DATA SOURCES, METHODOLOGIES, AND CONSIDERATIONS

Important public sources of data used in this report—discussed in the Data Guide—include the U.S. Department of Energy's (DOE) Manufacturing Energy Consumption Survey (MECS), EPA's Toxics Release Inventory (TRI) and relative Toxicity Scores from EPA's Risk-Screening Environmental Indicators (RSEI) model, EPA's National Emissions Inventory (NEI), EPA's *National Biennial RCRA Hazardous Waste Report* (BR), production data from the U.S. Geological Survey's (USGS) Mineral Commodity Summaries, and economic data from U.S. Department of Commerce (U.S. Census Bureau and Bureau of Economic Analysis).

Private sources of data are sector-specific; for example, cement kiln dust surveys for Cement Manufacturing, and information from the American Forest & Paper Association's Environmental, Health, and Safety Verification Program for Forest Products. These data sources are referenced in the sector chapter endnotes.

Normalization

The best available data for each sector are used to normalize the sectors' pollutant releases and management over time as described in the Data Guide.

As an example, the sector air emissions figures show air emissions from 1996 through 2005. In sections (b) and (c) of the figure showing trends in air emissions, data were normalized, often using the annual value of shipments (VOS), adjusted for inflation using 1996 dollars as the base year, or productivity data adjusted against the 1996 starting quantity. The formula for this adjustment is:

$$\text{Measures for Year 'A'} \times \frac{\text{1996 Normalized Data (\$ or production value)}}{\text{Year 'A' Normalizing Data (\$ or production value)}}$$

Dollars, when used for normalizing, are adjusted for inflation using U.S. Department of Commerce's Gross Domestic Product data, available at: http://bea.gov/national/xls/gdplev.xls.

For most sectors, value of shipment data are compiled based on the primary Standard Industrial Classification (SIC) (pre-1998) and North American Industry Classification System (NAICS) codes (1998 forward). For all other sectors, data are compiled directly from the source listed in the table in the Data Guide.

Production Data

The "At-a-Glance" section of each sector chapter presents a measure of the sector's output. As with normalizing, production data (e.g., tons of product produced annually by the sector) were the preferred metric for depicting the output of the sector. When production data were not available, alternate metrics were identified, as noted in the sector chapter endnotes.

Employment and Facility Counts

Data Processing

The County Business Patterns (CBP) data have been tabulated on a NAICS basis since 1998. Data for each sector are compiled for each metric based on the NAICS codes defining the sector. Data are available at: http://www.census.gov/epcd/cbp/view/cbpview.html.

Mapping

For most NAICS/SIC-defined sectors, the maps present facilities in the sector that are in one of EPA's data systems. EPA's data systems provide location information that can be used for mapping, although smaller facilities without federal permits or IDs are under-represented. For list-defined sectors (Cement Manufacturing and Iron & Steel), the maps present those facilities comprising the sector. For several sectors that are not well represented in EPA data systems, alternative data sources were used for developing the sector maps. These sectors are Construction, Colleges & Universities, and Ports. For Construction, U.S. Census Bureau information on the number of construction establishments per state was mapped. For Colleges & Universities, the map represents the institutions listed on www.collegeboard.com, maintained by the not-for-profit College Board association. For Ports, the map shows the U.S. ports listed on the American Association of Port Authorities website, available at: http://www.aapa-ports.org.

Energy Use

This report uses energy consumption data from the 2002 MECS published in 2005. DOE's Energy Information Administration (EIA) conducts the survey and defines the manufacturing sector as all manufacturing establishments (NAICS codes 31-33) in the 50 states and the District of Columbia.

Considerations

Detail of data

The Sector Strategies Program defines sectors based on 3-, 4-, 5-, and/or 6-digit NAICS code combinations. MECS energy consumption estimates for most manufacturing industries are only available at the 3-digit NAICS code level, although data for some select manufacturing sectors are available at the 6-digit NAICS code level. For the sectors in

this report, 2002 data at the 6-digit level are available for the Cement Manufacturing, Forest Products, Iron & Steel, and Metal Casting sectors.

Historical and current energy consumption data

The 2002 MECS sample size was approximately 15,500 establishments drawn from a sample frame representing 97-98% of the manufacturing payroll, which is approximately 60% of the establishments of the manufacturing sector. MECS data provide energy consumption by fuel type, including electricity, natural gas, residual fuel oil, distillate fuel oil, liquid petroleum gas, coal, coke, and other. The composition of the "other" fuels category varies from sector to sector. More detail is provided in individual sector chapters.

Although the 2002 MECS provides the most recent publicly available data on sector energy consumption, energy prices have undergone major changes in the last 6 years; the effects of such changes on sector energy consumption since 2002 are not reflected in the 2002 MECS data used in this analysis.

Energy consumption projections

For an overview of expected future trends for industrial energy consumption and associated carbon dioxide (CO_2) emissions, as well as energy projections for specific sectors, we referenced EIA's 2006 Annual Energy Outlook (AEO), EIA's most recent annual forecast of energy demand, supply, and prices through 2030.[1]

Energy efficiency and clean energy opportunities for manufacturing industries

We consulted industry-specific research conducted by DOE and research institutions such as the Ernest Orlando Lawrence Berkeley National Laboratory, as well as a number of online and hard-copy materials produced by industry trade associations that describe technological and process opportunities for increasing energy efficiency.

Industry commitments to environmental improvement with respect to energy use

We reviewed public-private partnership programs such as Climate VISION, which is supported by DOE, EPA, and the U.S. Departments of Transportation and Agriculture, and DOE's Industrial Technologies Program, for information on emerging industrial energy-efficient and clean energy opportunities for energy-intensive sectors, including developing technologies. Note that individual companies/facilities within each sector may also participate in other voluntary programs (e.g., ENERGY STAR, Performance Track, Climate Leaders, etc.).

Small businesses not included

MECS does not include small establishments, including those with fewer than 5 employees or those with 5 to 20 employees with annual payrolls and shipments below certain minimums.

Data Processing

This report uses MECS data on energy consumed for fuel-related purposes only (presented in MECS Table 3.2). MECS data are also available in terms of energy consumed for all purposes (or "first use," which includes fuels used as feedstocks); in terms of energy consumed for nonfuel purposes (primarily feedstocks); and in terms of consumption of fuels. While some industries use fuels as feedstocks—raw material inputs in the manufacturing process—feedstock-related fuel use may or may not contribute to criteria air pollutant (CAP) and greenhouse gas (GHG) emissions. As feedstock fuel use does not represent an opportunity for reducing the environmental impacts associated with energy consumption, the energy use sections of this report focuses on energy inputs for fuel use only. Units of measure are maintained in British thermal units (Btu). Data and documentation of EIA's data processing methodology used to develop sector energy consumption estimates are available online at: http://www.eia.doe.gov/emeu/mecs.

Air Emissions Reported to TRI

TRI was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and expanded by the Pollution Prevention Act of 1990. Section 313 of EPCRA provides three criteria defining the scope of facility owners/operators that report to EPA's TRI program:

1. The facility has 10 or more full-time employees, or the equivalent of 20,000 employee hours per year.

2. The facility is included in a list of applicable NAICS codes. The NAICS codes correspond to the following SIC codes: SIC 10 (except 1011, 1081, and 1094); 12 (except 1241); 20-39; 4911 (limited to facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce); 4931 (limited to facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce); 4939 (limited to facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce); 4953 (limited to facilities regulated under the Resource Conservation and Recovery Act (RCRA) Subtitle C, 42 U.S.C. section 6921 et seq.); 5169; 5171; and 7389 (limited to facilities primarily engaged insolvent recovery services on a contract or fee basis). Executive Order 13423 extended these reporting requirements to federal facilities, regardless of their SIC or NAICS code.

3. The facility manufactures (defined to include importing), processes, or otherwise uses any of the toxic chemicals listed on the EPCRA section 313 in amounts greater than the threshold quantities established in 40 Code of Federal Regulations (CFR) 372.25 and 372.28 in the course of a calendar year.

Facilities described above must report their releases and waste management quantities for a chemical included on the TRI list of toxic chemicals if they manufacture or process that chemical in quantities exceeding 25,000 lbs. within a calendar year, or otherwise use that chemical in quantities that exceed 10,000 lbs. per year in a calendar year. Reporting thresholds for TRI-listed chemicals designated by EPA as persistent bioaccumulative toxic (PBT) chemicals, such as lead and mercury, are lower.

In 2005, more than 23,000 facilities reported to EPA's TRI program. These facilities reported 4.4 billion lbs. of onsite and offsite disposal or other releases, which included 1.5 billion lbs. of air emissions, 242 million lbs. of water discharges, and 2.7 billion pounds of disposals. They also reported 25.1 billion lbs. of production-related waste managed.

Considerations

Comprises a list of reportable chemicals

Facilities in the TRI-reporting industry sectors must file if they exceed the reporting thresholds for any of the 600+ chemicals.

Only captures facilities above threshold

Note that only those facilities that exceed the TRI reporting thresholds are required to report to TRI; thus, TRI-reported trends may not be representative of the sector as a whole.

Small businesses not included

TRI excludes smaller facilities, that is, those with fewer than 10 employees.

Multimedia coverage

TRI reporting covers releases and other disposal to all environmental media (air, water, and land).

Changes in TRI requirements

Reporting thresholds for PBTs were lowered in reporting year 2000 (in 2001 for lead and lead compounds) to 10 lbs. or 100 lbs., depending on the chemical. These lower thresholds resulted in more facilities reporting, and caused significant increases in the quantities of some of the specific PBTs reported as released (including disposed) or managed as waste, such as lead and polycyclic aromatic compounds. However, given that the thresholds are so much lower than thresholds for non-PBTs, the increased quantities for this small group of chemicals usually did not influence overall sector trends for air emissions or waste management. The lower reporting threshold could also influence trends in hazardous air pollutants (HAPs), as many of the PBTs are also HAPs. The PBTs that are also HAPs are: chlordane, heptachlor, hexachlorobenzene, lead and lead compounds, mercury and mercury compounds, methoxychlor, polychlorinated biphenyls, polycyclic aromatic compounds, toxaphene, and trifluralin. Other changes to the TRI program, such as the addition of non-manufacturing industries in 1998, are not expected to influence trends for the sectors presented in this report.

Data accuracy

Facility owners/operators are responsible for TRI reporting using their best available information. The data facilities submit on releases and waste management quantities are calculated using one of the following methods: monitoring or measurement; mass balance calculations; emission factors; or engineering estimates. There is no independent verification of the accuracy of the submissions. The increasing use of direct electronic filing of TRI reports may reduce the potential for data processing errors. In 2005, 95% of the facilities submitting reports to TRI used electronic reporting.

Changes in best available information

Facilities are required to complete their TRI forms using their best available information. Industry representatives have pointed out that estimates of releases might change over time as more information becomes available. For example, while conducting measurements required by another regulation, such as emissions testing required by a National Emission Standard for Hazardous Air Pollutants, a facility may find a TRI-reportable chemical in its releases that it was not aware of previously. As facilities learn of the existence of various chemicals, they are then required to report those releases to TRI. This situation would result in an increased level of reported releases that is not necessarily accompanied by an increase in actual emissions.

Some sectors do not report

Facilities involved in oil and gas exploration and transportation, for example, are exempt from both TRI and BR. The publicly and privately owned marine facilities discussed in the Ports chapter also do not report to TRI, although their tenants may.

Data Processing

TRI data for reporting years 1996-2005 are sourced from the 2005 Public Data Release (PDR) for all but two sectors; data for Paint & Coatings and Shipbuilding & Ship Repair are drawn from the 2006 PDR. "Frozen" data are used to ensure reproducibility and to support later revisions of the analysis.

Trend data are normalized by changes in VOS or production, with 1996 as the baseline year.

For most sectors, data are compiled based on the most current primary SIC code reported on the TRI Form R. For example, if a facility reported differing primary SIC codes in reporting year 2004 and 2005, the primary SIC code from the most current available year (in this case 2005) was used. Similarly, if a facility did not report to TRI in 2005, data from the most recent year of available primary SIC code data were used. For the Cement Manufacturing and Iron & Steel sectors, and for the specialty-batch chemicals subsector, the sector TRI data are extracted based on predetermined facility lists. The count of the number of facilities reporting to TRI is a total of the number of unique

TRI identification numbers (IDs) in the sector. Each facility, as defined by the TRI program, should have one TRI ID.

For air emissions, TRI data elements for this report include:

- **Air Releases**—stack and fugitive emissions as reported in sections 5.1 and 5.2 of TRI Form R, respectively.
- **HAPs**—TRI includes all but six of the chemicals designated as HAPs, also known as "air toxics," by the Clean Air Act (CAA) Section 112b. HAPs are air pollutants that pose a direct threat to human health. TRI, rather than NEI, was used as the source for sector-level HAPs data; see discussion of "Criteria Air Pollutants" below. TRI was chosen as the data source primarily because TRI allows for an analysis of annual trends over a 10-year period, whereas NEI HAP data are available for 1999 and 2002 only. HAPs emissions include stack and fugitive emissions of the subset of TRI chemicals that are designated as HAPs, as reported in sections 5.1 and 5.2 of TRI Form R. The TRI HAP analysis in this report excludes three additional HAPs (4,4'-methylenediphenyl diisocyanate, hexamethylene-1,6-diisocyanate, and 2,3,7,8-tetrachlorodibenzo-p-dioxin), because these chemicals are reported to TRI only as part of larger chemical categories, and quantities of the individual chemicals released are not included in TRI.

For releases and management, data are presented in pounds (lbs). For toxicity-weighted results, data are presented as a ratio using 1996 as the baseline year.

Beginning with the 2006 reporting year, facilities reporting to TRI are required to use NAICS codes in place of the SIC codes previously used on TRI reporting forms. Facilities that report to TRI are required to use 2002 NAICS codes on reporting Form R and the Form A Certification Statement.[2]

Toxicity of Air Emissions

Aspects of RSEI influence the use of these modeled TRI data for EPA's Sector Strategies Program. Extensive documentation is available on the development of RSEI. Some of this information is summarized below. For more details, refer to EPA's Risk-Screening Environmental Indicators (RSEI) Methodology, Version 2.1.5, October 2007, available at: http://www.epa.gov/opptintr/rsei/pubs/method_oct2007.pdf.

Considerations

Uses highest relative toxicity weight for chemical categories

Because information on the chemical form released is not reported to TRI, chemicals within a chemical category (e.g., metal compounds, diisocyanates) are assumed to be released in the chemical form associated with the highest relative toxicity weight. The form of a chemical compound can affect its toxicity. For example, hexavalent chromium has an oral relative toxicity weight of 170 and an inhalation relative toxicity weight of 86,000; whereas trivalent chromium has an oral and inhalation relative toxicity weight of 0.33. TRI reports filed for "chromium" do not specify the valence, so all reported pounds of chromium are more conservatively assigned the relative toxicity weight of hexavalent chromium. In cases where a facility is releasing the chemical in the lower toxicity form, RSEI would overestimate toxicity-weighted results.

Comparing RSEI results

The numeric RSEI output depicts the relative toxicity of TRI releases for comparative purposes and is meaningful only when compared to other values produced by RSEI.

Excludes certain chemicals

There are 611 chemicals and chemical categories on the 2005 TRI Chemical List. Toxicity weights are available for 429 of these chemicals and chemical categories. Chemicals with relative toxicity weights account for more than 99% of the reported pounds for all on-site releases in 2005. If there is no relative toxicity weight available for a chemical, then the default Toxicity Score is zero. Examples of chemicals that do not have an assigned relative toxicity weight in RSEI include: dioxin and dioxin-like compounds, phenol, benzo(g,h,i)perylene, and tetrabromobisphenol-A.

Currently excludes toxicity weights for chemicals disposed

An inhalation relative toxicity weight is used for fugitive and stack air releases. An oral relative toxicity weight can be used for direct water releases, but is not included in this report. Releases to land and other disposal are not modeled because necessary data on site-specific conditions are lacking.

Acute human or environmental toxicity not addressed

RSEI addresses chronic human toxicity (cancer and non-cancer effects, e.g., developmental toxicity, reproductive toxicity, neurotoxicity, etc.) associated with long-term exposure but does not address concerns for either acute human toxicity or environmental toxicity.

Results presented do not include a risk perspective

Toxicity weighting of a chemical is not the same as identifying the risk potentially posed by a release of the chemical to the environment. "Risk" in that context would rely on additional information, such as the fate and transport of the chemical in the environment after it is released, the pathway of human exposure, the amount of chemical to which human subjects are exposed, the duration of exposure, and the amount of the chemical that enters the human body following exposure. Although the RSEI model can provide a relative risk-related perspective for air releases, only the toxicity portion of the model was used in the analysis for this report. Risk-related factors were not considered. Readers interested in the risk perspective for a facility or sector can use the publicly available RSEI model to conduct this screening-level risk analysis.

Data Processing

RSEI calculates toxicity-weighted results for each chemical by multiplying the quantity of chemical released to air by a chemical-specific toxicity weight. Results are then summed across chemicals to present overall sector-wide results. The toxicity weight is a relative value and is presented in this report relative to the sector's total 1996 toxicity-weighted results for all air emissions. Focusing on toxicity provides an alternative perspective to typical quantity-based environmental loadings and moves the discussion forward towards an impact-based assessment.

TRI documentation is available at: http://www.epa.gov/tri. RSEI model documentation is available at: http://www.epa.gov/opptintr/rsei.

Criteria Air Pollutants

EPA prepares the NEI based on input from numerous state, tribal, and local air pollution control agencies; industry-submitted data; data from other EPA databases; as well as emission estimates. State and local emissions inventories are submitted to EPA once every three years for most point sources contained in NEI. Through the 1999 NEI, EPA estimated emissions for any jurisdiction that did not submit an emissions inventory and where data were not available through industry submissions or other EPA databases. As a result of the Consolidated Emissions Reporting rule, NEI updates for 2002 and beyond are expected to include data uploads from all jurisdictions. The CAP and volatile organic compound (VOC) data presented in the sector chapters include emissions from point sources, and not emissions from area and mobile sources.

Considerations

Frequency of NEI

NEI data are released triennially, which limits the number of data points for a time-series analyses. The report includes data only from 2002, because data from prior years are not comparable or present other data challenges.

NEI HAP data

In addition to CAP data, NEI also includes data on the CAA designated HAPs. This report presents HAP data from TRI rather than NEI, primarily because TRI allows for annual trend analyses. NEI, in contrast, is generated every three years. Currently, the 1990 and 1996 NEI databases are not recommended for use due to unusable format or data quality concerns.

Data Processing

Final v3 2002 NEI Point Source CAP data were obtained from EPA's Clearinghouse for Inventories & Emissions Factors (CHIEF). Data and documentation are available at: http://www.epa.gov/ttn/chief/net/index.html.

For most sectors, data are compiled based on the facilities' SIC or NAICS codes as included in the NEI. For the Cement Manufacturing and Iron & Steel sectors and for the specialty-batch chemicals subsector, NEI data are extracted based on a predetermined list of facilities.

For particulate matter (PM) emissions, this report presents PM-Primary, which includes both the filterable and condensable portions of PM emissions.

Greenhouse Gases

For information regarding GHGs, this report relies on the *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005* (Inventory), and other public and private data sources. EPA prepares the Inventory to comply with existing commitments under the United Nations Framework Convention on Climate Change (UNFCCC).[3]

The edition of the Inventory used in this report summarizes the latest information on U.S. anthropogenic GHG emission trends from 1990 through 2005. To ensure that it is comparable to those of other UNFCCC Parties, the estimates presented in the Inventory were calculated using methodologies consistent with those recommended by the Intergovernmental Panel on Climate Change (IPCC) in the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (IPCC/UNEP/OECD/IEA 1997), the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (IPCC 2000), and the *IPCC Good Practice Guidance for Land Use, Land-Use Change, and Forestry* (IPCC 2003).

Water Use and Discharges

There is no national database for water withdrawals. Such information, which DOE is starting to collect, is usually kept at the state level.[4]

Facilities discharging directly into the waters of the United States (e.g., "direct dischargers") are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit. Data on discharges from NPDES-permitted facilities are entered into an EPA data system. EPA also develops the Effluent Data Statistics (EDS), which is a static file of annual loadings derived from the concentration and flow data submitted by NPDES facilities. The EDS file contains annual pollutant loadings (including for conventional pollutants) and flow at the permit level.

The Permit Compliance System (PCS) is the national database used to track compliance with NPDES, but it is being gradually phased out and replaced by a modernized system called the Integrated Compliance Information System (ICIS)-NPDES. Twenty-six states, territories, and tribes started using ICIS-NPDES in June 2006, and thus are not entering data into PCS.

Data on pollutant discharges to sewage treatment plants are collected by local pretreatment programs, but these data are not systematically electronically transmitted to the states or EPA. There is no national database for these indirect discharges of wastewater pollutants.

TRI Water Discharges

Considerations

While TRI chemicals discharged to water are a key issue for some sectors (e.g., Food & Beverage Manufacturing, Forest Products), for most sectors, toxic chemicals emitted to air and/or disposed are a larger concern. Depending on the sector, this report describes TRI water discharges from 1996 through 2005 (the most current data available at the time of the analyses presented in this report), with a focus on current (2005) discharges. We do not present toxicity-weighted discharge values, because the RSEI methodology does not account for ecological toxicity, which is an important impact of water discharges.

Data Processing

Water discharges includes discharges to water (from section 5.3 of TRI Form R) and to Publicly Owned Treatment Works for metals only (from section 6.1 of TRI Form R).

Hazardous Waste Management

Several aspects of the BR influence the use of these data for EPA's Sector Strategies Program.

Considerations

Large quantity generators (LQGs) and RCRA hazardous waste treatment, storage and disposal facilities (TSDFs) are covered. Small quantity generators (SQGs) are not included.

LQGs and TSDFs are required to submit a biennial hazardous waste report. LQGs have one or more of the following characteristics: the site generated, in any single calendar month, 1,000 kg (2,200 lbs.) or more of RCRA hazardous waste; the site accumulated, during any calendar month, more than 1 kg (2.2 lbs.) of RCRA acute hazardous waste; or the site generated, in any single calendar month, or accumulated at any time, more than 100 kg (220 lbs.) of spill cleanup material contaminated with RCRA acute hazardous waste.

Note that many facilities in the sectors discussed in this report may not be required to report to BR; thus, the BR data presented may not cover all the activities of the entire sector.

Data Processing

This report describes hazardous waste generation in 2005 (the most current data available at the time of the analyses presented in this report), with a focus on the largest sources of hazardous waste generation. Data and documentation can be found at: ftp.epa.gov/rcrainfodata/.

For this report, data are compiled based on the primary 3-, 4-, 5-, and/or 6-digit NAICS codes reported to BR. For the Cement Manufacturing and Iron & Steel sectors, and specialty-batch chemicals subsector, data are compiled based on predetermined facility lists. The count of the number of facilities reporting hazardous waste data is a total of the number of unique RCRA IDs in the sector.

Only data flagged for inclusion in the National Biennial Report are included. States may submit information on facilities with other status designations, such as SQGs, as well as data on other state-regulated wastes that are exempt from federal regulation. These data, while submitted to BR, are not always included in the National Biennial Report. To mimic the National Biennial Report methodology, only data flagged for inclusion are included in the analysis conducted for this report.

Waste associated with source code G61 and management code H141 are excluded from this analysis to avoid double counting of stored wastes. This is consistent with the National Biennial Report methodology.

Waste Management Reported to TRI

Considerations

TRI reporting typically presents air and water releases in the broader category "Disposal or Other Releases." This report distinguishes waste management and disposal from releases to air and water, above, and presents the data in the categories discussed below.

Data Processing

"Recycling" means the quantity of the toxic chemicals that is either recovered at the facility and made available for further use or sent offsite for recycling and subsequently made available for use in commerce, as reported in sections 8.4 and 8.5 of TRI Form R.

"Energy Recovery" means the quantity of the toxic chemicals combusted in an onsite or offsite energy recovery device, such as a boiler or industrial furnace, as reported in sections 8.2 and 8.3 of TRI Form R.

"Treatment" means the quantity of chemicals destroyed in onsite or offsite operations such as biological treatment, neutralization, incineration, and physical separation, as reported in sections 8.6 and 8.7 of TRI Form R.

"Disposal" includes data from the following sections of TRI Form R:

- Section 5.4: Underground Injection onsite to Class I, II-V Wells
- Section 5.5: Disposal to land onsite

- Section 6.2: Transfers to other offsite locations, for disposal codes only. The disposal codes are as follows:
  - M10 Storage only
  - M40 Solidification/Stabilization—Metals and Metal Compounds only
  - M41 Solidification/Stabilization—Metals and Metal Compounds only
  - M61 Wastewater Treatment (excluding POTW)—Metals and Metal Compounds only
  - M62 Wastewater Treatment (excluding POTW)—Metals and Metal Compounds only
  - M63 Surface Impoundment Recycling
  - M64 Other Landfills
  - M65 RCRA Subtitle C Landfills
  - M66 Subtitle C Surface Impoundment
  - M67 Other Surface Impoundment
  - M71 Underground Injection
  - M72 Offsite Disposal in Landfills
  - M73 Land Treatment
  - M79 Other Land Disposal
  - M81 Underground Injection to Class I Wells
  - M82 Underground Injection to Class II–V Wells
  - M90 Other Offsite Management
  - M91 Transfers to Waste Broker—Disposal
  - M94 Transfers to Waste Broker—Disposal
  - M99 Unknown

Comparing TRI and BR

Both TRI and BR contain information on waste. TRI includes information on toxic chemicals managed as waste. BR includes information on hazardous waste generated and managed. The quantities of hazardous waste reported to BR differ from those reported to TRI, because of numerous differences between the two systems, several of which are discussed below.

Differences in what is reported

TRI reporting is required for any toxic chemical (from a list of more than 600 chemicals) for which manufacturing, processing, or other use exceeds a reporting threshold. BR reporting is required for RCRA listed and characteristic hazardous wastes.

Differences in how quantities are reported

TRI includes the weight of the toxic chemicals within a waste stream, while RCRA reporting on hazardous wastes encompasses the weight of the entire waste or waste stream that meets the definition of RCRA hazardous waste. Therefore, hazardous wastes included in BR could be aqueous, solids, or sludges, weighing more than the toxic components portion alone. In addition, the waste streams reported to BR are considered hazardous, but may not contain constituents that are considered toxic as defined in TRI (e.g., waste streams may be hazardous to humans based on their ignitability, corrosivity, reactivity, toxicity, or hazardous constituents listed in 40 CFR 261 Appendix VIII).

Differences in reporting universes

There is overlap with some facilities reporting to both systems.

Differences in reporting frequency

TRI is annual; BR is every other year.