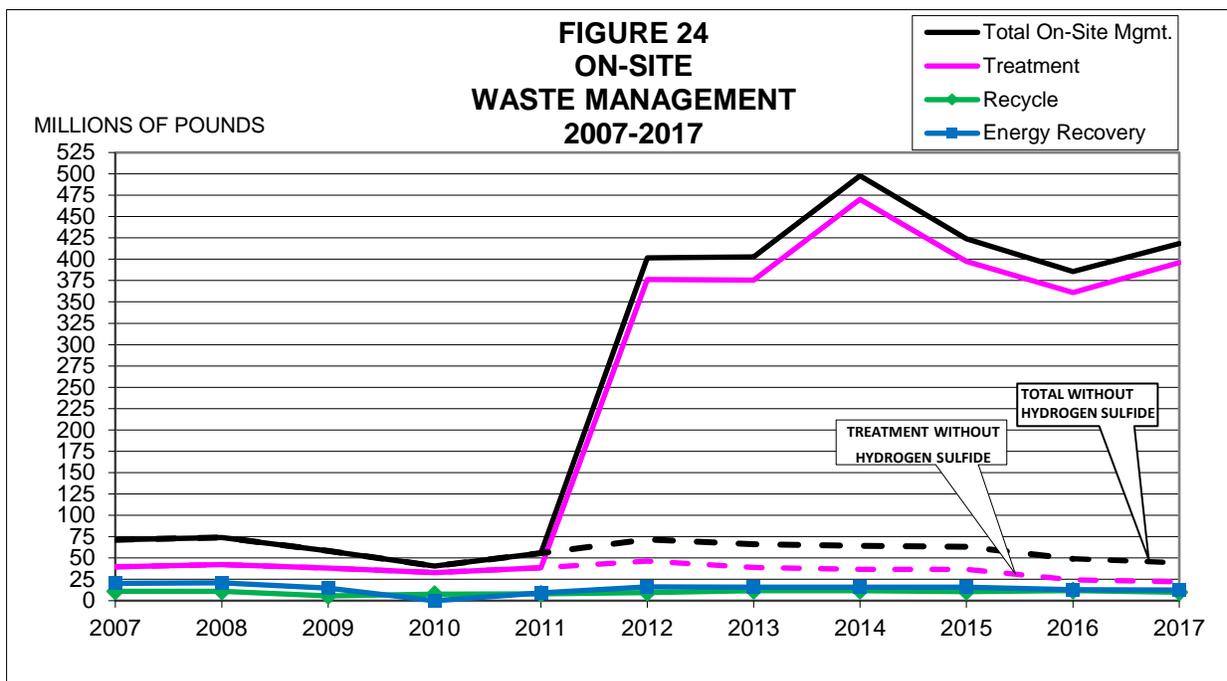
**TABLE 17**  
**MAJOR CHANGES IN OFF-SITE TRANSFERS FOR 2017 FROM 2016**

<b>FACILITY</b>	<b>CHEMICAL</b>	<b>OFF-SITE METHOD</b>	<b>CHANGE (pounds)</b>
Rohm & Haas B2 B3 B8	N,N-Dimethylformamide	Recycling	-275,250
Noramco	N-Butyl Alcohol	Energy Recovery	-189,271
Prince Minerals	Manganese Compounds	Disposal	-122,750
Noramco	Toluene	Energy Recovery	+213,441
Johnson Controls Distrib.	Lead Compounds	Recycle	+462,221
Johnson Controls Plant	Lead Compounds	Recycle	+1,551,096

### On-Site Waste Management, 2007-2017

At some facilities, wastes are managed on-site instead of being sent off-site for processing or disposal. On-site waste management (recycling, recovery for energy, or treatment at the facility) is the processing of chemicals in wastes that do not leave the site of the reporting facility. Although these amounts represent a loss of raw materials and/or finished product to the facility as waste, they are not as much of a threat to the environment as the on-site release categories; since these amounts are treated or recycled and not disposed of or released to the on-site environment. There is, of course, the risk that these chemicals may be accidentally released on-site to the environment during the waste management process. Also, most waste management operations are not 100% efficient, so a portion of the waste being treated in these operations will be released on-site and must be accounted for in the on-site releases reported by the facility.

Figure 24 below shows the trends for the three on-site waste management activities since 2007. Overall, on-site waste management amounts increased 8.5% (32,651,024 pounds) in 2017 compared to 2016. The on-site management of hydrogen sulfide accounted for 89.4% (373,948,964 pounds) of all on-site waste management activities, with the Delaware City Refinery treating the largest amount at 373,728,611 pounds. As noted on page 31, the addition of Hydrogen Sulfide to the list of reportable chemicals resulted in a 329 million pound increase in on-site treatment amounts reported for 2012.



The Delaware City Refinery is the only facility in the state that reports on-site energy recovery as part of its air pollution control activities. On-site energy recovery was down 2% (252,212 pounds) compared to 2016, with the refinery reporting ammonia as having the largest decrease in energy recovery compared to 2016.

The largest changes reported in on-site waste management for 2017 are:

**TABLE 18**  
**MAJOR CHANGES IN ON-SITE WASTE MANAGEMENT FOR 2017 FROM 2016**

<b>FACILITY</b>	<b>CHEMICAL</b>	<b>ON-SITE WASTE MANAGEMENT METHOD</b>	<b>AMOUNT OF CHANGE (pounds)</b>
Orient	Aniline	Recycling	-1,380,000
BASF Newport	Methanol	Treatment	-799,421
Air Liquide - Medal	Methanol	Recycling	-884,004
BASF Newport	Nitrate Compounds	Treatment	+921,135
Delaware City Refinery	Hydrogen Sulfide	Treatment	+37,426,904

These changes were balanced by smaller increases and decreases from other reports. Thirty-seven reports showed an increase in a waste management amount, while 26 reports showed a decrease for 2017. Total pounds for on-site waste management, excluding the addition of hydrogen sulfide, have decreased by 17.8 million pounds, or 44.6%, over the last 10 years or since 2007. The on-site waste management amount totals are in Table 15 on page 33, and Figure 6 on page 12 shows the relative amounts.

No trend is shown for total waste, as it would be dominated by on-site waste management, as shown in Figure 7 on page 13.



## Receiving TRI Chemicals in Wastes

When a facility transfers TRI chemical waste off-site, these wastes go to a receiving facility. Table 19 shows the total amounts of TRI chemicals reported as sent to 16 Delaware facilities from both in-state and out-of-state TRI facilities for 2017. The DNREC TRI program does not receive reports from any out-of-state TRI facilities that transfer wastes into Delaware; this data was obtained from the EPA.

**TABLE 19  
SUMMARY OF REPORTED TRI TRANSFERS  
TO DELAWARE FACILITIES  
FROM OTHER TRI FACILITIES IN 2017**

(IN POUNDS)

DELAWARE RECEIVING FACILITY	TOTAL TRANSFERS TO DELAWARE FROM DELAWARE TRI FACILITIES	TOTAL TRANSFERS TO DELAWARE FROM OUT-OF-STATE TRI FACILITIES	TOTAL TRANSFERS RECEIVED BY DELAWARE FACILITIES
BEAR DE POTW	18		18
CLEAN DELAWARE, LLC	19		19
CLEAN EARTH OF NEW CASTLE	339	826	1,165
DELAWARE RECYCLABLE PRODUCTS INC.	0.2		0.2
DIAMOND STATE RECYCLING CORP	41,392		41,392
DSWA CENTRAL SOLID WASTE MANAGEMENT CENTER	4,264		4,264
DSWA CHERRY ISLAND LANDFILL	2,493		2,493
DSWA JONES CROSSROADS LANDFILL	101		101
KENT COUNTY REGIONAL WWTF	43,891		43,891
KENT SCRAP METALS	71,781		71,781
MB RECYCLING		1,390	1,390
MIDDLETOWN-TOWNSEND-ODESSA TREATMENT PLANT	1		1
R & M RECYCLING LLC	45		45
SEAFORD WASTEWATER TREATMENT FACILITY	1,700		1,700
WASTE MANAGEMENT OF DELAWARE	5		5
WILMINGTON WASTEWATER TREATMENT PLANT	911,309		911,309
<b>TOTAL TRI TRANSFERS REPORTED</b>	<b>1,077,358</b>	<b>2,216</b>	<b>1,079,574</b>

Source: U.S. EPA 2017 Data October, 2018

The top receiving facility is the Wilmington Wastewater Treatment Plant, receiving TRI chemicals in wastewater from regional customers. Kent Scrap Metal received the second largest amount, for recycling, from one Delaware customer. Kent County Regional Waste Water Treatment Facility received the third highest amount, from four facilities. Diamond State Recycling received the fourth highest amount, for recycling, from three facilities in Delaware. The fifth largest amount transferred to a Delaware facility was to the DSWA's Central Solid Waste Management Center, receiving TRI chemicals for disposal from one Delaware facility. These five receiving facilities accounted for 99% of all TRI chemicals received in Delaware from all in-state and out-of-state TRI facilities. The size of these transfers to Delaware is only 9% of the total transfers shown in Table 15 on page 33, so more TRI waste goes out of the State than comes in.

## **Pollution Prevention/Reduction Programs in Delaware**

Data for TRI reportable chemicals and other chemicals is becoming increasingly more available to the public. This data availability has focused public attention and awareness on the existence and quantity of these chemicals and on their management and possible reduction. Although EPCRA does not require a facility to reduce releases of chemicals reportable under its programs, many companies and facilities are aware of the public availability of the data in this and other EPCRA reports and have implemented programs to reduce or eliminate releases of these chemicals. These programs may take the form of efficiency improvements, reuse, recycle, energy and material recovery, or material substitutions. The benefits of these programs are reduced raw material and waste disposal costs and reduced risks associated with the toxic chemicals. Also, these reductions demonstrate corporate responsibility to the facility's neighbors and improve the corporate image with the public.

There are numerous programs within DNREC that impact the management of TRI chemicals through the issuance of permits or through other regulatory and non-regulatory activities. Most releases reported under TRI are also regulated through air emission, water discharge, and/or land disposal permits. Potential sources of toxics undergo technical reviews through which potential threats to the environment and to human health are reviewed and identified prior to issuance of a permit. For example, the Engineering and Compliance Branch in the Division of Air Quality enforces a provision in the Clean Air Act Amendments of 1990 that targets the control of hazardous air pollutants (HAPs). Nearly all HAPs are also reportable TRI chemicals. In addition, the Engineering and Compliance staff monitors TRI data to assess whether a facility complies with its air permits for TRI chemicals. Another example is the work performed by the Accidental Release Prevention (ARP) program. The ARP staff uses the TRI data to detect deficiencies at a facility that might result in an increased risk of an accidental release.

DNREC's Division of Air Quality has monitored ambient air quality at locations around the State. For more information, please refer to the [Delaware Air Quality Report](#) paragraph in the ***For Further Information*** section on page 49 of this report.

In 2006, Delaware promulgated 7 DE Admin Code 1146, Electric Generating Unit (EGU) Multi-Pollutant Regulation, to establish sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and mercury (Hg) air emissions limitations for coal-fired and residual oil-fired EGUs located in Delaware. Within 7 DE Admin Code 1146 two phases of emissions limitations were established, with the first phase that became effective in 2009, and a more restrictive second phase of emissions limitations that became effective in January of 2013. Significant reductions in NO<sub>x</sub>, SO<sub>2</sub> and Hg emissions have been achieved by the Delaware EGUs subject to Delaware 7 DE Admin Code 1146, and full compliance with the regulation's more restrictive second phase emissions limitations for 2013 and related consent decrees have been achieved.

The reduction in NO<sub>x</sub>, SO<sub>2</sub>, and mercury emissions is:

1. Reducing the impact of those emissions on public health;
2. Aiding in Delaware's attainment of the State and National Ambient Air Quality Standard (NAAQS) for ground level ozone and fine particulate matter;
3. Helping to address local scale fine particulate and mercury problems attributable to coal and residual oil-fired electric generating units;
4. Improving visibility and helping to satisfy Delaware's EGU-related haze obligations.

In order to promote pollution prevention (P2), the EPA has increased the prominence and accessibility of the P2 information reported in sections 8.10 and 8.11 of TRI Form R. Some companies reporting P2 information are now highlighted in the EPA's annual report: <https://www.epa.gov/trinationalanalysis>, and all P2 entries reported nationally are featured in the TRI P2 search tool: <https://www3.epa.gov/enviro/facts/tri/p2.html>. P2 data is also newly accessible at the corporate level through this tool. To learn more about this, visit: <https://www.epa.gov/toxics-release-inventory-tri-program/pollution-prevention-p2-and-tri>.

One Delaware facility that reported a success in the P2 section of their TRI report for 2017 is HandyTube. Trichloroethylene (TCE), a possible carcinogen, is the primary TRI chemical reported by HandyTube and makes up 100% of the on-site release amount. It is used as a solvent to clean the stainless steel tubing produced at the facility. After 1994, HandyTube switched to a closed vacuum system for the TCE, which significantly reduced releases to air (92,000 pounds of TCE were released to air in 1994). HandyTube has continued to make improvements to the closed vacuum system that have further reduced TCE releases to air. In 2017, the facility added its first nonhazardous coil degreaser whereby fewer coils run through the TCE degreaser, resulting in continued TCE reductions. The facility reported 1,275 pounds of TCE released to air for 2017, a 67% reduction compared to 2016, and a 99% reduction compared to 1994.

## **National Perspective**

The national 2017 TRI data was recently released by the EPA. Placing the 2017 Delaware reports alongside the 2017 EPA data yields some rankings that provide a perspective for Delaware in the national TRI picture. Changes in the 2017 final national values because of report additions or revisions may change these rankings.

**TABLE 20**  
**RANKING OF ON-SITE RELEASES FOR SELECT STATES**

<b>State</b>	<b>Rank, Based on Pounds</b>	<b>Total On-Site Release (Pounds)</b>	<b>Rank, Based on Release Per Person</b>	<b>Rank, Based on Pounds Release Per Square Mile</b>
Alaska	1	1,173,620,000	1	7
Nevada	2	392,829,000	2	2
Utah	3	302,558,000	3	1
Texas	4	183,539,000	25	22
Delaware	43	4,594,000	31	6

On-site release totals are to the nearest 1000 pounds.

This data shows that Delaware ranks 43<sup>rd</sup> in the nation in total on-site releases by state for all TRI chemicals. This is 0.13% of the total on-site release amounts nationwide. Rankings can also be based on other criteria. Because Delaware has a small population (#45) and area (#49), releases are spread over fewer people and a smaller area, increasing the ranking on a per-person or per-square mile basis. Although Alaska reports, by far, had the highest amount of on-site releases, this state only received 182 reports from 26 facilities, less than Delaware's 191 reports from 55 facilities. Alaska reports are largely from mining operations, with over 1,089 million pounds (93% of the state total) reported released on-site for just two chemicals; lead compounds and zinc compounds.

Figure 25 shows the amounts of TRI on-site releases reported by four nearby states for 2013 through 2017. Of these five states, Pennsylvania reported the highest amount in on-site releases for 2017 at 34.1 million pounds, and Virginia reported the second highest at 30.8 million pounds. On-site releases for the region have generally trended downward over the 5 year span, although Delaware's numbers have remained fairly constant. Overall on-site releases for the 5 states are down 25.7% (27.3 million pounds) compared to 2013.

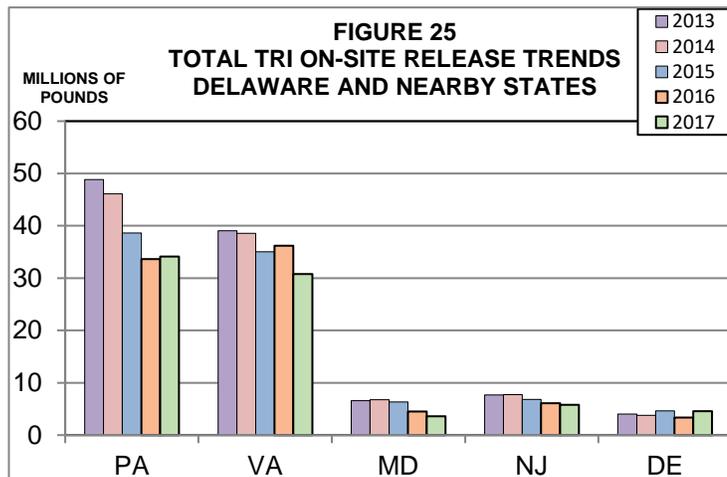


Table 21 compares releases from individual facilities nationally with releases from Delaware facilities. Nationally, 75 facilities had more **total on-site releases** than all the facilities in Delaware combined.

**TABLE 21**  
**SELECT FACILITY TOTAL ON-SITE RELEASES COMPARED TO DELAWARE**

Facility, State	Rank	Total On-Site Release (Pounds) to the nearest thousand
Red Dog Operations, Alaska	1	1,082,414,000
Kennecott Utah Copper Mine, Utah	2	234,373,000
Newmont Mining Twin Creeks, Nevada	3	120,983,000
<b>All Facilities Combined, Delaware</b>	Lower than #75	4,594,000

Seventy facilities each reported over 5 million pounds released on-site for 2017.

Nationwide, 102 facilities each released more **dioxins on-site**, based on Toxicity Equivalent Weight (TEQ), than all the facilities in Delaware combined. The TEQ differentiates between the highly toxic and the less toxic dioxins and dioxin-like compounds in this group. See pages 23-24 of this report for a further explanation of TEQ. Table 22 shows the top three facilities in the nation compared to the Delaware total on-site release of dioxins.

**TABLE 22**  
**COMPARISON OF DIOXIN TOTALS FOR TOP 3 FACILITIES TO DELAWARE TOTAL**

Facility, State	Rank	Toxicity Equivalent Weight (TEQ) On-Site Dioxin Release (Grams)
US Magnesium, LLC, Utah	1	174.83
Chemours Johnsonville Plant, TN	2	13.35
Real Alloy Recycling, KY	3	10.51
<b>All Facilities Combined, Delaware</b>	Lower than #102	0.15

For 2017, 26 facilities reported more than one gram of TEQ on-site dioxin release.

Nationwide, 215 facilities each released more **mercury and mercury compounds on-site** than all the facilities in Delaware combined. Table 23 shows the top three facilities in the nation compared to the Delaware total on-site release of mercury.

**TABLE 23**  
**COMPARISON OF MERCURY TOTALS FOR TOP 3 FACILITIES TO DELAWARE TOTAL**

<b>Facility, State</b>	<b>Rank</b>	<b>Total On-Site Mercury Release (Pounds)</b>
Newmont Mining Corp. Twin Creeks, Nevada	1	663,063
Barrick Cortez, Inc., Nevada	2	590,902
Red Dog Operations, Alaska	3	436,804
<b>All Facilities Combined, Delaware</b>	Lower than #215	190

Delaware ranks 17<sup>th</sup> among the states based on **total waste** reported to TRI. Table 24 compares **total waste** from individual facilities nationally with releases from Delaware facilities. Nationwide, 6 facilities each reported more **total waste** in their TRI reports than all of the facilities in Delaware combined.

**TABLE 24**  
**COMPARISON OF TOTAL WASTE FOR TOP 3 FACILITIES TO DELAWARE TOTAL**

<b>Facility, State</b>	<b>Rank</b>	<b>Total Waste (Pounds)</b>
AdvanSix Resins & Chemicals, Pennsylvania	1	3,777,527,111
Sabic Innovative Plastics, Indiana	2	2,169,051,153
Red Dog Operations, Alaska	3	1,082,450,070
<b>All Facilities Combined, Delaware</b>	Lower than #6	434,869,240

Some facilities in Delaware do rank near the top of the national rankings for specific categories. Relevant national rankings for facilities in Delaware for on-site releases and total waste reported are presented in the **TRI Facility Profiles** (see **Access to TRI Files** under the **Further Information Section** on page 49).

## **Nearby Facilities in Adjacent States**

Some facilities, although not located in Delaware, may be important to the environment in Delaware. These facilities are located near our border and may release TRI chemicals, particularly to the air or water, which may migrate into Delaware. Table 24 on the next page is a listing of some nearby facilities with significant TRI release amounts. This data is from EPA's preliminary 2017 TRI data set, which was gathered in October 2018.

**TABLE 25**  
**2017 On-Site Releases From Nearby Facilities in Adjacent States**

Facility (and ID number for map on next page)	State	Chemical	Media	Amount (Pounds)
Chemours Chambers Works, Deepwater 1 ★	New Jersey	Nitrate compounds	Water	616,477*
National Refrigerants, Rosenhayn 2 ★	New Jersey	Chloro-difluoromethane	Air	30,133**
Paulsboro Refining, Paulsboro 3 ★	New Jersey	Hydrogen cyanide	Air	248,237**
Paulsboro Refining, Paulsboro	New Jersey	Nitrate compounds	Water	644,884*
Paulsboro Refining, Paulsboro	New Jersey	Sulfuric acid	Air	118,051*
AdvanSix Resins & Chemicals, Philadelphia 4 ★	Pennsylvania	Cumene	Air	66,376**
AdvanSix Resins & Chemicals, Philadelphia	Pennsylvania	Phenol	Air	67,510**
PES Refinery, Philadelphia 5 ★	Pennsylvania	Benzene	Air	40,932**
PES Refinery, Philadelphia	Pennsylvania	Hydrogen cyanide	Air	65,343**
PES Refinery, Philadelphia	Pennsylvania	Sulfuric acid	Air	172,128*
Arkema, Bristol 6 ★	Pennsylvania	Methyl methacrylate	Air	34,750**
LSC Communications, Lancaster 7 ★	Pennsylvania	Toluene	Air	144,608**
Brunner Island Electric, York Haven 8 ★	Pennsylvania	Ammonia	Air	82,497*
Kimberly Clark, Chester 9 ★	Pennsylvania	Hydrochloric acid	Air	79,476**
Kimberly Clark, Chester	Pennsylvania	Sulfuric acid	Air	51,522*
Monroe Energy, Trainer 10 ★	Pennsylvania	N-Hexane	Air	60,119**
Monroe Energy, Trainer	Pennsylvania	Xylene	Air	55,719**
Monroe Energy, Trainer	Pennsylvania	1,2,4-Trimethylbenzene	Air	51,208**
Grace Davison Curtis Bay Works, Baltimore 11 ★	Maryland	Ammonia Ammonia	Air Water	554,200** 27,900*
Grace Davison Curtis Bay Works, Baltimore	Maryland	Nitrate compounds	Water	46,450*
Valley Proteins, Linkwood 12 ★	Maryland	Hydrogen sulfide	Air	228,914**
Salisbury Feed & Grain 13 ★	Maryland	N-Hexane	Air	232,730**
Alcore, Edgewood 14 ★	Maryland	Dichloromethane	Air	54,240**
Alcore, Edgewood	Maryland	Methanol	Air	32,680**
Perdue Farms, Accomac 15 ★	Virginia	Hydrogen sulfide	Air	75,900**
Perdue Farms, Accomac	Virginia	Nitrate compounds	Water	1,070,610*

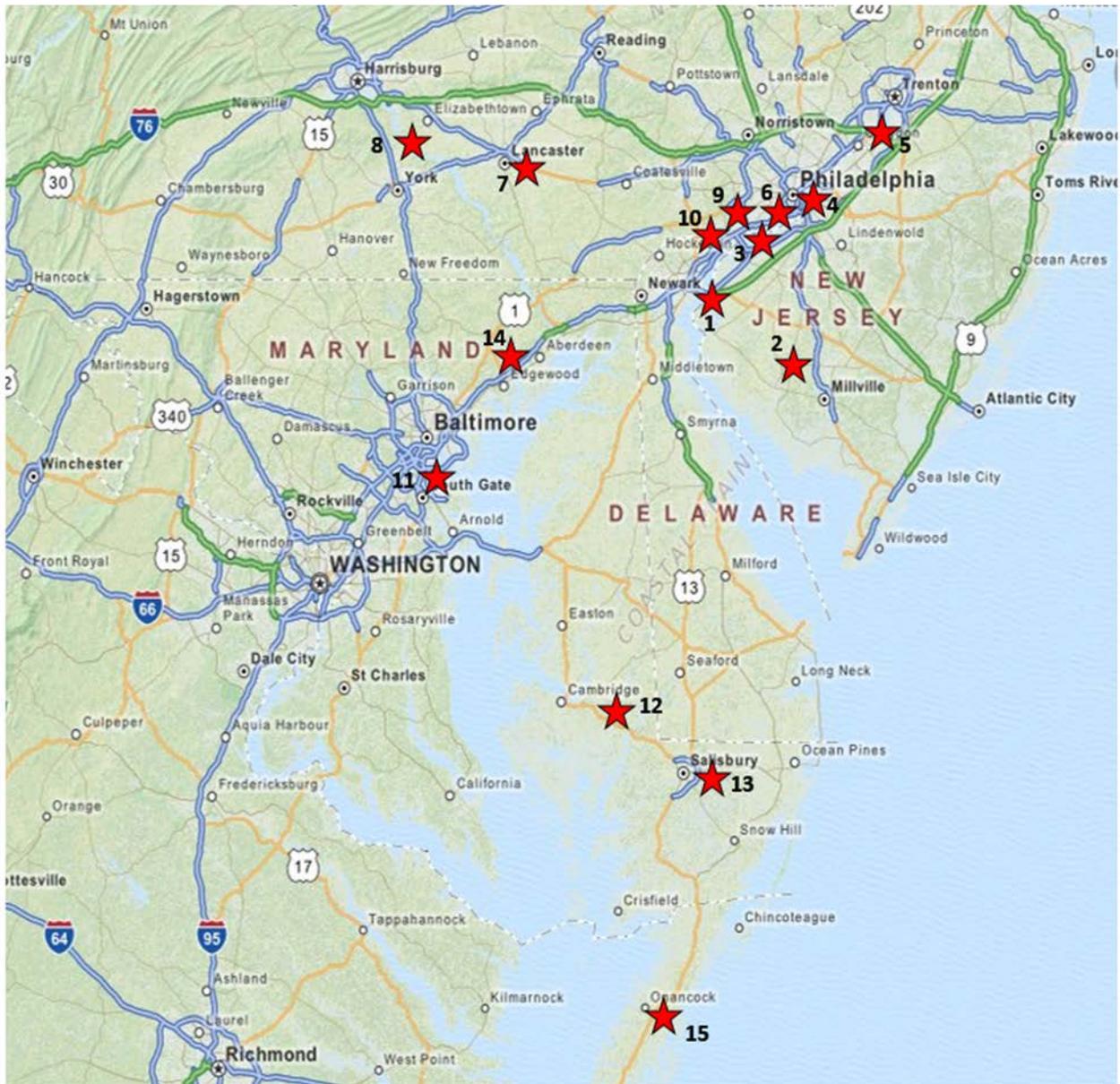
\* Delaware State total releases for this chemical are higher

\*\* Exceeds the Delaware State total for this chemical

As noted on pages 4-5, these amounts do not indicate the amount of human exposure. However, they do provide a comparison between releases in Delaware and some TRI chemicals released by nearby facilities in neighboring states.

Figure 26 shows the nearby facilities and their proximity to Delaware. Each star represents a facility location in the table above that reported an on-site release for a TRI chemical.

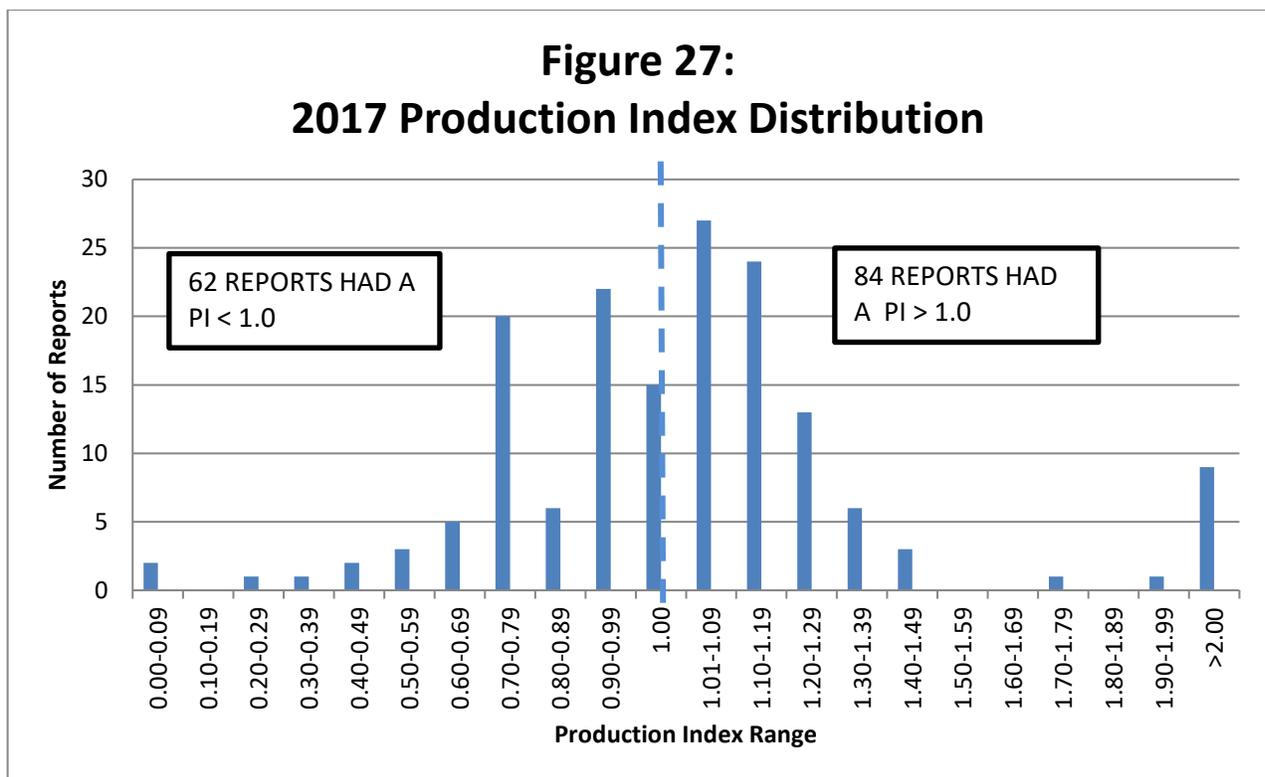
## Figure 26 Facilities in Nearby States



## TRI and the Economy

Facilities report a Production Index (PI) for each chemical. Along with TRI release and waste management data, this provides one way to estimate the impact of the economy, because the PI is the amount of production or activity directly associated with the demand for the chemical being reported. Some facilities, such as the power plants, can report the same PI for almost all of their chemicals, as they are directly related to the production of power. Other facilities, such as the ones in chemical manufacturing, report different PIs for different chemicals, as they are related more to the manufacture, process, or otherwise use of a specific chemical or line of chemicals. For some facilities, the determination of a PI is not precise, and therefore the PI may not be an exact indicator of production or chemical activity.

PI is reported as a number, representing the ratio of how production increased or decreased compared to the previous year. For example, a facility reporting an increase of 10% would report the PI as 1.10, while a facility reporting a decrease of 10%, would report the production as 90% of the previous year or a PI of 0.90. A facility having the same production level as the previous year would report the PI as 1.0. Figure 27 below, shows the distribution range of PIs reported. For 2017, of the 161 reports with PIs, 84 reported increases in production and 62 reported decreases. The remaining 15 reports had a 2017 production level equal to the previous year. The average PI reported was 1.079 or a 7.4% increase compared to 2016's production level. Form A TRI reports do not provide PI information, so only Form R reports are included here.





# FOR FURTHER INFORMATION

**Access to the TRI Files** - DNREC is responsible for collecting, processing, and distributing information submitted by Delaware facilities under the TRI program. This 2017 TRI report may be viewed at: <https://dnrec.alpha.delaware.gov/serc/documents/>. TRI Facility Profiles for each reporting facility in Delaware, and a searchable database for TRI are also available at the same location. Information on TRI and other EPCRA programs is located at: <https://dnrec.alpha.delaware.gov/serc/data/>.

TRI data is also available on the State of Delaware's open data portal at this link: <https://data.delaware.gov/Energy-and-Environment/Toxics-Release-Inventory/9bws-2xkb/data>

Information in the TRI searchable data base and open data portal are updated at least once a year to reflect revised or withdrawn TRI reports from prior years. These data bases may also reflect revisions to 2017 TRI reports which were not included in this report because they were received after October 1, 2018. This year, these two databases reflect a downward revision of Hanover Foods' ammonia releases to air from 15,779 to 8,003 pounds. This revision was received too late in October to be included in the EPA's 2017 TRI dataset, therefore it is not reflected in the analysis contained in this report.

The information submitted by facilities is available for review through the Freedom of Information Act (FOIA) process from DNREC's EPCRA Reporting Program located at 155 Commerce Way-Suite B, in Dover. Custom reports can also be generated from the database. For information on placing a request, call the TRI Coordinator at (302) 739-9405 during business hours. An on-line FOIA application is also available at: <http://www.dnrec.delaware.gov/Info/Pages/FOIA.aspx>

**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 (ToxFAQ's) are available upon request from DNREC's TRI program or available through the Agency for Toxic Substances and Disease Registry (ATSDR) at: <http://www.atsdr.cdc.gov/toxfaqs/index.asp> or from the New Jersey Department of Health at: <http://web.doh.state.nj.us/rtkhsfs/indexFs.aspx>

**EPA's TRI Home Page** - The TRI home page provides information on the many facets of the TRI program at the EPA, including a mapping tool, Q&A's, a link now to the 2017 national TRI data and early in 2019 year to the complete 2017 national analysis, a current list of reportable chemicals, 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/](http://www.epa.gov/tri/).

**TRI Reporting Forms** – Reporting instructions, reporting guidance, and examples of the traditional paper reporting forms are at: [https://ofmpub.epa.gov/apex/guideme\\_ext/f?p=104:1](https://ofmpub.epa.gov/apex/guideme_ext/f?p=104:1)

**Toxics Release Inventory National Analysis** - The EPA's annual TRI report. It covers national information and provides a good perspective on how Delaware compares to other states: <https://www.epa.gov/trinationalanalysis>. The 2017 edition of this report will be available in January of 2019. It can also be obtained by calling the Federal EPCRA Information Hotline at 1-800-424-9346. Other searchable database programs such as Envirofacts, TRI.net, and TRI-CHIP are EPA-developed programs that provide public access to multiple environmental databases, including TRI. Links are available at



<http://www2.epa.gov/toxics-release-inventory-tri-program/tri-data-and-tools> for data about hazardous waste, water permits, drinking water, Superfund sites, air, water, toxics, and more.

**Chemical Reporting Rule** – The EPA has issued the final Chemical Data Reporting (CDR) Rule. The purpose of this program is to collect information from manufacturers and importers of chemical substances and to make that information available for use by EPA. The rule was enhanced for 2012 reporting. More information can be found at:

<http://www.epa.gov/oppt/cdr/index.html>

**Delaware Division of Public Health Cancer Rates and Causes** - This site provides data and answers to many cancer-related questions:

<http://www.dhss.delaware.gov/dhss/dph/dpc/cancer.html>

**Right-to-Know Network** (RTK NET) - Searchable nationwide TRI data is available through RTK NET. RTK NET 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](http://www.rtknet.org)

**The Office of Pollution Prevention & Toxics - (OPPT)** 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.

**International “TRI”**. The United States Toxics Release Inventory (TRI), the oldest and most comprehensive Pollutant Release and Transfer Register (PRTR) system in the world, is one of several similar programs established, or being established, by countries around the world. Industrial facilities in these countries are required to report their emissions and other waste management of toxic chemicals to databases in their respective countries. These databases are designed to track the quantities of chemicals that are released to the air, land or water, or transferred to another site for recycle, treatment or disposal. The term used internationally for these TRI-like systems is Pollutant Release and Transfer Register (PRTR). The EPA has a web site for PRTR, and it is <http://www2.epa.gov/toxics-release-inventory-tri-program/tri-around-world>. There are now over 50 countries participating in PRTR programs, and links to several international environmental agencies and programs, with more being developed each year.

**Delaware Air Quality Report** - The annual air quality report is prepared by the Analytical Support Group 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 ambient air quality. For more information, please call (302) 323-4542. This report is available on-line at:

<http://www.dnrec.delaware.gov/Air/Pages/DAQ-Annual-Reports.aspx>.

**Delaware’s Department of Natural Resources and Environmental Control** has a variety of environmental information, including this report and other publications and reports, which are available at: <http://www.dnrec.delaware.gov/info/pages/ELibrary.aspx>. Environmental



Databases are available at: <http://www.dnrec.delaware.gov/Info/Pages/GISData.aspx>.  
Notifications of releases in Delaware can be found at: [Delaware Environmental Release Notification System \(DERNS\)](#).

**Other Delaware EPCRA Information** - In addition to TRI, there are other provisions of the Emergency Planning and Community Right to Know Act (EPCRA), which provide information to the public as well as to local emergency planning and response organizations. Delaware has its own EPCRA statute, which established these provisions under State law. For additional information, visit: <https://dnrec.alpha.delaware.gov/serc/data/>.

Questions or comments regarding the TRI program are welcome. Please direct questions, comments, or requests to:

Debra Nielsen  
TRI Coordinator  
EPCRA Reporting Program  
Emergency Prevention and Response Section  
DNREC Division of Waste and Hazardous Substances  
155 Commerce Way, Suite B  
Dover, DE 19904  
Tel. (302) 739-9405  
E-mail: [debra.nielsen@state.de.us](mailto:debra.nielsen@state.de.us)



# APPENDICES

## 2017





## APPENDIX A

### WHAT IS COMMUNITY RIGHT-TO-KNOW?

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#### **EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT**

A dramatic and fatal accident involving the release of a large quantity of methyl isocyanate gas occurred in Bhopal, India on December 3, 1984. As a result of this release and similar, although less tragic, accidents that occurred in the United States, Congress enacted the Emergency Planning and Community Right to Know Act (EPCRA), as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986. EPCRA requires certain facilities to report information about hazardous chemicals and substances at their facilities to Federal, state, and local authorities. The objective is to improve the ability of the facility and of local emergency response agencies to plan for and respond to chemical emergencies, and to give citizens information about chemicals present in their communities. Presidents have also issued Executive Orders to Federal agencies, which mandate their compliance with certain EPCRA requirements. In 1991, Delaware established its own EPCRA legislation that enhanced the Federal requirements.

#### **EMERGENCY PLANNING**

Each state was required to establish a State Emergency Response Commission (SERC) to oversee planning efforts. The SERC must appoint Local Emergency Planning Committees (LEPC), which in turn develop emergency response plans for their respective districts. In Delaware, the SERC is chaired by the Secretary of the Department of Public Safety. Emergency planning districts have been established in each county and for the City of Wilmington. Facilities having specifically identified Extremely Hazardous Substances above established threshold quantities are required to notify their LEPC. These facilities are the primary focus of planning activities.

#### **EMERGENCY RELEASE NOTIFICATION**

In the event of an accidental chemical release above an established amount, a facility is required to provide immediate notification of the release. A follow up written report is also required to provide details about the sequence of events, the actual response actions, and to identify any known or anticipated health risks associated with the release. The public may receive notification through the Environmental Release Notification System.

In response to Senate Bill 33, which became law in July 2001, the Department of Natural Resources and Environmental Control (DNREC) developed a system to allow Delawareans to learn promptly of releases or discharges of contaminants or pollutants that meet or exceed certain thresholds in their neighborhoods or throughout the state. When you register, you choose to be notified in one of three ways: By phone, by e-mail or by fax. You also can choose to be notified about releases from specific facilities or about all releases that occur in one or more zip codes throughout the state. Interested individuals may register for notification at: <http://apps.dnrec.state.de.us/derns/pub/>.

#### **HAZARDOUS CHEMICAL REPORTING**

Under U.S. Occupational Safety and Health Administration (OSHA) regulations, facilities are required to maintain a Material Safety Data Sheet (MSDS) for each chemical on site. Under EPCRA, facilities are required to submit a list of their MSDSs for hazardous chemicals on site above specific threshold amounts. This list must be updated as new chemicals are brought on site. In addition, facilities having such chemicals are required to file Hazardous Chemical Inventory Reports annually. These reports, also known as Tier II forms, can be filed on-line



## APPENDIX A

### WHAT IS COMMUNITY RIGHT-TO-KNOW?

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using Tier II Manager™ and data is available immediately for use by the EPCRA Reporting Program and emergency planning and response agencies. The data provides information on the identity, hazards, amounts, and locations of reportable chemicals at the facility, as well as emergency contacts, and a site plan.

Fees are also collected based on the number and type of chemicals reported. The fees are primarily used to support operations of the LEPCs.

#### **TOXICS RELEASE INVENTORY (TRI) REPORTING**

Facilities covered under TRI are required to file annual reports contain on-site releases, off-site transfers, and on-site waste management activities related to their use of certain toxic chemicals. These reports can be filed electronically at the same time to EPA and DNREC using EPA's TRI-ME (TRI Made Easy) program. This data is compiled and made available to the public through this report and other means. For more information regarding TRI, please refer to the **Introduction** and **What is the Toxics Release Inventory?** sections contained in this report.

#### **RISK MANAGEMENT PLANS**

Additional information regarding hazardous chemicals is available to the public due to the requirements contained in Title I, Section 112(r) of the Federal Clean Air Act Amendments of 1990. Section 112(r) requires that facilities handling substances with catastrophic potential submit a Risk Management Plan (RMP) that contains an executive summary, registration, off-site consequence analysis (OCA), five-year accident history, and a summary of their prevention and emergency response programs. The OCA consists of a "worst case" release scenario and an "alternative" release scenario. The "worst case" scenario estimates the area and populations affected by a catastrophic release. The "worst case" scenario is a hypothetical, conservative modeling exercise. Emergency planners use the toxic "alternative" scenario as a more realistic modeling exercise.

The information contained in the RMP builds upon the right-to-know principles of EPCRA by making all of the information including the OCA and five-year accident history available to local communities, emergency planners, and other stakeholders. Concerned citizens or the media may ask facilities to explain the risk management programs that they use to prevent or minimize the consequence of a catastrophic release. EPA encourages this communication to reduce the risk. This is similar to the way public knowledge of chemical releases to the environment through the availability of TRI data has led reporting facilities to reduce their toxic releases. Because of security concerns, the RMP information is restricted. However, this information is available for Delaware facilities by contacting the Accidental Release Prevention Program (ARP) <http://www.awm.delaware.gov/EPR/Pages/AccidentalReleasePrevention.aspx> or by contacting the EPA reading room at: <https://www.epa.gov/libraries>.

In Delaware, the Extremely Hazardous Substances Risk Management Act first passed in 1988, and amended in 1998, adopted new federal guidelines that enhance the community right-to-know information. The Delaware Accidental Release Program (ARP) has been granted full authority by the US EPA to administer the program within DNREC, reviews the facility RMPs for accuracy and completeness and inspects facilities to ensure that appropriate accidental release prevention programs have been implemented. For more information on accidental release prevention in Delaware, please refer to the DNREC ARP website above.



# APPENDIX B

## FACILITY CONTACT INFORMATION

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### **AEARO TECHNOLOGIES**

650 DAWSON DR  
NEWARK, DE 19713  
TOM FLAHERTY  
(302) 286-2415

### **AGILENT TECHNOLOGIES**

538 FIRST STATE BLVD.  
NEWPORT, DE 19804  
RENEE LEWANDOWSKI  
(302) 636-3668

### **AIR LIQUIDE ADVANCED SEPARATIONS**

305 WATER ST  
NEWPORT, DE 19804  
MICHAEL BAILEY  
(302) 225-2126

### **ALLEN HARIM FARMS – SEAFORD MILL**

20799 ALLEN ROAD  
SEAFORD, DE 19973  
MICHAEL SAUSE  
(302) 684-1640

### **ALLEN HARIM FOODS - HARBESON**

18752 HARBESON ROAD  
HARBESON, DE 19951  
MICHAEL SAUSE  
(302) 684-1640

### **AMICK FARMS**

10281 AMICK DRIVE  
DELMAR, DE 19940  
RICK MARTINSON  
(302) 846-9511

### **BALTIMORE AIRCOIL**

1162 HOLLY HILL RD  
MILFORD, DE 19963  
ANGELA SHEPPARD  
(302) 424-2566

### **BASF COLORS AND EFFECTS USA LLC**

205 S JAMES ST  
NEWPORT, DE 19804  
ROBERTO NELSON  
(973) 245-5230

### **CALPINE CORP. GARRISON ENERGY CENTER**

450 GARRISON OAK DRIVE  
DOVER, DE 19901  
GERALD KISSEL  
(302) 257-3570

### **COLOR WORKS PAINTING**

251 EDWARDS AVE  
NEW CASTLE, DE 19720  
SEAN O. HISTED  
(302) 324-8411

### **CRODA**

315 CHERRY LN  
NEW CASTLE, DE 19720  
CHRIS BARNETT  
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### **DELAWARE CITY REFINERY**

4550 WRANGLE HILL RD  
DELAWARE CITY, DE 19706  
LISA LINDSEY  
(302) 834-6033

### **DENTSPLY SIRONA MAIN PLANT**

38 W CLARKE AVE  
MILFORD, DE 19963-0359  
JESSE BAUTISTA  
(302) 422-4511

### **DENTSPLY SIRONA WEST PLANT**

779 E MASTEN CIR  
MILFORD, DE 19963-0359  
JESSE BAUTISTA  
(302) 422-4511



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## FACILITY CONTACT INFORMATION

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### DOVER AFB

436 CES/CC 600 CHEVRON AVE  
DOVER AFB, DE 19902  
JENNIFER VALLEE  
(302) 677-3370

### HANDY TUBE

124 VEPKO BOULEVARD  
CAMDEN, DE 19934  
REBECCA REIMER  
(302) 697-9521

### DUHADAWAY TOOL AND DIE SHOP

801 DAWSON DRIVE  
NEWARK, DE 19713  
JOHN O'DONNELL  
(302) 366-0113

### HANESBRANDS

631 RIDGELY ST - SUITE #1  
DOVER, DE 19904-2772  
DAVID SWICEGOOD  
(336) 519-2582

### DYK AUTOMOTIVE LLC

1 CROWELL ROAD  
WILMINGTON, DE 19804  
JERRY IVEY  
(302) 351-1147

### HANOVER FOODS

ROUTE 6 & DUCK CREEK ROAD  
CLAYTON, DE 19938  
ALVIN CONSTANTINE  
(302) 653-9281

### EDGE MOOR/HAY ROAD ENERGY CENTERS

200 HAY RD  
WILMINGTON, DE 19809  
NORMA DUNN  
(713) 830-8833

### HONEYWELL

6100 PHILADELPHIA PIKE  
CLAYMONT, DE 19703  
RUSSELL W. DAVIS  
(302) 791-6748

### FORMOSA PLASTICS

780 SCHOOLHOUSE RD  
DELAWARE CITY, DE 19706-0320  
KIMBERLY BENNETT  
(302) 836-2256

### IKO

120 HAY RD  
WILMINGTON, DE 19809  
STEVEN GRIER  
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### GAC SEAFORD

25938 NANTICOKE ST  
SEAFORD, DE 19973  
MICHAEL THRASHER  
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### INDIAN RIVER GENERATING STATION

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DAGSBORO, DE 19939  
DAVID GAIER  
(609) 524-4529

### GRIFFITH ENERGY-CARL KING

1400 E LEBANON RD  
DOVER, DE 19901  
CHARLIE RAINES  
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### INTERVET

29160 INTERVET LN  
MILLSBORO, DE 19966  
TOM BASTIAN  
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### FACILITY CONTACT INFORMATION

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**JOHNSON CONTROLS BATTERY PLANT**

700 N BROAD ST  
MIDDLETOWN, DE 19709  
STEPHEN GARRETT  
(260) 740-9336

**MOUNTAIRE FARMS OF DELAWARE**

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MILLSBORO, DE 19966  
ROGER MARINO  
(302) 934-3123

**JOHNSON CONTROLS DISTRIBUTION CENTER**

50 PATRIOT DR  
MIDDLETOWN, DE 19709  
TAMI KEMSKI  
(302) 696-3209

**NATIONAL GUARD TRAINING SITE RANGE**

1197 RIVER ROAD  
NEW CASTLE, DE 19720  
SGT SEAN MAYNARD  
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**JUSTIN TANKS**

21413 CEDAR CREEK AVE  
GEORGETOWN, DE 19947-6306  
EDWARD M. SHORT, PRESIDENT  
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**NORAMCO**

500 SWEDES LANDING RD  
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(302) 888-4477

**KUEHNE**

1645 RIVER RD  
DELAWARE CITY, DE 19706  
ALAN ROGERS  
(302) 834-4557

**ORIENT CORP**

111 PARK AVE  
SEAFORD, DE 19973  
DAVE CURRY  
(302) 628-1300

**METAL MASTERS**

100 INDUSTRIAL BLVD  
CLAYTON, DE 19938  
RICHARD J. MURPHY  
(302) 653-3087

**OWEN STEEL COMPANY**

813 S MARKET STREET  
WILMINGTON, DE 19801  
DAVID ZALESNE  
(803) 251-7565

**MOUNTAIRE FARMS - FRANKFORD**

11 DAISEY ST  
FRANKFORD, DE 19945  
ROGER MARINO  
(302) 934-3123

**PERDUE BRIDGEVILLE**

16447 ADAMS RD  
BRIDGEVILLE, DE 19933  
ANDREA STAUB  
(410) 341-2755

**MOUNTAIRE FARMS - SELBYVILLE**

HOOSIER ST & RAILROAD AVE  
SELBYVILLE, DE 19975  
ROGER MARINO  
(302) 934-3123

**PERDUE GEORGETOWN**

20621 SAVANNAH RD  
GEORGETOWN, DE 19947  
ANDREA STAUB  
(410) 341-2755



## APPENDIX B

### FACILITY CONTACT INFORMATION

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#### **PERDUE MILFORD**

255 N REHOBOTH BLVD  
MILFORD, DE 19963  
ANDREA STAUB  
(410) 341-2755

#### **ROHM & HAAS B7, B15**

50 BELLEVUE RD  
NEWARK, DE 19713  
CHRISTOPHER GLACKIN  
(302) 366-0500

#### **PICTSWEET BRIDGEVILLE**

18215 WESLEY CHURCH RD  
BRIDGEVILLE, DE 19933  
ALLEN WATTS  
(731) 663-7600

#### **SERVICE ENERGY DOVER**

3799 N DUPONT HWY  
DOVER, DE 19901  
DON STEINER  
(302) 734-7433

#### **PPG INDUSTRIES**

1886 LYNNBURY WOODS RD  
DOVER, DE 19904  
MITCH MAGEE  
(302) 672-2160

#### **SPI PHARMA**

40 CAPE HENLOPEN DR  
LEWES, DE 19958-1196  
JOHN CREIGHTON  
(616) 283-8506

#### **PRINCE MINERALS**

301 PIGEON POINT RD  
NEW CASTLE, DE 19720  
MARY SIMPLER  
(646) 747-4176

#### **V&S DELAWARE GALVANIZING**

511 CARROLL DRIVE  
NEW CASTLE, DE 19720  
IONUT ROIBU  
(302) 322-1420

#### **ROGERS CORP**

1100 GOVERNOR LEA RD  
BEAR, DE 19701  
TIMOTHY GAUTHIER  
(860) 779-5598

#### **VEOLIA RED LION PLANT**

766 GOVERNOR LEA RD  
DELAWARE CITY, DE 19706  
W. JAMES HARMAN  
(302) 834-5901

#### **ROHM & HAAS B2, B3, B8**

451 BELLEVUE RD  
NEWARK, DE 19713  
CHRISTOPHER GLACKIN  
(302) 366-0500

#### **VP RACING FUELS**

16 BROOKHILL DR  
NEWARK, DE 19702-1301  
SUSAN GRAY  
(210) 635-7744

#### **ROHM & HAAS B5, B6**

351 BELLEVUE RD  
NEWARK, DE 19713  
CHRISTOPHER GLACKIN  
(302) 366-0500

# APPENDIX C

## 2017 ON-SITE RELEASES BY FACILITY AND CHEMICAL

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES				TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND				
<b>AEARO TECHNOLOGIES LLC</b>								
DIISOCYANATES	0	2	0	0	2	10,048	0	
TOLUENE DIISOCYANATE (MIXED ISOMERS)	0	4	0	0	4	1,590	0	
<b>AEARO TECHNOLOGIES LLC Total</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>11,638</b>	<b>0</b>	
<b>AGILENT TECHNOLOGIES</b>								
ACETONITRILE	0	79	0	0	79	21,929	0	
METHANOL	0	1,755	0	0	1,755	52,052	0	
TOLUENE	0	41	0	0	41	151,103	0	
<b>AGILENT TECHNOLOGIES Total</b>	<b>0</b>	<b>1,875</b>	<b>0</b>	<b>0</b>	<b>1,875</b>	<b>225,084</b>	<b>0</b>	
<b>AIR LIQUIDE ADVANCED SEPARATIONS</b>								
CYCLOHEXANE	0	12,403	0	0	12,403	13,985	0	
METHANOL	0	7	0	0	7	56,335	1,827,349	
N,N-DIMETHYLFORMAMIDE	0	33	0	0	33	29,560	0	
N-HEXANE	0	10	0	0	10	0	1,521,163	
N-METHYL-2-PYRROLIDONE	0	811	0	0	811	61,832	0	
<b>AIR LIQUIDE ADVANCED SEPARATIONS Total</b>	<b>0</b>	<b>13,264</b>	<b>0</b>	<b>0</b>	<b>13,264</b>	<b>161,712</b>	<b>3,348,512</b>	
<b>ALLEN HARIM FARMS SEAFORD MILL</b>								
COPPER	1	0	0	0	0	0	0	
COPPER COMPOUNDS	1	0	0	0	0	0	0	
MANGANESE	1	0	0	0	0	0	0	
MANGANESE COMPOUNDS	1	0	0	0	0	0	0	
ZINC COMPOUNDS	1	0	0	0	0	0	0	
<b>ALLEN HARIM FARMS SEAFORD MILL Total</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>ALLEN HARIM FOODS HARBESON</b>								
NITRATE COMPOUNDS	0	0	74,690	0	74,690	0	0	
PERACETIC ACID	1	0	0	0	0	0	0	
<b>ALLEN HARIM FOODS HARBESON Total</b>	<b>1</b>	<b>0</b>	<b>74,690</b>	<b>0</b>	<b>74,690</b>	<b>0</b>	<b>0</b>	
<b>AMICK FARMS</b>								
COPPER COMPOUNDS	1	0	0	0	0	0	0	
MANGANESE COMPOUNDS	1	0	0	0	0	0	0	
ZINC COMPOUNDS	1	0	0	0	0	0	0	
<b>AMICK FARMS Total</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	

APPENDIX C

# APPENDIX C

## 2017 ON-SITE RELEASES BY FACILITY AND CHEMICAL

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES				TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND				
<b>BALTIMORE AIRCOIL COMPANY</b>								
CHROMIUM COMPOUNDS	0	5	0	0	5	171,026	0	
COBALT COMPOUNDS	0	0	0	0	0	21,000	0	
COPPER COMPOUNDS	0	0	0	0	0	28,565	0	
MANGANESE COMPOUNDS	0	5	0	0	5	85,090	0	
NICKEL COMPOUNDS	0	5	0	0	5	196,226	0	
<b>BALTIMORE AIRCOIL COMPANY Total</b>	<b>0</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>501,907</b>	<b>0</b>	
<b>BASF COLORS AND EFFECTS USA LLC</b>								
ANILINE	0	27	0	0	27	41,392	1,352	
BIPHENYL	0	100	0	0	100	98,376	2,599	
CYCLOHEXANE	0	49	0	0	49	30,434	0	
METHANOL	0	23,161	0	0	23,161	818,744	1,319,295	
NITRATE COMPOUNDS	0	0	0	0	0	22,656	0	
NITRIC ACID	0	0	0	0	0	0	23,021	
N-METHYL-2-PYRROLIDONE	0	0	0	0	0	53,105	0	
P-CHLOROANILINE	0	5	0	0	5	18,028	474	
XYLENE (MIXED ISOMERS)	0	1,188	0	0	1,188	994	0	
<b>BASF COLORS AND EFFECTS USA LLC Total</b>	<b>0</b>	<b>24,530</b>	<b>0</b>	<b>0</b>	<b>24,530</b>	<b>1,083,729</b>	<b>1,346,741</b>	
<b>CALPINE CORP - GARRISON ENERGY CENTER</b>								
AMMONIA	0	5,882	0	0	5,882	0	0	
<b>CALPINE CORP - GARRISON ENERGY CENTER Total</b>	<b>0</b>	<b>5,882</b>	<b>0</b>	<b>0</b>	<b>5,882</b>	<b>0</b>	<b>0</b>	
<b>COLOR WORKS PAINTING</b>								
MANGANESE	0	0	0	0	0	720	0	
<b>COLOR WORKS PAINTING Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>720</b>	<b>0</b>	
<b>CRODA</b>								
CERTAIN GLYCOL ETHERS	0	1	0	0	1	3,782	0	
DIETHANOLAMINE	0	7	0	0	7	5,532	0	
ETHYLENE GLYCOL	0	6	0	0	6	13,321	0	
ETHYLENE OXIDE	0	2,318	0	0	2,318	0	415	
METHANOL	0	578	0	0	578	10,550	0	
NAPHTHALENE	0	2	0	0	2	420	0	
N-BUTYL ALCOHOL	0	48	0	0	48	367	0	
NONYLPHENOL	0	507	0	0	507	1,914	0	
PROPYLENE OXIDE	0	234	0	0	234	0	765	
<b>CRODA Total</b>	<b>0</b>	<b>3,701</b>	<b>0</b>	<b>0</b>	<b>3,701</b>	<b>35,886</b>	<b>1,180</b>	

APPENDIX C

Source: DNREC 2017 TRI Database, October, 2018  
A "1" in the Form A column indicates a Form A report

All Amounts Are in Pounds

# APPENDIX C

## 2017 ON-SITE RELEASES BY FACILITY AND CHEMICAL

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES				TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND				
DELAWARE CITY REFINERY								
1,2,4-TRIMETHYLBENZENE	0	810	5	0	815	0	62,854	
1,3-BUTADIENE	0	250	0	0	250	0	0	
2,4-DIMETHYLPHENOL	0	0	165	0	165	0	231,421	
AMMONIA	0	62,168	1,513	0	63,681	257	11,881,123	
ANTHRACENE	0	0	5	0	5	0	0	
ASBESTOS (FRIABLE)	0	0	0	0	0	80,505	0	
BENZENE	0	7,072	10	0	7,082	478	487,057	
BENZO(G,H,I)PERYLENE	0	1	5	0	5	0	453	
CARBON DISULFIDE	0	1,223	0	0	1,223	0	3,517,860	
CARBONYL SULFIDE	0	482	0	0	482	0	12,876,055	
COBALT	0	40	210	0	250	70	0	
CREOSOTE	0	23	0	128	151	2,277	0	
CRESOL (MIXED ISOMERS)	0	0	330	0	330	0	336,901	
CUMENE	0	350	5	0	355	0	3,724	
CYANIDE COMPOUNDS	0	0	145	0	145	0	14,378	
CYCLOHEXANE	0	1,868	5	0	1,873	475	7,045	
DIOXIN AND DIOXIN-LIKE COMPOUNDS	0.000000	0.001263	0.000000	0.000000	0.001263	0.000000	0.001263	
ETHYLBENZENE	0	1,904	5	0	1,909	589	50,418	
ETHYLENE	0	2,962	0	0	2,962	0	0	
ETHYLENE GLYCOL	0	0	183	0	183	300	18,097	
HYDROCHLORIC ACID	0	214	0	0	214	0	114,926	
HYDROGEN CYANIDE	0	22,379	202	0	22,581	0	432,005	
HYDROGEN SULFIDE	0	11,845	1	0	11,846	0	373,728,611	
LEAD COMPOUNDS	0	101	2	0	103	477	0	
MERCURY COMPOUNDS	0.0000	92.0700	1.5000	0.0000	93.5700	4.9020	0.0000	
METHANOL	0	2,146	5	0	2,151	0	7,938	
MOLYBDENUM TRIOXIDE	0	14	0	0	14	45	0	
NAPHTHALENE	0	1,977	5	0	1,982	0	11,861	
N-HEXANE	0	17,688	5	0	17,693	0	94,589	
NITRATE COMPOUNDS	0	0	3,472,895	0	3,472,895	0	0	
PHENANTHRENE	0	4	5	0	9	7	40	
PHENOL	0	138	165	0	303	0	326,299	
POLYCYCLIC AROMATIC COMPOUNDS	0	235	4	0	239	0	372	
PROPYLENE	0	4,980	0	0	4,980	0	0	
STYRENE	0	11	5	0	16	0	1,160	
SULFURIC ACID	0	360,895	0	0	360,895	0	0	
TETRACHLOROETHYLENE	0	8	0	0	8	0	0	
TOLUENE	0	12,649	5	0	12,654	2,220	202,762	
XYLENE (MIXED ISOMERS)	0	5,426	5	0	5,431	89	200,096	
<b>DELAWARE CITY REFINERY Total</b>	<b>0</b>	<b>519,954</b>	<b>3,475,891</b>	<b>128</b>	<b>3,995,973</b>	<b>87,793</b>	<b>404,608,045</b>	

APPENDIX C

Source: DNREC 2017 TRI Database, October, 2018  
A "1" in the Form A column indicates a Form A report

All Amounts Are in Pounds

# APPENDIX C

## 2017 ON-SITE RELEASES BY FACILITY AND CHEMICAL

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES				TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND				
<b>DENTSPLY SIRONA MAIN PLANT</b>								
MERCURY	0.0000	0.6800	0.0000	0.0000	0.6800	193.5900	0.0000	
<b>DENTSPLY SIRONA MAIN PLANT Total</b>	<b>0.0000</b>	<b>0.6800</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.6800</b>	<b>193.5900</b>	<b>0.0000</b>	
<b>DENTSPLY SIRONA WEST PLANT</b>								
METHANOL	0	1,978	0	0	1,978	10,124	0	
METHYL METHACRYLATE	0	3,783	0	0	3,783	90	0	
TOLUENE	0	2,532	0	0	2,532	3,836	0	
<b>DENTSPLY SIRONA WEST PLANT Total</b>	<b>0</b>	<b>8,292</b>	<b>0</b>	<b>0</b>	<b>8,292</b>	<b>14,049</b>	<b>0</b>	
<b>DOVER AFB</b>								
1,2,4-TRIMETHYLBENZENE	0	52	0	0	52	1	0	
CUMENE	0	52	0	0	52	1	0	
ETHYLBENZENE	0	52	0	0	52	1	0	
NAPHTHALENE	0	52	0	0	52	1	0	
XYLENE (MIXED ISOMERS)	0	52	0	0	52	1	0	
<b>DOVER AFB Total</b>	<b>0</b>	<b>260</b>	<b>0</b>	<b>0</b>	<b>260</b>	<b>5</b>	<b>0</b>	
<b>DUHADAWAY TOOL &amp; DIE SHOP INC</b>								
CHROMIUM	0	0	0	0	0	11,472	0	
NICKEL	0	0	0	0	0	9,967	0	
<b>DUHADAWAY TOOL &amp; DIE SHOP INC Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21,439</b>	<b>0</b>	
<b>DYK AUTOMOTIVE LLC</b>								
METHANOL	0	5,355	0	0	5,355	0	0	
<b>DYK AUTOMOTIVE LLC Total</b>	<b>0</b>	<b>5,355</b>	<b>0</b>	<b>0</b>	<b>5,355</b>	<b>0</b>	<b>0</b>	
<b>EDGE MOOR/HAY ROAD ENERGY CENTERS</b>								
AMMONIA	0	8,844	1	0	8,845	76	0	
DIOXIN AND DIOXIN-LIKE COMPOUNDS	0.000000	0.005357	0.000000	0.000000	0.005357	0.000000	0.000000	
MERCURY	0.0000	13.2000	0.0010	0.0000	13.2010	0.0800	0.0000	
POLYCYCLIC AROMATIC COMPOUNDS	0	0	0	0	0	0	0	
<b>EDGE MOOR/HAY ROAD ENERGY CENTERS Total</b>	<b>0</b>	<b>8,857</b>	<b>1</b>	<b>0</b>	<b>8,858</b>	<b>76</b>	<b>0</b>	

APPENDIX C

# APPENDIX C

## 2017 ON-SITE RELEASES BY FACILITY AND CHEMICAL

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES				OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND	TOTAL		
<b>FORMOSA PLASTICS</b>							
AMMONIA	0	4,485	0	0	4,485	0	0
DIOXIN AND DIOXIN-LIKE COMPOUNDS	0.000000	0.000009	0.000000	0.000000	0.000009	0.000242	0.000000
VINYL ACETATE	0	34,162	0	0	34,162	0	0
VINYL CHLORIDE	0	45,949	1	0	45,950	220	204,100
<b>FORMOSA PLASTICS Total</b>	<b>0</b>	<b>84,596</b>	<b>1</b>	<b>0</b>	<b>84,597</b>	<b>220</b>	<b>204,100</b>
<b>GAC SEAFORD</b>							
1,2,4-TRIMETHYLBENZENE	1	0	0	0	0	0	0
<b>GAC SEAFORD Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>GRIFFITH ENERGY - CARL KING</b>							
1,2,4-TRIMETHYLBENZENE	1	0	0	0	0	0	0
NAPHTHALENE	1	0	0	0	0	0	0
XYLENE (MIXED ISOMERS)	1	0	0	0	0	0	0
<b>GRIFFITH ENERGY - CARL KING Total</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>HANDYTUBE</b>							
CHROMIUM	0	0	0	0	0	35,667	0
MANGANESE	0	0	0	0	0	3,693	0
NICKEL	0	0	0	0	0	32,557	0
TRICHLOROETHYLENE	0	1,275	0	0	1,275	10,323	0
<b>HANDYTUBE Total</b>	<b>0</b>	<b>1,275</b>	<b>0</b>	<b>0</b>	<b>1,275</b>	<b>82,240</b>	<b>0</b>
<b>HANESBRANDS</b>							
NITRATE COMPOUNDS	0	0	0	0	0	40,278	0
<b>HANESBRANDS Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>40,278</b>	<b>0</b>
<b>HANOVER FOODS</b>							
AMMONIA	0	15,779	0	0	15,779	0	0
<b>HANOVER FOODS Total</b>	<b>0</b>	<b>15,779</b>	<b>0</b>	<b>0</b>	<b>15,779</b>	<b>0</b>	<b>0</b>

APPENDIX C

# APPENDIX C

## 2017 ON-SITE RELEASES BY FACILITY AND CHEMICAL

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES				OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND	TOTAL		
<b>HONEYWELL</b>							
BORON TRIFLUORIDE	0	358	0	0	358	0	0
ETHYLENE GLYCOL	0	0	0	9,900	9,900	9,900	0
HYDROGEN FLUORIDE	0	544	0	0	544	0	70
METHANOL	0	6	0	0	6	2,360	0
<b>HONEYWELL Total</b>	<b>0</b>	<b>908</b>	<b>0</b>	<b>9,900</b>	<b>10,808</b>	<b>12,260</b>	<b>70</b>
<b>IKO</b>							
POLYCYCLIC AROMATIC COMPOUNDS	0	0	0	0	0	94	465
<b>IKO Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>94</b>	<b>465</b>
<b>INDIAN RIVER GENERATING STATION</b>							
AMMONIA	0	1,502	0	0	1,502	0	49,734
BARIUM COMPOUNDS	0	30	0	9,278	9,308	9	0
HYDROCHLORIC ACID	0	1,304	0	0	1,304	0	1,001,839
HYDROGEN FLUORIDE	0	572	0	0	572	0	42,428
LEAD COMPOUNDS	0	11	0	626	637	0	0
MERCURY COMPOUNDS	0.0000	1.7000	0.0000	80.8000	82.5000	0.0000	0.0000
SULFURIC ACID	0	977	0	0	977	0	550,595
<b>INDIAN RIVER GENERATING STATION Total</b>	<b>0</b>	<b>4,398</b>	<b>0</b>	<b>9,985</b>	<b>14,382</b>	<b>9</b>	<b>1,644,596</b>
<b>INTERVET</b>							
MERCURY COMPOUNDS	0.0000	0.0000	0.0000	0.0000	0.0000	8.1192	0.0000
<b>INTERVET Total</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>8.1192</b>	<b>0.0000</b>
<b>JOHNSON CONTROLS BATTERY PLANT</b>							
ANTIMONY COMPOUNDS	0	0	0	0	0	17,133	0
LEAD COMPOUNDS	0	52	47	0	99	4,420,595	0
<b>JOHNSON CONTROLS BATTERY PLANT Total</b>	<b>0</b>	<b>52</b>	<b>47</b>	<b>0</b>	<b>99</b>	<b>4,437,728</b>	<b>0</b>
<b>JOHNSON CONTROLS DISTRIBUTION</b>							
ANTIMONY COMPOUNDS	0	0	0	0	0	9,753	0
ARSENIC COMPOUNDS	0	0	0	0	0	600	0
LEAD COMPOUNDS	0	0	0	0	0	2,507,675	0
<b>JOHNSON CONTROLS DISTRIBUTION Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,518,028</b>	<b>0</b>

APPENDIX C

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## 2017 ON-SITE RELEASES BY FACILITY AND CHEMICAL

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES				TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND				
JUSTIN TANKS								
STYRENE	0	8,618	0	330	8,948	4,430	18,439	
<b>JUSTIN TANKS Total</b>	<b>0</b>	<b>8,618</b>	<b>0</b>	<b>330</b>	<b>8,948</b>	<b>4,430</b>	<b>18,439</b>	
KUEHNE								
CHLORINE	0	17	0	0	17	0	0	
<b>KUEHNE Total</b>	<b>0</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>0</b>	<b>0</b>	
METAL MASTERS								
CHROMIUM	0	1	0	0	1	203,695	0	
NICKEL	0	1	0	0	1	69,407	0	
<b>METAL MASTERS Total</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>273,102</b>	<b>0</b>	
MOUNTAIRE FARMS - FRANKFORD MILL								
COPPER COMPOUNDS	1	0	0	0	0	0	0	
MANGANESE COMPOUNDS	1	0	0	0	0	0	0	
ZINC COMPOUNDS	1	0	0	0	0	0	0	
<b>MOUNTAIRE FARMS - FRANKFORD MILL Total</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
MOUNTAIRE FARMS - SELBYVILLE PLANT								
PERACETIC ACID	0	667	0	0	667	0	255,288	
<b>MOUNTAIRE FARMS - SELBYVILLE PLANT Total</b>	<b>0</b>	<b>667</b>	<b>0</b>	<b>0</b>	<b>667</b>	<b>0</b>	<b>255,288</b>	
MOUNTAIRE FARMS OF DELAWARE								
COPPER COMPOUNDS	1	0	0	0	0	0	0	
HYDROGEN SULFIDE	0	13,031	0	0	13,031	0	104,099	
MANGANESE COMPOUNDS	1	0	0	0	0	0	0	
PERACETIC ACID	0	485	0	0	485	0	403,314	
ZINC COMPOUNDS	1	0	0	0	0	0	0	
<b>MOUNTAIRE FARMS OF DELAWARE Total</b>	<b>3</b>	<b>13,516</b>	<b>0</b>	<b>0</b>	<b>13,516</b>	<b>0</b>	<b>507,413</b>	
NATIONAL GUARD TRAINING SITE RANGE								
LEAD	0	0	0	3,733	3,733	0	0	
<b>NATIONAL GUARD TRAINING SITE RANGE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,733</b>	<b>3,733</b>	<b>0</b>	<b>0</b>	

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## 2017 ON-SITE RELEASES BY FACILITY AND CHEMICAL

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES				TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND				
<b>NORAMCO INC</b>								
METHANOL	0	60	0	0	60	99,549	0	
N-BUTYL ALCOHOL	0	25	0	0	25	367,028	0	
TOLUENE	0	101	0	0	101	638,955	0	
<b>NORAMCO INC Total</b>	<b>0</b>	<b>186</b>	<b>0</b>	<b>0</b>	<b>186</b>	<b>1,105,532</b>	<b>0</b>	
<b>ORIENT CORP</b>								
ANILINE	0	80	0	0	80	1,792	340,000	
CHROMIUM COMPOUNDS	0	0	0	0	0	0	0	
DIPHENYLAMINE	0	0	0	0	0	0	0	
NITROBENZENE	0	2	0	0	2	0	0	
ZINC COMPOUNDS	0	0	0	0	0	0	0	
<b>ORIENT CORP Total</b>	<b>0</b>	<b>82</b>	<b>0</b>	<b>0</b>	<b>82</b>	<b>1,792</b>	<b>340,000</b>	
<b>OWEN STEEL COMPANY</b>								
LEAD COMPOUNDS	0	0	0	0	0	211	0	
MANGANESE COMPOUNDS	0	37	0	0	37	2,440	0	
NICKEL COMPOUNDS	0	2	0	0	2	5,340	0	
<b>OWEN STEEL COMPANY Total</b>	<b>0</b>	<b>39</b>	<b>0</b>	<b>0</b>	<b>39</b>	<b>7,991</b>	<b>0</b>	
<b>PERDUE BRIDGEVILLE</b>								
COPPER COMPOUNDS	1	0	0	0	0	0	0	
MANGANESE COMPOUNDS	1	0	0	0	0	0	0	
ZINC COMPOUNDS	1	0	0	0	0	0	0	
<b>PERDUE BRIDGEVILLE Total</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>PERDUE GEORGETOWN</b>								
HYDROGEN SULFIDE	0	4,755	0	0	4,755	0	116,254	
NITRATE COMPOUNDS	0	0	272,306	0	272,306	79	0	
<b>PERDUE GEORGETOWN Total</b>	<b>0</b>	<b>4,755</b>	<b>272,306</b>	<b>0</b>	<b>277,061</b>	<b>79</b>	<b>116,254</b>	
<b>PERDUE MILFORD</b>								
PERACETIC ACID	0	0	0	0	0	17	33,046	
<b>PERDUE MILFORD Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>33,046</b>	

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## 2017 ON-SITE RELEASES BY FACILITY AND CHEMICAL

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES				OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND	TOTAL		
<b>PICTSWEET BRIDGEVILLE</b>							
AMMONIA	0	1,600	0	0	1,600	0	0
<b>PICTSWEET BRIDGEVILLE Total</b>	<b>0</b>	<b>1,600</b>	<b>0</b>	<b>0</b>	<b>1,600</b>	<b>0</b>	<b>0</b>
<b>PPG INDUSTRIES</b>							
CERTAIN GLYCOL ETHERS	0	2	0	0	2	1,732	0
ETHYLENE GLYCOL	0	0	0	0	0	3,948	0
ZINC COMPOUNDS	0	34	0	0	34	3,763	0
<b>PPG INDUSTRIES Total</b>	<b>0</b>	<b>36</b>	<b>0</b>	<b>0</b>	<b>36</b>	<b>9,443</b>	<b>0</b>
<b>PRINCE MINERALS LLC</b>							
BARIUM COMPOUNDS	1	0	0	0	0	0	0
MANGANESE COMPOUNDS	0	6	0	0	6	0	0
NICKEL COMPOUNDS	0	5	0	0	5	0	0
<b>PRINCE MINERALS LLC Total</b>	<b>1</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>0</b>
<b>ROGERS CORP</b>							
COPPER	0	10	0	0	10	5,023	0
ETHYLBENZENE	0	500	0	0	500	850	19,500
XYLENE (MIXED ISOMERS)	0	1,900	0	0	1,900	4,500	101,000
<b>ROGERS CORP Total</b>	<b>0</b>	<b>2,410</b>	<b>0</b>	<b>0</b>	<b>2,410</b>	<b>10,373</b>	<b>120,500</b>
<b>ROHM &amp; HAAS B2 B3 B8</b>							
DIISOCYANATES	0	0	0	0	0	8,587	0
N,N-DIMETHYLFORMAMIDE	0	4,554	0	0	4,554	1,020,728	4,850,816
<b>ROHM &amp; HAAS B2 B3 B8 Total</b>	<b>0</b>	<b>4,554</b>	<b>0</b>	<b>0</b>	<b>4,554</b>	<b>1,029,315</b>	<b>4,850,816</b>
<b>ROHM &amp; HAAS B5 B6</b>							
4,4'-METHYLENEBIS(2-CHLOROANILINE)	0	0	0	0	0	1,075	0
DIISOCYANATES	0	2	0	0	2	3,912	0
N-METHYL-2-PYRROLIDONE	0	2,109	0	0	2,109	63,415	0
<b>ROHM &amp; HAAS B5 B6 Total</b>	<b>0</b>	<b>2,111</b>	<b>0</b>	<b>0</b>	<b>2,111</b>	<b>68,402</b>	<b>0</b>
<b>ROHM &amp; HAAS B7 B15</b>							
4,4'-METHYLENEBIS(2-CHLOROANILINE)	0	0	0	0	0	601	0
N-METHYL-2-PYRROLIDONE	0	707	0	0	707	11,561	0
<b>ROHM &amp; HAAS B7 B15 Total</b>	<b>0</b>	<b>707</b>	<b>0</b>	<b>0</b>	<b>707</b>	<b>12,162</b>	<b>0</b>

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## 2017 ON-SITE RELEASES BY FACILITY AND CHEMICAL

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES				OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND	TOTAL		
SERVICE ENERGY DOVER							
1,2,4-TRIMETHYLBENZENE	1	0	0	0	0	0	0
TOLUENE	1	0	0	0	0	0	0
<b>SERVICE ENERGY DOVER Total</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
SPI PHARMA							
CHLORINE	1	0	0	0	0	0	0
NITRIC ACID	1	0	0	0	0	0	0
<b>SPI PHARMA Total</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
V&S DELAWARE GALVANIZING							
LEAD	0	10	2	0	12	6,523	7,408
ZINC COMPOUNDS	0	578	197	0	775	239,114	869,115
<b>V&amp;S DELAWARE GALVANIZING Total</b>	<b>0</b>	<b>588</b>	<b>199</b>	<b>0</b>	<b>787</b>	<b>245,637</b>	<b>876,523</b>
VEOLIA - RED LION PLANT							
HYDRAZINE	0	0	0	0	0	0	0
HYDRAZINE SULFATE	0	0	0	0	0	0	0
HYDROGEN SULFIDE	0	177	0	0	177	0	0
SULFURIC ACID	0	7,594	0	0	7,594	0	0
<b>VEOLIA - RED LION PLANT Total</b>	<b>0</b>	<b>7,771</b>	<b>0</b>	<b>0</b>	<b>7,771</b>	<b>0</b>	<b>0</b>
VP RACING FUELS							
TOLUENE	1	0	0	0	0	0	0
<b>VP RACING FUELS Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>STATE TOTALS</b>	<b>28</b>	<b>746,669</b>	<b>3,823,135</b>	<b>24,076</b>	<b>4,593,879</b>	<b>12,003,373</b>	<b>418,271,988</b>

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# APPENDIX D

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY FACILITY

	OFF SITE TRANSFERS						ON SITE WASTE MANAGEMENT				
	POTW	RECYCLE	ENERGY		DISPOSAL	TOTAL	RECYCLE	ENERGY		TREATMENT	TOTAL
			RECOVERY	TREATMENT				RECOVERY	TREATMENT		
<b>AEARO TECHNOLOGIES LLC</b>											
DIISOCYANATES	0	0	0	10,048	0	10,048	0	0	0	0	0
TOLUENE DIISOCYANATE (MIXED ISOMERS)	0	0	0	1,590	0	1,590	0	0	0	0	0
<b>AEARO TECHNOLOGIES LLC Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11,638</b>	<b>0</b>	<b>11,638</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>AGILENT TECHNOLOGIES</b>											
ACETONITRILE	0	0	21,929	0	0	21,929	0	0	0	0	0
METHANOL	0	0	51,910	142	0	52,052	0	0	0	0	0
TOLUENE	0	0	151,025	78	0	151,103	0	0	0	0	0
<b>AGILENT TECHNOLOGIES Total</b>	<b>0</b>	<b>0</b>	<b>224,864</b>	<b>220</b>	<b>0</b>	<b>225,084</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>AIR LIQUIDE ADVANCED SEPARATIONS</b>											
CYCLOHEXANE	0	0	13,985	0	0	13,985	0	0	0	0	0
METHANOL	0	0	0	56,335	0	56,335	1,827,349	0	0	0	1,827,349
N,N-DIMETHYLFORMAMIDE	20,700	0	8,860	0	0	29,560	0	0	0	0	0
N-HEXANE	0	0	0	0	0	0	1,521,163	0	0	0	1,521,163
N-METHYL-2-PYRROLIDONE	54,342	0	7,490	0	0	61,832	0	0	0	0	0
<b>AIR LIQUIDE ADVANCED SEPARATIONS Total</b>	<b>75,042</b>	<b>0</b>	<b>30,335</b>	<b>56,335</b>	<b>0</b>	<b>161,712</b>	<b>3,348,512</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,348,512</b>
<b>ALLEN HARIM FARMS SEAFORD MILL</b>											
COPPER	0	0	0	0	0	0	0	0	0	0	0
COPPER COMPOUNDS	0	0	0	0	0	0	0	0	0	0	0
MANGANESE	0	0	0	0	0	0	0	0	0	0	0
MANGANESE COMPOUNDS	0	0	0	0	0	0	0	0	0	0	0
ZINC COMPOUNDS	0	0	0	0	0	0	0	0	0	0	0
<b>ALLEN HARIM FARMS SEAFORD MILL Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>ALLEN HARIM FOODS HARBESON</b>											
NITRATE COMPOUNDS	0	0	0	0	0	0	0	0	0	0	0
PERACETIC ACID	0	0	0	0	0	0	0	0	0	0	0
<b>ALLEN HARIM FOODS HARBESON Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>AMICK FARMS</b>											
COPPER COMPOUNDS	0	0	0	0	0	0	0	0	0	0	0
MANGANESE COMPOUNDS	0	0	0	0	0	0	0	0	0	0	0
ZINC COMPOUNDS	0	0	0	0	0	0	0	0	0	0	0
<b>AMICK FARMS Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

APPENDIX D

# APPENDIX D

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY FACILITY

	OFF SITE TRANSFERS						ON SITE WASTE MANAGEMENT			
	POTW	RECYCLE	ENERGY		DISPOSAL	TOTAL	RECYCLE	ENERGY		TOTAL
			RECOVERY	TREATMENT				RECOVERY	TREATMENT	
<b>BALTIMORE AIRCOIL COMPANY</b>										
COBALT COMPOUNDS	0	21,000	0	0	0	21,000	0	0	0	0
COPPER COMPOUNDS	0	28,565	0	0	0	28,565	0	0	0	0
MANGANESE COMPOUNDS	0	85,090	0	0	0	85,090	0	0	0	0
NICKEL COMPOUNDS	0	196,226	0	0	0	196,226	0	0	0	0
CHROMIUM COMPOUNDS2	0	171,026	0	0	0	171,026	0	0	0	0
<b>BALTIMORE AIRCOIL COMPANY Total</b>	<b>0</b>	<b>501,907</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>501,907</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>BASF COLORS AND EFFECTS USA LLC</b>										
ANILINE	14,050	0	26,920	422	0	41,392	0	0	1,352	1,352
BIPHENYL	16,452	0	79,858	2,066	0	98,376	0	0	2,599	2,599
CYCLOHEXANE	0	30,434	0	0	0	30,434	0	0	0	0
METHANOL	607,129	200,239	4,588	6,788	0	818,744	398,160	0	921,135	1,319,295
NITRATE COMPOUNDS	22,656	0	0	0	0	22,656	0	0	0	0
NITRIC ACID	0	0	0	0	0	0	0	0	23,021	23,021
N-METHYL-2-PYRROLIDONE	11,260	41,845	0	0	0	53,105	0	0	0	0
P-CHLOROANILINE	2,840	0	14,839	349	0	18,028	0	0	474	474
XYLENE (MIXED ISOMERS)	306	0	688	0	0	994	0	0	0	0
<b>BASF COLORS AND EFFECTS USA LLC Total</b>	<b>674,693</b>	<b>272,518</b>	<b>126,893</b>	<b>9,625</b>	<b>0</b>	<b>1,083,729</b>	<b>398,160</b>	<b>0</b>	<b>948,581</b>	<b>1,346,741</b>
<b>CALPINE CORP - GARRISON ENERGY CENTER</b>										
AMMONIA	0	0	0	0	0	0	0	0	0	0
<b>CALPINE CORP - GARRISON ENERGY CENTER Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>COLOR WORKS PAINTING</b>										
MANGANESE	0	720	0	0	0	720	0	0	0	0
<b>COLOR WORKS PAINTING Total</b>	<b>0</b>	<b>720</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>720</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>CRODA</b>										
CERTAIN GLYCOL ETHERS	3,782	0	0	0	0	3,782	0	0	0	0
DIETHANOLAMINE	2,239	0	0	3,293	0	5,532	0	0	0	0
ETHYLENE GLYCOL	13,321	0	0	0	0	13,321	0	0	0	0
ETHYLENE OXIDE	0	0	0	0	0	0	0	0	415	415
METHANOL	5,539	0	0	5,011	0	10,550	0	0	0	0
NAPHTHALENE	0	0	0	420	0	420	0	0	0	0
N-BUTYL ALCOHOL	367	0	0	0	0	367	0	0	0	0
PROPYLENE OXIDE	0	0	0	0	0	0	0	0	765	765
NONYLPHENOL	1,914	0	0	0	0	1,914	0	0	0	0
<b>CRODA Total</b>	<b>27,162</b>	<b>0</b>	<b>0</b>	<b>8,724</b>	<b>0</b>	<b>35,886</b>	<b>0</b>	<b>0</b>	<b>1,180</b>	<b>1,180</b>

APPENDIX D

# APPENDIX D

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY FACILITY

	OFF SITE TRANSFERS						ON SITE WASTE MANAGEMENT			
	POTW	RECYCLE	ENERGY		DISPOSAL	TOTAL	RECYCLE	ENERGY		TOTAL
			RECOVERY	TREATMENT				RECOVERY	TREATMENT	
DELAWARE CITY REFINERY										
1,2,4-TRIMETHYLBENZENE	0	0	0	0	0	0	0	0	62,854	62,854
1,3-BUTADIENE	0	0	0	0	0	0	0	0	0	0
2,4-DIMETHYLPHENOL	0	0	0	0	0	0	0	0	231,421	231,421
AMMONIA	0	1	0	2	255	257	0	11,814,350	66,773	11,881,123
ANTHRACENE	0	0	0	0	0	0	0	0	0	0
ASBESTOS (FRIABLE)	0	0	0	0	80,505	80,505	0	0	0	0
BENZENE	0	9	463	0	6	478	0	398,183	88,874	487,057
BENZO(G,H,I)PERYLENE	0	0	0	0	0	0	0	0	453	453
CARBON DISULFIDE	0	0	0	0	0	0	0	120,801	3,397,059	3,517,860
CARBONYL SULFIDE	0	0	0	0	0	0	0	65,662	12,810,393	12,876,055
CREOSOTE	0	0	0	0	2,277	2,277	0	0	0	0
CRESOL (MIXED ISOMERS)	0	0	0	0	0	0	0	21,418	315,483	336,901
CUMENE	0	0	0	0	0	0	0	0	3,724	3,724
CYANIDE COMPOUNDS	0	0	0	0	0	0	0	0	14,378	14,378
CYCLOHEXANE	0	7	463	0	5	475	0	0	7,045	7,045
DIOXIN AND DIOXIN-LIKE COMPOUNDS	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.001263	0.001263
ETHYLBENZENE	0	8	573	0	8	589	0	0	50,418	50,418
ETHYLENE	0	0	0	0	0	0	0	0	0	0
ETHYLENE GLYCOL	0	0	0	0	300	300	0	0	18,097	18,097
HYDROCHLORIC ACID	0	0	0	0	0	0	0	0	114,926	114,926
HYDROGEN CYANIDE	0	0	0	0	0	0	0	0	432,005	432,005
HYDROGEN SULFIDE	0	0	0	0	0	0	0	0	373,728,611	373,728,611
LEAD COMPOUNDS	0	437	0	0	40	477	0	0	0	0
MERCURY COMPOUNDS	0.0000	4.8750	0.0000	0.0000	0.0270	4.9020	0.0000	0.0000	0.0000	0.0000
METHANOL	0	0	0	0	0	0	0	0	7,938	7,938
MOLYBDENUM TRIOXIDE	0	43	0	0	2	45	0	0	0	0
NAPHTHALENE	0	0	0	0	0	0	0	0	11,861	11,861
N-HEXANE	0	0	0	0	0	0	0	0	94,589	94,589
NITRATE COMPOUNDS	0	0	0	0	0	0	0	0	0	0
PHENANTHRENE	0	0	0	7	0	7	0	0	40	40
PHENOL	0	0	0	0	0	0	0	54,615	271,684	326,299
POLYCYCLIC AROMATIC COMPOUNDS	0	0	0	0	0	0	0	0	372	372
PROPYLENE	0	0	0	0	0	0	0	0	0	0
STYRENE	0	0	0	0	0	0	0	0	1,160	1,160
SULFURIC ACID	0	0	0	0	0	0	0	0	0	0
TETRACHLOROETHYLENE	0	0	0	0	0	0	0	0	0	0
TOLUENE	0	9	2,203	0	8	2,220	0	0	202,762	202,762
XYLENE (MIXED ISOMERS)	0	28	0	6	55	89	0	0	200,096	200,096
COBALT	0	66	0	0	4	70	0	0	0	0

APPENDIX D

# APPENDIX D

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY FACILITY

	OFF SITE TRANSFERS						ON SITE WASTE MANAGEMENT				
	POTW	RECYCLE	ENERGY		DISPOSAL	TOTAL	RECYCLE	ENERGY		TOTAL	
			RECOVERY	TREATMENT				RECOVERY	TREATMENT		
<b>DELAWARE CITY REFINERY Total</b>	0	613	3,701	16	83,463	87,793	0	12,475,029	392,133,016	404,608,045	
DENTSPLY SIRONA MAIN PLANT											
MERCURY	0	194	0	0.0000	0.0000	193.5900	0.0000	0.0000	0.0000	0.0000	
<b>DENTSPLY SIRONA MAIN PLANT Total</b>	<b>0</b>	<b>194</b>	<b>0</b>	<b>0.0000</b>	<b>0.0000</b>	<b>193.5900</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	
DENTSPLY SIRONA WEST PLANT											
METHANOL	81	0	10,043	0	0	10,124	0	0	0	0	
METHYL METHACRYLATE	90	0	0	0	0	90	0	0	0	0	
TOLUENE	0	0	3,836	0	0	3,836	0	0	0	0	
<b>DENTSPLY SIRONA WEST PLANT Total</b>	<b>170</b>	<b>0</b>	<b>13,879</b>	<b>0</b>	<b>0</b>	<b>14,049</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
DOVER AFB											
1,2,4-TRIMETHYLBENZENE	0	0	0	0	1	1	0	0	0	0	
CUMENE	0	0	0	0	1	1	0	0	0	0	
ETHYLBENZENE	0	0	0	0	1	1	0	0	0	0	
NAPHTHALENE	0	0	0	0	1	1	0	0	0	0	
XYLENE (MIXED ISOMERS)	0	0	0	0	1	1	0	0	0	0	
<b>DOVER AFB Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
DUHADAWAY TOOL & DIE SHOP INC											
CHROMIUM	0	11,358	0	0	114	11,472	0	0	0	0	
NICKEL	0	9,868	0	0	99	9,967	0	0	0	0	
<b>DUHADAWAY TOOL &amp; DIE SHOP INC Total</b>	<b>0</b>	<b>21,226</b>	<b>0</b>	<b>0</b>	<b>213</b>	<b>21,439</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
DYK AUTOMOTIVE LLC											
METHANOL	0	0	0	0	0	0	0	0	0	0	
<b>DYK AUTOMOTIVE LLC Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
EDGE MOOR/HAY ROAD ENERGY CENTERS											
AMMONIA	76	0	0	0	0	76	0	0	0	0	
DIOXIN AND DIOXIN-LIKE COMPOUNDS	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
MERCURY	0.0800	0.0000	0.0000	0.0000	0.0000	0.0800	0.0000	0.0000	0.0000	0.0000	
POLYCYCLIC AROMATIC COMPOUNDS	0	0	0	0	0	0	0	0	0	0	
<b>EDGE MOOR/HAY ROAD ENERGY CENTERS Total</b>	<b>76</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>76</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	

APPENDIX D

# APPENDIX D

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY FACILITY

	OFF SITE TRANSFERS						ON SITE WASTE MANAGEMENT			
	POTW	RECYCLE	ENERGY		DISPOSAL	TOTAL	RECYCLE	ENERGY		TOTAL
			RECOVERY	TREATMENT				RECOVERY	TREATMENT	
FORMOSA PLASTICS										
AMMONIA	0	0	0	0	0	0	0	0	0	0
DIOXIN AND DIOXIN-LIKE COMPOUNDS	0.000000	0.000027	0.000000	0.000000	0.000216	0.000242	0.000000	0.000000	0.000000	0.000000
VINYL ACETATE	0	0	0	0	0	0	0	0	0	0
VINYL CHLORIDE	0	0	0	0	220	220	0	0	204,100	204,100
<b>FORMOSA PLASTICS Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>220</b>	<b>220</b>	<b>0</b>	<b>0</b>	<b>204,100</b>	<b>204,100</b>
GAC SEAFORD										
1,2,4-TRIMETHYLBENZENE	0	0	0	0	0	0	0	0	0	0
<b>GAC SEAFORD Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
GRIFFITH ENERGY - CARL KING										
1,2,4-TRIMETHYLBENZENE	0	0	0	0	0	0	0	0	0	0
NAPHTHALENE	0	0	0	0	0	0	0	0	0	0
XYLENE (MIXED ISOMERS)	0	0	0	0	0	0	0	0	0	0
<b>GRIFFITH ENERGY - CARL KING Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
HANDYTUBE										
CHROMIUM	0	35,614	0	0	53	35,667	0	0	0	0
MANGANESE	0	3,688	0	0	5	3,693	0	0	0	0
NICKEL	0	32,479	0	0	78	32,557	0	0	0	0
TRICHLOROETHYLENE	0	0	0	10,323	0	10,323	0	0	0	0
<b>HANDYTUBE Total</b>	<b>0</b>	<b>71,781</b>	<b>0</b>	<b>10,323</b>	<b>136</b>	<b>82,240</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
HANESBRANDS										
NITRATE COMPOUNDS	40,278	0	0	0	0	40,278	0	0	0	0
<b>HANESBRANDS Total</b>	<b>40,278</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>40,278</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
HANOVER FOODS										
AMMONIA	0	0	0	0	0	0	0	0	0	0
<b>HANOVER FOODS Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

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## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY FACILITY

	OFF SITE TRANSFERS						ON SITE WASTE MANAGEMENT			
	POTW	RECYCLE	ENERGY		DISPOSAL	TOTAL	RECYCLE	ENERGY		TOTAL
			RECOVERY	TREATMENT				RECOVERY	TREATMENT	
<b>HONEYWELL</b>										
BORON TRIFLUORIDE	0	0	0	0	0	0	0	0	0	0
ETHYLENE GLYCOL	0	0	9,900	0	0	9,900	0	0	0	0
HYDROGEN FLUORIDE	0	0	0	0	0	0	0	0	70	70
METHANOL	80	0	2,280	0	0	2,360	0	0	0	0
<b>HONEYWELL Total</b>	<b>80</b>	<b>0</b>	<b>12,180</b>	<b>0</b>	<b>0</b>	<b>12,260</b>	<b>0</b>	<b>0</b>	<b>70</b>	<b>70</b>
<b>IKO</b>										
POLYCYCLIC AROMATIC COMPOUNDS	0	91	0	0	3	94	465	0	0	465
<b>IKO Total</b>	<b>0</b>	<b>91</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>94</b>	<b>465</b>	<b>0</b>	<b>0</b>	<b>465</b>
<b>INDIAN RIVER GENERATING STATION</b>										
AMMONIA	0	0	0	0	0	0	0	0	49,734	49,734
BARIUM COMPOUNDS	0	0	0	0	9	9	0	0	0	0
HYDROCHLORIC ACID	0	0	0	0	0	0	0	0	1,001,839	1,001,839
HYDROGEN FLUORIDE	0	0	0	0	0	0	0	0	42,428	42,428
LEAD COMPOUNDS	0	0	0	0	0	0	0	0	0	0
MERCURY COMPOUNDS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SULFURIC ACID	0	0	0	0	0	0	0	0	550,595	550,595
<b>INDIAN RIVER GENERATING STATION Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>1,644,596</b>	<b>1,644,596</b>
<b>INTERVET</b>										
MERCURY COMPOUNDS	0.0000	8.0000	0.0000	0.0000	0.1192	8.1192	0.0000	0.0000	0.0000	0.0000
<b>INTERVET Total</b>	<b>0.0000</b>	<b>8.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.1192</b>	<b>8.1192</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>
<b>JOHNSON CONTROLS BATTERY PLANT</b>										
ANTIMONY COMPOUNDS	0	17,128	0	0	6	17,133	0	0	0	0
LEAD COMPOUNDS	0	4,418,568	0	0	2,027	4,420,595	0	0	0	0
<b>JOHNSON CONTROLS BATTERY PLANT Total</b>	<b>0</b>	<b>4,435,696</b>	<b>0</b>	<b>0</b>	<b>2,032</b>	<b>4,437,728</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>JOHNSON CONTROLS DISTRIBUTION</b>										
ANTIMONY COMPOUNDS	0	9,753	0	0	0	9,753	0	0	0	0
ARSENIC COMPOUNDS	0	600	0	0	0	600	0	0	0	0
LEAD COMPOUNDS	1	2,507,034	0	0	640	2,507,675	0	0	0	0
<b>JOHNSON CONTROLS DISTRIBUTION Total</b>	<b>1</b>	<b>2,517,387</b>	<b>0</b>	<b>0</b>	<b>640</b>	<b>2,518,028</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

APPENDIX D

# APPENDIX D

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY FACILITY

	OFF SITE TRANSFERS						ON SITE WASTE MANAGEMENT			
	POTW	RECYCLE	ENERGY		DISPOSAL	TOTAL	RECYCLE	ENERGY		TOTAL
			RECOVERY	TREATMENT				RECOVERY	TREATMENT	
JUSTIN TANKS										
STYRENE	0	4,430	0	0	0	4,430	18,439	0	0	18,439
<b>JUSTIN TANKS Total</b>	<b>0</b>	<b>4,430</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4,430</b>	<b>18,439</b>	<b>0</b>	<b>0</b>	<b>18,439</b>
KUEHNE										
CHLORINE	0	0	0	0	0	0	0	0	0	0
<b>KUEHNE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
METAL MASTERS										
CHROMIUM	0	202,731	0	0	964	203,695	0	0	0	0
NICKEL	0	69,111	0	0	296	69,407	0	0	0	0
<b>METAL MASTERS Total</b>	<b>0</b>	<b>271,842</b>	<b>0</b>	<b>0</b>	<b>1,260</b>	<b>273,102</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
MOUNTAIRE FARMS - FRANKFORD MILL										
COPPER COMPOUNDS	0	0	0	0	0	0	0	0	0	0
MANGANESE COMPOUNDS	0	0	0	0	0	0	0	0	0	0
ZINC COMPOUNDS	0	0	0	0	0	0	0	0	0	0
<b>MOUNTAIRE FARMS - FRANKFORD MILL Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
MOUNTAIRE FARMS - SELBYVILLE PLANT										
PERACETIC ACID	0	0	0	0	0	0	0	0	255,288	255,288
<b>MOUNTAIRE FARMS - SELBYVILLE PLANT Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>255,288</b>	<b>255,288</b>
MOUNTAIRE FARMS OF DELAWARE										
COPPER COMPOUNDS	0	0	0	0	0	0	0	0	0	0
HYDROGEN SULFIDE	0	0	0	0	0	0	0	0	104,099	104,099
MANGANESE COMPOUNDS	0	0	0	0	0	0	0	0	0	0
PERACETIC ACID	0	0	0	0	0	0	0	0	403,314	403,314
ZINC COMPOUNDS	0	0	0	0	0	0	0	0	0	0
<b>MOUNTAIRE FARMS OF DELAWARE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>507,413</b>	<b>507,413</b>
NATIONAL GUARD TRAINING SITE RANGE										
LEAD	0	0	0	0	0	0	0	0	0	0
<b>NATIONAL GUARD TRAINING SITE RANGE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

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# APPENDIX D

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY FACILITY

	OFF SITE TRANSFERS						ON SITE WASTE MANAGEMENT			
	POTW	RECYCLE	ENERGY			TOTAL	RECYCLE	ENERGY		TOTAL
			RECOVERY	TREATMENT	DISPOSAL			RECOVERY	TREATMENT	
NORAMCO INC										
METHANOL	4,977	0	94,572	0	0	99,549	0	0	0	0
N-BUTYL ALCOHOL	18,351	0	348,677	0	0	367,028	0	0	0	0
TOLUENE	6,390	0	632,565	0	0	638,955	0	0	0	0
<b>NORAMCO INC Total</b>	<b>29,718</b>	<b>0</b>	<b>1,075,814</b>	<b>0</b>	<b>0</b>	<b>1,105,532</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
ORIENT CORP										
ANILINE	1,700	0	0	0	92	1,792	220,000	0	120,000	340,000
NITROBENZENE	0	0	0	0	0	0	0	0	0	0
ZINC COMPOUNDS	0	0	0	0	0	0	0	0	0	0
CHROMIUM COMPOUNDS2	0	0	0	0	0	0	0	0	0	0
DIPHENYLAMINE	0	0	0	0	0	0	0	0	0	0
<b>ORIENT CORP Total</b>	<b>1,700</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>92</b>	<b>1,792</b>	<b>220,000</b>	<b>0</b>	<b>120,000</b>	<b>340,000</b>
OWEN STEEL COMPANY										
LEAD COMPOUNDS	0	211	0	0	0	211	0	0	0	0
MANGANESE COMPOUNDS	0	2,440	0	0	0	2,440	0	0	0	0
NICKEL COMPOUNDS	0	5,340	0	0	0	5,340	0	0	0	0
<b>OWEN STEEL COMPANY Total</b>	<b>0</b>	<b>7,991</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7,991</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
PERDUE BRIDGEVILLE										
COPPER COMPOUNDS	0	0	0	0	0	0	0	0	0	0
MANGANESE COMPOUNDS	0	0	0	0	0	0	0	0	0	0
ZINC COMPOUNDS	0	0	0	0	0	0	0	0	0	0
<b>PERDUE BRIDGEVILLE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
PERDUE GEORGETOWN										
HYDROGEN SULFIDE	0	0	0	0	0	0	0	0	116,254	116,254
NITRATE COMPOUNDS	0	0	0	0	79	79	0	0	0	0
<b>PERDUE GEORGETOWN Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>79</b>	<b>79</b>	<b>0</b>	<b>0</b>	<b>116,254</b>	<b>116,254</b>
PERDUE MILFORD										
PERACETIC ACID	17	0	0	0	0	17	0	0	33,046	33,046
<b>PERDUE MILFORD Total</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>33,046</b>	<b>33,046</b>

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## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY FACILITY

	OFF SITE TRANSFERS						ON SITE WASTE MANAGEMENT			
	POTW	RECYCLE	ENERGY		DISPOSAL	TOTAL	RECYCLE	ENERGY		TOTAL
			RECOVERY	TREATMENT				RECOVERY	TREATMENT	
PICTSWEET BRIDGEVILLE										
AMMONIA	0	0	0	0	0	0	0	0	0	0
<b>PICTSWEET BRIDGEVILLE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
PPG INDUSTRIES										
CERTAIN GLYCOL ETHERS	565	0	0	504	663	1,732	0	0	0	0
ETHYLENE GLYCOL	1,789	0	0	67	2,092	3,948	0	0	0	0
ZINC COMPOUNDS	1,072	0	0	0	2,691	3,763	0	0	0	0
<b>PPG INDUSTRIES Total</b>	<b>3,426</b>	<b>0</b>	<b>0</b>	<b>571</b>	<b>5,446</b>	<b>9,443</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
PRINCE MINERALS LLC										
BARIUM COMPOUNDS	0	0	0	0	0	0	0	0	0	0
MANGANESE COMPOUNDS	0	0	0	0	0	0	0	0	0	0
NICKEL COMPOUNDS	0	0	0	0	0	0	0	0	0	0
<b>PRINCE MINERALS LLC Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
ROGERS CORP										
COPPER	18	5,000	0	0	5	5,023	0	0	0	0
ETHYLBENZENE	0	0	0	850	0	850	0	0	19,500	19,500
XYLENE (MIXED ISOMERS)	0	0	0	4,500	0	4,500	0	0	101,000	101,000
<b>ROGERS CORP Total</b>	<b>18</b>	<b>5,000</b>	<b>0</b>	<b>5,350</b>	<b>5</b>	<b>10,373</b>	<b>0</b>	<b>0</b>	<b>120,500</b>	<b>120,500</b>
ROHM & HAAS B2 B3 B8										
DIISOCYANATES	0	0	0	8,587	0	8,587	0	0	0	0
N,N-DIMETHYLFORMAMIDE	104,538	490,050	191,880	0	234,260	1,020,728	4,850,413	0	403	4,850,816
<b>ROHM &amp; HAAS B2 B3 B8 Total</b>	<b>104,538</b>	<b>490,050</b>	<b>191,880</b>	<b>8,587</b>	<b>234,260</b>	<b>1,029,315</b>	<b>4,850,413</b>	<b>0</b>	<b>403</b>	<b>4,850,816</b>
ROHM & HAAS B5 B6										
4,4'-METHYLENEBIS(2-CHLOROANILINE)	0	0	0	1,075	0	1,075	0	0	0	0
DIISOCYANATES	0	0	0	1,309	2,603	3,912	0	0	0	0
N-METHYL-2-PYRROLIDONE	0	58,948	0	2,084	2,383	63,415	0	0	0	0
<b>ROHM &amp; HAAS B5 B6 Total</b>	<b>0</b>	<b>58,948</b>	<b>0</b>	<b>4,468</b>	<b>4,986</b>	<b>68,402</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
ROHM & HAAS B7 B15										
4,4'-METHYLENEBIS(2-CHLOROANILINE)	0	0	0	601	0	601	0	0	0	0
N-METHYL-2-PYRROLIDONE	0	9,928	0	695	938	11,561	0	0	0	0
<b>ROHM &amp; HAAS B7 B15 Total</b>	<b>0</b>	<b>9,928</b>	<b>0</b>	<b>1,296</b>	<b>938</b>	<b>12,162</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

APPENDIX D

# APPENDIX D

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY FACILITY

	OFF SITE TRANSFERS						ON SITE WASTE MANAGEMENT			
	POTW	RECYCLE	ENERGY		DISPOSAL	TOTAL	RECYCLE	ENERGY		TOTAL
			RECOVERY	TREATMENT				RECOVERY	TREATMENT	
SERVICE ENERGY DOVER										
1,2,4-TRIMETHYLBENZENE	0	0	0	0	0	0	0	0	0	0
TOLUENE	0	0	0	0	0	0	0	0	0	0
<b>SERVICE ENERGY DOVER Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
SPI PHARMA										
CHLORINE	0	0	0	0	0	0	0	0	0	0
NITRIC ACID	0	0	0	0	0	0	0	0	0	0
<b>SPI PHARMA Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
V&S DELAWARE GALVANIZING										
LEAD	0	6,255	0	0	268	6,523	7,408	0	0	7,408
ZINC COMPOUNDS	0	199,872	0	0	39,242	239,114	869,115	0	0	869,115
<b>V&amp;S DELAWARE GALVANIZING Total</b>	<b>0</b>	<b>206,127</b>	<b>0</b>	<b>0</b>	<b>39,510</b>	<b>245,637</b>	<b>876,523</b>	<b>0</b>	<b>0</b>	<b>876,523</b>
VEOLIA - RED LION PLANT										
HYDRAZINE	0	0	0	0	0	0	0	0	0	0
HYDRAZINE SULFATE	0	0	0	0	0	0	0	0	0	0
HYDROGEN SULFIDE	0	0	0	0	0	0	0	0	0	0
SULFURIC ACID	0	0	0	0	0	0	0	0	0	0
<b>VEOLIA - RED LION PLANT Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
VP RACING FUELS										
TOLUENE	0	0	0	0	0	0	0	0	0	0
<b>VP RACING FUELS Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>STATE TOTALS</b>	<b>956,919</b>	<b>8,876,457</b>	<b>1,679,546</b>	<b>117,153</b>	<b>373,297</b>	<b>12,003,373</b>	<b>9,712,512</b>	<b>12,475,029</b>	<b>396,084,447</b>	<b>418,271,988</b>

APPENDIX D

# APPENDIX E

## 2017 ON-SITE RELEASE SUMMARY BY FACILITY

FACILITY - RANKED BY TOTAL ON-SITE RELEASE	ON-SITE RELEASES			TOTAL	TRANSFERS	ON-SITE
	TO AIR	TO WATER	TO LAND		OFF-SITE	WASTE MGMT.
DELAWARE CITY REFINERY	519,954	3,475,891	128	3,995,973	87,793	404,608,045
PERDUE GEORGETOWN	4,755	272,306	0	277,061	79	116,254
FORMOSA PLASTICS	84,596	1	0	84,597	220	204,100
ALLEN HARIM FOODS HARBESON	0	74,690	0	74,690	0	0
BASF COLORS AND EFFECTS USA LLC	24,530	0	0	24,530	1,083,729	1,346,741
HANOVER FOODS	15,779	0	0	15,779	0	0
INDIAN RIVER GENERATING STATION	4,398	0	9,985	14,382	9	1,644,596
MOUNTAIRE FARMS OF DELAWARE	13,516	0	0	13,516	0	507,413
AIR LIQUIDE ADVANCED SEPARATIONS	13,264	0	0	13,264	161,712	3,348,512
HONEYWELL	908	0	9,900	10,808	12,260	70
JUSTIN TANKS	8,618	0	330	8,948	4,430	18,439
EDGE MOOR/HAY ROAD ENERGY CENTERS	8,857	1	0	8,858	76	0
DENTSPLY SIRONA WEST PLANT	8,292	0	0	8,292	14,049	0
VEOLIA - RED LION PLANT	7,771	0	0	7,771	0	0
CALPINE CORP - GARRISON ENERGY CENTE	5,882	0	0	5,882	0	0
DYK AUTOMOTIVE LLC	5,355	0	0	5,355	0	0
ROHM & HAAS B2 B3 B8	4,554	0	0	4,554	1,029,315	4,850,816
NATIONAL GUARD TRAINING SITE RANGE	0	0	3,733	3,733	0	0
CRODA	3,701	0	0	3,701	35,886	1,180
ROGERS CORP	2,410	0	0	2,410	10,373	120,500
ROHM & HAAS B5 B6	2,111	0	0	2,111	68,402	0
AGILENT TECHNOLOGIES	1,875	0	0	1,875	225,084	0
PICTSWEET BRIDGEVILLE	1,600	0	0	1,600	0	0
HANDYTUBE	1,275	0	0	1,275	82,240	0
V&S DELAWARE GALVANIZING	588	199	0	787	245,637	876,523
ROHM & HAAS B7 B15	707	0	0	707	12,162	0
MOUNTAIRE FARMS - SELBYVILLE PLANT	667	0	0	667	0	255,288
DOVER AFB	260	0	0	260	5	0
NORAMCO INC	186	0	0	186	1,105,532	0
JOHNSON CONTROLS BATTERY PLANT	52	47	0	99	4,437,728	0
ORIENT CORP	82	0	0	82	1,792	340,000
OWEN STEEL COMPANY	39	0	0	39	7,991	0
PPG INDUSTRIES	36	0	0	36	9,443	0
KUEHNE	17	0	0	17	0	0
BALTIMORE AIRCOIL COMPANY	15	0	0	15	501,907	0
PRINCE MINERALS LLC	11	0	0	11	0	0
AEARO TECHNOLOGIES LLC	6	0	0	6	11,638	0
METAL MASTERS	1	0	0	1	273,102	0
DENTSPLY SIRONA MAIN PLANT	1	0	0	1	194	0
ALLEN HARIM FARMS SEAFORD MILL	0	0	0	0	0	0

# APPENDIX E

## 2017 ON-SITE RELEASE SUMMARY BY FACILITY

FACILITY - RANKED BY TOTAL ON-SITE RELEASE	ON-SITE RELEASES				TRANSFERS	ON-SITE
	TO AIR	TO WATER	TO LAND	TOTAL	OFF-SITE	WASTE MGMT.
SERVICE ENERGY DOVER	0	0	0	0	0	0
HANESBRANDS	0	0	0	0	40,278	0
PERDUE BRIDGEVILLE	0	0	0	0	0	0
IKO	0	0	0	0	94	465
GRIFFITH ENERGY - CARL KING	0	0	0	0	0	0
MOUNTAIRE FARMS - FRANKFORD MILL	0	0	0	0	0	0
PERDUE MILFORD	0	0	0	0	17	33,046
AMICK FARMS	0	0	0	0	0	0
JOHNSON CONTROLS DISTRIBUTION	0	0	0	0	2,518,028	0
GAC SEAFORD	0	0	0	0	0	0
SPI PHARMA	0	0	0	0	0	0
COLOR WORKS PAINTING	0	0	0	0	720	0
VP RACING FUELS	0	0	0	0	0	0
DUHADAWAY TOOL & DIE SHOP INC	0	0	0	0	21,439	0
INTERVET	0	0	0	0	8	0
<b>Grand Total</b>	<b>746,669</b>	<b>3,823,135</b>	<b>24,076</b>	<b>4,593,879</b>	<b>12,003,373</b>	<b>418,271,988</b>

# APPENDIX F

## 2017 ON-SITE RELEASES BY CHEMICAL AND FACILITY

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES			TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND			
<b>1,2,4-TRIMETHYLBENZENE</b>							
DELAWARE CITY REFINERY	0	810	5	0	815	0	62854
DOVER AFB	0	52	0	0	52	1	0
GAC SEAFORD	1	0	0	0	0	0	0
GRIFFITH ENERGY - CARL KING	1	0	0	0	0	0	0
SERVICE ENERGY DOVER	1	0	0	0	0	0	0
<b>1,2,4-TRIMETHYLBENZENE Total</b>	<b>3</b>	<b>862</b>	<b>5</b>	<b>0</b>	<b>867</b>	<b>1</b>	<b>62,854</b>
<b>1,3-BUTADIENE</b>							
DELAWARE CITY REFINERY	0	250	0	0	250	0	0
<b>1,3-BUTADIENE Total</b>	<b>0</b>	<b>250</b>	<b>0</b>	<b>0</b>	<b>250</b>	<b>0</b>	<b>0</b>
<b>2,4-DIMETHYLPHENOL</b>							
DELAWARE CITY REFINERY	0	0	165	0	165	0	231421
<b>2,4-DIMETHYLPHENOL Total</b>	<b>0</b>	<b>0</b>	<b>165</b>	<b>0</b>	<b>165</b>	<b>0</b>	<b>231,421</b>
<b>4,4'-METHYLENEBIS(2-CHLOROANILINE)</b>							
ROHM & HAAS B5 B6	0	0	0	0	0	1075	0
ROHM & HAAS B7 B15	0	0	0	0	0	601	0
<b>4,4'-METHYLENEBIS(2-CHLOROANILINE) Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,676</b>	<b>0</b>
<b>ACETONITRILE</b>							
AGILENT TECHNOLOGIES	0	79	0	0	79	21929	0
<b>ACETONITRILE Total</b>	<b>0</b>	<b>79</b>	<b>0</b>	<b>0</b>	<b>79</b>	<b>21,929</b>	<b>0</b>
<b>AMMONIA</b>							
CALPINE CORP - GARRISON ENERGY CENTER	0	5882	0	0	5882	0	0
DELAWARE CITY REFINERY	0	62168	1513	0	63681	257	11881123
EDGE MOOR/HAY ROAD ENERGY CENTERS	0	8844	1	0	8845	76	0
FORMOSA PLASTICS	0	4485	0	0	4485	0	0
HANOVER FOODS	0	15779	0	0	15779	0	0
INDIAN RIVER GENERATING STATION	0	1502	0	0	1502	0	49734
PICTSWEET BRIDGEVILLE	0	1600	0	0	1600	0	0
<b>AMMONIA Total</b>	<b>0</b>	<b>100,260</b>	<b>1,514</b>	<b>0</b>	<b>101,774</b>	<b>333</b>	<b>11,930,857</b>
<b>ANILINE</b>							
BASF COLORS AND EFFECTS USA LLC	0	27	0	0	27	41392	1352
ORIENT CORP	0	80	0	0	80	1792	340000
<b>ANILINE Total</b>	<b>0</b>	<b>107</b>	<b>0</b>	<b>0</b>	<b>107</b>	<b>43,184</b>	<b>341,352</b>
<b>ANTHRACENE</b>							
DELAWARE CITY REFINERY	0	0	5	0	5	0	0
<b>ANTHRACENE Total</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>

APPENDIX F

# APPENDIX F

## 2017 ON-SITE RELEASES BY CHEMICAL AND FACILITY

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES			TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND			
<b>ANTIMONY COMPOUNDS</b>							
JOHNSON CONTROLS BATTERY PLANT	0	0	0	0	0	17133	0
JOHNSON CONTROLS DISTRIBUTION	0	0	0	0	0	9753	0
<b>ANTIMONY COMPOUNDS Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26,886</b>	<b>0</b>
<b>ARSENIC COMPOUNDS</b>							
JOHNSON CONTROLS DISTRIBUTION	0	0	0	0	0	600	0
<b>ARSENIC COMPOUNDS Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>600</b>	<b>0</b>
<b>ASBESTOS (FRIABLE)</b>							
DELAWARE CITY REFINERY	0	0	0	0	0	80505	0
<b>ASBESTOS (FRIABLE) Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>80,505</b>	<b>0</b>
<b>BARIUM COMPOUNDS</b>							
INDIAN RIVER GENERATING STATION	0	30	0	9278	9308	9	0
PRINCE MINERALS LLC	1	0	0	0	0	0	0
<b>BARIUM COMPOUNDS Total</b>	<b>1</b>	<b>30</b>	<b>0</b>	<b>9,278</b>	<b>9,308</b>	<b>9</b>	<b>0</b>
<b>BENZENE</b>							
DELAWARE CITY REFINERY	0	7072	10	0	7082	478	487057
<b>BENZENE Total</b>	<b>0</b>	<b>7,072</b>	<b>10</b>	<b>0</b>	<b>7,082</b>	<b>478</b>	<b>487,057</b>
<b>BENZO(G,H,I)PERYLENE</b>							
DELAWARE CITY REFINERY	0	1	5	0	5	0	453
<b>BENZO(G,H,I)PERYLENE Total</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>453</b>
<b>BIPHENYL</b>							
BASF COLORS AND EFFECTS USA LLC	0	100	0	0	100	98376	2599
<b>BIPHENYL Total</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>98,376</b>	<b>2,599</b>
<b>BORON TRIFLUORIDE</b>							
HONEYWELL	0	358	0	0	358	0	0
<b>BORON TRIFLUORIDE Total</b>	<b>0</b>	<b>358</b>	<b>0</b>	<b>0</b>	<b>358</b>	<b>0</b>	<b>0</b>
<b>CARBON DISULFIDE</b>							
DELAWARE CITY REFINERY	0	1223	0	0	1223	0	3517860
<b>CARBON DISULFIDE Total</b>	<b>0</b>	<b>1,223</b>	<b>0</b>	<b>0</b>	<b>1,223</b>	<b>0</b>	<b>3,517,860</b>
<b>CARBONYL SULFIDE</b>							
DELAWARE CITY REFINERY	0	482	0	0	482	0	12876055
<b>CARBONYL SULFIDE Total</b>	<b>0</b>	<b>482</b>	<b>0</b>	<b>0</b>	<b>482</b>	<b>0</b>	<b>12,876,055</b>

APPENDIX F

# APPENDIX F

## 2017 ON-SITE RELEASES BY CHEMICAL AND FACILITY

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES			TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND			
<b>CERTAIN GLYCOL ETHERS</b>							
CRODA	0	1	0	0	1	3782	0
PPG INDUSTRIES	0	2	0	0	2	1732	0
<b>CERTAIN GLYCOL ETHERS Total</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>5,514</b>	<b>0</b>
<b>CHLORINE</b>							
KUEHNE	0	17	0	0	17	0	0
SPI PHARMA	1	0	0	0	0	0	0
<b>CHLORINE Total</b>	<b>1</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>0</b>	<b>0</b>
<b>CHROMIUM</b>							
DUHADAWAY TOOL & DIE SHOP INC	0	0	0	0	0	11472	0
HANDYTUBE	0	0	0	0	0	35667	0
METAL MASTERS	0	1	0	0	1	203695	0
<b>CHROMIUM Total</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>250,834</b>	<b>0</b>
<b>CHROMIUM COMPOUNDS</b>							
BALTIMORE AIRCOIL COMPANY	0	5	0	0	5	171026	0
ORIENT CORP	0	0	0	0	0	0	0
<b>CHROMIUM COMPOUNDS Total</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>171,026</b>	<b>0</b>
<b>COBALT</b>							
DELAWARE CITY REFINERY	0	40	210	0	250	70	0
<b>COBALT Total</b>	<b>0</b>	<b>40</b>	<b>210</b>	<b>0</b>	<b>250</b>	<b>70</b>	<b>0</b>
<b>COBALT COMPOUNDS</b>							
BALTIMORE AIRCOIL COMPANY	0	0	0	0	0	21000	0
<b>COBALT COMPOUNDS Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21,000</b>	<b>0</b>
<b>COPPER</b>							
ALLEN HARIM FARMS SEAFORD MILL	1	0	0	0	0	0	0
ROGERS CORP	0	10	0	0	10	5023	0
<b>COPPER Total</b>	<b>1</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>5,023</b>	<b>0</b>
<b>COPPER COMPOUNDS</b>							
ALLEN HARIM FARMS SEAFORD MILL	1	0	0	0	0	0	0
AMICK FARMS	1	0	0	0	0	0	0
BALTIMORE AIRCOIL COMPANY	0	0	0	0	0	28565	0
MOUNTAIRE FARMS - FRANKFORD MILL	1	0	0	0	0	0	0
MOUNTAIRE FARMS OF DELAWARE	1	0	0	0	0	0	0
PERDUE BRIDGEVILLE	1	0	0	0	0	0	0
<b>COPPER COMPOUNDS Total</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>28,565</b>	<b>0</b>

APPENDIX F

# APPENDIX F

## 2017 ON-SITE RELEASES BY CHEMICAL AND FACILITY

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES			TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND			
<b>CREOSOTE</b>							
DELAWARE CITY REFINERY	0	23	0	128	151	2277	0
<b>CREOSOTE Total</b>	<b>0</b>	<b>23</b>	<b>0</b>	<b>128</b>	<b>151</b>	<b>2,277</b>	<b>0</b>
<b>CRESOL (MIXED ISOMERS)</b>							
DELAWARE CITY REFINERY	0	0	330	0	330	0	336901
<b>CRESOL (MIXED ISOMERS) Total</b>	<b>0</b>	<b>0</b>	<b>330</b>	<b>0</b>	<b>330</b>	<b>0</b>	<b>336,901</b>
<b>CUMENE</b>							
DELAWARE CITY REFINERY	0	350	5	0	355	0	3724
DOVER AFB	0	52	0	0	52	1	0
<b>CUMENE Total</b>	<b>0</b>	<b>402</b>	<b>5</b>	<b>0</b>	<b>407</b>	<b>1</b>	<b>3,724</b>
<b>CYANIDE COMPOUNDS</b>							
DELAWARE CITY REFINERY	0	0	145	0	145	0	14378
<b>CYANIDE COMPOUNDS Total</b>	<b>0</b>	<b>0</b>	<b>145</b>	<b>0</b>	<b>145</b>	<b>0</b>	<b>14,378</b>
<b>CYCLOHEXANE</b>							
AIR LIQUIDE ADVANCED SEPARATIONS	0	12403	0	0	12403	13985	0
BASF COLORS AND EFFECTS USA LLC	0	49	0	0	49	30434	0
DELAWARE CITY REFINERY	0	1868	5	0	1873	475	7045
<b>CYCLOHEXANE Total</b>	<b>0</b>	<b>14,320</b>	<b>5</b>	<b>0</b>	<b>14,325</b>	<b>44,894</b>	<b>7,045</b>
<b>DIETHANOLAMINE</b>							
CRODA	0	7	0	0	7	5532	0
<b>DIETHANOLAMINE Total</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>5,532</b>	<b>0</b>
<b>DIISOCYANATES</b>							
AEARO TECHNOLOGIES LLC	0	2	0	0	2	10048	0
ROHM & HAAS B2 B3 B8	0	0	0	0	0	8587	0
ROHM & HAAS B5 B6	0	2	0	0	2	3912	0
<b>DIISOCYANATES Total</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>22,547</b>	<b>0</b>
<b>DIOXIN AND DIOXIN-LIKE COMPOUNDS</b>							
DELAWARE CITY REFINERY	0.000000	0.001263	0.000000	0.000000	0.001263	0.000000	0.001263
EDGE MOOR/HAY ROAD ENERGY CENTERS	0.000000	0.005357	0.000000	0.000000	0.005357	0.000000	0.000000
FORMOSA PLASTICS	0.000000	0.000009	0.000000	0.000000	0.000009	0.000242	0.000000
<b>DIOXIN AND DIOXIN-LIKE COMPOUNDS Total</b>	<b>0.000000</b>	<b>0.006630</b>	<b>0.000000</b>	<b>0.000000</b>	<b>0.006630</b>	<b>0.000242</b>	<b>0.001263</b>
<b>DIPHENYLAMINE</b>							
ORIENT CORP	0	0	0	0	0	0	0
<b>DIPHENYLAMINE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

APPENDIX F

# APPENDIX F

## 2017 ON-SITE RELEASES BY CHEMICAL AND FACILITY

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES			TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND			
<b>ETHYLBENZENE</b>							
DELAWARE CITY REFINERY	0	1904	5	0	1909	589	50418
DOVER AFB	0	52	0	0	52	1	0
ROGERS CORP	0	500	0	0	500	850	19500
<b>ETHYLBENZENE Total</b>	<b>0</b>	<b>2,456</b>	<b>5</b>	<b>0</b>	<b>2,461</b>	<b>1,440</b>	<b>69,918</b>
<b>ETHYLENE</b>							
DELAWARE CITY REFINERY	0	2962	0	0	2962	0	0
<b>ETHYLENE Total</b>	<b>0</b>	<b>2,962</b>	<b>0</b>	<b>0</b>	<b>2,962</b>	<b>0</b>	<b>0</b>
<b>ETHYLENE GLYCOL</b>							
CRODA	0	6	0	0	6	13321	0
DELAWARE CITY REFINERY	0	0	183	0	183	300	18097
HONEYWELL	0	0	0	9900	9900	9900	0
PPG INDUSTRIES	0	0	0	0	0	3948	0
<b>ETHYLENE GLYCOL Total</b>	<b>0</b>	<b>7</b>	<b>183</b>	<b>9,900</b>	<b>10,090</b>	<b>27,469</b>	<b>18,097</b>
<b>ETHYLENE OXIDE</b>							
CRODA	0	2318	0	0	2318	0	415
<b>ETHYLENE OXIDE Total</b>	<b>0</b>	<b>2,318</b>	<b>0</b>	<b>0</b>	<b>2,318</b>	<b>0</b>	<b>415</b>
<b>HYDRAZINE</b>							
VEOLIA - RED LION PLANT	0	0	0	0	0	0	0
<b>HYDRAZINE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>HYDRAZINE SULFATE</b>							
VEOLIA - RED LION PLANT	0	0	0	0	0	0	0
<b>HYDRAZINE SULFATE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>HYDROCHLORIC ACID</b>							
DELAWARE CITY REFINERY	0	214	0	0	214	0	114926
INDIAN RIVER GENERATING STATION	0	1304	0	0	1304	0	1001839
<b>HYDROCHLORIC ACID Total</b>	<b>0</b>	<b>1,518</b>	<b>0</b>	<b>0</b>	<b>1,518</b>	<b>0</b>	<b>1,116,765</b>
<b>HYDROGEN CYANIDE</b>							
DELAWARE CITY REFINERY	0	22379	202	0	22581	0	432005
<b>HYDROGEN CYANIDE Total</b>	<b>0</b>	<b>22,379</b>	<b>202</b>	<b>0</b>	<b>22,581</b>	<b>0</b>	<b>432,005</b>
<b>HYDROGEN FLUORIDE</b>							
HONEYWELL	0	544	0	0	544	0	70
INDIAN RIVER GENERATING STATION	0	572	0	0	572	0	42428
<b>HYDROGEN FLUORIDE Total</b>	<b>0</b>	<b>1,116</b>	<b>0</b>	<b>0</b>	<b>1,116</b>	<b>0</b>	<b>42,498</b>

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## 2017 ON-SITE RELEASES BY CHEMICAL AND FACILITY

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES			TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND			
<b>HYDROGEN SULFIDE</b>							
DELAWARE CITY REFINERY	0	11845	1	0	11846	0	373728611
MOUNTAIRE FARMS OF DELAWARE	0	13031	0	0	13031	0	104099
PERDUE GEORGETOWN	0	4755	0	0	4755	0	116254
VEOLIA - RED LION PLANT	0	177	0	0	177	0	0
<b>HYDROGEN SULFIDE Total</b>	<b>0</b>	<b>29,807</b>	<b>1</b>	<b>0</b>	<b>29,808</b>	<b>0</b>	<b>373,948,964</b>
<b>LEAD</b>							
NATIONAL GUARD TRAINING SITE RANGE	0	0	0	3733	3733	0	0
V&S DELAWARE GALVANIZING	0	10	2	0	12	6523	7408
<b>LEAD Total</b>	<b>0</b>	<b>10</b>	<b>2</b>	<b>3,733</b>	<b>3,745</b>	<b>6,523</b>	<b>7,408</b>
<b>LEAD COMPOUNDS</b>							
DELAWARE CITY REFINERY	0	101	2	0	103	477	0
INDIAN RIVER GENERATING STATION	0	11	0	626	637	0	0
JOHNSON CONTROLS BATTERY PLANT	0	52	47	0	99	4420595	0
JOHNSON CONTROLS DISTRIBUTION	0	0	0	0	0	2507675	0
OWEN STEEL COMPANY	0	0	0	0	0	211	0
<b>LEAD COMPOUNDS Total</b>	<b>0</b>	<b>164</b>	<b>49</b>	<b>626</b>	<b>839</b>	<b>6,928,957</b>	<b>0</b>
<b>MANGANESE</b>							
ALLEN HARIM FARMS SEAFORD MILL	1	0	0	0	0	0	0
COLOR WORKS PAINTING	0	0	0	0	0	720	0
HANDYTUBE	0	0	0	0	0	3693	0
<b>MANGANESE Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4,413</b>	<b>0</b>
<b>MANGANESE COMPOUNDS</b>							
ALLEN HARIM FARMS SEAFORD MILL	1	0	0	0	0	0	0
AMICK FARMS	1	0	0	0	0	0	0
BALTIMORE AIRCOIL COMPANY	0	5	0	0	5	85090	0
MOUNTAIRE FARMS - FRANKFORD MILL	1	0	0	0	0	0	0
MOUNTAIRE FARMS OF DELAWARE	1	0	0	0	0	0	0
OWEN STEEL COMPANY	0	37	0	0	37	2440	0
PERDUE BRIDGEVILLE	1	0	0	0	0	0	0
PRINCE MINERALS LLC	0	6	0	0	6	0	0
<b>MANGANESE COMPOUNDS Total</b>	<b>5</b>	<b>48</b>	<b>0</b>	<b>0</b>	<b>48</b>	<b>87,530</b>	<b>0</b>

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## 2017 ON-SITE RELEASES BY CHEMICAL AND FACILITY

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES			TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND			
<b>MERCURY</b>							
DENTSPLY SIRONA MAIN PLANT	0.0000	0.6800	0.0000	0.0000	0.6800	193.5900	0.0000
EDGE MOOR/HAY ROAD ENERGY CENTERS	0.0000	13.2000	0.0010	0.0000	13.2010	0.0800	0.0000
<b>MERCURY Total</b>	<b>0.0000</b>	<b>13.8800</b>	<b>0.0010</b>	<b>0.0000</b>	<b>13.8810</b>	<b>193.6700</b>	<b>0.0000</b>
<b>MERCURY COMPOUNDS</b>							
DELAWARE CITY REFINERY	0.0000	92.0700	1.5000	0.0000	93.5700	4.9020	0.0000
INDIAN RIVER GENERATING STATION	0.0000	1.7000	0.0000	80.8000	82.5000	0.0000	0.0000
INTERVET	0.0000	0.0000	0.0000	0.0000	0.0000	8.1192	0.0000
<b>MERCURY COMPOUNDS Total</b>	<b>0.0000</b>	<b>93.7700</b>	<b>1.5000</b>	<b>80.8000</b>	<b>176.0700</b>	<b>13.0212</b>	<b>0.0000</b>
<b>METHANOL</b>							
AGILENT TECHNOLOGIES	0	1755	0	0	1755	52052	0
AIR LIQUIDE ADVANCED SEPARATIONS	0	7	0	0	7	56335	1827349
BASF COLORS AND EFFECTS USA LLC	0	23161	0	0	23161	818744	1319295
CRODA	0	578	0	0	578	10550	0
DELAWARE CITY REFINERY	0	2146	5	0	2151	0	7938
DENTSPLY SIRONA WEST PLANT	0	1978	0	0	1978	10124	0
DYK AUTOMOTIVE LLC	0	5355	0	0	5355	0	0
HONEYWELL	0	6	0	0	6	2360	0
NORAMCO INC	0	60	0	0	60	99549	0
<b>METHANOL Total</b>	<b>0</b>	<b>35,046</b>	<b>5</b>	<b>0</b>	<b>35,051</b>	<b>1,049,714</b>	<b>3,154,582</b>
<b>METHYL METHACRYLATE</b>							
DENTSPLY SIRONA WEST PLANT	0	3783	0	0	3783	90	0
<b>METHYL METHACRYLATE Total</b>	<b>0</b>	<b>3,783</b>	<b>0</b>	<b>0</b>	<b>3,783</b>	<b>90</b>	<b>0</b>
<b>MOLYBDENUM TRIOXIDE</b>							
DELAWARE CITY REFINERY	0	14	0	0	14	45	0
<b>MOLYBDENUM TRIOXIDE Total</b>	<b>0</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>45</b>	<b>0</b>
<b>N,N-DIMETHYLFORMAMIDE</b>							
AIR LIQUIDE ADVANCED SEPARATIONS	0	33	0	0	33	29560	0
ROHM & HAAS B2 B3 B8	0	4554	0	0	4554	1020728	4850816
<b>N,N-DIMETHYLFORMAMIDE Total</b>	<b>0</b>	<b>4,587</b>	<b>0</b>	<b>0</b>	<b>4,587</b>	<b>1,050,288</b>	<b>4,850,816</b>
<b>NAPHTHALENE</b>							
CRODA	0	2	0	0	2	420	0
DELAWARE CITY REFINERY	0	1977	5	0	1982	0	11861
DOVER AFB	0	52	0	0	52	1	0
GRIFFITH ENERGY - CARL KING	1	0	0	0	0	0	0
<b>NAPHTHALENE Total</b>	<b>1</b>	<b>2,031</b>	<b>5</b>	<b>0</b>	<b>2,036</b>	<b>421</b>	<b>11,861</b>

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# APPENDIX F

## 2017 ON-SITE RELEASES BY CHEMICAL AND FACILITY

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES			TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND			
<b>N-BUTYL ALCOHOL</b>							
CRODA	0	48	0	0	48	367	0
NORAMCO INC	0	25	0	0	25	367028	0
<b>N-BUTYL ALCOHOL Total</b>	<b>0</b>	<b>73</b>	<b>0</b>	<b>0</b>	<b>73</b>	<b>367,395</b>	<b>0</b>
<b>N-HEXANE</b>							
AIR LIQUIDE ADVANCED SEPARATIONS	0	10	0	0	10	0	1521163
DELAWARE CITY REFINERY	0	17688	5	0	17693	0	94589
<b>N-HEXANE Total</b>	<b>0</b>	<b>17,698</b>	<b>5</b>	<b>0</b>	<b>17,703</b>	<b>0</b>	<b>1,615,752</b>
<b>NICKEL</b>							
DUHADAWAY TOOL & DIE SHOP INC	0	0	0	0	0	9967	0
HANDYTUBE	0	0	0	0	0	32557	0
METAL MASTERS	0	1	0	0	1	69407	0
<b>NICKEL Total</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>111,931</b>	<b>0</b>
<b>NICKEL COMPOUNDS</b>							
BALTIMORE AIRCOIL COMPANY	0	5	0	0	5	196226	0
OWEN STEEL COMPANY	0	2	0	0	2	5340	0
PRINCE MINERALS LLC	0	5	0	0	5	0	0
<b>NICKEL COMPOUNDS Total</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>201,566</b>	<b>0</b>
<b>NITRATE COMPOUNDS</b>							
ALLEN HARIM FOODS HARBESON	0	0	74690	0	74690	0	0
BASF COLORS AND EFFECTS USA LLC	0	0	0	0	0	22656	0
DELAWARE CITY REFINERY	0	0	3472895	0	3472895	0	0
HANESBRANDS	0	0	0	0	0	40278	0
PERDUE GEORGETOWN	0	0	272306	0	272306	79	0
<b>NITRATE COMPOUNDS Total</b>	<b>0</b>	<b>0</b>	<b>3,819,891</b>	<b>0</b>	<b>3,819,891</b>	<b>63,013</b>	<b>0</b>
<b>NITRIC ACID</b>							
BASF COLORS AND EFFECTS USA LLC	0	0	0	0	0	0	23021
SPI PHARMA	1	0	0	0	0	0	0
<b>NITRIC ACID Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>23,021</b>
<b>NITROBENZENE</b>							
ORIENT CORP	0	2	0	0	2	0	0
<b>NITROBENZENE Total</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>

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## 2017 ON-SITE RELEASES BY CHEMICAL AND FACILITY

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES			TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND			
<b>N-METHYL-2-PYRROLIDONE</b>							
AIR LIQUIDE ADVANCED SEPARATIONS	0	811	0	0	811	61832	0
BASF COLORS AND EFFECTS USA LLC	0	0	0	0	0	53105	0
ROHM & HAAS B5 B6	0	2109	0	0	2109	63415	0
ROHM & HAAS B7 B15	0	707	0	0	707	11561	0
<b>N-METHYL-2-PYRROLIDONE Total</b>	<b>0</b>	<b>3,627</b>	<b>0</b>	<b>0</b>	<b>3,627</b>	<b>189,913</b>	<b>0</b>
<b>NONYLPHENOL</b>							
CRODA	0	507	0	0	507	1914	0
<b>NONYLPHENOL Total</b>	<b>0</b>	<b>507</b>	<b>0</b>	<b>0</b>	<b>507</b>	<b>1,914</b>	<b>0</b>
<b>P-CHLOROANILINE</b>							
BASF COLORS AND EFFECTS USA LLC	0	5	0	0	5	18028	474
<b>P-CHLOROANILINE Total</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>18,028</b>	<b>474</b>
<b>PERACETIC ACID</b>							
ALLEN HARIM FOODS HARBESON	1	0	0	0	0	0	0
MOUNTAIRE FARMS - SELBYVILLE PLANT	0	667	0	0	667	0	255288
MOUNTAIRE FARMS OF DELAWARE	0	485	0	0	485	0	403314
PERDUE MILFORD	0	0	0	0	0	17	33046
<b>PERACETIC ACID Total</b>	<b>1</b>	<b>1,152</b>	<b>0</b>	<b>0</b>	<b>1,152</b>	<b>17</b>	<b>691,648</b>
<b>PHENANTHRENE</b>							
DELAWARE CITY REFINERY	0	4	5	0	9	7	40
<b>PHENANTHRENE Total</b>	<b>0</b>	<b>4</b>	<b>5</b>	<b>0</b>	<b>9</b>	<b>7</b>	<b>40</b>
<b>PHENOL</b>							
DELAWARE CITY REFINERY	0	138	165	0	303	0	326299
<b>PHENOL Total</b>	<b>0</b>	<b>138</b>	<b>165</b>	<b>0</b>	<b>303</b>	<b>0</b>	<b>326,299</b>
<b>POLYCYCLIC AROMATIC COMPOUNDS</b>							
DELAWARE CITY REFINERY	0	235	4	0	239	0	372
EDGE MOOR/HAY ROAD ENERGY CENTERS	0	0	0	0	0	0	0
IKO	0	0	0	0	0	94	465
<b>POLYCYCLIC AROMATIC COMPOUNDS Total</b>	<b>0</b>	<b>235</b>	<b>4</b>	<b>0</b>	<b>239</b>	<b>94</b>	<b>837</b>
<b>PROPYLENE</b>							
DELAWARE CITY REFINERY	0	4980	0	0	4980	0	0
<b>PROPYLENE Total</b>	<b>0</b>	<b>4,980</b>	<b>0</b>	<b>0</b>	<b>4,980</b>	<b>0</b>	<b>0</b>
<b>PROPYLENE OXIDE</b>							
CRODA	0	234	0	0	234	0	765
<b>PROPYLENE OXIDE Total</b>	<b>0</b>	<b>234</b>	<b>0</b>	<b>0</b>	<b>234</b>	<b>0</b>	<b>765</b>

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## 2017 ON-SITE RELEASES BY CHEMICAL AND FACILITY

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES			TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND			
<b>STYRENE</b>							
DELAWARE CITY REFINERY	0	11	5	0	16	0	1160
JUSTIN TANKS	0	8618	0	330	8948	4430	18439
<b>STYRENE Total</b>	<b>0</b>	<b>8,629</b>	<b>5</b>	<b>330</b>	<b>8,964</b>	<b>4,430</b>	<b>19,599</b>
<b>SULFURIC ACID</b>							
DELAWARE CITY REFINERY	0	360895	0	0	360895	0	0
INDIAN RIVER GENERATING STATION	0	977	0	0	977	0	550595
VEOLIA - RED LION PLANT	0	7594	0	0	7594	0	0
<b>SULFURIC ACID Total</b>	<b>0</b>	<b>369,466</b>	<b>0</b>	<b>0</b>	<b>369,466</b>	<b>0</b>	<b>550,595</b>
<b>TETRACHLOROETHYLENE</b>							
DELAWARE CITY REFINERY	0	8	0	0	8	0	0
<b>TETRACHLOROETHYLENE Total</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>0</b>
<b>TOLUENE</b>							
AGILENT TECHNOLOGIES	0	41	0	0	41	151103	0
DELAWARE CITY REFINERY	0	12649	5	0	12654	2220	202762
DENTSPLY SIRONA WEST PLANT	0	2532	0	0	2532	3836	0
NORAMCO INC	0	101	0	0	101	638955	0
SERVICE ENERGY DOVER	1	0	0	0	0	0	0
VP RACING FUELS	1	0	0	0	0	0	0
<b>TOLUENE Total</b>	<b>2</b>	<b>15,323</b>	<b>5</b>	<b>0</b>	<b>15,328</b>	<b>796,114</b>	<b>202,762</b>
<b>TOLUENE DIISOCYANATE (MIXED ISOMERS)</b>							
AEARO TECHNOLOGIES LLC	0	4	0	0	4	1590	0
<b>TOLUENE DIISOCYANATE (MIXED ISOMERS) Total</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>1,590</b>	<b>0</b>
<b>TRICHLOROETHYLENE</b>							
HANDYTUBE	0	1275	0	0	1275	10323	0
<b>TRICHLOROETHYLENE Total</b>	<b>0</b>	<b>1,275</b>	<b>0</b>	<b>0</b>	<b>1,275</b>	<b>10,323</b>	<b>0</b>
<b>VINYL ACETATE</b>							
FORMOSA PLASTICS	0	34162	0	0	34162	0	0
<b>VINYL ACETATE Total</b>	<b>0</b>	<b>34,162</b>	<b>0</b>	<b>0</b>	<b>34,162</b>	<b>0</b>	<b>0</b>
<b>VINYL CHLORIDE</b>							
FORMOSA PLASTICS	0	45949	1	0	45950	220	204100
<b>VINYL CHLORIDE Total</b>	<b>0</b>	<b>45,949</b>	<b>1</b>	<b>0</b>	<b>45,950</b>	<b>220</b>	<b>204,100</b>

APPENDIX F

# APPENDIX F

## 2017 ON-SITE RELEASES BY CHEMICAL AND FACILITY

FACILITY/CHEMICAL	FORM A	ON-SITE RELEASES			TOTAL	OFF-SITE TRANSFERS	ON-SITE WASTE MANAGEMENT
		TO AIR	TO WATER	TO LAND			
<b>XYLENE (MIXED ISOMERS)</b>							
BASF COLORS AND EFFECTS USA LLC	0	1188	0	0	1188	994	0
DELAWARE CITY REFINERY	0	5426	5	0	5431	89	200096
DOVER AFB	0	52	0	0	52	1	0
GRIFFITH ENERGY - CARL KING	1	0	0	0	0	0	0
ROGERS CORP	0	1900	0	0	1900	4500	101000
<b>XYLENE (MIXED ISOMERS) Total</b>	<b>1</b>	<b>8,566</b>	<b>5</b>	<b>0</b>	<b>8,571</b>	<b>5,584</b>	<b>301,096</b>
<b>ZINC COMPOUNDS</b>							
ALLEN HARIM FARMS SEAFORD MILL	1	0	0	0	0	0	0
AMICK FARMS	1	0	0	0	0	0	0
MOUNTAIRE FARMS - FRANKFORD MILL	1	0	0	0	0	0	0
MOUNTAIRE FARMS OF DELAWARE	1	0	0	0	0	0	0
ORIENT CORP	0	0	0	0	0	0	0
PERDUE BRIDGEVILLE	1	0	0	0	0	0	0
PPG INDUSTRIES	0	34	0	0	34	3763	0
V&S DELAWARE GALVANIZING	0	578	197	0	775	239114	869115
<b>ZINC COMPOUNDS Total</b>	<b>5</b>	<b>612</b>	<b>197</b>	<b>0</b>	<b>809</b>	<b>242,877</b>	<b>869,115</b>
<b>Grand Total</b>	<b>28</b>	<b>746,669</b>	<b>3,823,135</b>	<b>24,076</b>	<b>4,593,879</b>	<b>12,003,373</b>	<b>418,271,988</b>

APPENDIX F

# APPENDIX G

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY CHEMICAL

CHEMICAL/FACILITY	OFF SITE TRANSFERS						ON SITE WASTE MANAGEMENT			
	POTW	RECYCLE	ENERGY RECOVERY	TREATMENT	DISPOSAL	TOTAL	RECYCLE	ENERGY RECOVERY	TREATMENT	TOTAL
<b>1,2,4-TRIMETHYLBENZENE</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	62,854	62,854
DOVER AFB	0	0	0	0	1	1	0	0	0	0
GAC SEAFORD	0	0	0	0	0	0	0	0	0	0
GRIFFITH ENERGY - CARL KING	0	0	0	0	0	0	0	0	0	0
SERVICE ENERGY DOVER	0	0	0	0	0	0	0	0	0	0
<b>1,2,4-TRIMETHYLBENZENE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>62,854</b>	<b>62,854</b>
<b>1,3-BUTADIENE</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	0	0
<b>1,3-BUTADIENE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>2,4-DIMETHYLPHENOL</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	231,421	231,421
<b>2,4-DIMETHYLPHENOL Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>231,421</b>	<b>231,421</b>
<b>4,4'-METHYLENEBIS(2-CHLOROANILINE)</b>										
ROHM & HAAS B5 B6	0	0	0	1,075	0	1,075	0	0	0	0
ROHM & HAAS B7 B15	0	0	0	601	0	601	0	0	0	0
<b>4,4'-METHYLENEBIS(2-CHLOROANILINE) Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,676</b>	<b>0</b>	<b>1,676</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>ACETONITRILE</b>										
AGILENT TECHNOLOGIES	0	0	21,929	0	0	21,929	0	0	0	0
<b>ACETONITRILE Total</b>	<b>0</b>	<b>0</b>	<b>21,929</b>	<b>0</b>	<b>0</b>	<b>21,929</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>AMMONIA</b>										
CALPINE CORP - GARRISON ENERGY CENTE	0	0	0	0	0	0	0	0	0	0
DELAWARE CITY REFINERY	0	1	0	2	255	257	0	11,814,350	66,773	11,881,123
EDGE MOOR/HAY ROAD ENERGY CENTERS	76	0	0	0	0	76	0	0	0	0
FORMOSA PLASTICS	0	0	0	0	0	0	0	0	0	0
HANOVER FOODS	0	0	0	0	0	0	0	0	0	0
INDIAN RIVER GENERATING STATION	0	0	0	0	0	0	0	0	49,734	49,734
PICTSWEET BRIDGEVILLE	0	0	0	0	0	0	0	0	0	0
<b>AMMONIA Total</b>	<b>76</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>255</b>	<b>333</b>	<b>0</b>	<b>11,814,350</b>	<b>116,507</b>	<b>11,930,857</b>
<b>ANILINE</b>										
BASF COLORS AND EFFECTS USA LLC	14,050	0	26,920	422	0	41,392	0	0	1,352	1,352
ORIENT CORP	1,700	0	0	0	92	1,792	220,000	0	120,000	340,000
<b>ANILINE Total</b>	<b>15,750</b>	<b>0</b>	<b>26,920</b>	<b>422</b>	<b>92</b>	<b>43,184</b>	<b>220,000</b>	<b>0</b>	<b>121,352</b>	<b>341,352</b>
<b>ANTHRACENE</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	0	0
<b>ANTHRACENE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

APPENDIX G

# APPENDIX G

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY CHEMICAL

CHEMICAL/FACILITY	OFF SITE TRANSFERS					ON SITE WASTE MANAGEMENT				
	POTW	RECYCLE	ENERGY RECOVERY	TREATMENT	DISPOSAL	TOTAL	RECYCLE	ENERGY RECOVERY	TREATMENT	TOTAL
<b>ANTIMONY COMPOUNDS</b>										
JOHNSON CONTROLS BATTERY PLANT	0	17,128	0	0	6	17,133	0	0	0	0
JOHNSON CONTROLS DISTRIBUTION	0	9,753	0	0	0	9,753	0	0	0	0
<b>ANTIMONY COMPOUNDS Total</b>	<b>0</b>	<b>26,881</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>26,886</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>ARSENIC COMPOUNDS</b>										
JOHNSON CONTROLS DISTRIBUTION	0	600	0	0	0	600	0	0	0	0
<b>ARSENIC COMPOUNDS Total</b>	<b>0</b>	<b>600</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>600</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>ASBESTOS (FRIABLE)</b>										
DELAWARE CITY REFINERY	0	0	0	0	80,505	80,505	0	0	0	0
<b>ASBESTOS (FRIABLE) Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>80,505</b>	<b>80,505</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>BARIUM COMPOUNDS</b>										
INDIAN RIVER GENERATING STATION	0	0	0	0	9	9	0	0	0	0
PRINCE MINERALS LLC	0	0	0	0	0	0	0	0	0	0
<b>BARIUM COMPOUNDS Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>BENZENE</b>										
DELAWARE CITY REFINERY	0	9	463	0	6	478	0	398,183	88,874	487,057
<b>BENZENE Total</b>	<b>0</b>	<b>9</b>	<b>463</b>	<b>0</b>	<b>6</b>	<b>478</b>	<b>0</b>	<b>398,183</b>	<b>88,874</b>	<b>487,057</b>
<b>BENZO(G,H,I)PERYLENE</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	453	453
<b>BENZO(G,H,I)PERYLENE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>453</b>	<b>453</b>
<b>BIPHENYL</b>										
BASF COLORS AND EFFECTS USA LLC	16,452	0	79,858	2,066	0	98,376	0	0	2,599	2,599
<b>BIPHENYL Total</b>	<b>16,452</b>	<b>0</b>	<b>79,858</b>	<b>2,066</b>	<b>0</b>	<b>98,376</b>	<b>0</b>	<b>0</b>	<b>2,599</b>	<b>2,599</b>
<b>BORON TRIFLUORIDE</b>										
HONEYWELL	0	0	0	0	0	0	0	0	0	0
<b>BORON TRIFLUORIDE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>CARBON DISULFIDE</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	120,801	3,397,059	3,517,860
<b>CARBON DISULFIDE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>120,801</b>	<b>3,397,059</b>	<b>3,517,860</b>
<b>CARBONYL SULFIDE</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	65,662	12,810,393	12,876,055
<b>CARBONYL SULFIDE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>65,662</b>	<b>12,810,393</b>	<b>12,876,055</b>

APPENDIX G

# APPENDIX G

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY CHEMICAL

CHEMICAL/FACILITY	OFF SITE TRANSFERS					ON SITE WASTE MANAGEMENT				
	POTW	RECYCLE	ENERGY RECOVERY	TREATMENT	DISPOSAL	TOTAL	RECYCLE	ENERGY RECOVERY	TREATMENT	TOTAL
<b>CERTAIN GLYCOL ETHERS</b>										
CRODA	3,782	0	0	0	0	3,782	0	0	0	0
PPG INDUSTRIES	565	0	0	504	663	1,732	0	0	0	0
<b>CERTAIN GLYCOL ETHERS Total</b>	<b>4,347</b>	<b>0</b>	<b>0</b>	<b>504</b>	<b>663</b>	<b>5,514</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>CHLORINE</b>										
KUEHNE	0	0	0	0	0	0	0	0	0	0
SPI PHARMA	0	0	0	0	0	0	0	0	0	0
<b>CHLORINE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>CHROMIUM</b>										
DUHADAWAY TOOL & DIE SHOP INC	0	11,358	0	0	114	11,472	0	0	0	0
HANDYTUBE	0	35,614	0	0	53	35,667	0	0	0	0
METAL MASTERS	0	202,731	0	0	964	203,695	0	0	0	0
<b>CHROMIUM Total</b>	<b>0</b>	<b>249,703</b>	<b>0</b>	<b>0</b>	<b>1,131</b>	<b>250,834</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>CHROMIUM COMPOUNDS</b>										
BALTIMORE AIRCOIL COMPANY	0	171,026	0	0	0	171,026	0	0	0	0
ORIENT CORP	0	0	0	0	0	0	0	0	0	0
<b>CHROMIUM COMPOUNDS Total</b>	<b>0</b>	<b>171,026</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>171,026</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>COBALT</b>										
DELAWARE CITY REFINERY	0	66	0	0	4	70	0	0	0	0
<b>COBALT Total</b>	<b>0</b>	<b>66</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>70</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>COBALT COMPOUNDS</b>										
BALTIMORE AIRCOIL COMPANY	0	21,000	0	0	0	21,000	0	0	0	0
<b>COBALT COMPOUNDS Total</b>	<b>0</b>	<b>21,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>COPPER</b>										
ALLEN HARIM FARMS SEAFORD MILL	0	0	0	0	0	0	0	0	0	0
ROGERS CORP	18	5,000	0	0	5	5,023	0	0	0	0
<b>COPPER Total</b>	<b>18</b>	<b>5,000</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>5,023</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>COPPER COMPOUNDS</b>										
ALLEN HARIM FARMS SEAFORD MILL	0	0	0	0	0	0	0	0	0	0
AMICK FARMS	0	0	0	0	0	0	0	0	0	0
BALTIMORE AIRCOIL COMPANY	0	28,565	0	0	0	28,565	0	0	0	0
MOUNTAIRE FARMS - FRANKFORD MILL	0	0	0	0	0	0	0	0	0	0
MOUNTAIRE FARMS OF DELAWARE	0	0	0	0	0	0	0	0	0	0
PERDUE BRIDGEVILLE	0	0	0	0	0	0	0	0	0	0
<b>COPPER COMPOUNDS Total</b>	<b>0</b>	<b>28,565</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>28,565</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

APPENDIX G

# APPENDIX G

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY CHEMICAL

CHEMICAL/FACILITY	OFF SITE TRANSFERS						ON SITE WASTE MANAGEMENT			
	POTW	RECYCLE	ENERGY RECOVERY	TREATMENT	DISPOSAL	TOTAL	RECYCLE	ENERGY RECOVERY	TREATMENT	TOTAL
<b>CREOSOTE</b>										
DELAWARE CITY REFINERY	0	0	0	0	2,277	2,277	0	0	0	0
<b>CREOSOTE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,277</b>	<b>2,277</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>CRESOL (MIXED ISOMERS)</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	21,418	315,483	336,901
<b>CRESOL (MIXED ISOMERS) Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21,418</b>	<b>315,483</b>	<b>336,901</b>
<b>CUMENE</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	3,724	3,724
DOVER AFB	0	0	0	0	1	1	0	0	0	0
<b>CUMENE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>3,724</b>	<b>3,724</b>
<b>CYANIDE COMPOUNDS</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	14,378	14,378
<b>CYANIDE COMPOUNDS Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14,378</b>	<b>14,378</b>
<b>CYCLOHEXANE</b>										
AIR LIQUIDE ADVANCED SEPARATIONS	0	0	13,985	0	0	13,985	0	0	0	0
BASF COLORS AND EFFECTS USA LLC	0	30,434	0	0	0	30,434	0	0	0	0
DELAWARE CITY REFINERY	0	7	463	0	5	475	0	0	7,045	7,045
<b>CYCLOHEXANE Total</b>	<b>0</b>	<b>30,441</b>	<b>14,448</b>	<b>0</b>	<b>5</b>	<b>44,894</b>	<b>0</b>	<b>0</b>	<b>7,045</b>	<b>7,045</b>
<b>DIETHANOLAMINE</b>										
CRODA	2,239	0	0	3,293	0	5,532	0	0	0	0
<b>DIETHANOLAMINE Total</b>	<b>2,239</b>	<b>0</b>	<b>0</b>	<b>3,293</b>	<b>0</b>	<b>5,532</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>DIISOCYANATES</b>										
AEARO TECHNOLOGIES LLC	0	0	0	10,048	0	10,048	0	0	0	0
ROHM & HAAS B2 B3 B8	0	0	0	8,587	0	8,587	0	0	0	0
ROHM & HAAS B5 B6	0	0	0	1,309	2,603	3,912	0	0	0	0
<b>DIISOCYANATES Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19,944</b>	<b>2,603</b>	<b>22,547</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>DIOXIN AND DIOXIN-LIKE COMPOUNDS</b>										
DELAWARE CITY REFINERY	0	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.001263	0.001263
EDGE MOOR/HAY ROAD ENERGY CENTERS	0	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
FORMOSA PLASTICS	0	0.000027	0.000000	0.000000	0.000216	0.000242	0.000000	0.000000	0.000000	0.000000
<b>DIOXIN AND DIOXIN-LIKE COMPOUNDS Total</b>	<b>0</b>	<b>0.000027</b>	<b>0.000000</b>	<b>0.000000</b>	<b>0.000216</b>	<b>0.000242</b>	<b>0.000000</b>	<b>0.000000</b>	<b>0.001263</b>	<b>0.001263</b>
<b>DIPHENYLAMINE</b>										
ORIENT CORP	0	0	0	0	0	0	0	0	0	0
<b>DIPHENYLAMINE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

APPENDIX G

# APPENDIX G

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY CHEMICAL

CHEMICAL/FACILITY	OFF SITE TRANSFERS						ON SITE WASTE MANAGEMENT			
	POTW	RECYCLE	ENERGY RECOVERY	TREATMENT	DISPOSAL	TOTAL	RECYCLE	ENERGY RECOVERY	TREATMENT	TOTAL
<b>ETHYLBENZENE</b>										
DELAWARE CITY REFINERY	0	8	573	0	8	589	0	0	50,418	50,418
DOVER AFB	0	0	0	0	1	1	0	0	0	0
ROGERS CORP	0	0	0	850	0	850	0	0	19,500	19,500
<b>ETHYLBENZENE Total</b>	<b>0</b>	<b>8</b>	<b>573</b>	<b>850</b>	<b>9</b>	<b>1,440</b>	<b>0</b>	<b>0</b>	<b>69,918</b>	<b>69,918</b>
<b>ETHYLENE</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	0	0
<b>ETHYLENE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>ETHYLENE GLYCOL</b>										
CRODA	13,321	0	0	0	0	13,321	0	0	0	0
DELAWARE CITY REFINERY	0	0	0	0	300	300	0	0	18,097	18,097
HONEYWELL	0	0	9,900	0	0	9,900	0	0	0	0
PPG INDUSTRIES	1,789	0	0	67	2,092	3,948	0	0	0	0
<b>ETHYLENE GLYCOL Total</b>	<b>15,110</b>	<b>0</b>	<b>9,900</b>	<b>67</b>	<b>2,392</b>	<b>27,469</b>	<b>0</b>	<b>0</b>	<b>18,097</b>	<b>18,097</b>
<b>ETHYLENE OXIDE</b>										
CRODA	0	0	0	0	0	0	0	0	415	415
<b>ETHYLENE OXIDE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>415</b>	<b>415</b>
<b>HYDRAZINE</b>										
VEOLIA - RED LION PLANT	0	0	0	0	0	0	0	0	0	0
<b>HYDRAZINE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>HYDRAZINE SULFATE</b>										
VEOLIA - RED LION PLANT	0	0	0	0	0	0	0	0	0	0
<b>HYDRAZINE SULFATE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>HYDROCHLORIC ACID</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	114,926	114,926
INDIAN RIVER GENERATING STATION	0	0	0	0	0	0	0	0	1,001,839	1,001,839
<b>HYDROCHLORIC ACID Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,116,765</b>	<b>1,116,765</b>
<b>HYDROGEN CYANIDE</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	432,005	432,005
<b>HYDROGEN CYANIDE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>432,005</b>	<b>432,005</b>
<b>HYDROGEN FLUORIDE</b>										
HONEYWELL	0	0	0	0	0	0	0	0	70	70
INDIAN RIVER GENERATING STATION	0	0	0	0	0	0	0	0	42,428	42,428
<b>HYDROGEN FLUORIDE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>42,498</b>	<b>42,498</b>

APPENDIX G

# APPENDIX G

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY CHEMICAL

CHEMICAL/FACILITY	OFF SITE TRANSFERS					ON SITE WASTE MANAGEMENT				
	POTW	RECYCLE	ENERGY RECOVERY	TREATMENT	DISPOSAL	TOTAL	RECYCLE	ENERGY RECOVERY	TREATMENT	TOTAL
<b>HYDROGEN SULFIDE</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	373,728,611	373,728,611
MOUNTAIRE FARMS OF DELAWARE	0	0	0	0	0	0	0	0	104,099	104,099
PERDUE GEORGETOWN	0	0	0	0	0	0	0	0	116,254	116,254
VEOLIA - RED LION PLANT	0	0	0	0	0	0	0	0	0	0
<b>HYDROGEN SULFIDE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>373,948,964</b>	<b>373,948,964</b>
<b>LEAD</b>										
NATIONAL GUARD TRAINING SITE RANGE	0	0	0	0	0	0	0	0	0	0
V&S DELAWARE GALVANIZING	0	6,255	0	0	268	6,523	7,408	0	0	7,408
<b>LEAD Total</b>	<b>0</b>	<b>6,255</b>	<b>0</b>	<b>0</b>	<b>268</b>	<b>6,523</b>	<b>7,408</b>	<b>0</b>	<b>0</b>	<b>7,408</b>
<b>LEAD COMPOUNDS</b>										
DELAWARE CITY REFINERY	0	437	0	0	40	477	0	0	0	0
INDIAN RIVER GENERATING STATION	0	0	0	0	0	0	0	0	0	0
JOHNSON CONTROLS BATTERY PLANT	0	4,418,568	0	0	2,027	4,420,595	0	0	0	0
JOHNSON CONTROLS DISTRIBUTION	1	2,507,034	0	0	640	2,507,675	0	0	0	0
OWEN STEEL COMPANY	0	211	0	0	0	211	0	0	0	0
<b>LEAD COMPOUNDS Total</b>	<b>1</b>	<b>6,926,250</b>	<b>0</b>	<b>0</b>	<b>2,706</b>	<b>6,928,957</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>MANGANESE</b>										
ALLEN HARIM FARMS SEAFORD MILL	0	0	0	0	0	0	0	0	0	0
COLOR WORKS PAINTING	0	720	0	0	0	720	0	0	0	0
HANDYTUBE	0	3,688	0	0	5	3,693	0	0	0	0
<b>MANGANESE Total</b>	<b>0</b>	<b>4,408</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>4,413</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>MANGANESE COMPOUNDS</b>										
ALLEN HARIM FARMS SEAFORD MILL	0	0	0	0	0	0	0	0	0	0
AMICK FARMS	0	0	0	0	0	0	0	0	0	0
BALTIMORE AIRCOIL COMPANY	0	85,090	0	0	0	85,090	0	0	0	0
MOUNTAIRE FARMS - FRANKFORD MILL	0	0	0	0	0	0	0	0	0	0
MOUNTAIRE FARMS OF DELAWARE	0	0	0	0	0	0	0	0	0	0
OWEN STEEL COMPANY	0	2,440	0	0	0	2,440	0	0	0	0
PERDUE BRIDGEVILLE	0	0	0	0	0	0	0	0	0	0
PRINCE MINERALS LLC	0	0	0	0	0	0	0	0	0	0
<b>MANGANESE COMPOUNDS Total</b>	<b>0</b>	<b>87,530</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>87,530</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

APPENDIX G

# APPENDIX G

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY CHEMICAL

CHEMICAL/FACILITY	OFF SITE TRANSFERS					ON SITE WASTE MANAGEMENT				
	POTW	RECYCLE	ENERGY RECOVERY	TREATMENT	DISPOSAL	TOTAL	RECYCLE	ENERGY RECOVERY	TREATMENT	TOTAL
<b>MERCURY</b>										
DENTSPLY SIRONA MAIN PLANT	0	193.5900	0.0000	0.0000	0.0000	193.5900	0.0000	0.0000	0.0000	0.0000
EDGE MOOR/HAY ROAD ENERGY CENTERS	0	0.0000	0.0000	0.0000	0.0000	0.0800	0.0000	0.0000	0.0000	0.0000
<b>MERCURY Total</b>	<b>0</b>	<b>193.5900</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>193.6700</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>
<b>MERCURY COMPOUNDS</b>										
DELAWARE CITY REFINERY	0	4.8750	0.0000	0.0000	0.0270	4.9020	0.0000	0.0000	0.0000	0.0000
INDIAN RIVER GENERATING STATION	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
INTERVET	0	8.0000	0.0000	0.0000	0.1192	8.1192	0.0000	0.0000	0.0000	0.0000
<b>MERCURY COMPOUNDS Total</b>	<b>0</b>	<b>12.8750</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.1462</b>	<b>13.0212</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>
<b>METHANOL</b>										
AGILENT TECHNOLOGIES	0	0	51,910	142	0	52,052	0	0	0	0
AIR LIQUIDE ADVANCED SEPARATIONS	0	0	0	56,335	0	56,335	1,827,349	0	0	1,827,349
BASF COLORS AND EFFECTS USA LLC	607,129	200,239	4,588	6,788	0	818,744	398,160	0	921,135	1,319,295
CRODA	5,539	0	0	5,011	0	10,550	0	0	0	0
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	7,938	7,938
DENTSPLY SIRONA WEST PLANT	81	0	10,043	0	0	10,124	0	0	0	0
DYK AUTOMOTIVE LLC	0	0	0	0	0	0	0	0	0	0
HONEYWELL	80	0	2,280	0	0	2,360	0	0	0	0
NORAMCO INC	4,977	0	94,572	0	0	99,549	0	0	0	0
<b>METHANOL Total</b>	<b>617,806</b>	<b>200,239</b>	<b>163,393</b>	<b>68,276</b>	<b>0</b>	<b>1,049,714</b>	<b>2,225,509</b>	<b>0</b>	<b>929,073</b>	<b>3,154,582</b>
<b>METHYL METHACRYLATE</b>										
DENTSPLY SIRONA WEST PLANT	90	0	0	0	0	90	0	0	0	0
<b>METHYL METHACRYLATE Total</b>	<b>90</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>90</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>MOLYBDENUM TRIOXIDE</b>										
DELAWARE CITY REFINERY	0	43	0	0	2	45	0	0	0	0
<b>MOLYBDENUM TRIOXIDE Total</b>	<b>0</b>	<b>43</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>45</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>N,N-DIMETHYLFORMAMIDE</b>										
AIR LIQUIDE ADVANCED SEPARATIONS	20,700	0	8,860	0	0	29,560	0	0	0	0
ROHM & HAAS B2 B3 B8	104,538	490,050	191,880	0	234,260	1,020,728	4,850,413	0	403	4,850,816
<b>N,N-DIMETHYLFORMAMIDE Total</b>	<b>125,238</b>	<b>490,050</b>	<b>200,740</b>	<b>0</b>	<b>234,260</b>	<b>1,050,288</b>	<b>4,850,413</b>	<b>0</b>	<b>403</b>	<b>4,850,816</b>
<b>NAPHTHALENE</b>										
CRODA	0	0	0	420	0	420	0	0	0	0
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	11,861	11,861
DOVER AFB	0	0	0	0	1	1	0	0	0	0
GRIFFITH ENERGY - CARL KING	0	0	0	0	0	0	0	0	0	0
<b>NAPHTHALENE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>420</b>	<b>1</b>	<b>421</b>	<b>0</b>	<b>0</b>	<b>11,861</b>	<b>11,861</b>

APPENDIX G

# APPENDIX G

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY CHEMICAL

CHEMICAL/FACILITY	OFF SITE TRANSFERS					ON SITE WASTE MANAGEMENT				
	POTW	RECYCLE	ENERGY RECOVERY	TREATMENT	DISPOSAL	TOTAL	RECYCLE	ENERGY RECOVERY	TREATMENT	TOTAL
<b>N-BUTYL ALCOHOL</b>										
CRODA	367	0	0	0	0	367	0	0	0	0
NORAMCO INC	18,351	0	348,677	0	0	367,028	0	0	0	0
<b>N-BUTYL ALCOHOL Total</b>	<b>18,718</b>	<b>0</b>	<b>348,677</b>	<b>0</b>	<b>0</b>	<b>367,395</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>N-HEXANE</b>										
AIR LIQUIDE ADVANCED SEPARATIONS	0	0	0	0	0	0	1,521,163	0	0	1,521,163
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	94,589	94,589
<b>N-HEXANE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,521,163</b>	<b>0</b>	<b>94,589</b>	<b>1,615,752</b>
<b>NICKEL</b>										
DUHADAWAY TOOL & DIE SHOP INC	0	9,868	0	0	99	9,967	0	0	0	0
HANDYTUBE	0	32,479	0	0	78	32,557	0	0	0	0
METAL MASTERS	0	69,111	0	0	296	69,407	0	0	0	0
<b>NICKEL Total</b>	<b>0</b>	<b>111,458</b>	<b>0</b>	<b>0</b>	<b>473</b>	<b>111,931</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>NICKEL COMPOUNDS</b>										
BALTIMORE AIRCOIL COMPANY	0	196,226	0	0	0	196,226	0	0	0	0
OWEN STEEL COMPANY	0	5,340	0	0	0	5,340	0	0	0	0
PRINCE MINERALS LLC	0	0	0	0	0	0	0	0	0	0
<b>NICKEL COMPOUNDS Total</b>	<b>0</b>	<b>201,566</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>201,566</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>NITRATE COMPOUNDS</b>										
ALLEN HARIM FOODS HARBESON	0	0	0	0	0	0	0	0	0	0
BASF COLORS AND EFFECTS USA LLC	22,656	0	0	0	0	22,656	0	0	0	0
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	0	0
HANESBRANDS	40,278	0	0	0	0	40,278	0	0	0	0
PERDUE GEORGETOWN	0	0	0	0	79	79	0	0	0	0
<b>NITRATE COMPOUNDS Total</b>	<b>62,934</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>79</b>	<b>63,013</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>NITRIC ACID</b>										
BASF COLORS AND EFFECTS USA LLC	0	0	0	0	0	0	0	0	23,021	23,021
SPI PHARMA	0	0	0	0	0	0	0	0	0	0
<b>NITRIC ACID Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>23,021</b>	<b>23,021</b>
<b>NITROBENZENE</b>										
ORIENT CORP	0	0	0	0	0	0	0	0	0	0
<b>NITROBENZENE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

APPENDIX G

# APPENDIX G

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY CHEMICAL

CHEMICAL/FACILITY	OFF SITE TRANSFERS						ON SITE WASTE MANAGEMENT			
	POTW	RECYCLE	ENERGY RECOVERY	TREATMENT	DISPOSAL	TOTAL	RECYCLE	ENERGY RECOVERY	TREATMENT	TOTAL
<b>N-METHYL-2-PYRROLIDONE</b>										
AIR LIQUIDE ADVANCED SEPARATIONS	54,342	0	7,490	0	0	61,832	0	0	0	0
BASF COLORS AND EFFECTS USA LLC	11,260	41,845	0	0	0	53,105	0	0	0	0
ROHM & HAAS B5 B6	0	58,948	0	2,084	2,383	63,415	0	0	0	0
ROHM & HAAS B7 B15	0	9,928	0	695	938	11,561	0	0	0	0
<b>N-METHYL-2-PYRROLIDONE Total</b>	<b>65,602</b>	<b>110,721</b>	<b>7,490</b>	<b>2,779</b>	<b>3,321</b>	<b>189,913</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>NONYLPHENOL</b>										
CRODA	1,914	0	0	0	0	1,914	0	0	0	0
<b>NONYLPHENOL Total</b>	<b>1,914</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,914</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>P-CHLOROANILINE</b>										
BASF COLORS AND EFFECTS USA LLC	2,840	0	14,839	349	0	18,028	0	0	474	474
<b>P-CHLOROANILINE Total</b>	<b>2,840</b>	<b>0</b>	<b>14,839</b>	<b>349</b>	<b>0</b>	<b>18,028</b>	<b>0</b>	<b>0</b>	<b>474</b>	<b>474</b>
<b>PERACETIC ACID</b>										
ALLEN HARIM FOODS HARBESON	0	0	0	0	0	0	0	0	0	0
MOUNTAIRE FARMS - SELBYVILLE PLANT	0	0	0	0	0	0	0	0	255,288	255,288
MOUNTAIRE FARMS OF DELAWARE	0	0	0	0	0	0	0	0	403,314	403,314
PERDUE MILFORD	17	0	0	0	0	17	0	0	33,046	33,046
<b>PERACETIC ACID Total</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>691,648</b>	<b>691,648</b>
<b>PHENANTHRENE</b>										
DELAWARE CITY REFINERY	0	0	0	7	0	7	0	0	40	40
<b>PHENANTHRENE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>40</b>	<b>40</b>
<b>PHENOL</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	54,615	271,684	326,299
<b>PHENOL Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>54,615</b>	<b>271,684</b>	<b>326,299</b>
<b>POLYCYCLIC AROMATIC COMPOUNDS</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	372	372
EDGE MOOR/HAY ROAD ENERGY CENTERS	0	0	0	0	0	0	0	0	0	0
IKO	0	91	0	0	3	94	465	0	0	465
<b>POLYCYCLIC AROMATIC COMPOUNDS Total</b>	<b>0</b>	<b>91</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>94</b>	<b>465</b>	<b>0</b>	<b>372</b>	<b>837</b>
<b>PROPYLENE</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	0	0
<b>PROPYLENE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>PROPYLENE OXIDE</b>										
CRODA	0	0	0	0	0	0	0	0	765	765
<b>PROPYLENE OXIDE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>765</b>	<b>765</b>

APPENDIX G

# APPENDIX G

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY CHEMICAL

CHEMICAL/FACILITY	OFF SITE TRANSFERS					ON SITE WASTE MANAGEMENT				
	POTW	RECYCLE	ENERGY RECOVERY	TREATMENT	DISPOSAL	TOTAL	RECYCLE	ENERGY RECOVERY	TREATMENT	TOTAL
<b>STYRENE</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	1,160	1,160
JUSTIN TANKS	0	4,430	0	0	0	4,430	18,439	0	0	18,439
<b>STYRENE Total</b>	<b>0</b>	<b>4,430</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4,430</b>	<b>18,439</b>	<b>0</b>	<b>1,160</b>	<b>19,599</b>
<b>SULFURIC ACID</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	0	0
INDIAN RIVER GENERATING STATION	0	0	0	0	0	0	0	0	550,595	550,595
VEOLIA - RED LION PLANT	0	0	0	0	0	0	0	0	0	0
<b>SULFURIC ACID Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>550,595</b>	<b>550,595</b>
<b>TETRACHLOROETHYLENE</b>										
DELAWARE CITY REFINERY	0	0	0	0	0	0	0	0	0	0
<b>TETRACHLOROETHYLENE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>TOLUENE</b>										
AGILENT TECHNOLOGIES	0	0	151,025	78	0	151,103	0	0	0	0
DELAWARE CITY REFINERY	0	9	2,203	0	8	2,220	0	0	202,762	202,762
DENTSPLY SIRONA WEST PLANT	0	0	3,836	0	0	3,836	0	0	0	0
NORAMCO INC	6,390	0	632,565	0	0	638,955	0	0	0	0
SERVICE ENERGY DOVER	0	0	0	0	0	0	0	0	0	0
VP RACING FUELS	0	0	0	0	0	0	0	0	0	0
<b>TOLUENE Total</b>	<b>6,390</b>	<b>9</b>	<b>789,629</b>	<b>78</b>	<b>8</b>	<b>796,114</b>	<b>0</b>	<b>0</b>	<b>202,762</b>	<b>202,762</b>
<b>TOLUENE DIISOCYANATE (MIXED ISOMERS)</b>										
AEARO TECHNOLOGIES LLC	0	0	0	1,590	0	1,590	0	0	0	0
<b>TOLUENE DIISOCYANATE (MIXED ISOMERS) Tot</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,590</b>	<b>0</b>	<b>1,590</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>TRICHLOROETHYLENE</b>										
HANDYTUBE	0	0	0	10,323	0	10,323	0	0	0	0
<b>TRICHLOROETHYLENE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10,323</b>	<b>0</b>	<b>10,323</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>VINYL ACETATE</b>										
FORMOSA PLASTICS	0	0	0	0	0	0	0	0	0	0
<b>VINYL ACETATE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>VINYL CHLORIDE</b>										
FORMOSA PLASTICS	0	0	0	0	220	220	0	0	204,100	204,100
<b>VINYL CHLORIDE Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>220</b>	<b>220</b>	<b>0</b>	<b>0</b>	<b>204,100</b>	<b>204,100</b>

APPENDIX G

# APPENDIX G

## 2017 OFF-SITE TRANSFERS AND WASTE MANAGED ON-SITE BY CHEMICAL

CHEMICAL/FACILITY	OFF SITE TRANSFERS						ON SITE WASTE MANAGEMENT			
	POTW	RECYCLE	ENERGY RECOVERY	TREATMENT	DISPOSAL	TOTAL	RECYCLE	ENERGY RECOVERY	TREATMENT	TOTAL
<b>XYLENE (MIXED ISOMERS)</b>										
BASF COLORS AND EFFECTS USA LLC	306	0	688	0	0	994	0	0	0	0
DELAWARE CITY REFINERY	0	28	0	6	55	89	0	0	200,096	200,096
DOVER AFB	0	0	0	0	1	1	0	0	0	0
GRIFFITH ENERGY - CARL KING	0	0	0	0	0	0	0	0	0	0
ROGERS CORP	0	0	0	4,500	0	4,500	0	0	101,000	101,000
<b>XYLENE (MIXED ISOMERS) Total</b>	<b>306</b>	<b>28</b>	<b>688</b>	<b>4,506</b>	<b>56</b>	<b>5,584</b>	<b>0</b>	<b>0</b>	<b>301,096</b>	<b>301,096</b>
<b>ZINC COMPOUNDS</b>										
ALLEN HARIM FARMS SEAFORD MILL	0	0	0	0	0	0	0	0	0	0
AMICK FARMS	0	0	0	0	0	0	0	0	0	0
MOUNTAIRE FARMS - FRANKFORD MILL	0	0	0	0	0	0	0	0	0	0
MOUNTAIRE FARMS OF DELAWARE	0	0	0	0	0	0	0	0	0	0
ORIENT CORP	0	0	0	0	0	0	0	0	0	0
PERDUE BRIDGEVILLE	0	0	0	0	0	0	0	0	0	0
PPG INDUSTRIES	1,072	0	0	0	2,691	3,763	0	0	0	0
V&S DELAWARE GALVANIZING	0	199,872	0	0	39,242	239,114	869,115	0	0	869,115
<b>ZINC COMPOUNDS Total</b>	<b>1,072</b>	<b>199,872</b>	<b>0</b>	<b>0</b>	<b>41,933</b>	<b>242,877</b>	<b>869,115</b>	<b>0</b>	<b>0</b>	<b>869,115</b>
<b>STATE TOTALS</b>	<b>956,919</b>	<b>8,876,457</b>	<b>1,679,546</b>	<b>117,153</b>	<b>373,297</b>	<b>12,003,373</b>	<b>9,712,512</b>	<b>12,475,029</b>	<b>396,084,447</b>	<b>418,271,988</b>

APPENDIX G

# APPENDIX H

## 2017 ON-SITE RELEASE SUMMARY BY CHEMICAL

CHEMICAL - RANKED BY TOTAL ON-SITE RELEASE	ON-SITE RELEASES			TOTAL	TRANSFERS OFF-SITE	ON-SITE WASTE MGMT.
	TO AIR	TO WATER	TO LAND			
NITRATE COMPOUNDS	0	3,819,891	0	3,819,891	63,013	0
SULFURIC ACID	369,466	0	0	369,466	0	550,595
AMMONIA	100,260	1,514	0	101,774	333	11,930,857
VINYL CHLORIDE	45,949	1	0	45,950	220	204,100
METHANOL	35,046	5	0	35,051	1,049,714	3,154,582
VINYL ACETATE	34,162	0	0	34,162	0	0
HYDROGEN SULFIDE	29,807	1	0	29,808	0	373,948,964
HYDROGEN CYANIDE	22,379	202	0	22,581	0	432,005
N-HEXANE	17,698	5	0	17,703	0	1,615,752
TOLUENE	15,323	5	0	15,328	796,114	202,762
CYCLOHEXANE	14,320	5	0	14,325	44,894	7,045
ETHYLENE GLYCOL	7	183	9,900	10,090	27,469	18,097
BARIUM COMPOUNDS	30	0	9,278	9,308	9	0
STYRENE	8,629	5	330	8,964	4,430	19,599
XYLENE (MIXED ISOMERS)	8,566	5	0	8,571	5,584	301,096
BENZENE	7,072	10	0	7,082	478	487,057
PROPYLENE	4,980	0	0	4,980	0	0
N,N-DIMETHYLFORMAMIDE	4,587	0	0	4,587	1,050,288	4,850,816
METHYL METHACRYLATE	3,783	0	0	3,783	90	0
LEAD	10	2	3,733	3,745	6,523	7,408
N-METHYL-2-PYRROLIDONE	3,627	0	0	3,627	189,913	0
ETHYLENE	2,962	0	0	2,962	0	0
ETHYLBENZENE	2,456	5	0	2,461	1,440	69,918
ETHYLENE OXIDE	2,318	0	0	2,318	0	415
NAPHTHALENE	2,031	5	0	2,036	421	11,861
HYDROCHLORIC ACID	1,518	0	0	1,518	0	1,116,765
TRICHLOROETHYLENE	1,275	0	0	1,275	10,323	0
CARBON DISULFIDE	1,223	0	0	1,223	0	3,517,860
PERACETIC ACID	1,152	0	0	1,152	17	691,648
HYDROGEN FLUORIDE	1,116	0	0	1,116	0	42,498
1,2,4-TRIMETHYLBENZENE	862	5	0	867	1	62,854
LEAD COMPOUNDS	164	49	626	839	6,928,957	0
ZINC COMPOUNDS	612	197	0	809	242,877	869,115
NONYLPHENOL	507	0	0	507	1,914	0
CARBONYL SULFIDE	482	0	0	482	0	12,876,055
CUMENE	402	5	0	407	1	3,724
BORON TRIFLUORIDE	358	0	0	358	0	0
CRESOL (MIXED ISOMERS)	0	330	0	330	0	336,901
PHENOL	138	165	0	303	0	326,299
1,3-BUTADIENE	250	0	0	250	0	0
COBALT	40	210	0	250	70	0
POLYCYCLIC AROMATIC COMPOUNDS	235	4	0	239	94	837
PROPYLENE OXIDE	234	0	0	234	0	765
MERCURY COMPOUNDS	93.7700	1.5000	80.8000	176.0700	13.0212	0.0000
2,4-DIMETHYLPHENOL	0	165	0	165	0	231,421
CREOSOTE	23	0	128	151	2,277	0
CYANIDE COMPOUNDS	0	145	0	145	0	14,378
ANILINE	107	0	0	107	43,184	341,352
BIPHENYL	100	0	0	100	98,376	2,599
ACETONITRILE	79	0	0	79	21,929	0
N-BUTYL ALCOHOL	73	0	0	73	367,395	0

# APPENDIX H

## 2017 ON-SITE RELEASE SUMMARY BY CHEMICAL

CHEMICAL - RANKED BY TOTAL ON-SITE RELEASE	ON-SITE RELEASES			TOTAL	TRANSFERS OFF-SITE	ON-SITE WASTE MGMT.
	TO AIR	TO WATER	TO LAND			
MANGANESE COMPOUNDS	48	0	0	48	87,530	0
CHLORINE	17	0	0	17	0	0
MERCURY	13.8800	0.0010	0.0000	13.8810	193.6700	0.0000
MOLYBDENUM TRIOXIDE	14	0	0	14	45	0
NICKEL COMPOUNDS	12	0	0	12	201,566	0
COPPER	10	0	0	10	5,023	0
PHENANTHRENE	4	5	0	9	7	40
TETRACHLOROETHYLENE	8	0	0	8	0	0
DIETHANOLAMINE	7	0	0	7	5,532	0
ANTHRACENE	0	5	0	5	0	0
BENZO(G,H,I)PERYLENE	1	5	0	5	0	453
P-CHLOROANILINE	5	0	0	5	18,028	474
CHROMIUM COMPOUNDS	5	0	0	5	171,026	0
TOLUENE DIISOCYANATE (MIXED ISOME	4	0	0	4	1,590	0
DIISOCYANATES	4	0	0	4	22,547	0
CERTAIN GLYCOL ETHERS	3	0	0	3	5,514	0
NITROBENZENE	2	0	0	2	0	0
CHROMIUM	1	0	0	1	250,834	0
NICKEL	1	0	0	1	111,931	0
4,4'-METHYLENEBIS(2-CHLOROANILINE)	0	0	0	0	1,676	0
DIOXIN AND DIOXIN-LIKE COMPOUNDS	0.006630	0.000000	0.000000	0.006630	0.000242	0.001263
COBALT COMPOUNDS	0	0	0	0	21,000	0
NITRIC ACID	0	0	0	0	0	23,021
ASBESTOS (FRIABLE)	0	0	0	0	80,505	0
ANTIMONY COMPOUNDS	0	0	0	0	26,886	0
HYDRAZINE	0	0	0	0	0	0
ARSENIC COMPOUNDS	0	0	0	0	600	0
DIPHENYLAMINE	0	0	0	0	0	0
MANGANESE	0	0	0	0	4,413	0
COPPER COMPOUNDS	0	0	0	0	28,565	0
HYDRAZINE SULFATE	0	0	0	0	0	0
<b>STATE TOTALS</b>	<b>746,669</b>	<b>3,823,135</b>	<b>24,076</b>	<b>4,593,879</b>	<b>12,003,373</b>	<b>418,271,988</b>

# APPENDIX I

## 2017 PBT RELEASE AND TRANSFER DETAIL

PBT CHEMICAL / FACILITY	ON-SITE RELEASES				TRANSFERS	ON-SITE
	AIR	WATER	LAND	TOTAL	OFF SITE	WASTE MGMT.
<b>BENZO(G,H,I)PERYLENE</b>						
DELAWARE CITY REFINERY	0.64	4.57	0.00	5.21	0.00	453.00
<b>BENZO(G,H,I)PERYLENE Total</b>	<b>0.64</b>	<b>4.57</b>	<b>0.00</b>	<b>5.21</b>	<b>0.00</b>	<b>453.00</b>
<b>DIOXIN AND DIOXIN-LIKE COMPOUNDS</b>						
DELAWARE CITY REFINERY	0.001263	0.000000	0.000000	0.001263	0.000000	0.001263
EDGE MOOR/HAY ROAD ENERGY CENTERS	0.005357	0.000000	0.000000	0.005357	0.000000	0.000000
FORMOSA PLASTICS	0.000009	0.000000	0.000000	0.000009	0.000242	0.000000
<b>DIOXIN AND DIOXIN-LIKE COMPOUNDS Total</b>	<b>0.006630</b>	<b>0.000000</b>	<b>0.000000</b>	<b>0.006630</b>	<b>0.0002</b>	<b>0.001263</b>
<b>LEAD</b>						
NATIONAL GUARD TRAINING SITE RANGE	0.00	0.00	3,733.10	3,733.10	0.00	0.00
V&S DELAWARE GALVANIZING	9.60	2.20	0.00	11.80	6,523.25	7,408.00
<b>LEAD Total</b>	<b>9.60</b>	<b>2.20</b>	<b>3,733.10</b>	<b>3,744.90</b>	<b>6,523.25</b>	<b>7,408.00</b>
<b>LEAD COMPOUNDS</b>						
DELAWARE CITY REFINERY	100.51	2.40	0.00	102.91	476.90	0.00
INDIAN RIVER GENERATING STATION	11.10	0.00	625.70	636.80	0.10	0.00
JOHNSON CONTROLS BATTERY PLANT	52.10	47.10	0.00	99.20	4,420,595.00	0.00
JOHNSON CONTROLS DISTRIBUTION	0.00	0.00	0.00	0.00	2,507,674.50	0.00
OWEN STEEL COMPANY	0.00	0.00	0.00	0.00	211.00	0.00
<b>LEAD COMPOUNDS Total</b>	<b>163.71</b>	<b>49.50</b>	<b>625.70</b>	<b>838.91</b>	<b>6,928,957.50</b>	<b>0.00</b>
<b>MERCURY</b>						
DENTSPLY SIRONA MAIN PLANT	0.6800	0.0000	0.0000	0.6800	193.5900	0.0000
EDGE MOOR/HAY ROAD ENERGY CENTERS	13.2000	0.0010	0.0000	13.2010	0.0800	0.0000
<b>MERCURY Total</b>	<b>13.8800</b>	<b>0.0010</b>	<b>0.0000</b>	<b>13.8810</b>	<b>193.6700</b>	<b>0.0000</b>
<b>MERCURY COMPOUNDS</b>						
DELAWARE CITY REFINERY	92.0700	1.5000	0.0000	93.5700	4.9020	0.0000
INDIAN RIVER GENERATING STATION	1.7000	0.0000	80.8000	82.5000	0.0000	0.0000
INTERVET	0.0000	0.0000	0.0000	0.0000	8.1192	0.0000
<b>MERCURY COMPOUNDS Total</b>	<b>93.7700</b>	<b>1.5000</b>	<b>80.8000</b>	<b>176.0700</b>	<b>13.0212</b>	<b>0.0000</b>
<b>POLYCYCLIC AROMATIC COMPOUNDS</b>						
DELAWARE CITY REFINERY	234.85	3.76	0.00	238.61	0.00	372.00
EDGE MOOR/HAY ROAD ENERGY CENTERS	0.10	0.02	0.00	0.12	0.00	0.00
IKO	0.00	0.00	0.00	0.00	94.10	465.10
<b>POLYCYCLIC AROMATIC COMPOUNDS Total</b>	<b>234.95</b>	<b>3.78</b>	<b>0.00</b>	<b>238.73</b>	<b>94.10</b>	<b>837.10</b>
<b>STATE PBT TOTALS</b>	<b>516.55</b>	<b>61.55</b>	<b>4,439.60</b>	<b>5,017.70</b>	<b>6,935,781.54</b>	<b>8,698.10</b>

# APPENDIX J

## 2017 CARCINOGEN RELEASE AND TRANSFER DETAIL

CARCINOGEN / FACILITY	TOTAL ON-SITE RELEASES				TRANSFERS	ON-SITE
	AIR	WATER	LAND	TOTAL	OFF SITE	WASTE MGMT.
<b>1,3-BUTADIENE</b>						
DELAWARE CITY REFINERY	250.00	0.00	0.00	250.00	0.00	0.00
<b>1,3-BUTADIENE Total</b>	<b>250.00</b>	<b>0.00</b>	<b>0.00</b>	<b>250.00</b>	<b>0.00</b>	<b>0.00</b>
<b>4,4'-METHYLENEBIS(2-CHLOROANILINE)</b>						
ROHM & HAAS B5 B6	0.04	0.00	0.00	0.04	1,075.00	0.00
ROHM & HAAS B7 B15	0.04	0.00	0.00	0.04	601.00	0.00
<b>4,4'-METHYLENEBIS(2-CHLOROANILINE) Total</b>	<b>0.07</b>	<b>0.00</b>	<b>0.00</b>	<b>0.07</b>	<b>1,676.00</b>	<b>0.00</b>
<b>ARSENIC COMPOUNDS</b>						
JOHNSON CONTROLS DISTRIBUTION	0.00	0.00	0.00	0.00	600.20	0.00
<b>ARSENIC COMPOUNDS Total</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>600.20</b>	<b>0.00</b>
<b>ASBESTOS (FRIABLE)</b>						
DELAWARE CITY REFINERY	0.00	0.00	0.00	0.00	80,505.00	0.00
<b>ASBESTOS (FRIABLE) Total</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>80,505.00</b>	<b>0.00</b>
<b>BENZENE</b>						
DELAWARE CITY REFINERY	7,072.00	10.37	0.00	7,082.37	477.68	487,057.00
<b>BENZENE Total</b>	<b>7,072.00</b>	<b>10.37</b>	<b>0.00</b>	<b>7,082.37</b>	<b>477.68</b>	<b>487,057.00</b>
<b>CHROMIUM COMPOUNDS</b>						
BALTIMORE AIRCOIL COMPANY	5.00	0.00	0.00	5.00	171,026.00	0.00
ORIENT CORP	0.00	0.00	0.00	0.00	0.00	0.00
<b>CHROMIUM COMPOUNDS Total</b>	<b>5.00</b>	<b>0.00</b>	<b>0.00</b>	<b>5.00</b>	<b>171,026.00</b>	<b>0.00</b>
<b>COBALT COMPOUNDS</b>						
BALTIMORE AIRCOIL COMPANY	0.00	0.00	0.00	0.00	21,000.00	0.00
<b>COBALT COMPOUNDS Total</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>21,000.00</b>	<b>0.00</b>
<b>CREOSOTE</b>						
DELAWARE CITY REFINERY	23.00	0.00	128.00	151.00	2,277.00	0.00
<b>CREOSOTE Total</b>	<b>23.00</b>	<b>0.00</b>	<b>128.00</b>	<b>151.00</b>	<b>2,277.00</b>	<b>0.00</b>
<b>CUMENE</b>						
DELAWARE CITY REFINERY	350.00	5.00	0.00	355.00	0.00	3,724.00
DOVER AFB	52.00	0.00	0.00	52.00	1.00	0.00
<b>CUMENE Total</b>	<b>402.00</b>	<b>5.00</b>	<b>0.00</b>	<b>407.00</b>	<b>1.00</b>	<b>3,724.00</b>
<b>ETHYLBENZENE</b>						
DELAWARE CITY REFINERY	1,904.00	5.00	0.00	1,909.00	588.63	50,418.00
DOVER AFB	52.00	0.00	0.00	52.00	1.00	0.00
ROGERS CORP	500.00	0.00	0.00	500.00	850.00	19,500.00
<b>ETHYLBENZENE Total</b>	<b>2,456.00</b>	<b>5.00</b>	<b>0.00</b>	<b>2,461.00</b>	<b>1,439.63</b>	<b>69,918.00</b>
<b>ETHYLENE OXIDE</b>						
CRODA	2,317.50	0.00	0.00	2,317.50	0.00	415.00
<b>ETHYLENE OXIDE Total</b>	<b>2,317.50</b>	<b>0.00</b>	<b>0.00</b>	<b>2,317.50</b>	<b>0.00</b>	<b>415.00</b>
<b>HYDRAZINE</b>						
VEOLIA - RED LION PLANT	0.00	0.00	0.00	0.00	0.00	0.00
<b>HYDRAZINE Total</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>HYDRAZINE SULFATE</b>						
VEOLIA - RED LION PLANT	0.00	0.00	0.00	0.00	0.00	0.00
<b>HYDRAZINE SULFATE Total</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>LEAD</b>						
NATIONAL GUARD TRAINING SITE RANGE	0.00	0.00	3,733.10	3,733.10	0.00	0.00
V&S DELAWARE GALVANIZING	9.60	2.20	0.00	11.80	6,523.25	7,408.00
<b>LEAD Total</b>	<b>9.60</b>	<b>2.20</b>	<b>3,733.10</b>	<b>3,744.90</b>	<b>6,523.25</b>	<b>7,408.00</b>
<b>LEAD COMPOUNDS</b>						
DELAWARE CITY REFINERY	100.51	2.40	0.00	102.91	476.90	0.00
INDIAN RIVER GENERATING STATION	11.10	0.00	625.70	636.80	0.10	0.00
JOHNSON CONTROLS BATTERY PLANT	52.10	47.10	0.00	99.20	4,420,595.00	0.00
JOHNSON CONTROLS DISTRIBUTION	0.00	0.00	0.00	0.00	2,507,674.50	0.00
OWEN STEEL COMPANY	0.00	0.00	0.00	0.00	211.00	0.00
<b>LEAD COMPOUNDS Total</b>	<b>163.71</b>	<b>49.50</b>	<b>625.70</b>	<b>838.91</b>	<b>6,928,957.50</b>	<b>0.00</b>
<b>NAPHTHALENE</b>						
CRODA	1.50	0.00	0.00	1.50	420.00	0.00
DELAWARE CITY REFINERY	1,977.00	5.00	0.00	1,982.00	0.06	11,861.00
DOVER AFB	52.00	0.00	0.00	52.00	1.00	0.00
GRIFFITH ENERGY - CARL KING	0.00	0.00	0.00	0.00	0.00	0.00
<b>NAPHTHALENE Total</b>	<b>2,030.50</b>	<b>5.00</b>	<b>0.00</b>	<b>2,035.50</b>	<b>421.06</b>	<b>11,861.00</b>
<b>NICKEL</b>						
DUHADAWAY TOOL & DIE SHOP INC	0.00	0.00	0.00	0.00	9,967.00	0.00
HANDYTUBE	0.00	0.00	0.00	0.00	32,557.00	0.00
METAL MASTERS	0.50	0.00	0.00	0.50	69,407.00	0.00
<b>NICKEL Total</b>	<b>0.50</b>	<b>0.00</b>	<b>0.00</b>	<b>0.50</b>	<b>111,931.00</b>	<b>0.00</b>

# APPENDIX J

## 2017 CARCINOGEN RELEASE AND TRANSFER DETAIL

CARCINOGEN / FACILITY	TOTAL ON-SITE RELEASES				TRANSFERS	ON-SITE
	AIR	WATER	LAND	TOTAL	OFF SITE	WASTE MGMT.
<b>NICKEL COMPOUNDS</b>						
BALTIMORE AIRCOIL COMPANY	5.00	0.00	0.00	5.00	196,226.00	0.00
OWEN STEEL COMPANY	2.00	0.00	0.00	2.00	5,340.00	0.00
PRINCE MINERALS LLC	4.70	0.00	0.00	4.70	0.00	0.00
<b>NICKEL COMPOUNDS Total</b>	<b>11.70</b>	<b>0.00</b>	<b>0.00</b>	<b>11.70</b>	<b>201,566.00</b>	<b>0.00</b>
<b>NITROBENZENE</b>						
ORIENT CORP	2.00	0.00	0.00	2.00	0.00	0.00
<b>NITROBENZENE Total</b>	<b>2.00</b>	<b>0.00</b>	<b>0.00</b>	<b>2.00</b>	<b>0.00</b>	<b>0.00</b>
<b>P-CHLOROANILINE</b>						
BASF COLORS AND EFFECTS USA LLC	5.00	0.00	0.00	5.00	18,027.80	474.00
<b>P-CHLOROANILINE Total</b>	<b>5.00</b>	<b>0.00</b>	<b>0.00</b>	<b>5.00</b>	<b>18,027.80</b>	<b>474.00</b>
<b>POLYCYCLIC AROMATIC COMPOUNDS</b>						
DELAWARE CITY REFINERY	234.85	3.76	0.00	238.61	0.00	372.00
EDGE MOOR/HAY ROAD ENERGY CENTERS	0.10	0.02	0.00	0.12	0.00	0.00
IKO	0.00	0.00	0.00	0.00	94.10	465.10
<b>POLYCYCLIC AROMATIC COMPOUNDS Total</b>	<b>234.95</b>	<b>3.78</b>	<b>0.00</b>	<b>238.73</b>	<b>94.10</b>	<b>837.10</b>
<b>PROPYLENE OXIDE</b>						
CRODA	234.40	0.00	0.00	234.40	0.00	765.00
<b>PROPYLENE OXIDE Total</b>	<b>234.40</b>	<b>0.00</b>	<b>0.00</b>	<b>234.40</b>	<b>0.00</b>	<b>765.00</b>
<b>STYRENE</b>						
DELAWARE CITY REFINERY	11.14	5.00	0.00	16.14	0.00	1,160.00
JUSTIN TANKS	8,618.00	0.00	330.00	8,948.00	4,430.00	18,439.00
<b>STYRENE Total</b>	<b>8,629.14</b>	<b>5.00</b>	<b>330.00</b>	<b>8,964.14</b>	<b>4,430.00</b>	<b>19,599.00</b>
<b>TETRACHLOROETHYLENE</b>						
DELAWARE CITY REFINERY	7.80	0.00	0.00	7.80	0.00	0.00
<b>TETRACHLOROETHYLENE Total</b>	<b>7.80</b>	<b>0.00</b>	<b>0.00</b>	<b>7.80</b>	<b>0.00</b>	<b>0.00</b>
<b>TOLUENE DIISOCYANATE (MIXED ISOMERS)</b>						
AEARO TECHNOLOGIES LLC	4.48	0.00	0.00	4.48	1,590.00	0.00
<b>TOLUENE DIISOCYANATE (MIXED ISOMERS) Total</b>	<b>4.48</b>	<b>0.00</b>	<b>0.00</b>	<b>4.48</b>	<b>1,590.00</b>	<b>0.00</b>
<b>TRICHLOROETHYLENE</b>						
HANDYTUBE	1,275.00	0.00	0.00	1,275.00	10,323.00	0.00
<b>TRICHLOROETHYLENE Total</b>	<b>1,275.00</b>	<b>0.00</b>	<b>0.00</b>	<b>1,275.00</b>	<b>10,323.00</b>	<b>0.00</b>
<b>VINYL ACETATE</b>						
FORMOSA PLASTICS	34,162.00	0.00	0.00	34,162.00	0.00	0.00
<b>VINYL ACETATE Total</b>	<b>34,162.00</b>	<b>0.00</b>	<b>0.00</b>	<b>34,162.00</b>	<b>0.00</b>	<b>0.00</b>
<b>VINYL CHLORIDE</b>						
FORMOSA PLASTICS	45,949.00	0.60	0.00	45,949.60	220.30	204,100.00
<b>VINYL CHLORIDE Total</b>	<b>45,949.00</b>	<b>0.60</b>	<b>0.00</b>	<b>45,949.60</b>	<b>220.30</b>	<b>204,100.00</b>
<b>STATE TOTAL</b>	<b>105,245</b>	<b>86</b>	<b>4,817</b>	<b>110,149</b>	<b>7,563,087</b>	<b>806,158</b>

# APPENDIX K

## TRI REPORTING FORMS – FORM R



Sample Form R  
For Reporting year 2017

Form Approved OMB Number: 2025-0009

Approval Expires: 7/31/2018

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<b>EPA</b> United States Environmental Protection Agency		<b>FORM R</b> Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also Known as Title III of the Superfund Amendments and Reauthorization Act		TRI Facility ID Number _____	
				Toxic Chemical, Category, or Generic Name _____	
This section only applies if you are revising or withdrawing a previously submitted form, otherwise leave blank.		<b>Revision (Enter up to two code(s))</b> _____		<b>Withdrawal (Enter up to two code(s))</b> _____	
IMPORTANT: See instructions to determine when "Not Applicable (NA)" boxes should be checked.					
<b>PART I. FACILITY IDENTIFICATION INFORMATION</b>					
<b>SECTION 1. REPORTING YEAR</b> _____					
<b>SECTION 2. TRADE SECRET INFORMATION</b>					
2.1 Are you claiming the toxic chemical identified on page 2 as a trade secret? <input type="checkbox"/> Yes (Answer question 2.2; attach substantiation forms)			<input type="checkbox"/> No (Do not answer 2.2; go to Section 3)		
			2.2 Is this copy <input type="checkbox"/> Sanitized <input type="checkbox"/> Unsanitized (Answer only if "Yes" in 2.1)		
<b>SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)</b> I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.					
Name and official title of owner/operator or senior management official:			Signature:		Date signed:
<b>SECTION 4. FACILITY IDENTIFICATION</b>					
Facility or Establishment Name		TRI Facility ID Number			
Physical Street Address		Mailing Address (if different from physical street address)			
City/County/Tribe/State/ZIP Code		City/State/ZIP Code		Country (Non-US)	
4.2 This report contains information for: (Important: Check a or b; check c or d if applicable)					
a. <input type="checkbox"/> An entire facility		b. <input type="checkbox"/> Part of a facility		c. <input type="checkbox"/> A federal facility	
				d. <input type="checkbox"/> GOCO	
4.3 Technical Contact Name			Telephone Number (include area code and ext.)		
Email Address					
4.4 Public Contact Name			Telephone Number (include area code and ext.)		
Email Address					
4.5 NAICS Code(s) (6 digits)		Primary	a.	b.	c.
			d.	e.	f.
4.6 Dun & Bradstreet Number(s) (9 digits)		a.	b.		
<b>SECTION 5. Parent Company Information</b>					
5.1 Name of U.S. Parent Company (for TRI Reporting purposes)			No U.S. Parent Company (for TRI Reporting purposes) <input type="checkbox"/>		
5.2 Parent Company's Dun & Bradstreet Number		NA <input type="checkbox"/>			

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# APPENDIX K

## TRI REPORTING FORMS – FORM R

Sample Form R  
For Reporting year 2017

Form Approved OMB Number: 2025-0009

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<h3 style="margin: 0;">FORM R</h3> <p style="margin: 0;">Part II. CHEMICAL-SPECIFIC INFORMATION</p>		TRI Facility ID Number  Toxic Chemical, Category, or Generic Name		
<b>SECTION 1. TOXIC CHEMICAL IDENTITY</b> (Important: DO NOT complete this section if you are reporting a mixture component in Section 2 below.)				
1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)			
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)			
1.3	Generic Chemical Name (Important: Complete only if Part I, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.)			
<b>SECTION 2. MIXTURE COMPONENT IDENTITY</b> (Important: DO NOT complete this section if you completed Section 1.)				
2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)			
<b>SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY</b> (Important: Check all that apply.)				
3.1	Manufacture the toxic chemical: a. <input type="checkbox"/> Produce    b. <input type="checkbox"/> Import  If Produce or Import c. <input type="checkbox"/> For on-site use/processing d. <input type="checkbox"/> For sale/distribution e. <input type="checkbox"/> As a byproduct f. <input type="checkbox"/> As an impurity	3.2 Process the toxic chemical: a. <input type="checkbox"/> As a reactant b. <input type="checkbox"/> As a formulation component c. <input type="checkbox"/> As an article component d. <input type="checkbox"/> Repackaging e. <input type="checkbox"/> As an impurity	3.3 Otherwise use the toxic chemical: a. <input type="checkbox"/> As a chemical processing aid b. <input type="checkbox"/> As a manufacturing aid c. <input type="checkbox"/> Ancillary or other use	
<b>SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ON-SITE AT ANY TIME DURING THE CALENDAR YEAR</b>				
4.1	<input style="width: 50px;" type="text"/> (Enter two digit code from instruction package.)			
<b>SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ON-SITE</b>				
		A. Total Release (pounds/year*) (Enter a range code** or estimate)	B. Basis of Estimate (Enter code)	C. Percent from Stormwater
5.1	Fugitive or non-point air emissions	NA <input type="checkbox"/>		
5.2	Stack or point air emissions	NA <input type="checkbox"/>		
5.3	Discharges to receiving streams or water bodies (Enter one name per box)	NA <input type="checkbox"/>		
Stream or Water Body Name		Reach Code (optional)		
5.3.1				
5.3.2				
5.3.3				
If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box <input style="width: 50px;" type="text"/>		and indicate the Part II, Section 5.3 page number in this box. <input style="width: 50px;" type="text"/> (Example: 1, 2, 3, etc.)		

EPA form 9350 -1 (Rev. 06/2014) – Previous editions are obsolete.

\*For Dioxin or Dioxin-like compounds, report in grams/year.  
 \*\*Range Codes: A= 1-10 pounds; B= 11-499 pounds; C= 500-999 pounds.

# APPENDIX K

## TRI REPORTING FORMS – FORM R



TOXICS RELEASE INVENTORY

Sample Form R  
For Reporting year 2017

Form Approved OMB Number: 2025-0009

Approval Expires: 7/31/2018

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<b>FORM R</b>		TRI Facility ID Number	
<b>Part II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)</b>		Toxic Chemical, Category, or Generic Name	
<b>SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ON-SITE (continued)</b>			
		NA	A. Total Release (pounds/year*) (Enter a range code** or estimate)
			B. Basis of Estimate (Enter code)
5.4-5.5	Disposal to land on-site		
5.4.1	Class I Underground Injection Wells	<input type="checkbox"/>	
5.4.2	Class II-V Underground Injection Wells	<input type="checkbox"/>	
5.5.1A	RCRA Subtitle C landfills	<input type="checkbox"/>	
5.5.1B	Other landfills	<input type="checkbox"/>	
5.5.2	Land treatment/application farming	<input type="checkbox"/>	
5.5.3A	RCRA Subtitle C surface impoundments	<input type="checkbox"/>	
5.5.3B	Other surface impoundments	<input type="checkbox"/>	
5.5.4	Other disposal	<input type="checkbox"/>	
<b>SECTION 6. TRANSFER(S) OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS</b>			
<b>6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)</b>		NA	<input type="checkbox"/>
6.1. ___	POTW Name		
POTW Address			
City	County	State	ZIP
A. Quantity Transferred to this POTW (pounds/year*) (Enter range code** or estimate)		B. Basis of Estimate (Enter code)	
If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages in this box <input type="text"/>			
and indicate the Part II, Section 6.1 page number in this box. <input type="text"/> (Example: 1, 2, 3, etc.)			
<b>SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS</b>		NA	<input type="checkbox"/>
6.2. ___	Off-Site EPA Identification Number (RCRA ID No.)		
Off-Site Location Name:			
Off-Site Address:			
City	County	State	ZIP
		Country (non-US)	
Is this location under control of reporting facility or parent company? <input type="checkbox"/> Yes <input type="checkbox"/> No			

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\*\*Range Codes: A= 1-10 pounds; B= 11-499 pounds; C= 500-999 pounds.



# APPENDIX K

## TRI REPORTING FORMS - FORM R

TOXICS RELEASE INVENTORY

Sample Form R  
For Reporting year 2017

Form Approved OMB Number: 2025-0009

Approval Expires: 7/31/2018

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<b>FORM R</b> <b>Part II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)</b>	TRI Facility ID Number
	Toxic Chemical, Category, or Generic Name

**SECTION 6.2. TRANSFERS TO OTHER OFF-SITE LOCATION (CONTINUED)**

A. Total Transfer (pounds/year**) (Enter a range code*** or estimate)	B. Basis of Estimate (Enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (Enter code)
1.	1.	1. M
2.	2.	2. M
3.	3.	3. M
4.	4.	4. M

6.2 Off-Site EPA Identification Number (RCRA ID No.)

Off-Site Location Name:

Off-Site Address:

City	County	State	ZIP	Country (non-US)
------	--------	-------	-----	------------------

Is this location under control of reporting facility or parent company?  Yes  No

A. Total Transfer (pounds/year**) (Enter a range code*** or estimate)	B. Basis of Estimate (Enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (Enter code)
1.	1.	1. M
2.	2.	2. M
3.	3.	3. M
4.	4.	4. M

**SECTION 7A. ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY**

Not Applicable (NA) - Check here if no on-site waste treatment method is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (Enter code)		b. Waste Treatment Method(s) Sequence (Enter 3- or 4-character code(s))				c. Waste Treatment Efficiency (Enter 2 character code)
7A.1a	7A.1b	1	2	7A.1c		
	3	4	5			
	6	7	8			
7A.2a	7A.2b	1	2	7A.2c		
	3	4	5			
	6	7	8			
7A.3a	7A.3b	1	2	7A.3c		
	3	4	5			
	6	7	8			
7A.4a	7A.4b	1	2	7A.4c		
	3	4	5			
	6	7	8			
7A.5a	7A.5b	1	2	7A.5c		
	3	4	5			
	6	7	8			

If additional pages of Part II, Section 6.2/7.A are attached, indicate the total number of pages in this  box and indicate the Part II, Section 6.2/7.A page number in this box.  (Example: 1, 2, 3, etc.)

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\*For Dioxin or Dioxin-like compounds, report in grams/year.  
\*\*Range Codes: A= 1-10 pounds; B= 11-499 pounds; C= 500-999 pounds.

# APPENDIX K

## TRI REPORTING FORMS – FORM R



Sample Form R  
For Reporting year 2017

Form Approved OMB Number: 2025-0009  
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<b>FORM R</b>		TRI Facility ID Number		
<b>Part II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)</b>		Toxic Chemical, Category, or Generic Name		
<b>SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES</b>				
<input type="checkbox"/> NA Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.				
Energy Recovery Methods (Enter 3-character code(s))				
1	2	3		
<b>SECTION 7C. ON-SITE RECYCLING PROCESSES</b>				
<input type="checkbox"/> NA Check here if no on-site recycling is applied to any waste stream containing the toxic chemical or chemical category.				
Recycling Methods (Enter 3-character code(s))				
1.	2.	3.		
<b>SECTION 8. SOURCE REDUCTION AND WASTE MANAGEMENT</b>				
	Column A Prior Year (pounds/year <sup>**</sup> )	Column B Current Reporting Year (pounds/year <sup>**</sup> )	Column C Following Year (pounds/year <sup>**</sup> )	Column D Second Following Year (pounds/year <sup>**</sup> )
<b>8.1 – 8.7 Production-Related Waste Managed</b>				
<b>8.1a</b>	Total on-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills			
<b>8.1b</b>	Total other on-site disposal or other releases			
<b>8.1c</b>	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills			
<b>8.1d</b>	Total other off-site disposal or other releases			
<b>8.2</b>	Quantity used for energy recovery on-site			
<b>8.3</b>	Quantity used for energy recovery off-site			
<b>8.4</b>	Quantity recycled on-site			
<b>8.5</b>	Quantity recycled off-site			
<b>8.6</b>	Quantity treated on-site			
<b>8.7</b>	Quantity treated off-site			
<b>8.8</b>	Non-production-related waste managed <sup>***</sup>			
<b>8.9</b>	<input type="checkbox"/> Production ratio or <input type="checkbox"/> Activity ratio (select one and enter value to right)			
<b>8.10</b>	Did your facility engage in any newly implemented source reduction activities for this chemical during the reporting year? If so, complete the following section; if not, check NA. NA <input type="checkbox"/>			
	Source Reduction Activities (Enter code(s))	Methods to Identify Activity (Enter code(s))		Estimated annual reduction (Enter code(s)) (optional)
<b>8.10.1</b>		a.	b.	c.
<b>8.10.2</b>		a.	b.	c.
<b>8.10.3</b>		a.	b.	c.
<b>8.10.4</b>		a.	b.	c.

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<sup>\*\*</sup>For Dioxin or Dioxin-like compounds, report in grams/year.

<sup>\*\*\*</sup>Includes quantities released to the environment or transferred off-site as a result of remedial actions, catastrophic events, or other one-time events not associated with production processes



# APPENDIX K

## TRI REPORTING FORMS – FORM R

Sample Form R  
For Reporting year 2017

Form Approved OMB Number: 2025-0009  
Approval Expires: 7/31/2018 **Page 6 of 6**

<b>FORM R</b>		TRI Facility ID Number
<b>Part II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)</b>		Toxic Chemical, Category, or Generic Name
<b>SECTION 8.11. DISPOSAL OR OTHER RELEASES, SOURCE REDUCTION, AND RECYCLING ACTIVITIES</b>		
<b>8.11</b>	If you wish to submit additional optional information on source reduction, recycling, or pollution control activities, provide it here.	
<div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%); opacity: 0.2; font-size: 48px; pointer-events: none;">DO NOT SUBMIT TO EPA</div>		
<b>SECTION 9. MISCELLANEOUS INFORMATION</b>		
<b>9.1</b>	If you wish to submit any miscellaneous, additional, or optional information regarding your Form R submission, provide it here.	
<div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%); opacity: 0.2; font-size: 48px; pointer-events: none;">DO NOT SUBMIT TO EPA</div>		

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# APPENDIX L

## TRI REPORTING FORMS - FORM A



Sample Form A Page 1  
For Reporting year 2017

Form Approved OMB Number: 2025-0009  
Approval Expires: 7/31/2018

Page 1 of \_\_\_

 United States Environmental Protection Agency		<b>TOXICS RELEASE INVENTORY</b> <b>FORM A</b>			
					TRI Facility ID Number
This section only applies if you are revising or withdrawing a previously submitted form, otherwise leave blank.		Revision (Enter up to two code(s)) <input type="text"/> <input type="text"/>		Withdrawal (Enter up to two code(s)) <input type="text"/> <input type="text"/>	
IMPORTANT: See instructions to determine when "Not Applicable (NA)" boxes should be checked.					
<b>PART I. FACILITY IDENTIFICATION INFORMATION</b>					
<b>SECTION 1. REPORTING YEAR</b> _____					
<b>SECTION 2. TRADE SECRET INFORMATION</b>					
2.1	Are you claiming the toxic chemical identified on page 2 as a trade secret? <input type="checkbox"/> Yes (Answer question 2.2; attach substantiation forms)		<input type="checkbox"/> No (Do not answer 2.2; go to Section 3)		2.2
					Is this copy <input type="checkbox"/> Sanitized <input type="checkbox"/> Unsanitized (Answer only if "Yes" in 2.1)
<b>SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)</b>					
I hereby certify that to the best of my knowledge and belief, for each toxic chemical listed in this statement, the annual reportable amount as defined in 40 CFR 372.27(a), did not exceed 500 pounds for this reporting year and that the chemical was manufactured, processed, or otherwise used in an amount not exceeding 1 million pounds during this reporting year.					
Name and official title of owner/operator or senior management official:			Signature:		Date signed:
<b>SECTION 4. FACILITY IDENTIFICATION</b>					
4.1	Facility or Establishment Name		TRI Facility ID Number		
	Physical Street Address		Mailing Address (if different from physical street address)		
	City/County/Tribe/State/ZIP Code		City/State/ZIP Code	Country (Non-US)	
4.2	This report contains information for: (Important: Check c or d if applicable) <span style="float: right;">c. <input type="checkbox"/> A Federal facility    d. <input type="checkbox"/> GOCO</span>				
4.3	Technical Contact Name		Telephone Number (include area code and ext.)		
	Email Address				
4.4	Public Contact Name		Telephone Number (include area code and ext.)		
	Email Address				
4.5	NAICS Code(s) (6 digits)		a.	b.	c.
	Primary a. _____ b. _____ c. _____ d. _____ e. _____ f. _____				
4.6	Dun & Bradstreet Number(s) (9 digits)		a. _____		
			b. _____		
<b>SECTION 5. PARENT COMPANY INFORMATION</b>					
5.1	Name of U.S. Parent Company (for TRI Reporting purposes)			No U.S. Parent Company (for TRI Reporting purposes) <input type="checkbox"/>	
5.2	Parent Company's Dun & Bradstreet Number		NA <input type="checkbox"/>		

EPA Form 9350 -2 (Rev. 06/2014) - Previous editions are obsolete.



TOXICS RELEASE INVENTORY

# APPENDIX L

## TRI REPORTING FORMS - FORM A

Sample Form A Page 2  
For Reporting year 2017

Form Approved OMB Number: 2025-0009  
Approval Expires: 7/31/2018

Page \_\_\_ of \_\_\_

EPA FORM A		TRI Facility ID Number
PART II. CHEMICAL IDENTIFICATION		
Do not use this form for reporting PBT chemicals, including Dioxin and Dioxin-like Compounds*		
<b>SECTION 1. TOXIC CHEMICAL IDENTITY</b>		Report ___ of ___
1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)	
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)	
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.)	
<b>SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above)</b>		
2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)	
<b>SECTION 1. TOXIC CHEMICAL IDENTITY</b>		Report ___ of ___
1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)	
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)	
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.)	
<b>SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above)</b>		
2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)	
<b>SECTION 1. TOXIC CHEMICAL IDENTITY</b>		Report ___ of ___
1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)	
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)	
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.)	
<b>SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above)</b>		
2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)	
<b>SECTION 1. TOXIC CHEMICAL IDENTITY</b>		Report ___ of ___
1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)	
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)	
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "Yes". Generic Name must be structurally descriptive.)	
<b>SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above)</b>		
2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)	

\*See the TRI Reporting Forms and Instructions manual for the list of PBT Chemicals (including Dioxin and Dioxin-like Compounds)

# APPENDIX M TRI REPORTING FORMS DIOXIN SCHEDULE 1



EPA United States Environmental Protection Agency		FORM R Schedule 1				TRI Facility ID Number
PART II. CHEMICAL-SPECIFIC INFORMATION (continued)						
SECTION 5. QUANTITY OF DIOXIN AND DIOXIN-LIKE COMPOUND ENTERING EACH ENVIRONMENTAL MEDIUM ON-SITE						
5.1	NA	5.2	NA	5.3	5.3.3	
Fugitive or non-point air emissions		Stack or point air emissions		Discharges to receiving streams or water bodies (Enter data for one stream or water body per box) NA		
D. Mass (grams) of each compound in the category (1-17)						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						

If additional pages of Section 5.3 are attached, indicate the total number of pages in this box   
and indicate the Section 5.3 page number in this box  (Example: 1, 2, 3, etc.)

EP A Form 9350-3



TOXICS RELEASE INVENTORY

# APPENDIX M TRI REPORTING FORMS DIOXIN SCHEDULE 1

Form Approved OMB Number: 2025-0009  
Approval Expires: 7/31/2018

FORM R Schedule 1		TRI Facility ID Number						
PART II. CHEMICAL-SPECIFIC INFORMATION (continued)								
SECTION 5. QUANTITY OF DIOXIN AND DIOXIN-LIKE COMPOUNDS ENTERING EACH ENVIRONMENTAL MEDIUM ON-SITE		5.4 - 5.5 Disposal to land on-site						
C. Mass (grams) of each compound in the category (1-17)	5.4.1	5.4.2	5.5.1.A	5.5.1.B	5.5.2	5.5.3A	5.5.3B	5.5.4
	NA	NA	RCRA Subtitle C landfills	Other landfills	Land treatment/ application farming	RCRA Subtitle C surface impoundments	Other surface impoundments	Other disposal
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								

EPA Form 9350-3

# APPENDIX M TRI REPORTING FORMS DIOXIN SCHEDULE 1



<b>FORM R Schedule 1</b>										TRI Facility ID Number								
<b>PART II. CHEMICAL-SPECIFIC INFORMATION (continued)</b>																		
<b>SECTION 6. TRANSFERS OF DIOXIN AND DIOXIN-LIKE COMPOUNDS IN WASTES TO OFF-SITE LOCATIONS</b>																		
<b>6.1. DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWS) NA</b>																		
<b>C. Mass (grams) of Each Compound in the Category (1-17)</b>																		
6.1. _____	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
<b>6.2. TRANSFERS TO OTHER OFF-SITE LOCATIONS</b>																		
<b>D. Mass (grams) of each compound in the category (1-17)</b>																		
<b>6.2. _____</b>																		
<b>1.</b>																		
9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<b>2.</b>																		
9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<b>3.</b>																		
9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<b>4.</b>																		
9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<b>6.2. _____</b>																		
<b>1.</b>																		
9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<b>2.</b>																		
9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<b>3.</b>																		
9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<b>4.</b>																		
9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

If additional pages of Section 6.1 or 6.2 are attached, indicate the total number of pages in this box   
and indicate the Section 6.1 or 6.2 page number in this box  (Example: 1, 2, 3, etc.)



TOXICS RELEASE INVENTORY

# APPENDIX M TRI REPORTING FORMS DIOXIN SCHEDULE 1

FORM R Schedule 1 PART II. CHEMICAL-SPECIFIC INFORMATION (continued)													TRI Facility ID Number	
SECTIONS 8.1-8.8. WASTE MANAGEMENT QUANTITIES FOR DIOXIN AND DIOXIN-LIKE COMPOUNDS (current year only)														
8.1-8.7 Production-related waste managed														
8.1a	8.1b	8.1c	8.1d	8.2	8.3	8.4	8.5	8.6	8.7	8.8				
Total on-site disposal to Class 1 Underground Wells, Injection Wells, RCRA Subtitle C landfills, and other landfills	Total other on-site disposal or other releases	Total off-site disposal to Class 1 Underground Wells, Injection Wells, RCRA Subtitle C landfills, and other landfills	Total other off-site disposal or other releases	Quantity used for energy recovery on-site	Quantity used for energy recovery off-site	Quantity recycled on-site	Quantity recycled off-site	Quantity treated on-site	Quantity treated off-site	Non-production related waste managed*				
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														

Column F. Mass (grams) of each compound in the category (1-17)

EPA Form 9350-3

\*Includes quantities released to the environment or transferred off-site as a result of remedial actions, catastrophic events, or other one-time events not associated with production processes





EPCRA Reporting Program  
Emergency Prevention and Response Section, DNREC  
155 Commerce Way, Suite B  
Dover, DE 19904  
(302) 739-9405

The Department of Natural Resources and Environmental Control  
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and the diversity of its workforce.

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