U.S. EPA Toxics Release Inventory – 2002 Data Release
Summary of Key Findings

U.S. EPA TRI Program

The United States (U.S) Environmental Protection Agency (EPA) Toxics Release Inventory (TRI) program collects information on the disposal or other releases and other waste management activities of over 650 chemicals from industrial sources in all 50 states and U.S. territories. The information has been collected annually since 1987. For 2002, the latest year for which data are available, disposal or other releases of these chemicals reported to EPA totaled over 4.79 billion pounds from 24,379 U.S. facilities submitting 93,380 chemical forms.

The 2002 TRI data are now available online in a searchable, sortable format at http://www.epa.gov/triexplorer. We invite you to visit our web site and explore the data to learn more about toxic chemical releases and waste management activities across the U.S., by state, county or even zip code – and more! *It's your right to know.*

The following information reflects the TRI data as of April 1, 2004 in EPA's TRI Explorer. However, in certain cases during EPA's analysis of the data some facility reporting errors have been identified that are contained in the dataset. Adjustments have been made in some analyses presented here and are noted accordingly in *Important Considerations* to assist the user in understanding TRI data. Reporting errors will be corrected in TRI Explorer sometime in the summer of 2004.

Overview of the TRI 2002 Data Release

The time period covered for this year's data release is January 1, 2002 to December 31, 2002. These 2002 data were reported to EPA by July 1, 2003 and were released to the public in June 2004. Data for previous years back to 1988 are also available.

A TRI release to the environment includes disposal or other releases. What does this mean?

Facilities dispose of TRI chemicals by placing them in on-site underground injection wells, landfills, surface impoundments, or by sending them off-site to other facilities for placement in underground injection wells, landfills, and/or surface impoundments. Metals sent to Publicly Owned Treatment Works (POTWs) or other waste treatment facilities are also included.

Other ways facilities release TRI chemicals is by discharging them to an environmental medium on-site. These releases include air emissions and discharges to receiving streams or water bodies.

The following categories are used for presenting this information:

On-site disposal or other releases: On-site disposal or other releases include emissions to the air, discharges to bodies of water, disposal at the facility to land, and disposal in underground

injection wells. Disposal or other releases are reported to TRI by media type. On-site disposal or other releases are reported in Section 5 of Form R.

Off-site disposal or other releases (transfers off-site to disposal or other releases): An off-site disposal or other release is a discharge of a toxic chemical to the environment that occurs as a result of a facility's transferring a waste containing a TRI chemical off-site for disposal or other release, as reported in Section 6 of Form R. Certain other types of transfers are also categorized as off-site disposal or other release because, except for location, the outcome of transferring the chemical off-site is the same as disposing of it or releasing it on-site. For each transfer, the amount of the chemical in the waste, type of management activity (chosen from a list of codes referred to as "M" codes) undertaken by the receiving facility, and the address of the receiving site is reported.

Total on- and off-site disposal or other releases: sum of on-site disposal or other releases and off-site disposal or other releases.

TRI chemicals in production-related waste managed: Information about facilities' management of TRI chemicals in waste is reported in Section 8 of Form R. Data collected include amounts of the chemicals recycled, burned for energy recovery, and treated both on- and off-site. Data are also given for quantities disposed of or otherwise released on- and off-site.

What are the time periods used for presenting TRI data?

There are several different time periods for which data are presented. The data included in each time period differ because the reporting requirements have changed over time. No chemicals that have been delisted are included.

2001-2002: includes all chemicals and all industries reporting for 2001 and 2002

2000-2002: excludes lead and lead compounds because reporting thresholds were lowered beginning with the 2001 reporting year.

1998-2002: excludes all PBT chemicals and vanadium and vanadium compounds. Some PBT chemicals were added and others had their reporting thresholds lowered beginning with the 2000 reporting year. Vanadium's reporting definition was changed and vanadium compounds were added to the list for 2000.

1988-2002: excludes aluminum oxide, ammonia, hydrochloric acid, sulfuric acid, PBT chemicals, vanadium and vanadium compounds. These chemicals have had changes to reporting requirements or have been added to the TRI chemical list since 1988. Also, excludes chemicals added to the list in 1990, 1994 and 1995. Also, excludes reporting from industries added to the reporting requirements beginning with the 1998 reporting year (these industries are metal mining, coal mining, electrical utilities, chemical wholesale distributors, petroleum bulk terminals/bulk storage, hazardous waste treatment facilities and solvent recovery facilities).

Overview of the TRI 2002 Data

What were the total reported disposal or other releases for 2002?
Over 4.79 billion pounds were disposed of or otherwise released to the environment in 2002 by TRI regulated facilities that reported to EPA.

- 89% (4.28 billion pounds) was disposed of or otherwise released **on-site**, including
  - 1.63 billion pounds (43%) of air emissions
  - 597 million pounds (12.5%) in Class I underground injection wells, RCRA Subtitle C landfills and other landfills
  - 982 million pounds (20%) of other land disposal (such as waste piles, spills or leaks)
- 11% (514 million pounds) was sent **off-site** for disposal or other releases, including
  - 273 million pounds (6%) to underground injection wells, RCRA Subtitle C landfills and other landfills
  - 127 million pounds (3%) of metals sent for solidification and/or stabilization

Facilities may limit contamination and human exposure by disposing of or otherwise releasing waste in certain ways. For example, disposal of harmful materials in Class I Underground Injection wells located in isolated formations beneath the lowermost underground source of drinking water limits potential for contamination. Similarly, disposal to landfills that are designed with liners, covers, leak detection systems, and groundwater monitoring systems also limits the potential for human exposure and contamination.

What are the total reported waste management quantities for 2002?
TRI chemicals managed in production-related waste totaled 26.2 billion pounds in 2002.

- 37 percent (9.72 billion pounds) was recycled on- and off-site.
- 30 percent (7.86 billion pounds) was treated on- and off-site.
- 19 percent (4.90 billion pounds) was disposed of or otherwise released on- and off-site.
- 14 percent (3.68 billion pounds) was combusted for energy recovery on- and off-site.

The Pollution Prevention Act of 1990 (PPA) requires facilities to report information about the quantities of TRI chemicals they manage in waste, both on-and off-site, including amounts reported as recycled, burned for energy recovery, treated or disposed of or otherwise released on- or off-site.

How do the 2002 TRI data compare to the 2001 TRI data?
Overall, when compared to quantities reported for the previous year (2001), total disposal or other releases of TRI chemicals **decreased** by 819 million pounds or 15%.

- On-site disposal or other releases **decreased** by 776 million pounds (15%).

- Air emissions **decreased** by 25 million pounds (1%),
- RCRA Subtitle C landfills and other landfills **decreased** by 53 million pounds (12%),
- Other land disposal (such as waste piles, spills and leaks) **decreased** by 542 million pounds (35%), and
- Surface Impoundments **decreased** by 170 million pounds (18%).
- However, Class I underground injection wells **increased** by 8.3 million pounds (4%),
- Surface water discharges **increased** by over 400,000 pounds (0.2 %).

- Off-site disposal or other releases **decreased** by 44 million pounds (8%).

What are some of the reasons for the large decrease from 2001 to 2002?

The metal mining sector reported an overall decrease of 43% from 2001, largely related to the court's decision in Barrick Goldstrike Mines v. EPA. See below for a comparison of the 2002 data with the 2001 data without the metal mining sector.

Total disposal or other releases of TRI chemicals, without the metal mining sector (which had a decrease of 971 million pounds), **increased** by 151 million pounds or 5%.

- On-site disposal or other releases **increased** by 196 million pounds (7%).
  - Other land disposal (such as waste piles, spills and leaks) **increased** by 217 million pounds (195%),
  - However, Class I underground injection wells **increased** by 8.3 million pounds or 4%,
  - Surface Impoundments **increased** by 34 million pounds (19%), and
  - Surface water discharges **increased** by over 500,000 pounds (0.2 %).
  - However, air emissions **decreased** by 24 million pounds (1%) and
  - RCRA Subtitle C landfills and other landfills **decreased** by 49 million pounds (14%).
- Off-site disposal or other releases **decreased** by 44 million pounds (8%).

Total production-related waste managed **decreased** by 4 percent (by 1.05 billion pounds) from 2001 to 2002, although some activities did show increases.

- Quantity disposed of or otherwise released **decreased** by 771 million pounds (14%).
- Treated on-site **decreased** by 553 million pounds (7%).
- Energy recovery on-site **increased** by 234 million pounds (9%).
- Recycling on-site **increased** by 118 million pounds (2%).

Which industry sectors reported the largest decreases in disposal or other releases, 2001-2002?

- The metal mining sector reported the largest total disposal or other releases in 2002 (with 1.30 billion pounds in 2002) and a **decrease** of 971 million pounds (43%).
- Hazardous waste/solvent recovery facilities reported 183 million pounds of total disposal or other releases in 2002 and a **decrease** of 41 million pounds (18%).

Which industry sectors reported the largest increases in disposal or other releases, 2001-2002?

- The primary metals sector reported 743 million pounds in 2002 and an **increase** of 209 million pounds (39%)
- Electric utilities reported 1.10 billion pounds in 2002, the second largest total disposal or other releases behind the metal mining sector, and an **increase** of 37 million pounds (3.5%), including an increase of 12 million pounds of air emissions.

Are there particular facilities with large increases in these industry sectors?
The 209 million pound increase from the primary metals sector was due to one facility in Arizona that reported an increase of 248 million pounds. The facility had "one-time" reported amounts as other on-site land disposal related to discontinued operations related to mining.

One electric utility reported an increase of 22 million pounds in on-site surface impoundments and 12 electric utilities reported increases of on-site air emissions of more than 2 million pounds.

Federal Facilities

All federal facilities, whether operated by federal agencies or contractors (e.g. military bases), are required to report to EPA's TRI Program.

- For 2002, a total of 315 federal facilities submitted 1,002 forms and reported 85 million pounds of total on- and off-site disposal or other releases.
- Disposal or other releases by federal facilities **increased** by 6.8 million pounds (9%) and the number of federal facilities reporting increased by 10%.
- Total production-related waste managed at federal facilities **decreased** by 13 million pounds or 6% from 2001 to 2002.

Why did federal facilities show an overall increase in disposal or other releases?
The increase in disposal or other releases is not attributed to the increase in the number of federal facilities reporting. The increase in disposal or other releases is largely attributed to one federal facility that reported an increase of 7.0 million pounds in disposal or other releases from increased coal use for electricity generation.

One federal facility reported a decrease in production-related waste of 21 million pounds from

reduced off-site recycling of copper for coin production.

2002 Chemical Snapshots

PERSISTENT BIOACCUMULATIVE TOXIC (PBT) CHEMICALS

2002 is the third year, at reduced reporting thresholds, that the Toxics Release Inventory includes data on persistent bioaccumulative and toxic (PBT) chemicals such as dioxins, mercury, and PCBs. For lead and lead compounds, it is the second year of reporting at reduced thresholds.

Why is there particular concern for PBT chemicals?

PBT chemicals are of particular concern not only because they are toxic, but also because they remain in the environment for long periods of time and are not readily destroyed (they persist) and build up or accumulate in body tissues (they bioaccumulate).

What are the total PBT disposal or other releases for 2002?

Total disposal or other releases of PBT chemicals were 452 million pounds in 2002.

- 91% (411 million pounds) was disposed of or otherwise released **on-site**, including
  - 233 million pounds (52%) in other land disposal (such as waste piles, spills or leaks)
  - 129 million pounds (28%) in on-site surface impoundments
- 9% (41 million pounds) were disposed of or otherwise released **off-site**.

What were the top PBT chemicals released in 2002?

- Lead and lead compounds accounted for 98 percent (442 million pounds) of total disposal or other releases of PBT chemicals in 2002.
- Mercury and mercury compounds accounted for 1 percent (5.3 million pounds) of total disposal or other releases of PBT chemicals in 2002.
- Dioxin and dioxin-like compounds accounted for 141,187 **grams** of total disposal or other releases of PBT chemicals in 2002.

Important considerations:

The preceding number was adjusted to account for one facility that reported 311,022 grams of dioxin and dioxin-like compounds for 2002 in error. The TRI data available to the public through TRI Explorer will show total disposal or other releases of dioxin and dioxin-like compounds in 2002 as 452,209 grams because of this error.

How do the 2002 PBT data compare to the 2001 PBT data?
Overall, when compared to quantities reported for the previous year (2001), total disposal or other releases of persistent bioaccumulative and toxic (PBT) chemicals **increased** by 11 million pounds or 3% from 2001 to 2002.

Important considerations:
The preceding number was adjusted to account for one facility that had an error in reporting for lead and lead compounds resulting in an apparent decrease of 16 million pounds from 2001 to 2002. The TRI data available to the public through TRI Explorer will show total disposal or other releases of PBT chemicals decreased by 4.4 million pounds (1%) because of the errors for lead and lead compounds and dioxin and dioxin-like compounds.

LEAD AND LEAD COMPOUNDS

The reporting threshold for lead and lead compounds was lowered beginning with the 2001 reporting year so this is the second year of reporting under the lowered threshold.

What were the total reported disposal or other releases of lead and lead compounds for 2002?
Total disposal or other releases of lead and lead compounds were 442 million pounds for 2002.

- 91% (404 million pounds) was disposed of or otherwise released **on-site**, including
  - 229 million pounds (52%) of other land disposal (such as waste piles, spills or leaks)
  - 127 million pounds (29%) to surface impoundments
  - 1.5 million pounds (0.3%) of air emissions
- 9% (38 million pounds) were **off-site** disposal or other releases

How do the 2002 data compare to 2001?
Lead and lead compounds disposal or other releases **increased** by 14 million pounds or 3% from 2001 to 2002.

Important considerations:
The preceding number was adjusted to account for one facility that had an error in reporting for lead and lead compounds resulting in an apparent decrease of 16 million pounds. The TRI data available to the public through TRI Explorer will show total disposal or other releases of lead and lead compounds decreased by 2.2 million pounds (0.5%) because of this error.

- Two metal mining facilities reported 50% of the total 2002 releases (mostly on-site) and accounted for a combined increase of 95 million pounds from 2001 to 2002.

DIOXIN AND DIOXIN-LIKE COMPOUNDS

Dioxin and dioxin-like compounds were added to the TRI list for reporting year 2000 at a lowered reporting threshold of 0.1 grams.

What were the total dioxin and dioxin-like compounds disposal or other releases for 2002?

Total disposal or other releases for dioxin and dioxin-like compounds were 141,187 grams in 2002.

- 38% (54,045 grams) were **on-site** disposal or other releases, including
  - 3% (4,409 grams) of air emissions
- 62% (87,142 grams) were **off-site** disposal or other releases, including
  - 51% (71,515 grams of transfers to other land disposal (e.g., waste piles)

Important considerations:

The preceding numbers were adjusted to account for one facility that reported 311,022 grams of dioxin and dioxin-like compounds for 2002 in error. The TRI data available to the public through TRI Explorer will show total disposal or other releases of dioxin and dioxin-like compounds in 2002 as 452,209 grams because of this error.

How do the 2002 data compare to data for 2001 and 2000 for dioxins and dioxin-like compounds?

The change in dioxin and dioxin-like compounds disposal or other releases was:

- From **2001 to 2002**, total disposal or other releases of dioxin and dioxin-like compounds **decreased** by 5% (7,802 grams).
- From **2000 to 2002** (over three years), total disposal or other releases of dioxins **increased** by 43% (42,188 grams).

Important considerations:

The preceding numbers were adjusted to account for one facility that reported 311,022 grams for 2002 in error. The TRI data available to the public through TRI Explorer will show total disposal or other releases of dioxin and dioxin-like compounds increased by 303,218 grams (204%) from 2001 to 2002 and increased by 353,210 grams (357%) from 2000 to 2002 because of this error.

  - Two facilities reported an increase of 47,627 grams from 2000 to 2001 with one facility reporting based on improved estimation and one facility reporting a one-time shut down and closure of a process impoundment.

MERCURY AND MERCURY COMPOUNDS

The reporting threshold for mercury and mercury compounds was lowered beginning with the 2000 reporting year so this is the third year of reporting under the lowered threshold.

What were the total mercury and mercury compounds disposal or other releases for 2002?

Total disposal or other releases of mercury and mercury compounds were 5.3 million pounds in 2002.

- 97% (5.1 million pounds) were **on-site** disposal or other releases, including
  - 3.2 million pounds (60%) of other land disposal (waste piles, spills or leaks)
  - 1.7 million pounds (31%) of surface impoundments
  - 143,599 pounds (3%) of air emissions
- 3% (166,891 pounds) were **off-site** disposal or other releases.
- Three metal mining facilities accounted for 75% (4.0 million pounds) of the total disposal or other releases of mercury and mercury compounds for 2002.
  - These facilities reported disposal or other releases mainly to on-site surface impoundments and on-site landfills other than RCRA Subtitle C landfills.

Which industry sectors reported the largest disposal or other releases of mercury and mercury compounds in 2002?

- The metal mining industry reported the largest disposal or other releases of mercury and mercury compounds (93% of the total mercury and mercury compounds releases).
- Electric utilities reported the largest air emissions of any industry sector, with 63% of all air emissions of mercury and mercury compounds.
  - However, there was no appreciable change in air emissions of mercury and mercury compounds from electric utilities from 2001 to 2002.
- Hazardous waste/solvent recovery facilities reported the largest off-site disposal or other releases (off-site transfers to disposal) of mercury and mercury compounds with 38% of all off-site disposal or other releases.

How do the 2002 data compare to data for 2001 and 2000 for mercury and mercury compounds?

From **2001 to 2002**, disposal or other releases for mercury and mercury compounds **increased** by 10% (465,962 million pounds).

- Total on-site disposal or other releases **increased** by 11% (513,888 pounds), including
  - **increase** of 407,253 pounds (33%) in on-site surface impoundments
  - **decrease** of 6,692 pounds (4%) in air emissions.
- Total off-site releases **decreased** by 22% (47,926 pounds).
- Three metal mining facilities reported a combined increase of 868,152 pounds from 2001 to 2002.

From **2000 to 2002** (over three years), disposal or other releases for mercury and mercury compounds **increased** by 22% (965,990 million pounds).

- Total on-site disposal or other releases **increased** by 48% (1.7 million pounds), including
  - ► a combined increase by three metal mining facilities of 1.7 million pounds.
- On-site air emissions of mercury and mercury compounds **decreased** by 18,262 pounds (13%) from 2000 to 2002.

Looking at TRI data over the years

TRI DATA, 1998-2002

Over the five years from 1998 to 2002, total on- and off-site disposal or other releases of TRI chemicals **decreased** by 37 percent (by 2.50 billion pounds).

- The metal mining sector reported a decrease of 2.07 million pounds.
- Without the metal mining sector, total disposal or other releases decreased by 11 percent (by 423 million pounds).

Total production-related waste **decreased** by 11% (3.21 billion pounds) from 1998 to 2002.

- Quantity disposed of or otherwise released **decreased** by 36% (2.48 billion pounds)
- Recycling on- and off-site **decreased** by 3% (301 million pounds)
- Treatment on- and off-site **decreased** by 6% (489 million pounds)
- Energy recovery on- and off-site **increased** by 2% (56 million pounds)

TRI DATA, 1988-2002

Over the fifteen years from 1988 to 2002, total on- and off-site disposal or other releases of TRI chemicals decreased by 49 percent (by 1.56 billion pounds), looking at trends in the industries and chemicals that have been reported since that time.