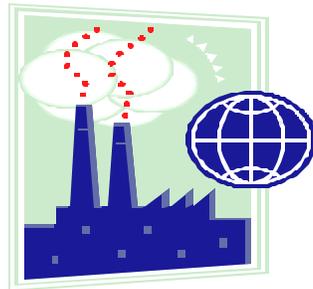


2010 VIRGINIA TOXICS RELEASE INVENTORY REPORT

March 2012

TRI



**Summary of Data from
2010 Industry Reports**



Virginia Department of Environmental Quality Mission and Programs

It is the mission of the Virginia Department of Environmental Quality to protect the environment of Virginia in order to promote the health and well-being of Virginians. To this end, the Department implements numerous programs, as described on the Department's website at <http://www.deq.virginia.gov/Programs.aspx>. These range from media programs on air quality, water quality, and waste management, to area programs (such as the Chesapeake Bay Program and the Virginia Coastal Program), to more specific programs (such as Small Business Assistance and Citizen Monitoring), and others too numerous to list here. The Department is committed to pollution prevention and elimination or reduction of waste at the source of generation. Pollution prevention programs include the Virginia Environmental Excellence Program. All parts of the agency and other sectors of government, Virginia businesses and industry, and Virginia's citizens have a role in managing and controlling the release of toxic chemicals in the Commonwealth.

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Executive Summary

2010 Virginia Toxics Release Inventory (TRI) Report

In March of each year, the Virginia Department of Environmental Quality (Department or DEQ) publishes the Virginia Toxics Release Inventory (TRI) Report, pursuant to Virginia Code § 10.1-1186.1. The Virginia TRI Report contains information on the release or management of listed chemicals and chemical categories, as reported by Virginia industries in specified industrial sectors and by federal facilities located within the Commonwealth. The facilities' reports are required by Title III of the federal Superfund Amendment and Reauthorization Act (SARA Title III), also known as the Emergency Planning and Community Right-to-Know Act (EPCRA). The Virginia TRI Report is a multi-media report, covering air, water, and waste management activities, and it addresses a variety of handling practices, including releases, recycling, energy recovery, and on-site and off-site treatment and disposal. The 2010 TRI data represents the 24th year of data collection from facilities for distribution to the public. The TRI program continues to fulfill its goal of providing chemical use, release, and waste management information to the public.

This year's Virginia TRI report covers calendar year 2010, which is the most recent year of available data. It includes all reports and revisions received by the Department on or before January 16, 2012. For calendar year 2010, 423 Virginia facilities filed 1,491 individual reports on the release, transfer, or management of TRI chemicals or chemical categories. This was a 0.5 percent increase from the 421 facilities and a 4.2 percent decrease from the 1,556 reports filed for calendar year 2009. In 2010, Virginia facilities reported the release, transfer, or management of 154 chemicals and chemical categories, of the more than 650 chemicals and chemical categories that are subject to the TRI reporting requirements.

According to the reports, Virginia facilities reported the release, transfer, or on-site management of 911.4 million pounds of TRI chemicals during calendar year 2010 (a 1.1 percent increase from 2009). Of this total:

- *46.3 million pounds of TRI chemicals were released on-site at reporting Virginia facilities (a 4.2 percent decrease from 2009);*
- *79.2 million pounds of TRI chemicals were transferred off-site from reporting Virginia facilities for treatment, recycling, energy recovery, or disposal (a 22.5 percent increase from 2009) and;*
- *785.9 million pounds of TRI chemicals were managed on-site by treatment, recycling, or energy recovery (a 0.3 percent decrease from 2009).*

Since the inception of the TRI Program there appears to be a decreasing trend in the amount of TRI chemicals being released to the environment. Overall results from the most recent TRI data show:

- *The total amount of TRI chemicals reported as released to air for 2010 decreased by 1,528,224 pounds (5.8 percent) compared to 2009.*
- *The total amount of TRI chemicals reported as released to water for 2010 decreased by 494,692 pounds (2.7 percent) compared to 2009.*

The Virginia TRI Report addresses separately those TRI chemicals that the U.S. Environmental Protection Agency (EPA) has designated as persistent bioaccumulative toxins (PBTs). These chemicals remain in the environment for long periods of time, are not readily destroyed, and build up or accumulate in body tissue. According to the 2010 PBT reports:

- *367,054 pounds of PBT TRI chemicals were released on-site at reporting Virginia facilities;*
- *979,425 pounds of PBT TRI chemicals were transferred off-site from reporting Virginia facilities for treatment, recycling, energy recovery, or disposal; and*
- *185,782 pounds of PBT TRI chemicals were managed on-site by treatment, recycling, or energy recovery.*

Dioxins and dioxin-like compounds account for 15.64 grams (approximately 0.0344 pounds) of the PBT chemicals released, transferred, or managed by Virginia facilities during calendar year 2010.

As required by statute, the Virginia TRI Report also provides information by industrial sectors (identified by the North American Industry Classification System), facilities, and facility location (jurisdiction). For calendar year 2010 three reporting industrial sectors accounted for 72.9 percent of the total on-site releases to the environment. These were: Chemical Manufacturing; Utilities; and Food Manufacturing. The text of the report provides additional information about the industrial sectors, facilities, and jurisdictions with the largest reported on-site release, on-site management and other management of TRI chemicals.

The Virginia TRI Report provides the public with information concerning specified toxic chemicals and chemical compounds that are manufactured, processed, or otherwise used at Virginia facilities. Responsible use of this information can help both the public and industry identify potential concerns and develop effective strategies for reducing toxic chemical usage and release. The TRI data does not, however, represent a measure of the public's exposure to chemicals, nor does it assess risk. Many of the releases are regulated and permitted under other state and federal programs that are designed to protect human health and the environment. Because of differences in report generation schedules and receipt of reports, the information in the Virginia TRI Report will not precisely match the information in the national [Toxics Release Inventory - Public Data Release](#), as published by EPA.

Introduction

Part One - Virginia TRI Reporting

Statutory and Regulatory Basis

The Virginia Toxics Release Inventory (TRI) Report is published annually pursuant to Virginia Code § 10.1-1186.1. It contains information on the release, transfer, or management of listed chemicals and chemical categories, as reported by more than 400 Virginia industries and federal facilities. The facilities are required to submit their reports pursuant to the federal Emergency Planning and Community Right-to-Know Act (EPCRA), also known as SARA Title III.¹ Virginia Code § 10.1-1186.1 directs the Virginia Department of Environmental Quality (the Department or DEQ) to publish the Virginia TRI Report in March of each year and to include information for the most recent calendar year for which data are available - in this case, calendar year 2010. The Virginia Code also directs that the report be organized by chemical, facility, facility location, and standard industrial classification (SIC) code. Federal regulations require facilities to submit their TRI reports both to the U.S. Environmental Protection Agency (EPA) and to the Commonwealth. The Virginia TRI Report is compiled directly from the reports received from Virginia facilities.

A glossary of terms used in this report is included as Appendix A.

Current Year (2010) Virginia Facility Reports

Pursuant to federal requirements, facilities are required to submit their reports for a calendar year by the following July 1, i.e., facilities were required to file their reports on their calendar year 2010 activities on or before July 1, 2011. Therefore, data for calendar year 2010 are the most recent available for this March 2012 report. This report includes all facility reports and revisions received by the Department on or before January 16, 2012. For reporting year 2010, 423 Virginia facilities filed 1,491 individual reports on the release or other management of TRI chemicals or chemical categories. This was a slight change from the 421 facilities and 1,556 reports that were filed for reporting year 2009. Data for all reporting years are available to the public from the DEQ's SARA Title III office. This report and its attachments are available to the public on DEQ's website at <http://www.deq.virginia.gov/Programs/Air/AirQualityPlanningEmissions/SARATitleIII/SARA313ToxicReleaseInventory.aspx>.

In 2010, Virginia facilities reported the release, transfer, or management of 154 of the more than 650 chemicals and chemical categories that are subject to TRI reporting requirements.

Improvements to the 2010 Virginia TRI Report

Assessing risk is beyond the scope of this report and is subject to site-specific interpretations and calculations. Readers are encouraged to utilize the resources listed in this report, its appendices, and other data to analyze the overall use, release, and management of TRI chemicals.

¹ 42 U.S.C. § 11023, or SARA § 313

Virginia is one of 30 states participating in the State Data Exchange program for online data collection of TRI reports. States that join the TRI State Data Exchange can save resources by getting all of their data sent electronically via the Central Data Exchange (CDX). Participating states may be viewed at the following site: http://www.epa.gov/tri/stakeholders/state/state_exchange/index.htm.

Part Two - National Toxics Release Inventory Reporting Program

The National Toxics Release Inventory

The Virginia TRI Report is compiled directly from reports that Virginia facilities submit under federal law and regulations.² Using those same authorities, EPA compiles and maintains nationwide information in its *Toxics Release Inventory – National Analysis*, which is available to the public on EPA's website at <http://www.epa.gov/tri/>. The National Toxics Release Inventory was established to provide information to the public about the presence and release of toxic and hazardous chemicals in their communities. From inception, the national TRI program and Virginia's program have been expanding and evolving to meet the needs of an informed public. A list of supplementary resources on the program can be found in Appendix B and more detailed information about the historical changes to the TRI program can be found in Chapter Four.

Facilities That Must Report

Under the national TRI program, a facility must submit a TRI report (or reports) to EPA and the state if:

- 1) **It has ten or more full-time employees** (a combined total for all employees of 20,000 hours or more for the year);
- 2) **The facility's primary business is within one of the covered North American Industrial Classification System (NAICS) codes.** The industry sectors include metal mining, coal mining, paper and allied products, chemicals and allied products, petroleum terminals and bulk stations, and others. The complete list of covered industry groups is provided in Appendix C; and
- 3) **The facility manufactured, processed, or otherwise used a reportable toxic chemical in quantities greater than the established threshold during the course of a calendar year.** The annual thresholds for non-PBT TRI chemicals are 25,000 pounds for manufacturing, 25,000 pounds for processing, and 10,000 pounds for "otherwise use". For PBT chemicals, the thresholds are lower. For example, dioxin and dioxin-like compounds have a threshold of 0.1 gram, and lead and lead compounds have a threshold of 100 pounds. For PBT chemicals, these lower reporting thresholds apply whether the chemical is manufactured, processed, or otherwise used.

² The national TRI was established under Title III, Section 313, of the Federal Superfund Amendments and Reauthorization Act (SARA), which is also known as the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), 42 U.S.C § 11023. The related federal regulations are found at 40 CFR Part 372.

Federal facilities also are required to comply with EPCRA and the Pollution Prevention Act (PPA) of 1990, in accordance with Executive Order 13148. This Executive Order requires all federal facilities that manufacture, process, or otherwise use any listed EPCRA Section 313 chemical above the reporting threshold to submit a TRI report. The first federal facility reports were submitted on or before July 1, 1995, for calendar year 1994.

Chemicals and Chemical Categories

For a chemical or chemical category to remain on or be added to the TRI list, it must be known to cause or to reasonably be anticipated to cause one of the following:

- adverse acute health effects at significant concentration levels beyond facility boundaries as a result of continuous or frequently occurring releases;
- cancer in humans; or
- a significant adverse effect on the environment because of its toxicity and persistence in the environment.

As new chemicals of concern are identified, they are added to the TRI list. Conversely, if TRI chemicals are found not to meet the toxicity requirements, they can be deleted. Currently, the reportable TRI chemical list contains more than 650 chemicals and chemical categories. A complete list of TRI chemicals and chemical categories for calendar year 2010 reports can be found in the EPA publication "The Emergency Planning and Community Right-to-Know Act - Section 313 Release and other Waste Management Reporting Requirements" (EPA260/K-01-001, February, 2001). The publication is available online at http://www.epa.gov/tri/guide_docs/pdf/2000/brochure2000.pdf. As noted, for 2010, Virginia facilities reported the release, transfer, or management of 154 of the more than 650 chemicals and chemical categories that are subject to the TRI.

Reporting Forms and Activities That Must Be Reported

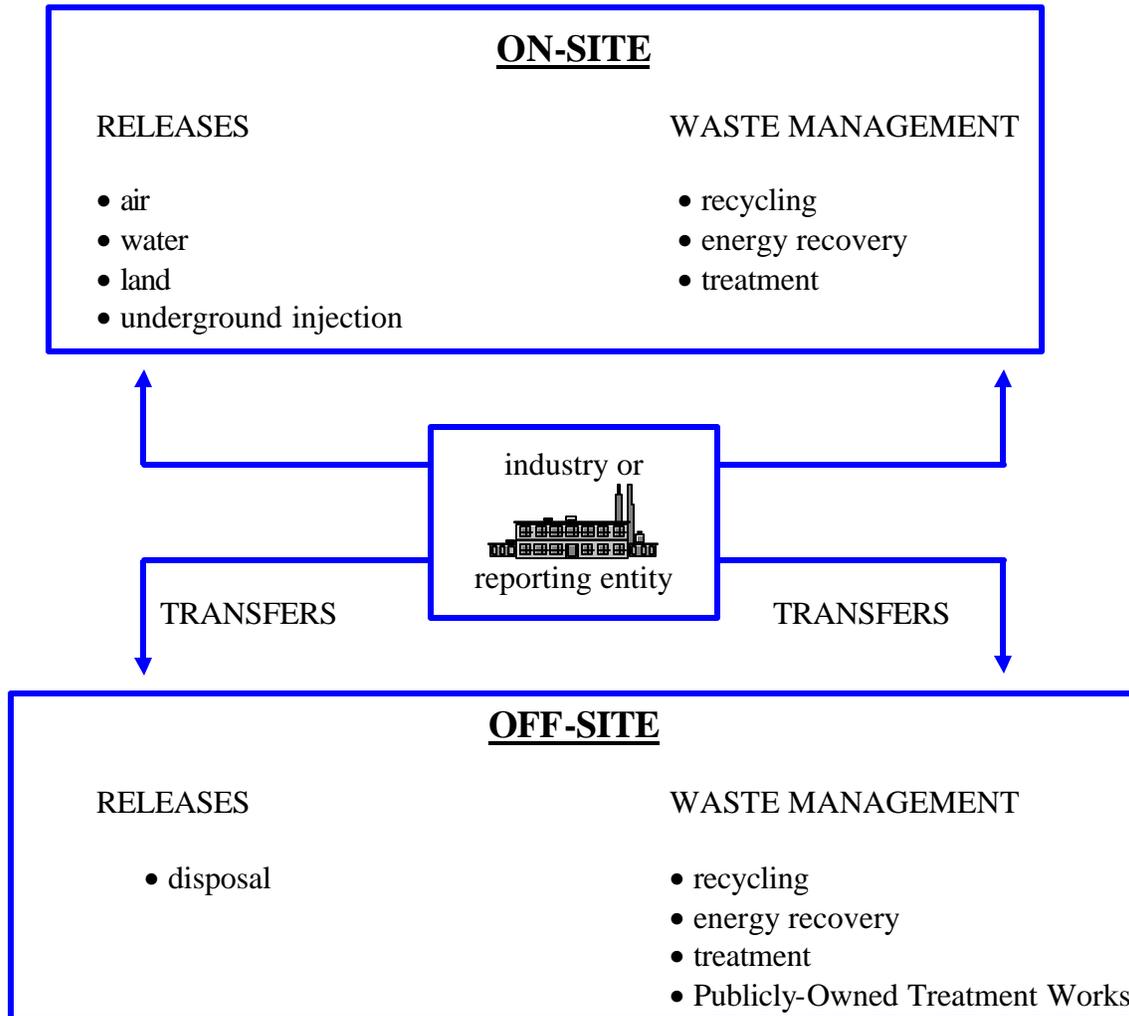
Each year, reporting facilities submit one reporting form for each TRI chemical or chemical category that is manufactured, processed, or otherwise used in amounts equal to or greater than the threshold values. For each TRI chemical or chemical category, facilities must submit either a Form A (simplified form) or a Form R (long form). Examples of both forms are provided in Appendix D. Form A has restrictions governing its use. The 2009 Omnibus Appropriation Act has returned TRI reporting requirements to the rules in effect prior to the TRI Burden Reduction Rule, announced in December, 2006. The change requires that reports on persistent, bioaccumulative, and toxic (PBT) chemicals be submitted on the Form R. For all other chemicals the shorter form, Form A, may be used only if the "annual reporting amount" is 500 pounds or less and the chemical was manufactured, processed, or otherwise used in an amount not exceeding 1 million pounds during the reporting year.

Data used to prepare quantitative information in the Virginia TRI Report come principally from Part II of the Form R reports, and specifically from Sections 5, 6, 7, and 8 of Part II, Form R. These sections are referred to throughout the Virginia TRI Report and are described below:

- **Section 5: Quantity of toxic chemical entering/releasing to each environmental medium on-site.** Release reporting is broken down into categories: releases to the air (from stack and fugitive emissions), releases to water (on-site and to publicly-owned treatment works (POTWs)), and releases to land (underground injection, disposal to land, Resource and Conservation Recovery Act (RCRA) Subtitle C landfill, other landfills, land treatment/application farming, surface impoundment, or other disposal).
- **Section 6: Transfers of the toxic chemical in wastes to off-site locations.** Section 6 contains two main subsections: transfers to publicly-owned treatment works (POTWs), and transfers to all other off-site locations (in-state or out-of-state). Facilities are required to provide the name and location of off-site locations, the quantity transferred, and the method of management (treated, disposed, recycled, or burned for energy recovery).
- **Section 7: On-site waste treatment methods and efficiency (including energy recovery processes and recycling processes).** Facilities are asked to provide mostly qualitative information on the on-site treatment processes, the estimated range of influent concentration, and the efficiency of the operation.
- **Section 8: Source reduction and recycling activities.** Section 8 was added to the Form R reporting as a result of the federal Pollution Prevention Act of 1990 to track production-related activities. Section 8 extracts and re-aggregates data reported in Sections 5 through 7 into environmental releases (production-related on-site and off-site releases), off-site transfers/management, and on-site management. Where Section 7 contains qualitative information about on-site management practices, a subsection of Section 8 asks for related quantitative data. Section 8 and its subsections also request previous year reporting and future year estimates for production-related releases, transfers for off-site management, and on-site management. Other subsections of Section 8 ask for episodic/catastrophic releases (non-production related), qualitative information on source reduction activities, and a production ratio or activity index to better engage the facility's efforts in source reduction.

The flow chart (Figure 1) on the following page illustrates the information collected on Form R for TRI chemicals.

Figure 1 - Schematic Diagram of the TRI Data Collected



Part Three - Uses and Limitations of TRI Data

The Virginia TRI Report provides the public with information concerning designated toxic chemicals and chemical categories manufactured, processed, or otherwise used at facilities, including the amounts released to the environment and managed as wastes.

Industry can use the data to: obtain an overview of use and release of toxic chemicals, identify and reduce costs associated with toxic waste, identify promising areas for pollution prevention, establish reduction targets, and measure and document progress toward reduction goals.

The public availability of the data has assisted many facilities in working with their communities to develop effective strategies for reducing environmental and human health risks that may result from toxic chemical releases.

Nevertheless, there are limitations on the use of TRI data:

1. The TRI report contains reported information on the quantities of chemicals released and managed, not the public's exposure to, or risk from the chemicals. Risk to human health by a chemical release depends on the toxicity of the chemical, how it disperses, reacts, or persists in the environment and the quantity, concentration, and type of human exposure. Furthermore, chemicals reported for the TRI report are not weighted by their toxicity. For example, a pound of one substance may be more toxic or hazardous than 1,000 pounds of another. Due to the limited nature of TRI data collected, readers are strongly discouraged from making any health or environmental risk/exposure assessments from the information presented. Many of the TRI chemical releases are permitted under other federal and state regulatory programs and; data from these regulatory programs may provide additional information to better inform residents about their environment.
2. The TRI program captures only a portion of all toxic chemical releases in Virginia. It does not account for TRI chemicals from most non-manufacturing facilities, facilities with fewer than 10 employees, facilities that do not meet the chemical quantity thresholds, other non-industrial sources, or transportation-related emissions.
3. The majority of facilities report TRI data based on estimates. The TRI program does not require that they monitor releases, only that they use best available data. Using different methods to estimate data can result in significant variability from one facility to another, as well as from one year to the next.
4. Patterns of releases and other waste management activities can change significantly from one year to the next. Thus, the data in this report for a specific facility differ from those reported for a prior year.
5. Direct comparison between figures in this report and figures in past Virginia Toxics Release Inventory Summary Reports is discouraged because of changes in reporting requirements and the authorized incorporation of revisions to previous years' data. Several historical comparisons, with appropriate standardization of data, are provided in Chapter 4 and Appendix E of this report.
6. EPA is required by law to compile an annual *Toxics Release Inventory – National Analysis* on the national level. It is anticipated that the data published in the Virginia TRI Report will not completely correspond to the data published by the EPA. Contributing factors include: differing dates on which data are extracted for processing, revised facility reports, and facilities that mistakenly report to the Commonwealth or EPA but not both. The Department and EPA continue to work together to rectify such differences.

The data for calendar year 2010 shows an increase (1.1 percent) in the amounts of TRI chemicals released on-site, transferred off-site, and managed on-site from 2009 (see Chapter 4). There has been a downward trend in the amount of TRI chemicals released to the environment and managed as wastes in Virginia since the implementation of the TRI program in 1988.

Chapter One - 2010 Virginia TRI Data Review

Chapter One describes the 2010 reporting year data in its entirety, based on the type of activity and the chemicals and chemical categories reported. The chapter is divided into four parts. Part One presents an overview and summary of 2010 data collected. Part Two discusses on-site releases of TRI chemicals to the environment, whether to air, water, or land. These data are derived from Section 5 of the Form R reports. Part Three of Chapter One discusses the off-site transfers of TRI chemicals, whether to publicly-owned treatment works (POTWs) or to other off-site locations. These data are derived from Section 6 of the Form R reports. Part Four of Chapter One discusses on-site and off-site management activities. These data are derived from Section 8 of the Form R reports. While this chapter includes all TRI chemicals, Chapter Two addresses persistent bioaccumulative toxic (PBT) chemicals in more detail.

As described in the Introduction, Section 8 of the federal Form R asks facilities to extract and re-aggregate certain data from Sections 5 and 6. To avoid double-counting these chemicals in the Overview and Summary, only data that are independent of Sections 5 and 6 are presented when discussing "On-Site Management" in Part One of this chapter. When discussing Section 8 data as a whole, however, all the data are used in Part Four of this chapter; including data extracted and re-aggregated from Sections 5 and 6, so that the balance between various on-site and off-site management activities can be shown. Appendices F and G contain facility-specific information, arranged by jurisdiction, for TRI chemicals (excluding PBTs) and for PBT chemicals, respectively.

Part One - 2010 Overview and Summary

For calendar year 2010, Virginia facilities reported that they released, transferred, or managed approximately 911.4 million pounds of TRI chemicals (see Table 1).

Approximately 46.3 million pounds of TRI chemicals were reported to have been released on-site to the environment. Air releases represented 24.9 million pounds, or 53.9 percent of all the TRI chemicals released on-site in 2010. Releases to the water totaled approximately 18.0 million pounds, or 38.9 percent of the total released on-site. Releases to the land totaled approximately 3.3 million pounds, or 7.2 percent of the total released on-site. For 2010, the amount of TRI chemical releases to the environment represented approximately 5.1 percent of the total TRI chemicals.

Off-site transfers totaled approximately 79.2 million pounds of TRI chemicals. Off-site transfers to POTWs totaled approximately 17.1 million pounds. Off-site transfers to other (non-POTW) facilities (for treatment, recycling, energy recovery and disposal) totaled approximately 62.1 million pounds. For 2010, the amount of TRI chemicals transferred off-site represented approximately 8.7 percent of the total for TRI chemicals by this measure.

Facilities reported that approximately 785.9 million pounds of TRI chemicals were managed on-site by treatment, recycling, or energy recovery. For 2010 this amount of chemicals managed on-site represents approximately 86.2 percent of the total TRI chemicals.

Table 1. Summary of Data by Type of Release, Transfer, and On-Site Management for TRI Chemicals (in pounds per year)

ON-SITE RELEASES BY MEDIA (Section 5 of Form R)	
Total Air	24,950,898
Fugitive Air	2,923,579
Stack Air	22,027,319
Total Water	18,015,632
Total Land	3,315,364
Landfills	1,589,054
Land Treatment / Application	4,730
Surface Impoundment	1,237,176
Other Disposal	484,404
Total On-Site Releases to Media	46,281,894

OFF-SITE TRANSFERS BY TYPE (Section 6 of Form R)	
Publicly Owned Treatment Works (POTWs) (includes metals and metal compounds)	17,097,584
Total Other Off-Site Transfers	62,135,336
Off-Site Transfers for Recycling	36,951,977
Off-Site Transfers for Energy Recovery	4,323,546
Off-Site Transfers for Other Treatment	17,657,248
Off-Site Transfers for Disposal	3,202,565
Total Off-Site Transfers	79,232,921

ON-SITE MANAGEMENT (From Section 8 of Form R) *	
Treated On-Site	90,926,988
Recycled On-Site	688,774,463
Energy Recovery On-Site	6,193,687
Total On-Site Management	785,895,138

Total TRI Chemicals Released On-site to Media, Transferred Off-site, or Managed On-site by Reporting Facilities	911,409,953
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* The data for the on-site management of TRI chemicals is a summary of data collected from Part II, Sections 8.2, 8.4, and 8.6 of the Form R. These sections, in turn, are quantitative data not reported anywhere else in the Form R and reflect on the descriptive data reported in Part II, Section 7 (on-site management practices - treatment, energy recovery, and recycling) of the Form R. Data extracted and re-aggregated to Section 8 from Sections 5 and 6 of Form R have not been included here to avoid duplicate counting.

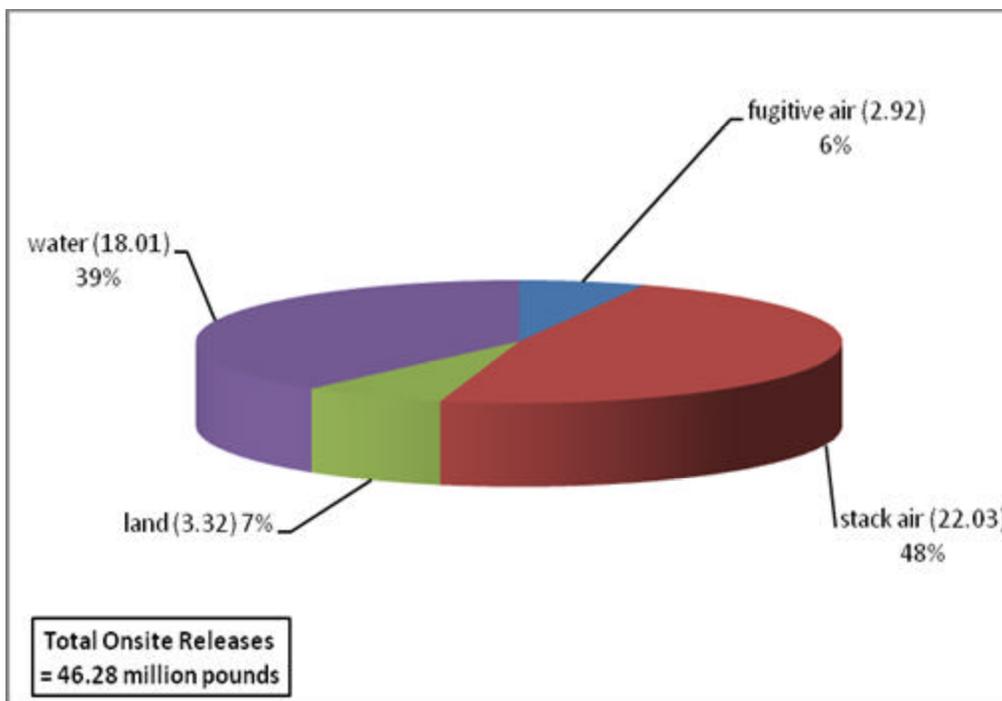
Part Two - On-Site Releases to the Environment

Part Two of this chapter discusses the on-site releases of TRI chemicals to the environment by facilities, as reported in Section 5 of the TRI Form R. The quantities reported in Section 5 include production-related releases, any catastrophic releases or one-time events not associated with routine production processes.

A release refers to an on-site discharge of TRI chemicals to the air, water, land, and/or disposal in underground injection wells. Any reductions in waste achieved by on-site treatment methods are taken into account when facilities determine their release data. Approximately 46.3 million pounds of TRI chemicals were reported as released into the environment by reporting facilities for reporting year 2010.

Figure 2. On-Site Releases of TRI Chemicals to All Media for Reporting Year 2010

(from Section 5 of Form R. The number inside the parentheses is the quantity of releases in each category in millions of pounds, and the percent figure is the percent of total on-site releases.) There were no underground injection releases reported in 2010.



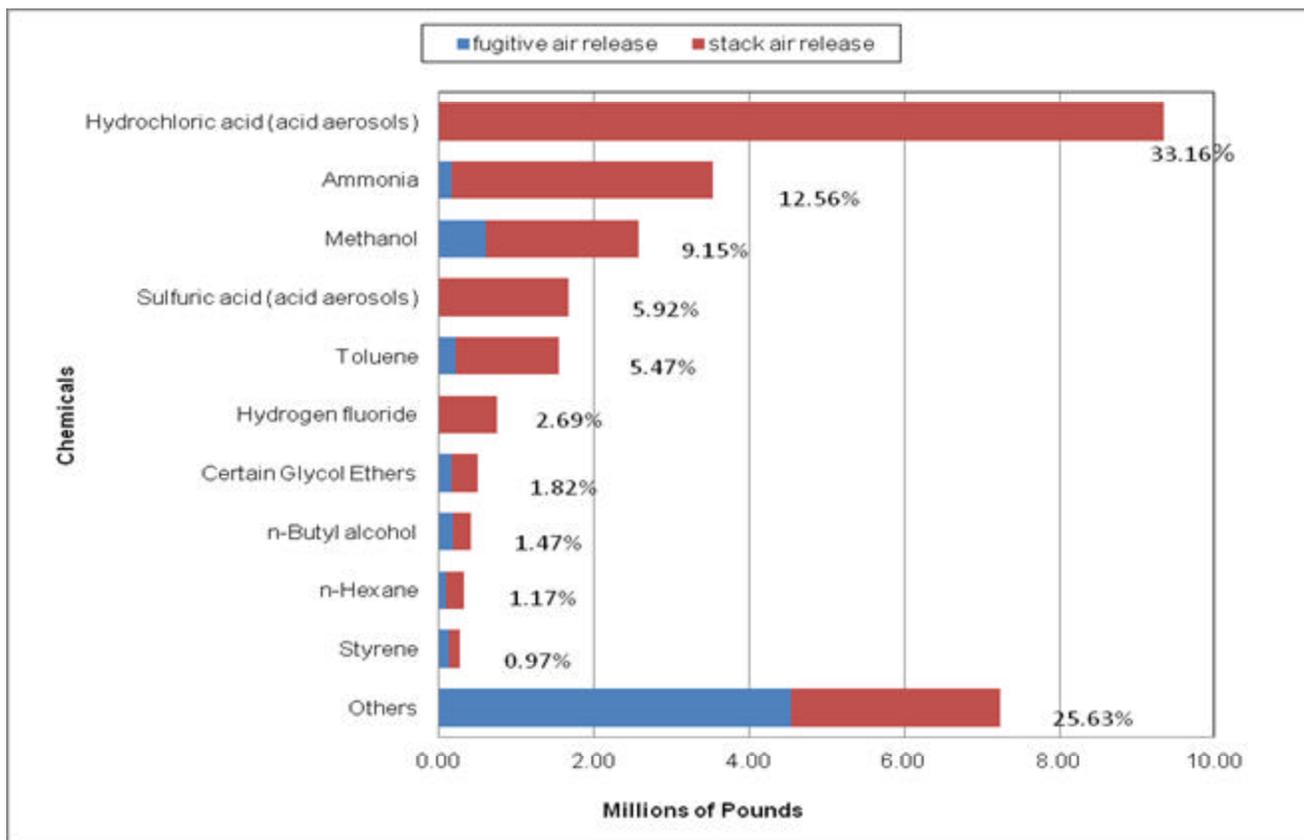
On-Site Releases to the Air

On-site air releases are classified as either “fugitive” (non-point source) or “stack” (point source) air emissions. Examples of fugitive air emissions are equipment leaks from valves, pump seals, flanges, compressors, sampling connections, open-ended lines, and evaporative losses from surface impoundments and spills. Stack air emissions are releases to the air that are conveyed through stacks, ducts, pipes, vents, or other confined air streams. Most, if not all, facilities reporting to TRI have permitted stack air emissions.

Based on the amount of fugitive and stack emissions reported, the total amount of releases to the air of all TRI chemicals was approximately 24.9 million pounds, which accounted for 53.9 percent of the total on-site releases to all media (air, water, and land). Ten TRI chemicals released to the air made up approximately 74.4 percent of the total reported TRI air emissions in 2010 (See Figure 3). Those ten TRI chemicals were: hydrochloric acid, ammonia, methanol, sulfuric acid, toluene, hydrogen fluoride, certain glycol ethers, n-Butyl alcohol, n-Hexane, and styrene. Most reported acid aerosols such as hydrochloric acid, sulfuric acid, and hydrogen fluoride were reported as generated during the combustion of coal or oil. Electric power generating facilities contributed to the emissions of acid aerosols. Ammonia, methanol, and toluene continued to be the air pollutants reported primarily from the manufacturing sector.

Figure 3. Top Ten TRI Chemicals Released to the Air On-Site in 2010

(from Section 5 of Form R. The number next to each bar is the percent of total air releases for all 2010 chemicals reported.)

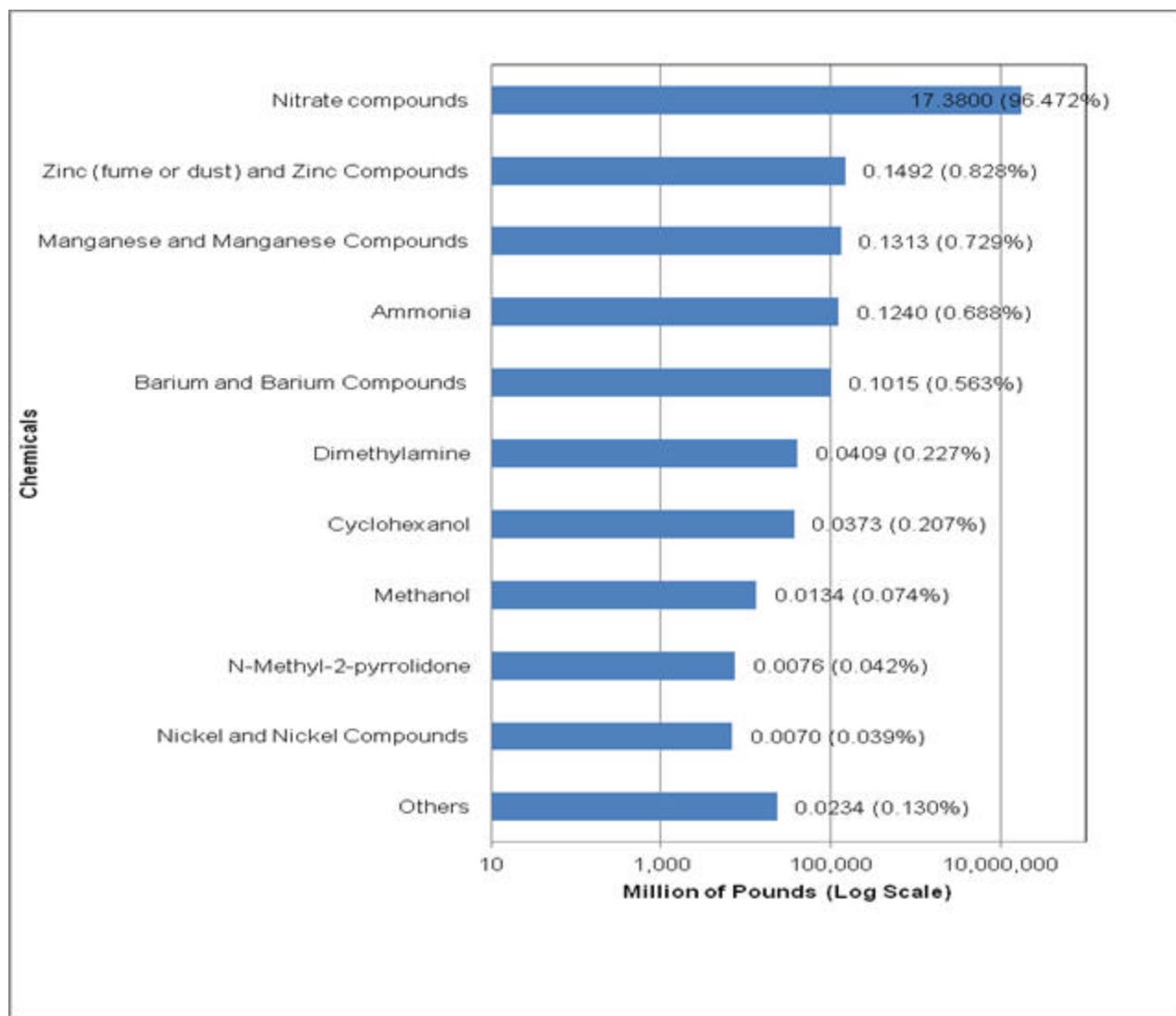


On-Site Releases to Water

On-site releases to water include discharges to surface waters, such as rivers, lakes, ponds, and streams. Reported on-site releases of TRI chemicals to water in 2010 totaled approximately 18.0 million pounds and accounted for 38.9 percent of all on-site releases to the air, water, and land in 2010. Ten chemicals and chemical categories accounted for more than 99.9 percent of the on-site TRI chemical releases to the water. Those ten TRI chemicals were: nitrate compounds (96.5 percent of total releases to water), zinc and zinc compounds, manganese and manganese compounds, ammonia, barium and barium compounds, dimethylamine, cyclohexanol, methanol, n-methyl-2-pyrrolidone, and nickel and nickel compounds. Nitrate compounds are a common byproduct of industrial wastewater treatment processes and have consistently been reported as the chemical released in the highest quantity to the surface water.

Figure 4. Top Ten TRI Chemicals Released to Water On-Site in 2010

(from Section 5 of Form R.) The information presented here is in logarithmic, base 10 scale, which compresses the bar chart to show up to 840-fold magnitudes of the difference between **nitrate compounds and other chemicals**. Please note the scale mark of 1.000 means 1million pounds, the scale mark of 0.100 means 0.1 million pounds, etc. The number by the bars represents the quantity in millions of pounds followed by percent of total reported releases to water.



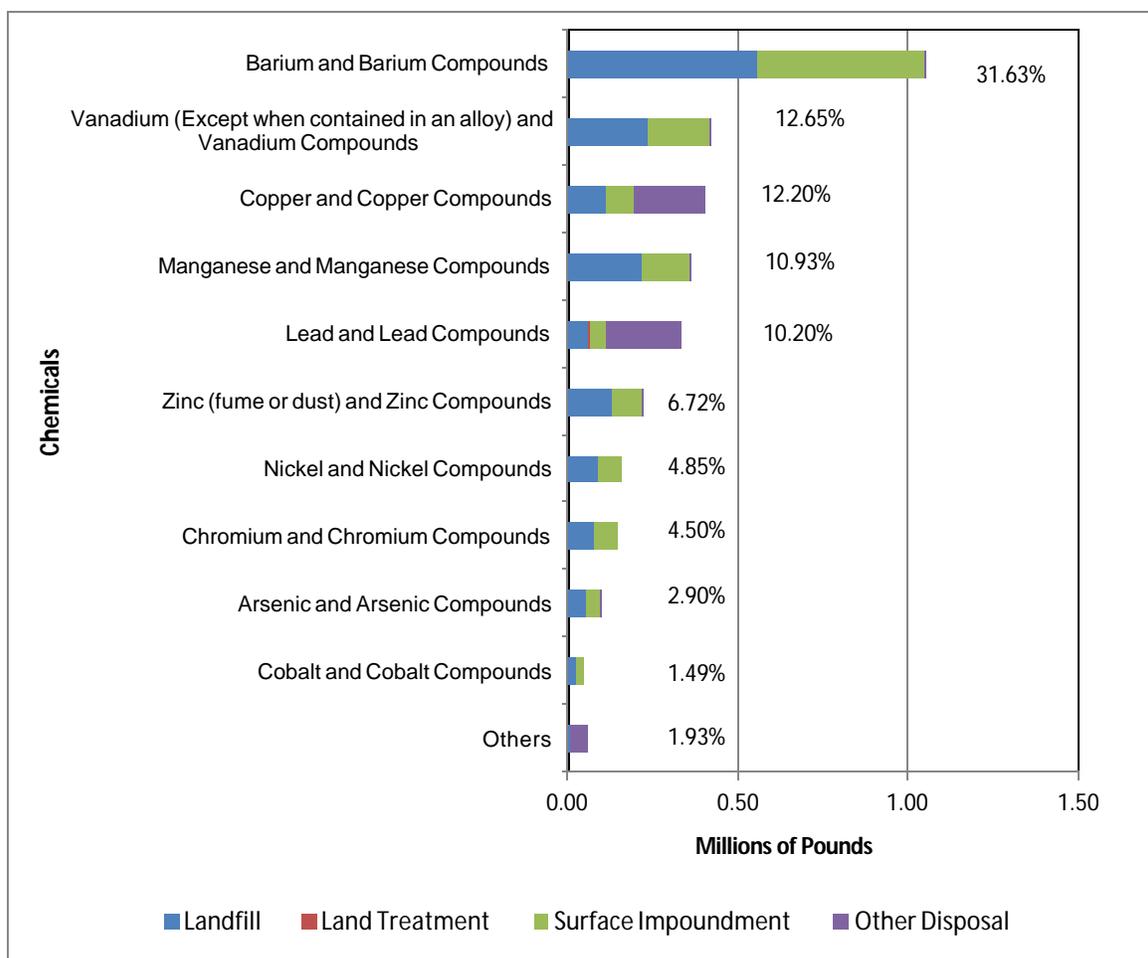
On-Site Releases to the Land

On-site releases to the land refer to landfilling, surface impoundment, land treatment/application farming, or any other release of a TRI chemical to land within the boundaries of a facility. Virginia does not permit underground injection as a method of hazardous waste disposal (nor was any reported) and no underground injection or Resource and Conservation Recovery Act (RCRA) Subtitle C-permitted land disposal of TRI chemicals was reported in 2010.

The total amount of TRI chemicals released to the land in Virginia during 2010 was approximately 3.3 million pounds. This accounted for 7.2 percent of all reported on-site TRI releases (releases to the air, water, and land). Ten TRI chemicals constituted approximately 98.1 percent of all of the TRI chemicals released to the land. They were: barium and barium compounds, vanadium and vanadium compounds, copper and copper compounds, manganese and manganese compounds, lead and lead compounds, zinc and zinc compounds, nickel and nickel compounds, chromium and chromium compounds, arsenic and arsenic compounds, and cobalt and cobalt compounds (Figure 5). Metals and metal compounds such as barium are found naturally in coal combusted for energy generation and in the ashes remaining after combustion of the coal.

Figure 5. Top Ten TRI Chemicals Released On-Site to the Land in 2010

(from Section 5 of Form R. The number next to each bar is the percent of total on-site land releases for all 2010 reported)



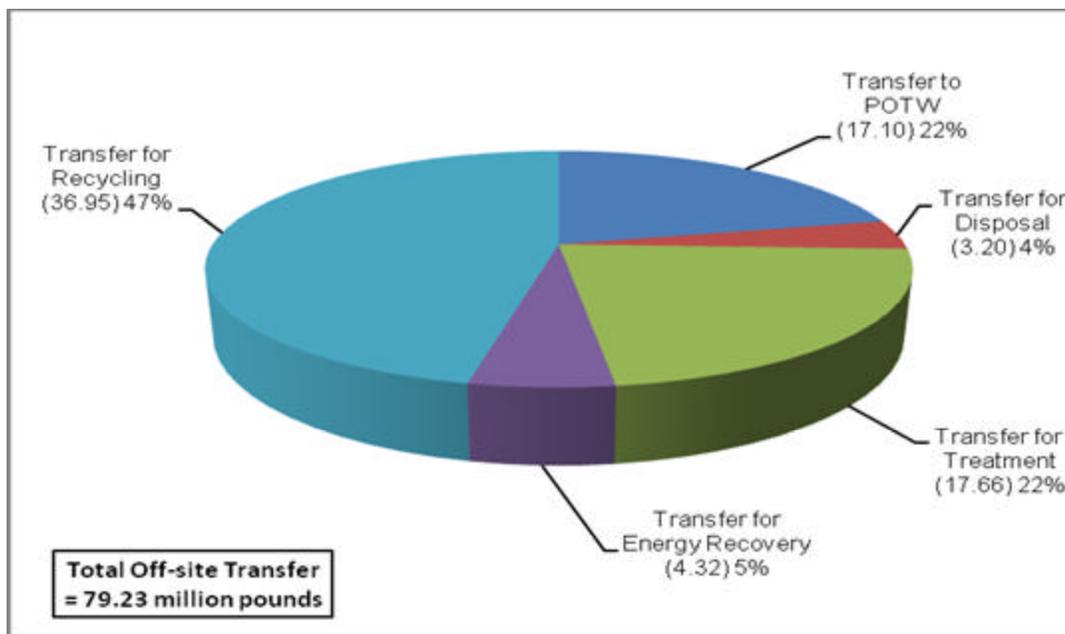
Part Three - Off-Site Transfers

Transfers refer to TRI chemicals sent off-site. Transfers are reported as transfers to POTWs or other off-site destinations, such as incinerators, landfills, or other facilities for treatment, recycling, energy recovery, or disposal that are not part of the reporting facility.

In this section, data was collected from Section 6 of Form R. For 2010, approximately 79.2 million pounds of TRI chemicals were reported as sent off-site for further management or disposal.

Figure 6. All Off-Site Transfers of TRI Chemicals for Reporting Year 2010

(from Section 6 of Form R. The number inside the parentheses is the quantity of transfers in each category in millions of pounds and the percent figure is the percent of total transfers.)

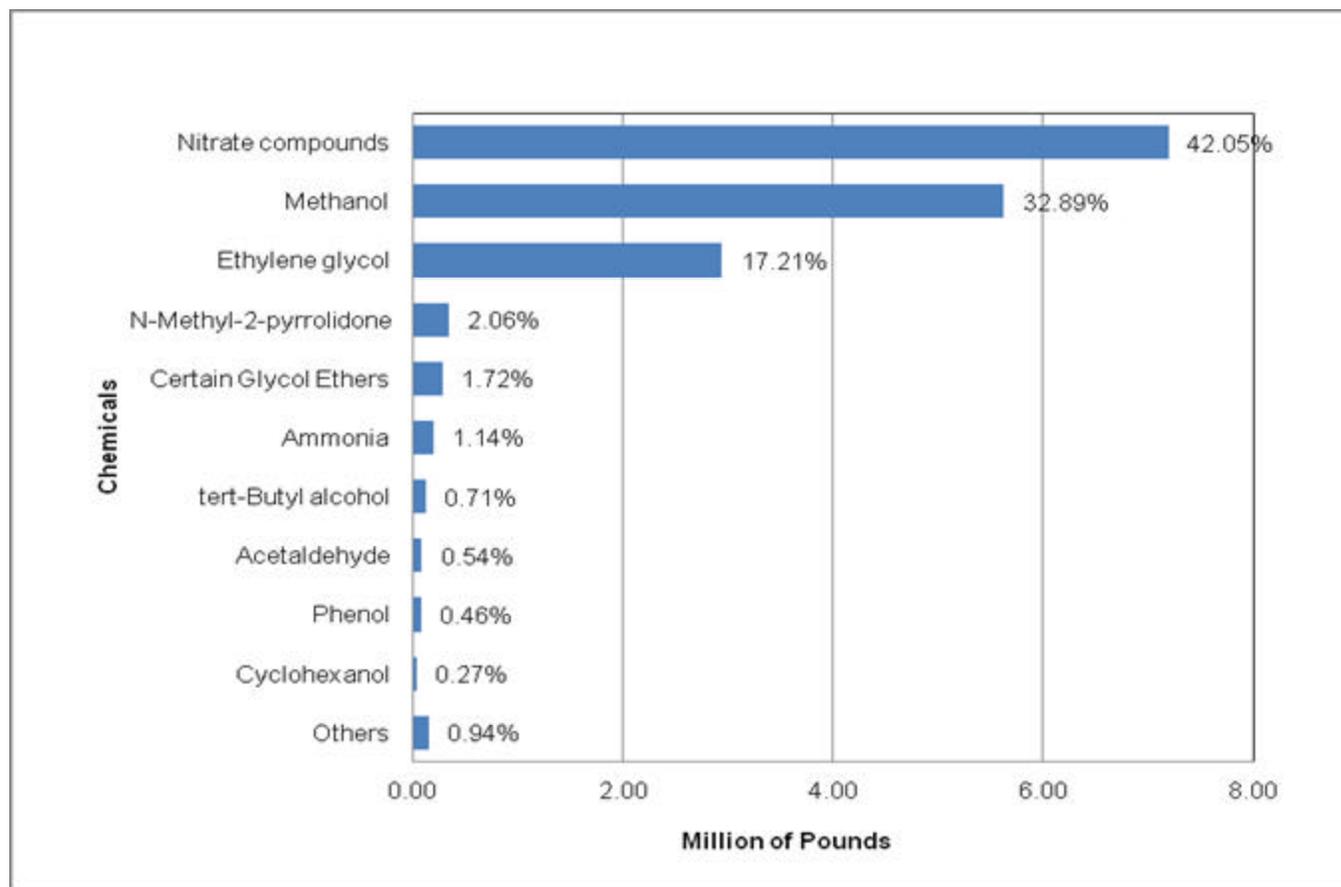


Transfers to Publicly-Owned Treatment Works (POTWs)

A POTW is a wastewater treatment facility that is owned by a state or local government. Wastewater from facilities reporting under TRI is transferred through pipes or sewers to the POTW. The TRI information summarized below reports transfers of a chemical to a POTW; however, this is not necessarily the same as the release of a chemical to the environment. TRI chemicals may be treated, destroyed, and/or removed from the environment in a POTW's physical, chemical, and biological treatment processes. Some TRI chemicals are almost completely destroyed by a POTW. However, not all chemicals can be treated or removed by a POTW. Some chemicals such as metals and metal compounds may be removed but not destroyed. These may ultimately be disposed of in a permitted landfill, disposed of in a permitted land application process, or released through a permitted discharge to receiving waters.

Ten TRI chemicals accounted for approximately 99.1 percent or 16.9 million pounds of the approximately 17.1 million pounds of TRI chemicals transferred to POTWs in reporting year 2010. Nitrate compounds were the leading pollutant discharged to POTWs for treatment for this reporting period. The other nine top-reported TRI chemicals transferred to POTWs in 2010 were: methanol, ethylene glycol, n-methyl-2-pyrrolidone, certain glycol ethers, ammonia, tert-butyl alcohol, acetaldehyde, phenol, and cyclohexanol.

Figure 7. Top Ten TRI Chemicals Transferred to Publicly-Owned Treatment Works (POTWs) in 2010 (from Section 6.1 of the Form R. The number next to each bar is the percent of total transfers to POTW)

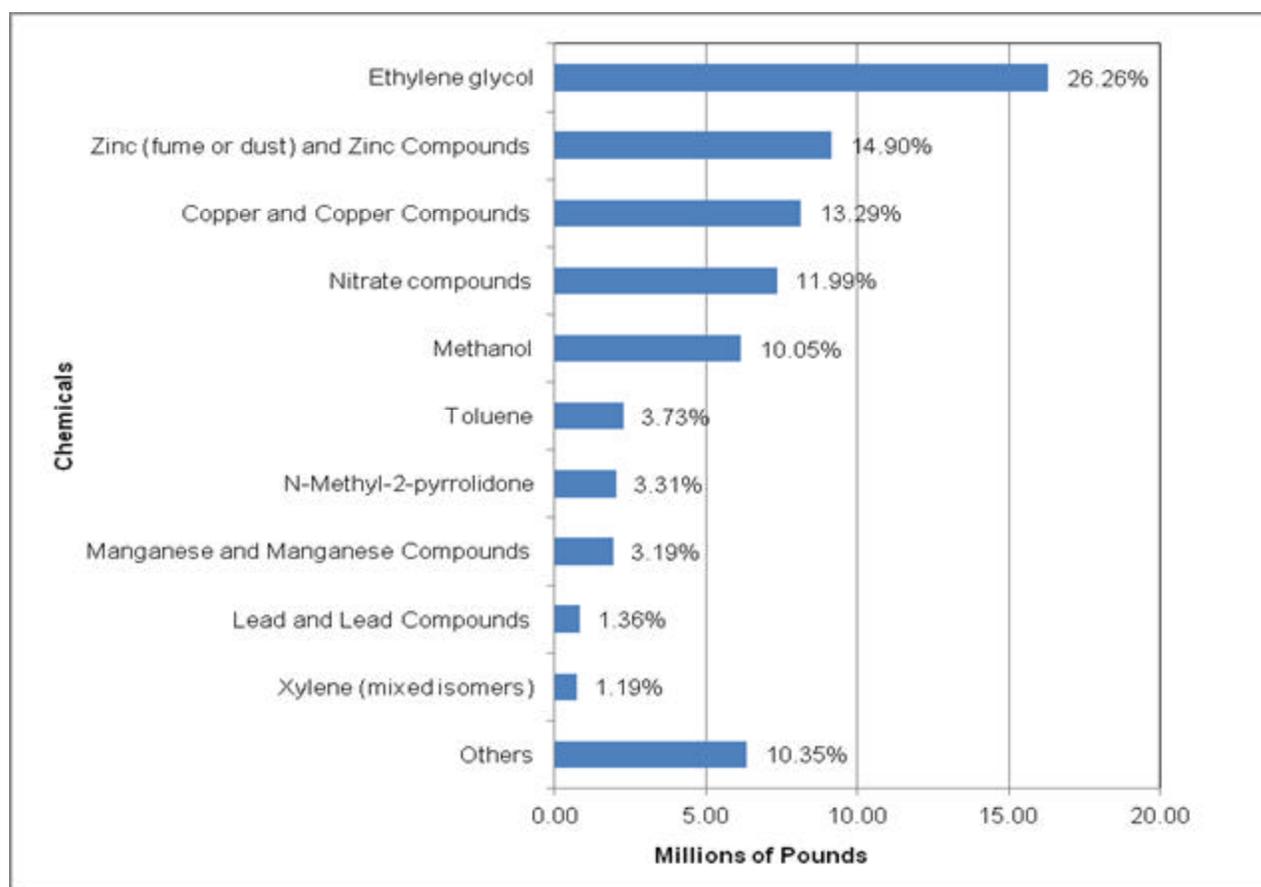


Transfers to Other Off-Site Locations

The Form R also reports the transfers of TRI chemicals to facilities other than POTWs. These off-site locations include incinerators, landfills, and other treatment, energy recovery, recycling, and/or disposal facilities. Off-site transfers can be to facilities located inside or outside of the Commonwealth.

In 2010 the total amount of TRI chemicals transferred to other off-site locations was approximately 62.1 million pounds. Ten TRI chemicals represented approximately 89.7 percent of the total TRI chemicals transferred off-site to locations other than POTWs. Those ten TRI chemicals and chemical categories transferred off-site to locations other than POTWs in 2010 were: ethylene glycol, zinc and zinc compounds, copper and copper compounds, nitrate compounds, methanol, toluene, n-methyl-2-pyrrolidone, manganese and manganese compounds, lead and lead compounds, and xylene (mixed isomers).

Figure 8. Top Ten TRI Chemicals Transferred to Off-Site Locations Other than POTWs in 2010 (from Section 6.2 of the Form R. The number next to each bar is the percent of total transfers to other off-site locations)



Part Four - On-Site and Off-Site Management

Under the Pollution Prevention Act of 1990, facilities subject to EPCRA Section 313 must report their source reduction and recycling activities. Consequently, EPA added Section 8 to the Form R to track production-related activities. Section 8 contains 11 subsections and requires facilities to extract and re-aggregate data reported in Sections 5 through 7 into releases (on- and off-site releases to the environment); off-site transfers/management; and on-site management categories. This part of Chapter One discusses all Section 8 data so that the relative methods of toxic chemical management can be compared.

Some of the data and information reported in Sections 5, 6, and 7 are handled differently for Section 8 reporting. The differences are that the releases-to-the-environment data in Section 8 exclude catastrophic releases and one-time events not associated with the production process. Furthermore, metal and metal compounds reported as transfers for off-site management in Section 6 are aggregated with the on-site release data from Section 5 as releases to the environment. Metal and metal compounds cannot be destroyed through treatment; hence, their final disposal is considered a release to the environment. There are other differences in how quantities are reported, so that the total toxics managed, as reported in Section 8, do not precisely match the total in Table 1. Also, Section 8 is the only part of the Form R that contains quantitative data on on-site waste management activities other than releases. While Section 7 contains qualitative information about on-site management practices, a subsection of Section 8 asks for quantitative data related to information reported in Section 7.

Consistent with the pollution prevention goal, Section 8 of Form R and its subsections also report additional information that addresses resource reduction efforts. In general, facilities utilize several options to manage TRI chemicals. Treatment of waste, both on-site and off-site, involves a variety of methods, including biological treatment, neutralization, incineration, and physical separation. Another option is on-site or off-site recycling. This involves the toxic chemicals in waste being recovered or reclaimed and being returned for further processing or being made available for use in commerce. Energy recovery involves the combustion of toxic chemicals in industrial furnaces or boilers that generate energy for on-site or off-site use. The least preferable and last management option is disposal, which is considered a release to the environment.

As reported in Section 8 of the 2010 facility reports, 894.3 million pounds of production-related TRI chemicals were released, treated, recycled, or recovered both on-site and off-site from Virginia facilities. Approximately 88 percent of the TRI chemicals were managed on-site, and 5 percent of the TRI chemicals were released into the environment on-site. About 7 percent of the TRI chemicals were transferred off-site to be managed by various means.

Chapter Two - 2010 TRI Data for PBT Chemicals

Persistent bioaccumulative toxic (PBT) chemicals are those that remain in the environment for long periods of time, are not readily destroyed, and build up or accumulate in body tissue. Because of these attributes, beginning with reporting year 2000, EPA added several PBT chemicals to the TRI reporting list, and it lowered the reporting thresholds for 18 PBT chemicals and chemical categories. Beginning with reporting year 2001, lead and lead compounds were added to the PBT list, and their thresholds lowered to 100 pounds per year. Previously, lead and lead compounds had been treated as non-PBT chemicals.

For reporting year 2010, the Department received 312 reports and revisions for PBT chemicals, out of a total of 1,491 TRI reports and revisions (20.9 percent). Table 2 shows the reporting thresholds for the TRI PBTs. The table also shows that only seven of the 20 PBTs were reported as released, transferred, or managed by facilities in Virginia for reporting year 2010. Appendix G has facility-specific information for PBT chemicals.

Table 2. TRI Reporting Year 2010 Persistent Bioaccumulative Toxic (PBT) Chemicals - Reporting Thresholds and Number of Reports Received

CAS Number	Chemical /Chemical Category Name	Reporting threshold	Reports received
309-00-2	Aldrin	100 lbs.	0
191-24-2	Benzo(g,h,i)perylene	10 lbs.	30
57-74-9	Chlordane	10 lbs.	0
N150	Dioxin and Dioxin-Like Compounds	0.1 gram	30
76-44-8	Heptachlor	10 lbs.	0
118-74-1	Hexachlorobenzene	10 lbs.	0
465-73-6	Isodrin	10 lbs.	0
7439-92-1	Lead	100 lbs.	92
N420	Lead Compounds	100 lbs.	84
7439-97-6	Mercury	10 lbs.	4
N458	Mercury Compounds	10 lbs.	34
72-43-5	Methoxychlor	100 lbs.	0
29082-74-4	Octochlorostyrene	10 lbs.	0
40487-42-1	Pendimethalin	100 lbs.	0
608-93-5	Pentachlorobenzene	10 lbs.	0
1336-36-3	Polychlorinated biphenyls (PCBs)	10 lbs.	0
N590	Polycyclic aromatic compounds (PACs)	100 lbs.	38
79-94-7	Tetrabromobisphenol A (TBBPA)	100 lbs.	0
8001-35-2	Toxaphene	10 lbs.	0
1582-09-8	Trifluralin	100 lbs.	0

Table 3 on page 18 provides an overview and summary of 2010 PBT data. The data are organized as in Table 1, Chapter 1. In order to avoid duplicate counting, data extracted and re-aggregated in Section 8 from Sections 5 and 6 of Form R have not been included as "On-Site Management" in Table 3.

Table 3. Summary of Data by Type of Release, Transfer, and On-Site Management for PBT Chemicals

(Dioxin and dioxin-like compounds are listed separately from the "Other PBT Chemicals" column because they were reported in grams, while the other PBT chemicals were reported in pounds. A conversion to pounds is shown in parentheses.)

ON-SITE RELEASES BY MEDIA (Section 5 of Form R)	Dioxin and dioxin-like compounds* in amounts for the year	Other PBT chemicals in amounts for the year
Total Air	10.42 g (0.0229lbs.)	26,087.08 lbs.
Fugitive Air	0.03 g (0.0000 lbs.)	4,146.41 lbs.
Stack Air	10.39 g (0.0229 lbs.)	21,940.67 lbs.
Water	1.35 g (0.0030 lbs.)	2,954.41 lbs.
Land	0.62 g (0.0014 lbs.)	338,012.45 lbs.
Total On-Site Releases to Media	12.39 g (0.0273 lbs.)	367,053.94 lbs.
OFF-SITE TRANSFERS BY TYPE (Section 6 of Form R)		
Publicly Owned Treatment Works (POTWs) (includes metals and metal compounds)	0.00 g (0.0000 lbs.)	1,297.99 lbs.
Total Other Off-Site Transfers	2.83 g (0.0062 lbs.)	978,126.73 lbs.
Off-Site Transfers for Recycling	0.00 g (0.0000 lbs.)	587,231.85 lbs.
Off-Site Transfers for Energy Recovery	0.00 g (0.0000 lbs.)	59.27 lbs.
Off-Site Transfers for Other Treatment	0.00 g (0.0000 lbs.)	3,685.61 lbs.
Off-Site Transfers for Disposal	2.83 g (0.0062 lbs.)	387,150.00 lbs.
Total Off-Site Transfers	2.83 g (0.0062 lbs.)	979,424.72 lbs.
ON-SITE MANAGEMENT (Section 8 of Form R)		
Treated On-Site	0.42 g (0.0009 lbs.)	5.40 lbs.
Recycled On-Site	0 g (0 lbs.)	185,776.11 lbs.
Energy Recovery On-Site	0 g (0 lbs.)	0.00 lbs.
Total On-Site Management	0.42 g (0.0009 lbs.)	185,781.51 lbs.
Total PBT Chemicals Released On-site, Transferred Off-site, and Managed On-site by Reporting Facilities	15.64 g (0.0344 lbs.)	1,532,260.17 lbs.

* Facilities are allowed to report PBT chemicals up to 7 decimal places accuracy. For presentation purposes the summary amounts in this table have been rounded; however, the integrity of facility reported data has been maintained in the database. The specific data that was reported by each facility is provided in Appendix G.

Comparing Table 3 (PBT information) to Table 1 (information on all TRI chemicals), the amount of reported PBTs released on-site (367,054 pounds) was approximately 0.8 percent of the total TRI chemicals released on-site to the environment. The reported PBTs managed on-site (185,781 pounds) were less than one percent (0.02 percent) of the total TRI chemicals managed on-site. The reported PBTs transferred off-site for treatment, recycling, energy recovery, or disposal (979,425 pounds) were approximately 1.2 percent of the total TRI chemicals transferred off-site. In reporting year 2009, the on-site releases of PBT contributed to 0.6 percent of the total releases, 0.02 percent of on-site management, and 1.2 percent of off-site transfers.

Information on the amounts of each individual chemical or chemical category released on-site, transferred off-site, and managed on-site for the seven PBT chemicals reported by Virginia facilities is provided in Table 4.

Table 4. Reporting Year 2010 Amounts of TRI PBT Chemicals released on-site, transferred off-site, and managed on-site by PBT

(Dioxin and Dioxin-like compounds have been converted to pounds and included in the totals)

Chemical Name	Released On-Site (in pounds)	Transferred Off-Site (in pounds)	Managed On-Site (in pounds)
Benzo(g,h,i)perylene	242.62	506.95	2,856.90
Dioxin and Dioxin-Like Compounds	0.03	0.01	0.00
Lead	96,437.83	138,311.49	1,360.00
Lead Compounds	258,064.59	831,373.34	0.01
Mercury	8.00	671.00	0.00
Mercury Compounds	2,157.67	228.88	0.00
Polycyclic aromatic compounds (PACs)	10,143.22	8,333.07	181,564.60
Total for all 7 chemical/categories	367,053.96	979,424.74	185,781.51

Of the PBTs listed in Table 4, lead and lead compounds, and polycyclic aromatic compounds (PACs), represented the most reported on-site releases to the environment, off-site transfers, and on-site management of PBT chemicals. Lead and lead compounds contributed to the bulk (96.6 percent) of the PBT on-site releases. Referring back to Figure 5 in Chapter 1, lead and lead compounds ranked fifth in chemicals released on site to land in Virginia. Releases of lead and lead compounds and mercury and mercury compounds to the air (via stacks) or to the land (through fly ash disposal) can result from coal or oil combustion. PACs may form as a result of incomplete combustion of coal or oil or as a by-product of other industrial processes. PACs found in the waste stream can contain adequate British thermal units (BTUs) for energy recovery from incinerated waste.

Table 5 data show the distribution of PBTs versus reported activities (manufacture, process, or otherwise use). A facility may report more than one type of activity for a single TRI chemical.

Table 5. Activities and Uses of PBT chemicals at facilities (from Section 3 of the Form R) for 2010

Chemical Name	Activities Reported						
	manufacturing only	processing only	otherwise use only	both manufacturing & processing	both manufacturing & otherwise use	both processing & otherwise use	manufacturing & processing & otherwise use
Benzo(g,h,i)perylene	23	17	12	8	8	0	3
Dioxin and Dioxin-Like Compounds	28	3	0	1	0	0	0
Lead	29	67	35	14	9	8	4
Lead Compounds	54	55	51	9	18	5	23
Mercury	0	3	4	0	0	3	0
Mercury Compounds	31	19	22	5	8	0	13
Polycyclic aromatic compounds (PACs)	28	18	19	6	13	0	4
Total for all 7 chemical/categories	193	182	143	43	56	16	47

Table 5 shows that “manufacturing only” was the most frequently reported activity (193) involving PBT chemicals. Manufacturing was followed by “processing only” (182) and “otherwise use” (143). The major industrial sectors that reported processing of lead or lead compounds were the furniture and fixture industries; stone, clay, glass, and concrete products industries; primary metal and fabricated metal products industries; electronic or electrical equipment manufacturers; petroleum bulk plant operators; and manufacturer of transportation equipment. Dioxin and dioxin-like compounds are normally a product of incomplete combustion of waste streams containing chlorinated products. Lead or lead compounds can be co-manufactured under chemical manufacturing processes or as a by-product of fuel (coal or fuel oil) combustion. Industries such as primary metal; stone, clay, and glass products; transportation equipment manufacturers; electric power generation facilities; solvent recovery facilities; and paper and allied products industries were key reporters of lead compounds and mercury compounds in all three (manufacturing, processing, and otherwise used) activities.

Chapter Three – Industrial Sectors, Facilities, and Locations

In this chapter, data is presented by industrial sectors, as identified by the primary North American Industry Classification System Code (Part One), facilities (Part Two), and facility locations (Part Three). The chapter identifies the top ten Virginia industrial sectors, facilities, and facility locations (also referred to as jurisdictions) based on the reported on-site releases and the total on-site management of TRI chemicals.

As with Table 1 (Chapter 1) and Table 3 (Chapter 2), in order to avoid double counting, the data in this chapter for on-site management do not include the data extracted and re-aggregated from Sections 5 and 6 of Form R. Complete rankings of industrial sectors, facilities, and jurisdictions are included in the appendices H, I, and J.

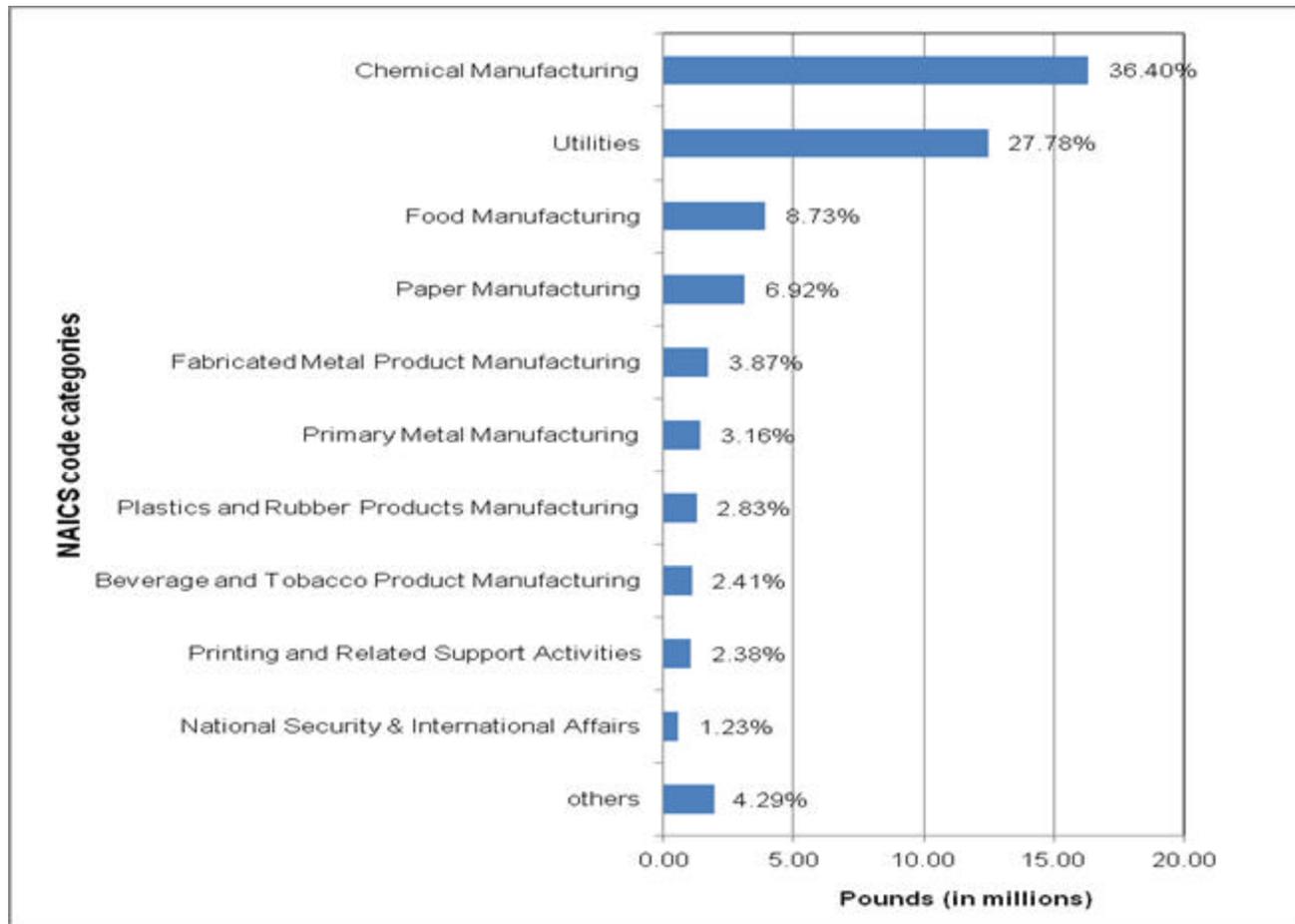
Part One - Industrial Sectors

Industrial Sectors Reporting On-Site Releases of TRI Chemicals

Twenty-six industrial sectors, including federal facilities, are subject to TRI reporting requirements (see Appendix C). The three industrial sectors reporting the most on-site releases of TRI chemicals for 2010, based on the primary North American Industrial Classification System (NAIC) Code, were: chemical manufacturing; utilities (electric, gas, and sanitary services); and food manufacturing. These three sectors contributed to 72.9 percent of the total on-site releases to the environment. The remaining industrial sectors for 2010 were: paper manufacturing, fabricated metal product manufacturing, primary metal manufacturing, plastics and rubber manufacturing; beverage and tobacco product manufacturing; printing and related support activities; and national security and international affairs. A complete ranking of industrial sectors reporting on-site TRI releases is provided in Appendix H-1.

Figure 9. Top 10 Reporting Industrial Sectors (based on NAICS codes) Releasing TRI Chemicals On-Site in Virginia for 2010

(from Section 5 of the Form R. The number next to each bar is the percent of total on-site releases for all 2010 chemicals reported.)

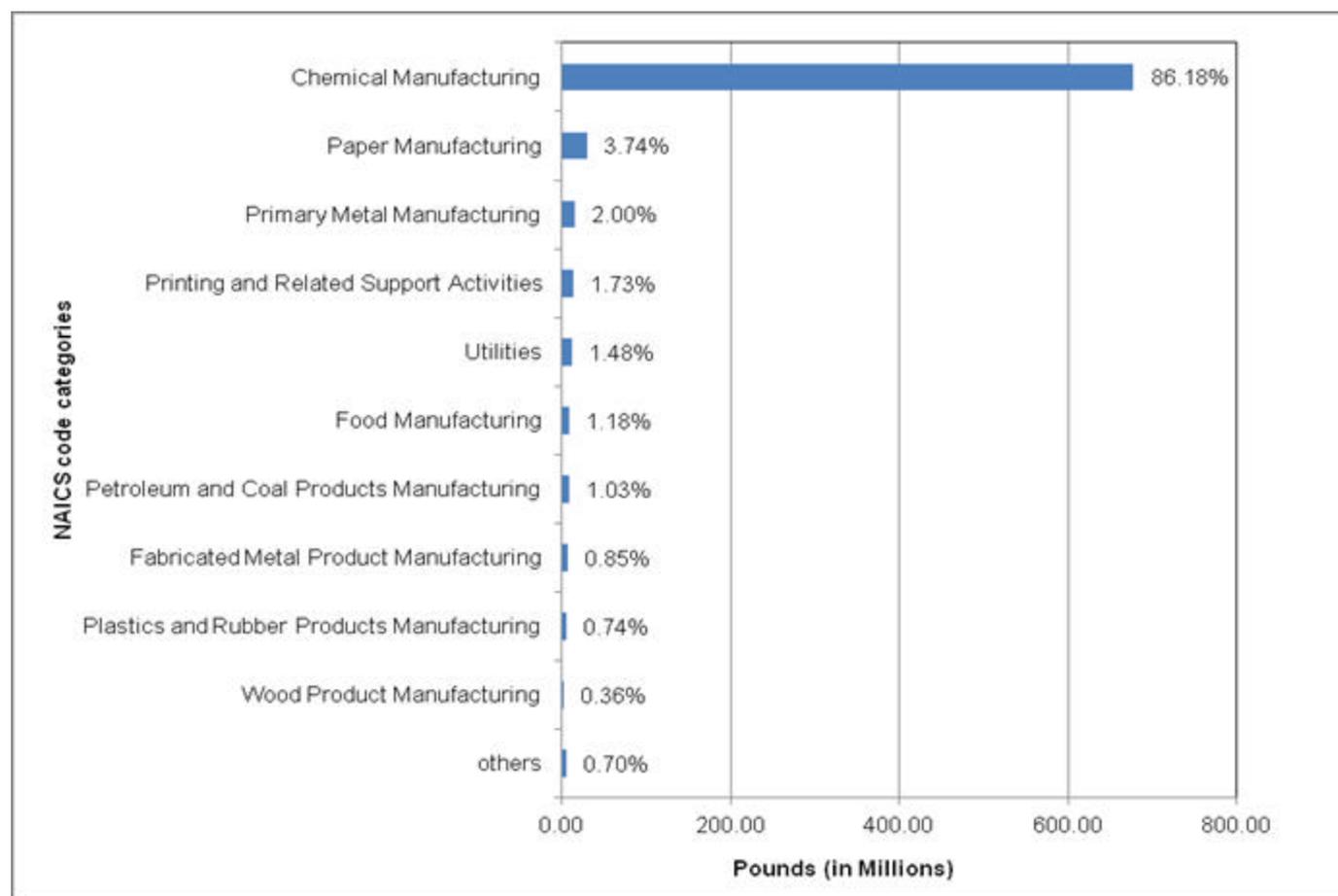


Industrial Sectors Reporting On-Site Management of TRI Chemicals

The three industrial sectors reporting the most on-site management of TRI chemicals (see Figure 10) for 2010 based on the primary North American Industrial Classification System (NAICS) Code were: chemical manufacturing, paper manufacturing, and primary metal manufacturing. These three sectors contributed to 91.9 percent of the total of on-site management of TRI chemicals. The remaining top ten industrial sectors for 2010 were: printing and related support activities; utilities; food manufacturing; petroleum and coal products; fabricated metal products manufacturing; plastics and rubber manufacturing; and wood product manufacturing. A complete ranking of industrial sectors reporting on-site TRI management is provided in Appendix H-2.

Figure 10. Top 10 Reporting Industrial Sectors (based on NAICS codes) Managing TRI Chemicals On-Site in Virginia for 2010

(from Section 8 of the Form R. The number next to each bar is the percent total of on-site management for all 2010 chemicals reported. This figure does not include the data extracted and re-aggregated from Sections 5 and 6 of Form R.)



Part Two - Facilities

Facilities Reporting On-Site Releases of TRI Chemicals

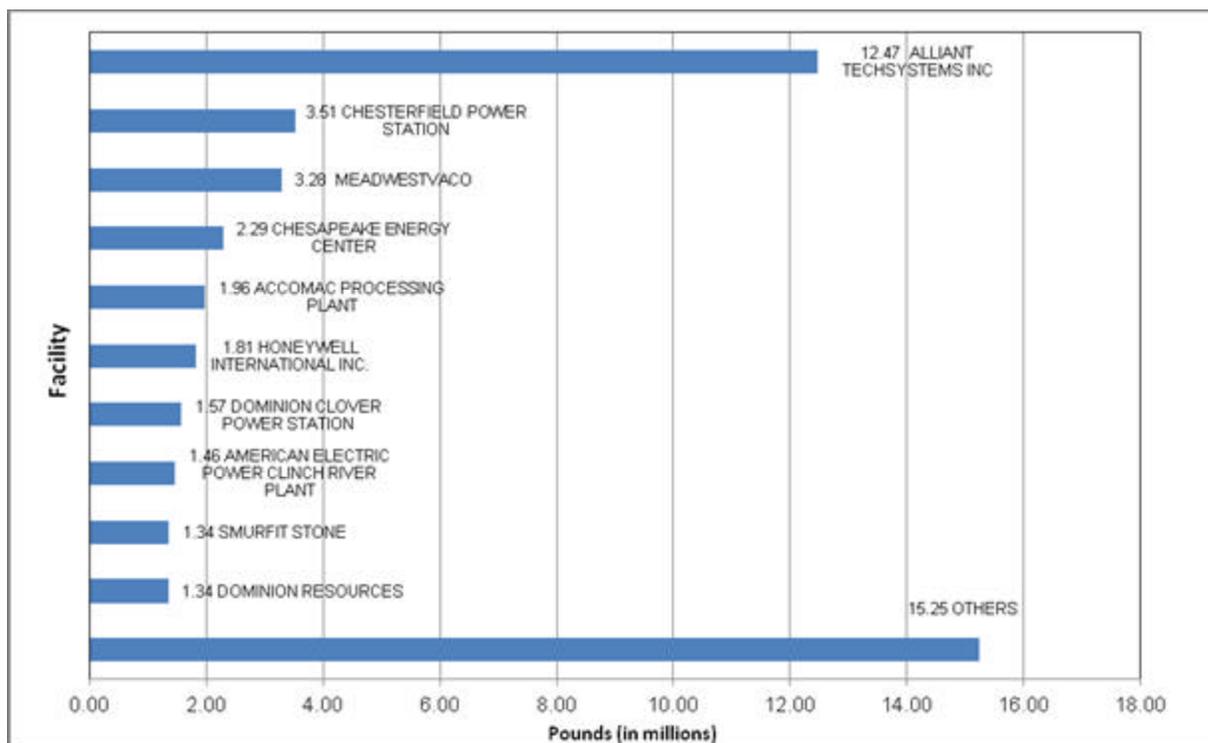
Virginia facilities that reported the highest contributions to the on-site release of TRI chemicals to the air (fugitive and stack), water, and land in 2010 were:

- Alliant Techsystems Inc. - Radford, Montgomery County
- Chesterfield Power Station - Chester, Chesterfield County
- Meadwestvaco of Virginia - Covington
- Chesapeake Energy Center – Chesapeake City
- Accomac Processing Plant – Accomack County
- Honeywell International Inc. – Hopewell
- Dominion Clover Power Station – Clover, Halifax County
- American Electric Power Clinch River Plant - Cleveland, Russell County
- Smurfit Stone – King William County
- Dominion Resources Yorktown Power Station – York County

These facilities accounted for 62.7 percent (31.03 million pounds) of all reported TRI releases to these media for 2010. Of the ten facilities, five are utility facilities, three are chemical manufacturing facilities; one is a paper manufacturing facility, and one is a food manufacturing facility. Figure 11 shows the quantity of TRI chemicals each of these facilities released in Virginia in 2010. See Appendix I-1 for a complete ranking of on-site releases by facility.

Figure 11. 2010 Top Ten Virginia Facilities Reporting Releases of TRI Chemicals On-Site

(from Section 5 of the Form R. The number next to each bar is the total on-site releases (in millions of pounds) for each facility.)



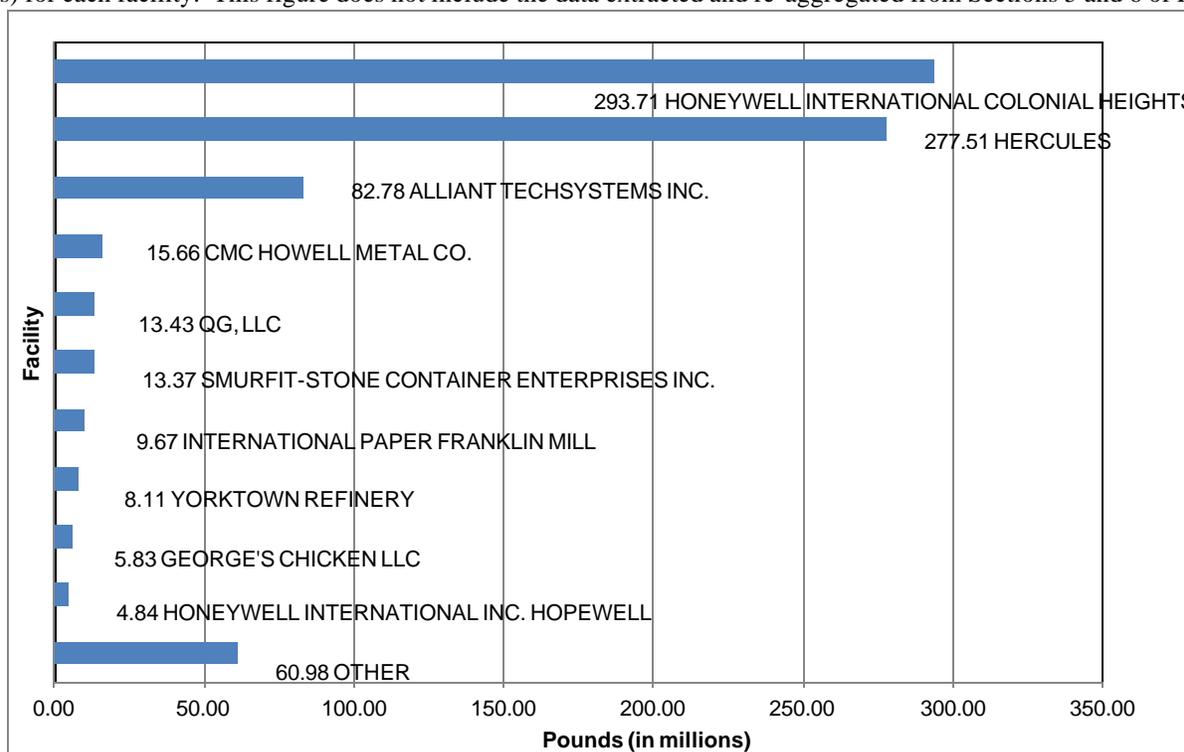
Facilities Reporting On-Site Management of TRI Chemicals

Figure 12 shows the ten Virginia facilities reporting management of the greatest quantity of TRI chemicals on-site in 2010 other than releases. These facilities were:

- Honeywell International Colonial Heights Plant - Colonial Heights, Hopewell
- Hercules Inc. - Hopewell
- Alliant Techsystems Inc. – Radford, Montgomery County
- CMC Howell Metal Co. – New Market, Shenandoah County
- QG, LLC - Henrico County
- Smurfit Stone Container, Enterprises Inc. - King William County
- International Paper Franklin Mill – Franklin, Isle of Wight County
- Yorktown Refinery - Grafton, York County
- George’s Chicken LLC – Edinburg, Shenandoah County
- Honeywell International - Hopewell

These facilities accounted for approximately 92.2 percent (724.9 million pounds) of all reported on-site management (other than releases) in 2010. Figure 12 shows the quantity of TRI chemicals each of these facilities managed on-site in Virginia in 2010. Of the ten facilities, four are chemical manufacturing facilities; two are paper manufacturing facilities; one is a petroleum and coal products manufacturing facility; one is a primary metal manufacturing facility, one is a food manufacturing facility, and one is a primary metal manufacturing facility. See Appendix I-2 for a ranking of on-site management by facility.

Figure 12: 2010 Top Ten Virginia Facilities Managing TRI Chemicals On-Site, Other than Releases(from Section 8 of the Form R. The number next to each bar is the total on-site management (in millions of pounds) for each facility. This figure does not include the data extracted and re-aggregated from Sections 5 and 6 of Form R)



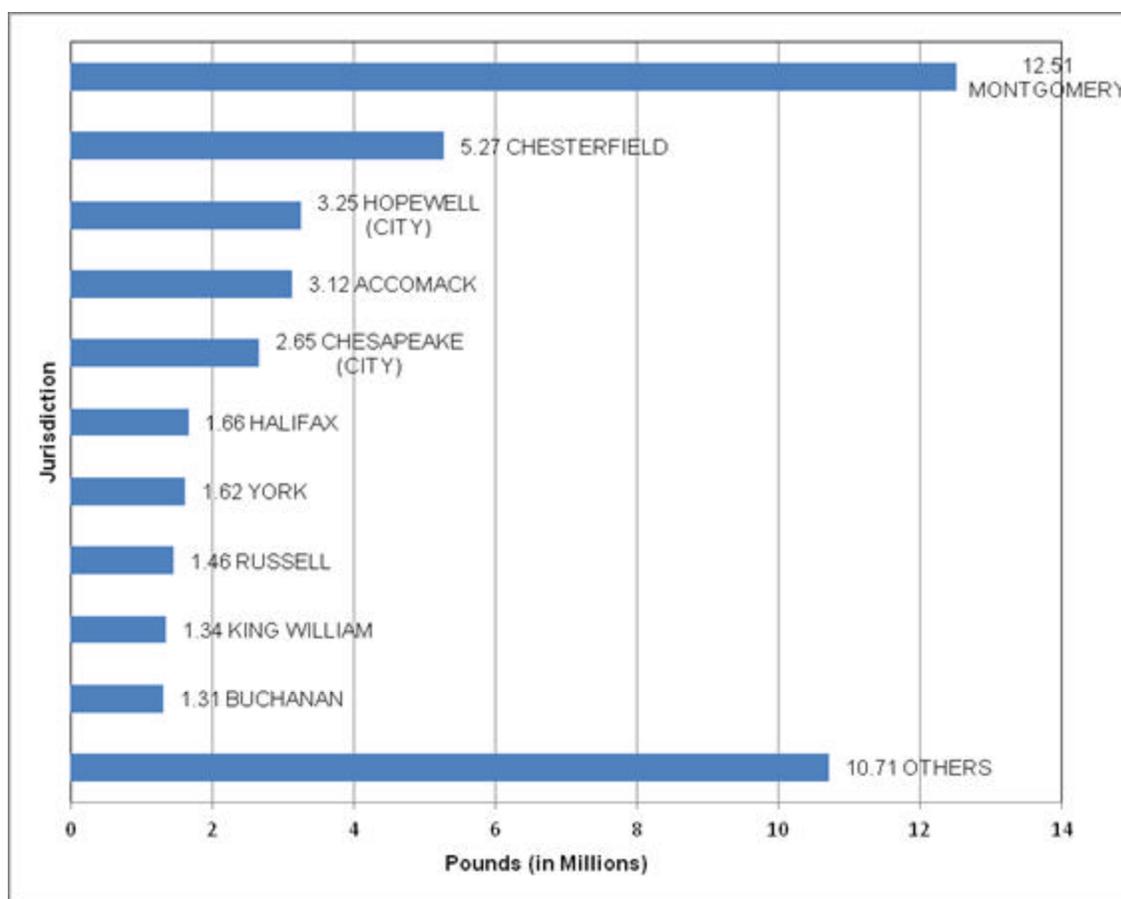
Part Three - Jurisdictions

Jurisdictions with Facilities Reporting On-Site Releases of TRI Chemicals

The Virginia jurisdictions (counties and independent cities) with facilities having the largest reported amount of total TRI chemicals released on-site to the environment (air, water, and land) in 2010 were as follows: Montgomery County, Chesterfield County, Hopewell (city), Accomack County, Chesapeake (city), Halifax County, York County, Russell County, King William County, and Buchanan County. The reported on-site releases occurring within these jurisdictions comprised 73.9 percent (34.2 million pounds) of the total TRI chemicals released on-site into the Virginia environment by reporting facilities in Virginia.

Appendix J-1 of this document contains a ranking of jurisdictions by the on-site releases of facilities located in each jurisdiction. Furthermore, Appendices F and G contain detailed information about facilities located in these jurisdictions.

Figure 13. 2010 Top Ten Virginia Jurisdictions for On-Site TRI Releases Reported by Facilities (from Section 5 of the Form R). The number next to each bar represents the total on-site releases (in millions of pounds) for each jurisdiction.



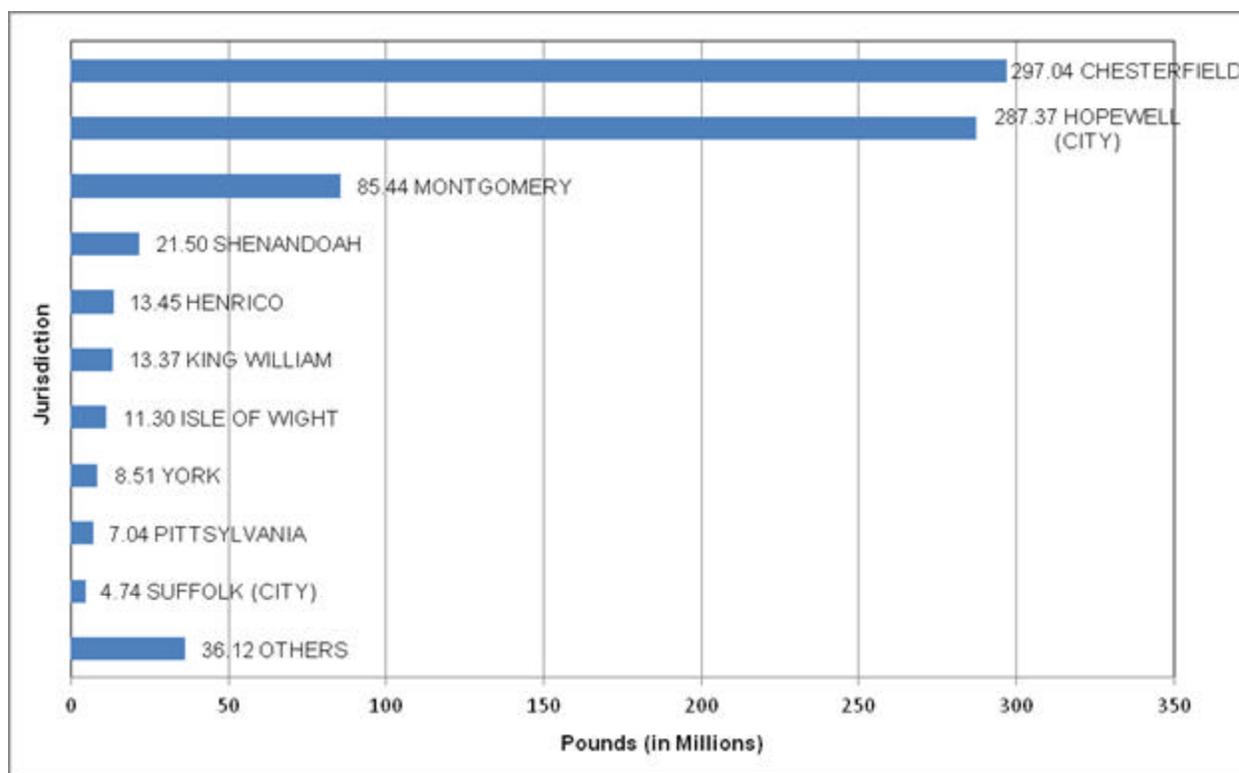
Jurisdictions with Facilities Reporting Other On-site Management of TRI Chemicals

The Virginia jurisdictions with facilities having the largest amount of total reportable TRI chemicals managed on-site (other than releases) were: Chesterfield County, Hopewell (city), Montgomery County, Shenandoah, Henrico County, King William County, Isle of Wight County, York County, Pittsylvania County, and Suffolk (city). The on-site management of these chemicals in these jurisdictions comprised 95.4 percent (749.8 million pounds) of total TRI chemicals managed on-site (other than releases) by reporting facilities in Virginia.

Appendix J-2 of this document contains a ranking of jurisdictions by the on-site management of facilities located there. Furthermore, Appendices F and G contain detailed information about facilities located in these jurisdictions.

Figure 14. 2010 Top Ten Virginia Jurisdictions for TRI Chemicals Managed On-Site as Reported by Facilities:

(from Section 8 of the Form R. The number next to each bar is the total on-site management (in millions of pounds) for each jurisdiction. This figure does not include the data extracted and re-aggregated from Sections 5 and 6 of Form R.)



Chapter Four – Virginia TRI Historical Comparison

Since its inception, the Toxics Release Inventory (TRI) program has been expanding and evolving, providing more information to the public about the presence and release of toxic and hazardous chemicals in communities. Over the past 24 years, various regulatory changes have occurred. In addition, facilities are authorized to revise reports from previous years. This makes direct comparison of current data to historical reports difficult and potentially misleading. Appendix E provides further information about the changes in reporting requirements, and sets out limited historical data that have been standardized.³

Nevertheless, reporting years 2008, 2009 and 2010 are generally comparable, and Chapter Four presents data for those three years. All revisions for these reporting years received on or before January 16, 2012, have been incorporated into this chapter. It should be noted, however, that beginning with reporting year 2001, lead and lead compounds were re-designated as PBT chemicals, and the threshold for reporting was reduced to 100 pounds. This caused facilities to submit more reports for lead and lead compounds for reporting years 2001 through 2008.

Table 6 compares TRI data for reporting years 2008 to 2010 by type of release, transfer, and on-site management.

For reporting year 2010 the total amount of on-site releases shows a decrease from the corresponding amount for reporting year 2009; off-site transfers increased and on-site management decreased from the corresponding amount for reporting year 2009. From 2009 to 2010 the total TRI chemicals released on-site, transferred off-site, or managed on-site increased by 1.1 percent.

The most noticeable change for the on-site releases in Table 6 is a 5.8 percent decrease in on-site releases to air and a 2.7 percent decrease in on-site release to water. There was an overall decrease of 4.2 percent for on-site releases from 2009 to 2010.

Table 6 also shows that the management of TRI chemicals through treatment, recycling, or energy recovery decreased in 2010. The most notable change for the 2009 report data was the decrease in on-site energy recovery. The overall quantities of TRI chemicals managed on-site decreased by 0.3 percent for 2010.

The overall quantities of TRI chemicals transferred off-site for further management or disposal increased by 22.5 percent from 2009 to 2010.

Longer term trends can be seen in the last column of Table 6. Over the three years, on-site releases of TRI chemicals decreased 6.7 percent, off-site transfers decreases by 3.6 percent, and on-site management decreased by 8.2 percent. From 2008 through 2010, Virginia facilities reported a 7.7 percent decrease in the release, transfer, or other management of TRI chemicals.

³ The information in Appendix E is historical and is for general comparison only.
Virginia TRI Report – Summary of Data
from 2010 Facility Reports (issued March 2012)

Table 6. Comparison Summary Data by Type of Release, Transfer, and On-Site Management for TRI Chemicals for 2008, 2009, and 2010 (from Table 1)

MANAGEMENT ACTIVITIES	YR 2008 (POUNDS)	YR 2009 (POUNDS)	YR2010 (POUNDS)	changes 2009-2010	% change 2009- 2010	%change 2008- 2010
ON-SITE RELEASES						
AIR (TOTAL)	28,135,278.28	26,479,122.19	24,950,898.30	-1,528,223.90	-5.77%	-11.32%
FUGITIVE AIR	3,745,316.47	3,321,892.21	2,923,579.43	-398,312.80	-11.99%	-21.94%
STACK AIR	24,389,961.81	23,157,229.98	22,027,318.87	-1,129,911.10	-4.88%	-9.69%
WATER	18,517,343.84	18,510,323.67	18,015,631.90	-494,691.80	-2.67%	-2.71%
LAND	2,947,121.80	3,314,544.39	3,315,363.85	819.50	0.02%	12.49%
TOTAL	49,599,743.92	48,303,990.25	46,281,894.05	-2,022,096.20	-4.19%	-6.69%
OFF-SITE TRANSFERS						
POTW	19,247,765.19	17,505,710.11	17,097,584.24	-408,125.90	-2.33%	-11.17%
OTHER OFF-SITE TRANSFERS	62,900,306.15	47,200,231.11	62,135,336.42	14,935,105.30	31.64%	-1.22%
RECYCLING	23,839,514.18	16,902,708.97	36,951,977.43	20,049,268.50	118.62%	55.00%
ENERGY RECOVERY	11,890,050.07	8,172,615.25	4,323,545.54	-3,849,069.70	-47.10%	-63.64%
OTHER TREATMENT	20,585,545.89	17,395,939.21	17,657,248.24	261,309.00	1.50%	-14.23%
DISPOSAL	6,585,196.00	4,728,967.68	3,202,565.22	-1,526,402.50	-32.28%	-51.37%
TOTAL	82,148,071.34	64,705,941.22	79,232,920.66	14,526,979.40	22.45%	-3.55%
ON-SITE MANAGEMENT						
TREATED ON -SITE	129,318,937.56	107,812,282.91	90,926,987.52	-16,885,295.40	-15.66%	-29.69%
RECYCLED ON -SITE	696,216,440.00	667,902,995.35	688,774,463.08	20,871,467.70	3.12%	-1.07%
ENERGY RECOVERY ON -SITE	30,294,591.00	12,484,066.65	6,193,687.15	-6,290,379.50	-50.39%	-79.56%
TOTAL	855,829,968.56	788,199,344.91	785,895,137.75	-2,304,207.20	-0.29%	-8.17%
GRAND TOTAL	987,577,783.8	901,209,276.37	911,409,952.46	10,200,676.10	1.13%	-7.71%

Table 7 compares, in detail, the TRI data for PBT chemicals by type of release, transfer, and on-site management for reporting years 2008 to 2010. From 2008 to 2010, the total of PBT chemicals released on-site, transferred off site, or managed on-site decreased by 25.2 percent.

The most notable change for the 2010 report data was the increase in the on-site releases of PBT chemicals compared to 2009. Table 7 also shows a decrease in the release, transfer, or other management of PBT chemicals for reporting years 2008 to 2010.

Table 7. Comparison Summary Data by Type of Release, Transfer, and On-site Management for PBT chemicals for 2008, 2009 and 2010 (from Table 3)

MANAGEMENT ACTIVITES	YR 2008 (POUNDS)	YR 2009 (POUNDS)	YR2010 (POUNDS)	changes 2009-2010	% change 2009-2010	%change 2008- 2010
ON-SITE RELEASES						
AIR (TOTAL)	26,421.52	25,437.83	26,087.08	649.32	2.55%	-1.27%
FUGITIVE AIR	4,060.27	3,829.75	4,146.41	316.66	8.27%	2.12%
STACK AIR	22,361.25	21,608.01	21,940.67	332.66	1.54%	-1.88%
WATER	1,162.57	1,751.03	2,954.41	1,203.38	68.72%	154.13%
LAND	260,917.10	250,527.11	338,012.45	87,485.34	34.92%	29.55%
TOTAL	288,501.19	277,715.97	367,053.94	89,338.04	32.17%	27.23%
OFF-SITE TRANSFERS						
POTW	832.79	1,148.42	1,297.99	149.60	13.02%	55.86%
OTHER OFF-SITE TRANSFERS	1,274,247.91	797,687.47	978,126.73	180,439.30	22.62%	-25.69%
RECYCLING	902,666.63	543,843.84	587,231.85	43,388.00	7.98%	-34.94%
ENERGY RECOVERY	50.70	27.46	59.27	31.80	115.84%	16.90%
OTHER TREATMENT	2,056.60	710.53	3,685.61	2,975.10	418.71%	79.21%
DISPOSAL	369,473.98	253,105.64	387,150.00	134,044.40	52.96%	4.78%
TOTAL	1,275,080.70	798,835.89	979,424.72	180,588.83	22.61%	-25.63%
ON-SITE MANAGEMENT						
TREATED ON -SITE	60.27	5.00	5.40	0.40	8.00%	-91.04%
RECYCLED ON -SITE	322,281.81	169,820.00	185,776.11	15,956.10	9.40%	-42.36%
ENERGY RECOVERY ON -SITE	0.00	0.00	0.00	0.00	0.00%	0.00%
TOTAL	322,342.08	169,825.00	185,781.51	15,956.50	9.40%	-42.37%
GRAND TOTAL	1,885,923.97	1,246,376.86	1,532,260.17	285,883.30	22.94%	-25.21%

Chapter Five - Conclusion

The 2010 Virginia TRI Report is issued pursuant to Virginia Code §10.1-1186.1. The report has information on chemicals and chemical categories, activities involving their use, industrial sectors, facilities, and facility locations (jurisdictions).

The report provides information concerning listed toxic chemicals and chemical categories that are manufactured, processed, or otherwise used at Virginia facilities, including amounts released to the environment, transferred off-site, and managed on-site. Industry can use the data in a variety of ways, including as a measurement of progress toward reduction targets.

Since 1988, the amount of TRI chemicals released or otherwise managed has decreased. The data for reporting year 2010 shows a decrease in the amount of TRI chemicals released on-site. The data also indicate an increase in off-site transfers and a decrease in on-site management. At this time, it is not possible to predict with confidence whether these trends will continue.