



State of Utah
Department of Environmental Quality

Utah Toxic Release Inventory
Reporting Year 2003
Data Summary Report

Division of Environmental Response and Remediation
May 2005

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EXECUTIVE SUMMARY

Introduction

The Toxic Release Inventory (TRI) is a database providing information concerning releases of certain chemicals into the environment, and transfers to off-site facilities. Reports must be submitted by July 1 of the following year in which the releases occurred. This report is a summary of data submitted to the Utah Department of Environmental Quality (UDEQ) for calendar year 2003. TRI information includes only selected industrial sectors using larger volumes of certain listed chemicals. Therefore, TRI data only includes a relatively small portion of all chemical releases of environmental significance. TRI data can be used to provide basic information on the types and volumes of waste and emissions at a facility, but the data must be used with other concentration, migration, environmental target, and exposure information to assess a level of human health or environmental risk.

2003 TRI Summary

For calendar year 2003, 189 facilities filed a total of 788 Form R reports for 124 different TRI-listed chemicals and chemical categories. There are 121 TRI facilities (64%) located along the Wasatch Front in Weber, Davis, Salt Lake, and Utah counties.

Total Releases

On-site and off-site release totals of TRI listed chemicals increased by 37% (67.5 million pounds) from 180.7 million pounds in 2002 to 248.2 million pounds in 2003. The increase is attributable to an increase of 67.8 million pounds of releases to land reported by Kennecott. Total combined releases from Kennecott facilities account for 83% of the total amount of chemical releases reported in Utah for this reporting year.

Releases to Air

TRI-reported releases to the air totaled 9.1 million pounds in 2003. This is a reduction of 9.4 million pounds from 18.5 million pounds in 2002. This reduction represents a decrease of 51% between 2002 and 2003. U.S. Magnesium is credited for this vast reduction, which can be attributed to implementation of process technology improvements over the past several years that have significantly reduced chlorine emissions.

Releases to Land

Total TRI chemical releases to land in Utah were reported at 229.7 million pounds in 2003. This represents a 48.7% increase from 154.5 million pounds reported released in 2002. Kennecott facilities reported an increase of 67.3 million pounds of chemicals released to land. These increases are attributed to a total increase in the volumetric amount of material mined, an increased concentration of lead mined in a portion of the mine, and in an increase in the overall volume of material processed. The latter contributed to an overall increase in the amount of material processed to waste streams including waste rock and process waste discharged to the tailings impoundment. Finally, Kennecott reported a decrease in the efficiency of a copper

recovery from the process waste stream.¹ The combined total release volume to land for all three Kennecott facilities in 2003 was 206.4 million pounds.

Releases to Surface Water

Total TRI chemical releases to surface water in Utah in 2003 were about 57,000 pounds. This is a 9.5% decrease from the 63,000 pounds of releases reported in 2002. Chevron Products Company reported a release of 33,000 pounds for nitrate compounds to the Great Salt Lake. Approximately 19,000 pounds of various TRI chemicals were released to surface waters, the majority being to the Great Salt Lake, from Kennecott facilities.

Transfers to POTWs

Publicly Owned Treatment Works (POTWs) are publicly owned wastewater treatment plants. Transfers to POTWs totaled 1.27 million pounds in 2003 which is a slight decrease compared to total transfers to POTWs of 1.32 million pounds in 2002. Nitrates constitute about 74% of the total chemicals released, while the remaining 26% is comprised of a variety of organic and inorganic chemicals.

TRI-reported releases to POTWs do not include information concerning the rate of release or concentrations of chemicals in the release. However, State and Federal law requires industrial facilities with wastewater flows exceeding federally established chemical concentrations to operate industrial pretreatment equipment to reduce such concentrations below harmful levels before discharging to the POTWs.

Other Off-Site Transfers

Transfers of TRI chemicals to “other off-site” locations are transfers to facilities other than POTWs. Often these facilities include chemical recyclers and waste disposal sites. In 2003 there was a 22% increase (1.7 million pounds) in off-site transfers from 7.6 million pounds in 2002 to 9.3 million pounds in 2003.

Persistent Bioaccumulative Toxic (PBT) Chemicals

Reported releases of dioxin and dioxin-like compounds increased 64.8% from 2,648 grams in 2002 to 4,362 grams in 2003. U.S. Magnesium reported 4,346 grams of dioxin and dioxin-like chemicals, which constitutes 99.6% of the total quantity of dioxin and dioxin-like chemicals reported in 2003. U.S. Magnesium reported a 66.2% increase in the amount of dioxin and dioxin-like compounds released from 2,615 grams in 2002 to 4,346 grams in 2003. One percent of the total volume released by U.S. Magnesium was reported in the releases to air while the remaining 99% was released to land.

¹ DEQ personal communication with KUC environmental management personnel March 21, 2005.

INTRODUCTION

What is the Toxic Release Inventory?

The Toxic Release Inventory (TRI) is a database providing information about releases of certain TRI program specific chemicals and chemical categories into the environment, and transfers to off-site facilities. Facilities report their TRI information annually to the U.S. Environmental Protection Agency (EPA) and to the state in which they are located. Reports must be submitted by July 1 of the following year in which the release(s) occurred. This report is a summary of data submitted to the Utah Department of Environmental Quality for calendar year 2003.

Who Must Report a TRI?

A facility must report to TRI if it:

- Conducts operations within specified Standard Industrial Classification (SIC) Codes; and
- Has 10 or more full-time employees (or equivalent); and
- Manufactures or processes more than 25,000 pounds or uses more than 10,000 pounds of any TRI listed chemical during the calendar year.

TRI data only includes reports from manufacturing facilities and federally owned facilities, coal mining, metal mining, electrical generation facilities combusting coal or oil, hazardous waste disposal, wholesale bulk petroleum distribution, chemical wholesale distribution, and solvent recycling.

What Type of Information Must Be Reported?

A facility must report the:

- Amount of each listed chemical released to the air, water, or soil;
- Amount of each listed chemical transferred off-site or sent to a wastewater treatment plant;
- Amount of each listed chemical recycled, treated, or disposed; and
- Facility's pollution reduction activities.

What Types of Chemicals are Subject to Reporting?

Over 600 chemicals and chemical categories were included in the reporting list for 2003, based on acute or chronic human health or environmental effects. There were no additions to the list of chemicals for reporting year 2003. TRI program specific chemicals are listed under the Code of Federal Regulations 40 CFR part 355. A copy of the current CFR is available to download from the Internet at www.gpoaccess.gov/index.html. Changes promulgated by EPA to the TRI program, i.e., addition or deletion of TRI program chemicals or chemical categories, are updated annually in the CFR publications.

What Are the Benefits and Uses of TRI Data?

TRI data can be used in a variety of ways:

- The public can use TRI data to identify potential concerns.
- Governments can use TRI data to evaluate environmental programs and establish regulatory priorities.
- The data can be used to provide basic information on the types and volumes of waste being generated or managed at a facility and, in conjunction with other data, can be utilized to study and identify potential hazards to the public health or environment.
- Industry can use TRI data to establish release reduction targets and document release reduction progress.

What Are the Limitations of the Data?

- *Not All Toxic Releases/Transfers Are Reported.* Only a few sectors of industry are currently required to submit TRI reports. Thus, only a portion of all chemical releases or transfers is included in the inventory. Additionally, the list of chemicals for which reporting is required is not inclusive of all chemicals known to have significant public health or environmental impact.
- *Reported Release/Transfer Totals Usually Are Based on Estimations Only.* No special monitoring is required to calculate emission or transfer totals. Reported data is often based on estimations.
- *Smaller Release Totals Are Reported as Ranges, Not Exact Numbers.* If a chemical release or transfer estimate was below 1,000 pounds, companies were allowed to report ranges of 1-10, 11-499, and 500-999 pounds. In such cases, staff entered the mid-point of the range in the State database. These estimations may, therefore, be above or below the actual figure.
- *TRI Statewide Totals Cannot Be Compared Easily From Year to Year.* The TRI list of chemicals requiring reporting and methods requiring the estimating of emissions have changed significantly through the 16-year history of TRI reporting. Facilities may meet the TRI reporting requirements and submit TRI reports for some years and not others. These changes make accurate multi-year comparisons of statewide release or transfer totals very difficult.

What Cautions Should Be Used in Interpreting TRI Data?

- *TRI Reports Releases, Not Exposures.* Release estimates alone are not sufficient to determine exposure, risk of exposure, or calculate potential adverse health or environmental affects.
- *TRI Does Not Report Concentrations.* TRI emission totals do not include information on the concentration of chemicals in air, water, or wastes placed on land. A large release may be a large volume at low concentration.

- *TRI Releases Are Often Permitted by State or Federal Law.* TRI releases are often permitted by state or federal environmental agencies after an evaluation has concluded the release will not adversely affect human health or the environment.

How Can the Public Obtain TRI Information?

Extracts of TRI information can be obtained from several sources:

- Computer summaries of Utah TRI information or copies of original TRI submissions can be obtained by submitting a written request to:

Utah Division of Environmental Response and Remediation
168 North 1950 West, 1st Floor
P.O. Box 14840
Salt Lake City, Utah 84114-4840
Or email the request to mzucker@utah.gov

A customer may choose to have pages copied by a DERR employee at a cost of \$0.25 per single-sided page. Pages copied by the customer are \$0.05 per single-sided page with the first 10 pages free. Specialized computer summaries are available for a fee charged at an hourly rate. Most reports require less than one hour's time to create a specialized summary. Please call DEQ (801-536-4100) for current hourly rates.

The EPA offers access to TRI data on the World Wide Web at the following two websites:

- www.epa.gov/tri
- www.epa.gov/enviro/html/tris

EPA and EPA Region VIII provides a variety of information about the Emergency Planning and Community Right-To-Know Act at these websites:

- www.epa.gov/Region8/toxics_pesticides/epcra/epcra.html
- yosemite.epa.gov/oswer/ceppoweb.nsf/content/epcraoverview.htm

FACILITY OVERVIEW

Number of Reporting Facilities

For calendar year 2003, 189 Utah facilities filed a total of 788 TRI reports for 124 different TRI-listed chemicals. Figure 1 shows the annual trend of the facility count and quantity of chemical reports submitted. In comparison with 2002 data, the number of facilities that submitted under TRI increased by eleven (178 to 189), while the number of chemical reports increased by 24 from 764 to 788. The quantity of unique chemicals reported increased by three from 121 to 124.

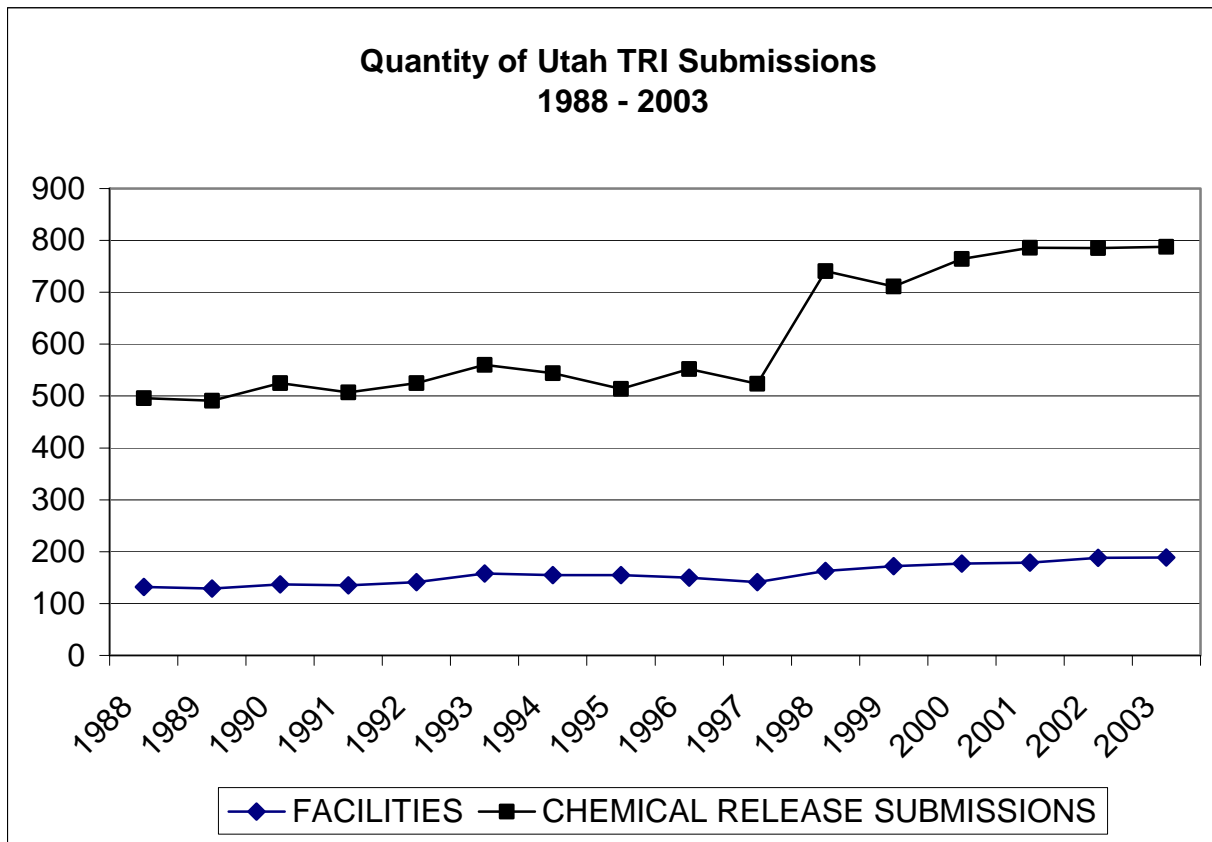


Figure 1

Facility Location

Each facility reports its latitude and longitude as part of the TRI submission. This information permits mapping of TRI facility locations. In Figure 2, each dot represents the location of a TRI facility. The majority of TRI reporting facilities, 121 of 189 reporting facilities (64%), are located along the Wasatch Front.

Utah 2003 TRI Facility Locations

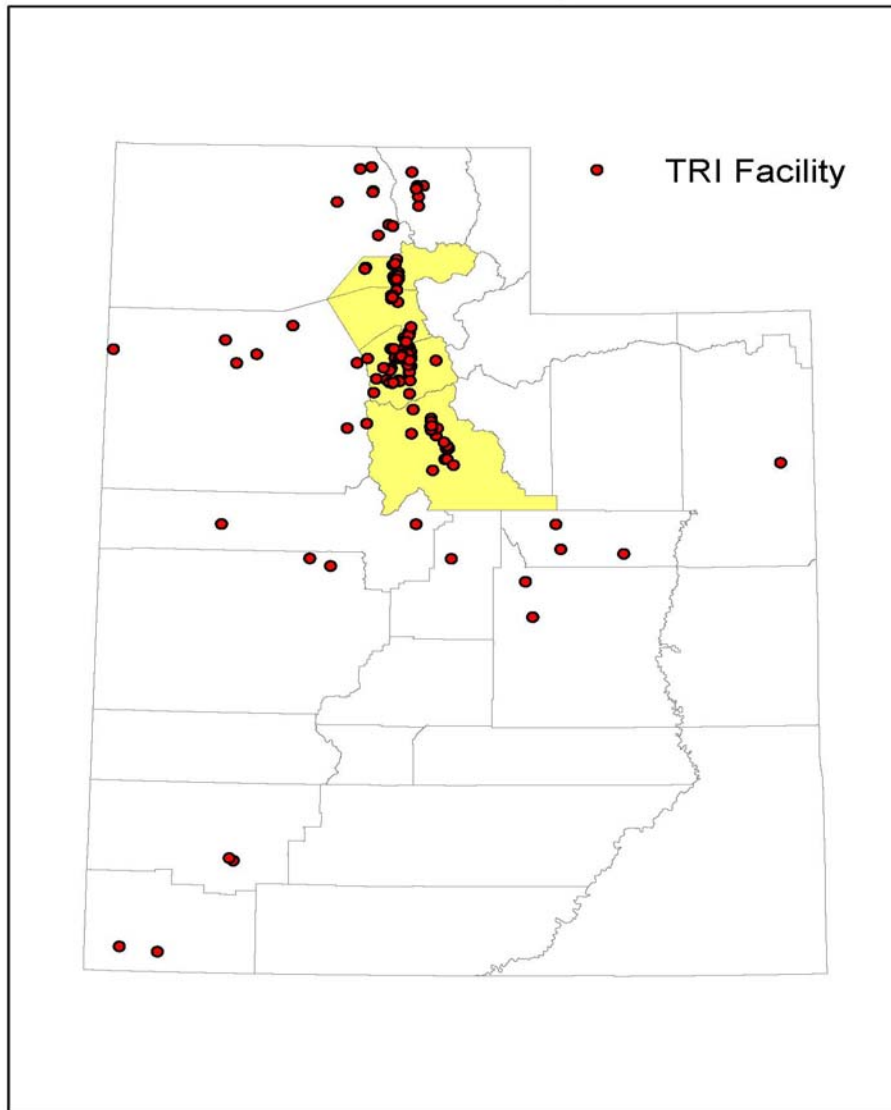


Figure 2

Figure 3 below displays the 2003 TRI reporting by industry sector category. The 189 facilities reporting are categorized into 21 industrial sectors based on Standard Industrial Classification Code groups. The seven industrial sectors with the greatest number of facilities reporting are identified in Figure 3. The greatest number of facilities reporting were from the Fabricated Metal Products sector (29 facilities) and Chemicals sector (25 facilities).

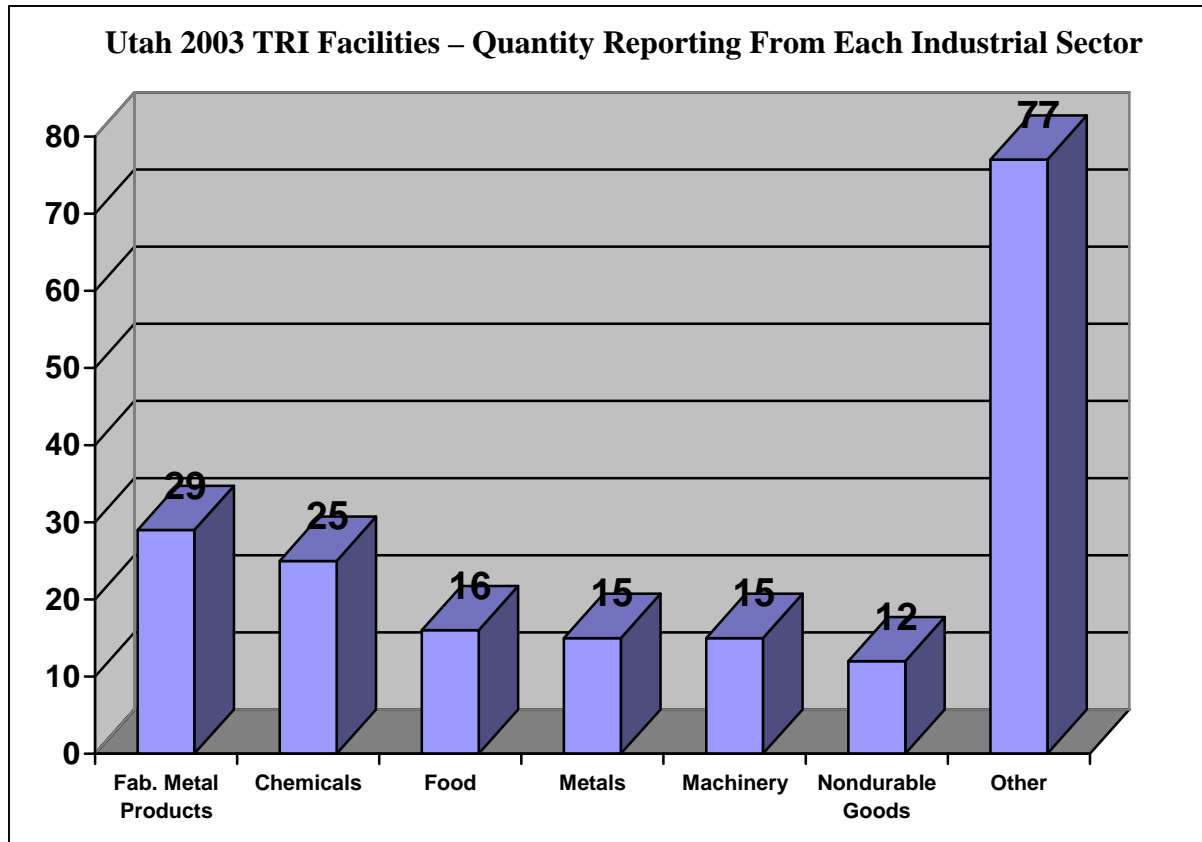


Figure 3

The 13 industrial sectors that comprise the “Other” category are:

1. Metal Mining
2. Coal Mining
3. Lumber and Wood Products
4. Furniture and Fixtures
5. Printing and Publishing
6. Petroleum and Coal Products
7. Rubber and Miscellaneous Plastics Products
8. Instruments and Related Products
9. Miscellaneous Manufacturing Industries
10. Electric Gas and Sanitary Services
11. Business Services
12. National Security and International Affairs
13. Transportation Equipment

Total Releases

Total TRI chemical releases from Utah facilities increased by 37.3% from 180.7 million pounds in 2002 to 248.2 million pounds in 2003. The increase occurred almost entirely as releases to land. Total off-site transfers to treatment, storage, and disposal (TSD) facilities increased by 23%. Total releases of persistent, toxic, and bioaccumulative (PBT) chemicals (specifically dioxin and dioxin-like compounds) increased by 65%. The trend for all other types of releases (i.e., releases to air, water, and transfers to POTWs) showed a decrease.

Total on-site and off-site releases include:

- On-site releases at the reporting facility to air, land, and water.
- Transfers of TRI-listed metals to municipal wastewater treatment plants (POTW). Generally, metals pass untreated through conventional treatment plants and are discharged in the plant effluent.
- TRI chemicals transferred to and disposed at off-site facilities, which are regarded as being released to the environment.

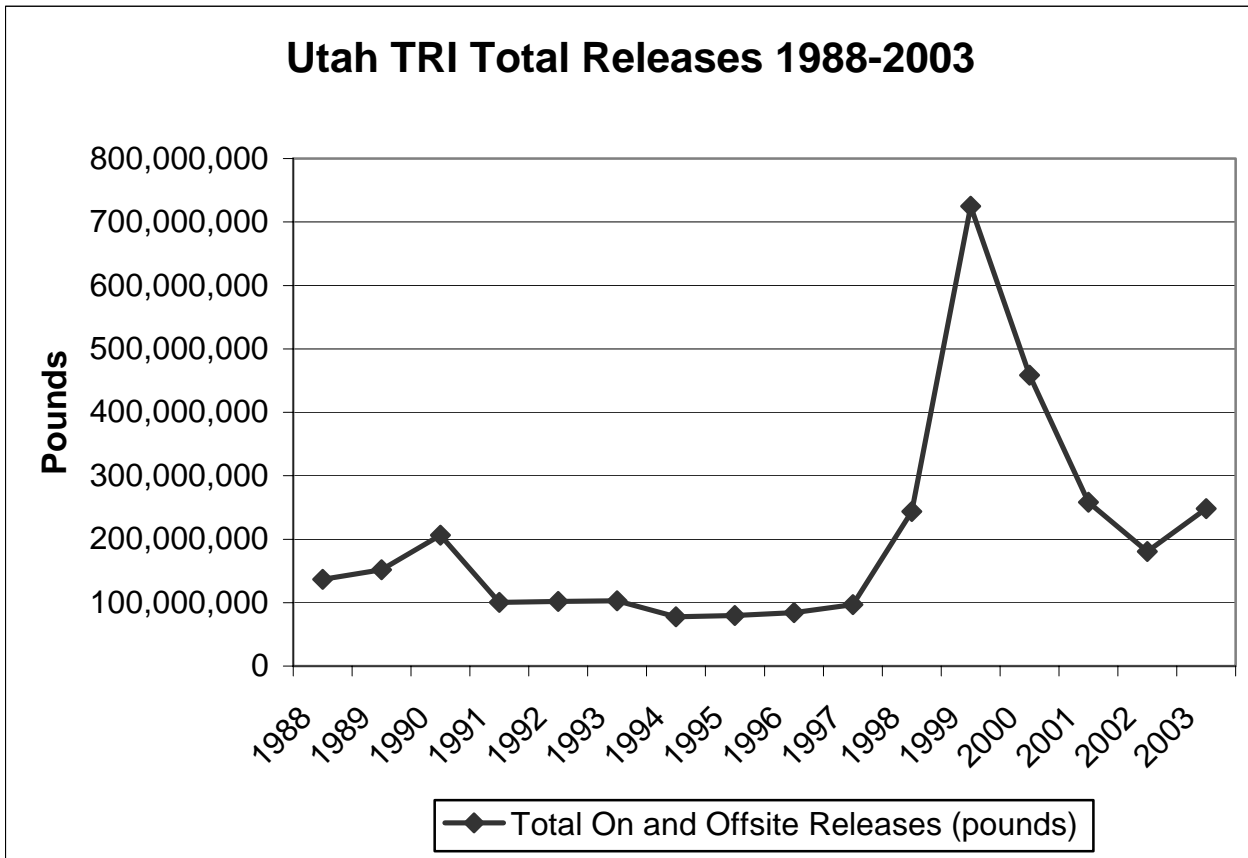


Figure 4

The top 10 facilities for on-site and off-site releases are shown in Table 1. As indicated in Table 1, Kennecott Mine, Concentrators & Power Plant, Kennecott Smelter & Refinery facilities, and the Clean Harbors Grassy Mountain facility were the three top contributors to total releases occurring in Utah in 2003.

Table 1	
Utah 2003 TRI Top 10 Facilities - Total On-Site and Off-Site Releases	
Lbs/Year	Facility Name
180,945,462	KENNECOTT UTAH COPPER MINE, CONCENTRATORS, & POWER PLANT
25,683,321	KENNECOTT UTAH COPPER SMELTER & REFINERY
9,300,127	CLEAN HARBORS GRASSY MOUNTAIN, LLC
8,291,756	NUCOR STEEL - A DIV. OF NUCOR CORP
4,444,159	US MAGNESIUM, LLC
3,967,874	PACIFIC STATES CAST IRON PIPE COMPANY
2,561,119	ENVIROCARE OF UTAH, INC.
2,322,792	PACIFICORP HUNTINGTON PLANT
1,472,420	BONANZA POWER PLANT
1,245,214	WESTERN ZIRCONIUM

The top 10 on-site and off-site chemical releases are shown in Table 2. Copper compounds, lead compounds, and zinc compounds constitute the chemicals released in greatest quantities.

Table 2	
Utah 2003 TRI Top 10 Chemicals Total On-Site and Off-Site Releases	
Lbs/Year	Chemical Name
109,998,741	Copper Compounds
87,967,075	Lead Compounds
13,854,306	Zinc Compounds
5,764,303	Arsenic Compounds
4,240,142	Polychlorinated biphenyls
3,836,218	Barium Compounds
3,696,266	Hydrochloric acid (aerosol forms only)
3,617,336	Manganese
2,952,329	Chlorine
1,484,261	Nitrate Compounds

Totals for on-site releases include releases to air, land, and water occurring strictly at the facility, and exclude releases that may occur after materials are transferred off-site. The top 10 facility totals for on-site releases are given in Table 3.

Table 3	
Utah 2003 TRI Top 10 Facilities - Total On-Site Releases	
Facility	Lbs/Year
KENNECOTT UTAH COPPER MINE, CONCENTRATORS, & POWER PLANT	180,945,212
KENNECOTT UTAH COPPER SMELTER & REFINERY	25,675,494
CLEAN HARBORS GRASSY MOUNTAIN, LLC	9,025,669
US MAGNESIUM, LLC	4,444,159
PACIFIC STATES CAST IRON PIPE COMPANY	3,967,874
ENVIROCARE OF UTAH, INC.	2,561,119
PACIFICORP HUNTINGTON PLANT	2,321,155
BONANZA POWER PLANT	1,471,114
WESTERN ZIRCONIUM	1,245,214
PACIFICORP HUNTER PLANT	1,239,700

The top 10 chemicals for on-site releases to air, land, and water are shown in Table 4.

Table 4	
Utah 2003 TRI Top 10 Chemicals - Total On-Site Releases	
Lbs/Year	Chemical Name
109,700,615	Copper Compounds
87,021,067	Lead Compounds
6,970,969	Zinc Compounds
5,757,843	Arsenic Compounds
4,122,591	Polychlorinated biphenyls
3,800,606	Barium Compounds
3,696,261	Hydrochloric acid (aerosol forms only)
3,617,070	Manganese
2,952,329	Chlorine
1,484,256	Nitrate Compounds

A comparison of the data presented in Table 2 and Table 4 shows only minor differences between Table 2 “Total On and Off-Site Releases” in comparison to Table 4 “Total On-Site Releases.” The differences in reporting between total on-site and off-site releases, and total off-site only releases consist of: (1) metals released from POTWs, and (2) TRI chemicals transferred off-site for disposal. Thus the small differences found in on- and off-site releases compared to off-site (only) releases shows that TRI metals released by POTWs and other TRI chemicals transferred off-site for disposal were relatively low.

One difference noted this year appears in the comparison reported for zinc compounds. This difference is attributable to 6.9 million pounds of zinc compounds transferred for off-site disposal by Nucor Steel. This amount accounts for 99.9 % of the difference discussed above.

RELEASES TO AIR

Figure 5 illustrates total releases to air, which decreased by 51% from 18.5 million pounds in 2002, to 9.1 million pounds in 2003. This is the lowest total release to air for Utah in the 17-year history of the TRI program.

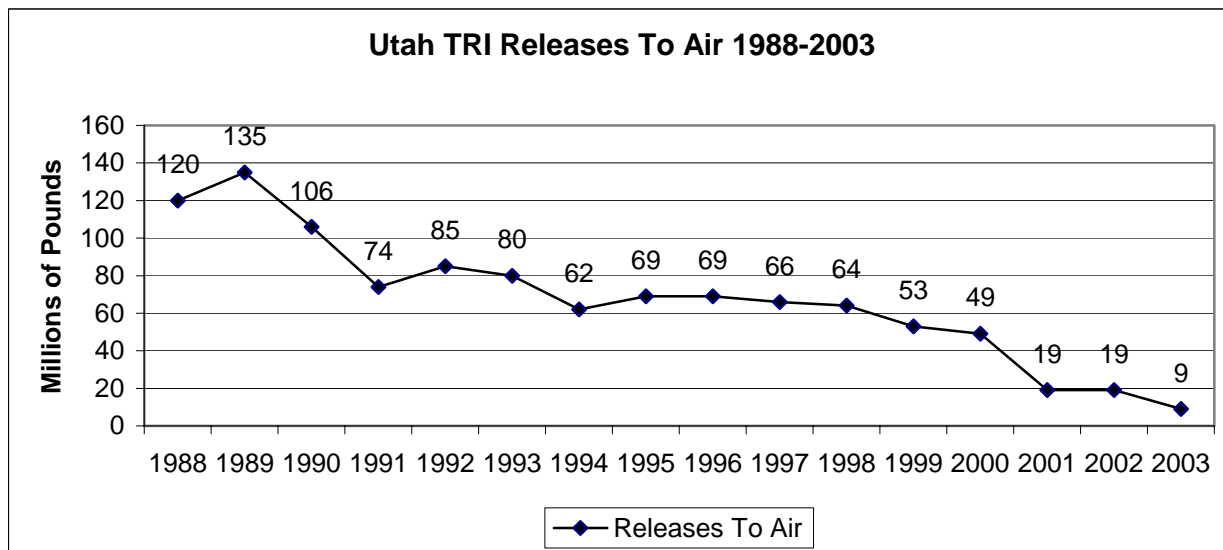


Figure 5

The top 10 facility totals for chemical releases to air are shown in Table 5. U.S. Magnesium was the greatest releaser to air in 2003. However, U.S. Magnesium’s annual trend of total releases continues to decrease significantly. Additional discussion about U.S. Magnesium is presented below.

Table 5 Utah 2003 TRI Top 10 Facilities - Total Releases to Air	
Lbs/Year	Facility
4,444,137	US MAGNESIUM, LLC
1,013,981	ATK THIOKOL INCORPORATED
958,082	PACIFICORP HUNTINGTON PLANT
310,739	PACIFICORP CARBON PLANT
229,865	PACIFICORP HUNTER PLANT
156,205	TESORO REFINING AND MARKETING COMPANY
149,677	BRUSH RESOURCES INC, MILL
147,510	INTERMOUNTAIN POWER GENERATING STATION
143,740	KENNECOTT UTAH COPPER SMELTER & REFINERY
130,496	U.S. DOD, U.S. AIR FORCE, OGDEN AIR LOGISTICS CENTER

The top 10 chemicals released to air are shown in Table 6.

Lbs/Year	Chemical Name
3,644,261	Hydrochloric acid (aerosol forms only)
2,952,329	Chlorine
552,527	Hydrogen fluoride
410,674	Ammonia
296,824	Sulfuric acid (aerosol forms only)
151,521	Toluene
141,858	1,1-Dichloro-1-fluoroethane
86,998	Styrene
84,250	Xylene (mixed isomers)
76,808	Copper Compounds

U.S. Magnesium is the primary contributor to total releases to air with a total of 4.4 million pounds of TRI chemicals released. ATK Thiokol is the second largest contributor to releases to air with a reported release of 1 million pounds in 2003. U.S. Magnesium has continued their recent annual downward trend to reduce chlorine releases significantly and has decreased their total release amounts for all chemicals by 69% in 2003. With implementation of U.S. Magnesium's process upgrades, beginning in reporting year 2003, chlorine was not the chemical released in the greatest amount; hydrochloric acid (aerosol forms only) replaced chlorine as the chemical of greatest volume released to air. Total chlorine released to air decreased by 78.7% from 13.9 million pounds in 2003 to 3 million pounds in 2004.

The primary industrial contributors to the release of 3.6 million pounds of hydrochloric acid (aerosols only) include: smelting and refining of non-ferrous metals except copper and aluminum (1.5 million pounds), rocket motor manufacturing (988,000 pounds), and coal fired power plants (1.1 million pounds). These contributors comprise 98% of the aerosol hydrochloric acid released.

ATK Thiokol releases to air increased by 76% between 2002 and 2003 while this facility's releases to air of hydrochloric acid (aerosol form only) increased by 83% from 540,000 lbs. in 2002 to 989,000 lbs. in 2003. This increase can be largely attributed to rocket motor tests conducted during the reporting year.

U.S. Magnesium

U.S. Magnesium has historically been the largest contributor to TRI releases to air in Utah. Nationally, U.S. Magnesium has been among the highest-ranking facilities for TRI chemicals emissions to air. U.S. Magnesium is located along the southwest side of the Great Salt Lake in the western desert of Tooele County. U.S. Magnesium produces magnesium metal by extraction of magnesium chloride from brines drawn from the lake. Chlorine and hydrochloric acid are produced as by-products of the magnesium extraction process.

Figure 6 shows that U.S. Magnesium's total emissions of TRI chemicals decreased by 69.9% from 14.8 million pounds in 2002 to 4.4 million pounds in 2003. The facility's releases of hydrochloric acid increased by 63.5%, from 926,000 pounds in 2002 to 1.5 million pounds in 2003 while the amount of chlorine released by U.S. Magnesium decreased significantly by 78.9% from 13.8 million pounds in 2002 to 2.9 million pounds in 2003. U.S. Magnesium attributes their reductions to improved operations.²

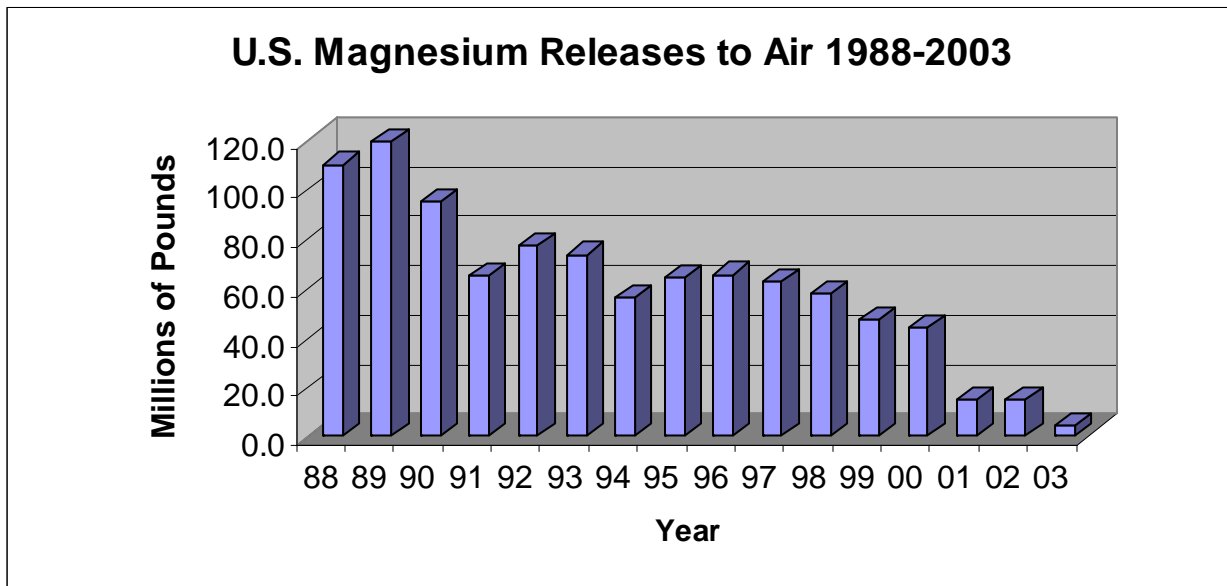


Figure 6

Over the past several years the company has implemented new process technology. The process cells do not generate as much chlorine and have also increased chlorine capture efficiency and chlorine process reuse.³

RELEASES TO LAND

Releases to land include releases made to: (1) landfills designed to receive solid waste; (2) surface impoundments for liquid waste; (3) land treatment, incorporating the waste into the soil; or (4) other disposal, such as placing material containing TRI chemicals on land.

Table 7 shows the top 10 facility total releases to land. TRI chemical releases to land in Utah increased by 48.7% by 75 million pounds from 154.5 million pounds in 2002 to 229.7 million pounds in 2003. The Kennecott Utah Copper Mine reported a 48.7% increase of 67 million pounds in releases to land, which comprises 89% of the total releases to land category for Utah. The amount of lead reported released by Kennecott Mine increased from 46 to 80 million pounds while the amount of copper released increased from 66 million to 100 million pounds. The 67 million pound increase reported by Kennecott constitutes 99.7% of the increase in total releases

² DEQ personal communication with USM environmental management personnel March 21, 2005.

³ Utah Division of Air Quality site manager provided additional explanation of increased process efficiencies achieved by the plant; electronic correspondence March 24, 2005.

in Utah for 2003. The increase in lead released is attributable to a zone encountered containing a higher concentration of naturally occurring lead in the ore while mining Kennecott's Bingham Canyon Mine. The greater amounts of lead were reported as portion of the waste rock. The increase in quantity of copper released by the Kennecott Mine is attributed mostly to an increase in the volume of throughput (raw material ore mined and fed into processing) to the tailings impoundment combined with a decrease in copper recovery process efficiency.⁴

Table 7	
Utah 2003 TRI Top 10 Facilities - Total Releases to Land	
Lbs/Year	Facility Name
180,914,368	KENNECOTT UTAH COPPER MINE, CONCENTRATORS, & POWER PLANT
25,523,099	KENNECOTT UTAH COPPER SMELTER & REFINERY
9,025,425	CLEAN HARBORS GRASSY MOUNTAIN, LLC
3,953,887	PACIFIC STATES CAST IRON PIPE COMPANY
2,561,119	ENVIROCARE OF UTAH, INC.
1,411,547	BONANZA POWER PLANT
1,363,073	PACIFICORP HUNTINGTON PLANT
1,210,428	WESTERN ZIRCONIUM
1,009,835	PACIFICORP HUNTER PLANT
986,837	INTERMOUNTAIN POWER GENERATING STATION

Table 8 identifies the top 10 chemicals released to land in 2003.

Table 8	
Utah 2003 TRI Top 10 Chemicals - Total Releases to Land	
Lbs/Year	Chemical Name
109,621,544	Copper Compounds
87,007,482	Lead Compounds
6,955,172	Zinc Compounds
5,751,196	Arsenic Compounds
4,122,546	Polychlorinated biphenyls
3,793,210	Barium Compounds
3,615,375	Manganese
1,450,485	Nitrate Compounds
1,402,326	Chromium Compounds
1,208,089	Nickel Compounds

The Kennecott Utah Copper Mine, Concentrators & Power Plant, and the Smelter & Refinery facilities were the largest releases of copper compounds (108.2 million pounds) and lead compounds (83.9 million pounds) contained in waste rock and tailings processed by these facilities. Other chemicals, including metal compounds (zinc compounds, arsenic compounds,

⁴ DEQ personal communication with KUC environmental management personnel March 21, and May 2, 2005.

barium compounds, manganese, chromium compounds, and nickel compounds), nitrate compounds, and polychlorinated biphenyls (PCBs) comprise the remaining majority of the largest quantity releases to land.

The Clean Harbors Grassy Mountain facility reported a significant increase in the quantity of polychlorinated biphenyls released to land in 2003. The reported quantity released in 2002 was 38,000 pounds, while the reported quantity released in 2003 was 4.1 million pounds. The facility believes the figure reported for report year 2003 may be erroneous. Clean Harbors is currently researching the issue, however, due to time constraints with EPA's public data release, DEQ was not able to incorporate revised release data into the statistical calculations completed to generate the data presented in this report.⁵

Mining

Three mining facilities reported under the TRI program for reporting year 2003:

- Kennecott Barneys Canyon Mining Company
- Kennecott Utah Copper Mine, Concentrators & Power Plant
- Brush Resources, Inc., Mill

For 2003 virtually 100% of releases reported from mines were releases to land. According to the mining industry, major sources of TRI releases to land totals are processed materials such as waste rock and tailings placed on-site.

Kennecott Facilities

Kennecott Utah Copper (KUC) operates extensive mining, milling, smelting, and refining operations in western Salt Lake County. The company's mine is one of the world's largest open pit mines. Annually the facility extracts millions of tons of overburden, waste rock, and ore as part of its operations. Ore is concentrated and shipped by pipeline to the smelter, which produces copper, gold, and sulfuric acid. The Kennecott Barneys Canyon Mine is an open pit gold mine. About 89.9% of the Utah total releases to land for reporting year 2003 were reported by Kennecott facilities in the form of copper, lead, manganese, chromium, arsenic, and other metals compounds. Releases to land reported under TRI from Kennecott facilities consist largely of metals present at lower concentrations in mill tailings.

The combined total release quantities reported from Kennecott facilities account for 83.3% of the total release quantities reported by all facilities in Utah in 2003. The combined total release quantities reported from Kennecott facilities in the reporting category of *releases to land*, account for 89% of the total amount of chemical release quantities that were reported by all facilities in Utah.

The Kennecott Utah Copper Smelter and Refinery has submitted TRI reports separate from Kennecott's mining facilities since 1987. As shown in Figure 7, releases to land that originated

⁵ DEQ personal communication with Clean Harbors Grassy Mountain environmental management personnel March 22, 2005.

from smelter operations increased slightly from 25.1 million pounds in 2002 to 25.6 million pounds reported in 2003.

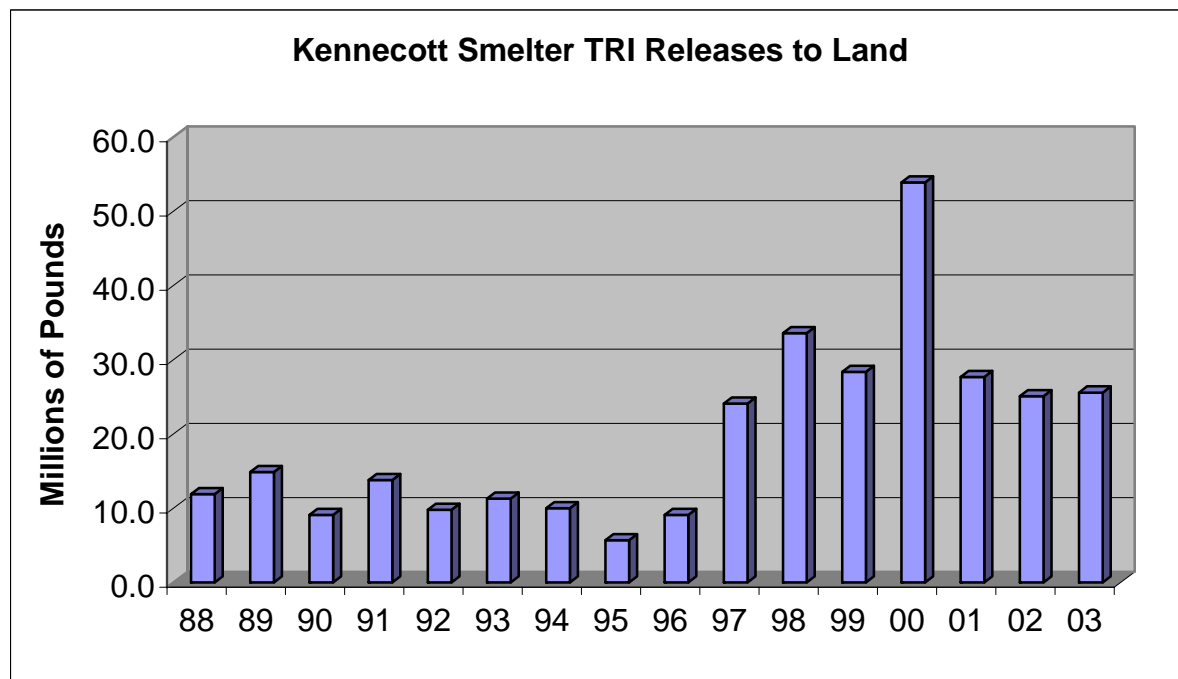


Figure 7

Chemicals representing the highest total releases to land (in millions of pounds) in 2003 from Kennecott Smelter are: copper (8.0), zinc (5.6), arsenic (5.4), and lead (4.2).

Waste Disposal Facilities

Waste disposal facilities that treat, store, and/or dispose of hazardous waste comprise an industrial sector required to submit TRI reports. Subtitle C of the Resource Conservation and Recovery Act and the Utah Solid and Hazardous Waste Act regulate these facilities. Facilities in this class reporting in 2003 include:

- Clean Harbors Aragonite, LLC.
- Clean Harbors Grassy Mountain, LLC.
- Envirocare

Slightly greater than 97% of releases reported by these facilities are releases to land. The EPA TRI definition of a *release* to land includes the placement of TRI chemicals into landfills, including landfills specifically constructed under requirements of RCRA and Utah Law to contain the waste inside the landfill and preclude a release. Clean Harbors Grassy Mountain facility reported 9 million pounds of waste treated, stored, and/or disposed in 2003. Clean Harbors Aragonite reported 2.2 million pounds of total off-site transfers. Releases increased from 6.3 million pounds in 2002 to 9.3 million pounds in 2003.

Table 9 shows that Clean Harbors Grassy Mountain and Envirocare are the only two facilities in 2003 to report releases to land from a waste disposal facility. Releases to land have been comprised of metals compounds, primarily copper, zinc, and lead with a variety of additional metals.

The Clean Harbors Grassy Mountain facility reported a marked increase in the release of polychlorinated biphenyls (PCB) in 2003. In 2002 the amount of PCBs released from Grassy Mountain was reported at 38,000 pounds; in 2003 the facility reported a release amount of 4.1 million pounds. As mentioned above the facility suspects that the PCB quantity reported for 2003 may be erroneous and is currently reviewing their data.

Table 9	
Utah 2003 TRI Waste Disposal Facility Releases to Land	
Lbs/Year	Facility Name
9,025,425	CLEAN HARBORS GRASSY MOUNTAIN, LLC
2,561,119	ENVIROCARE OF UTAH, INC.

Table 10 lists the top 10 TRI chemical totals released to land from waste disposal facilities.

Table 10	
Utah 2003 TRI Top Chemical Releases to Land from Waste Disposal Facilities	
Lbs/Year	Chemical
4,122,534	Polychlorinated biphenyls
2,789,555	Lead Compounds
1,278,637	Copper Compounds
1,119,042	Zinc Compounds
552,390	Chromium Compounds
354,531	Selenium Compounds
313,540	Barium Compounds
192,618	Aluminum (fume or dust)
172,784	Arsenic Compounds
155,518	Cadmium Compounds

Electric Utilities

Electric utilities that burn coal or oil for electric energy production were first required to submit TRI reports in 1998. Table 11 shows electric utility facilities reporting in 2003.

Table 11	
Utah 2003 TRI Coal-Fired Electric Utility Releases to Land	
Lbs/Year	Facility Name
1,411,547	BONANZA POWER PLANT
986,837	INTERMOUNTAIN POWER GENERATING STATION
124,618	PACIFICORP CARBON PLANT
57,012	SUNNYSIDE COGENERATION ASSOCIATES

Table 12 below provides the top 10 chemicals released to land by the coal-fired electric utility sector.

Table 12	
Utah 2003 TRI Chemical Releases to Land from Coal-Fired Electric Utilities	
Lbs/Year	Chemical Name
1,903,677	Barium Compounds
157,658	Chromium Compounds
133,104	Manganese Compounds
76,477	Lead Compounds
65,000	Arsenic Compounds
61,282	Vanadium Compounds
43,000	Copper Compounds
41,000	Zinc Compounds
25,000	Nickel Compounds
23,900	Antimony Compounds
19,287	Lead
16,000	Cobalt Compounds
14,000	Selenium Compounds
514	Mercury Compounds
108	Mercury
6.6177*	Dioxin and Dioxin-Like Compounds

* Indicates this quantity is reported in unit grams.

RELEASES TO SURFACE WATER

TRI-reported releases to surface water in Utah are a small percentage of total releases reported under TRI. Since only a small percentage of industries in Utah are required to submit TRI

reports, this TRI report identifies only a portion of the total chemical discharges to surface water bodies. However, in addition to TRI reports, many facilities are also required to submit “discharge monitoring reports” to the Utah Division of Water Quality which provide additional information on chemical concentrations and chemical amounts released to surface water.

Total TRI chemical releases to surface water in Utah reported in 2003 amounted to about 57,000 pounds. This is a slight decrease from the 63,000 pounds released in 2002. This is a significant decrease from 2001 for which the total release to surface water was slightly greater than one million pounds. This dramatic decrease is largely attributable to cessation of operations at Geneva Steel, which reported the vast majority of the TRI chemicals released to surface waters in past years. Table 13 provides the list of the top facilities that released TRI chemicals to surface waters in 2003.

Table 13	
Utah 2003 TRI Top Facilities Releases to Surface Water	
Lbs/Year	Facility Name
37,592	CHEVRON PRODUCTS COMPANY- SALT LAKE REFINERY
10,102	KENNECOTT UTAH COPPER MINE, CONCENTRATORS, & POWER PLANT
8655	KENNECOTT UTAH COPPER SMELTER & REFINERY
170	VALMONT COATINGS – INTERMOUNTAIN GALVANIZING
154	USA INDUSTRIES
152	NUCOR STEEL - A DIV. OF NUCOR CORP
100	PACIFICORP CARBON PLANT
36	CERROWIRE & CABLE CO.
10	RUBBER ENGINEERING
3	VARIAN MEDICAL SYSTEMS, X-RAY PRODUCTS

Table 14 lists the top chemical releases to surface water in 2003.

Chevron Products Company released 33,000 pounds of nitrate compounds to the Great Salt Lake in 2003. An additional 19,000 pounds of total TRI chemicals were reported released from Kennecott Copper facilities to surface water in 2003.

Table 14	
Utah 2003 TRI Top Chemical Releases to Surface Water	
Lbs/Year	Chemical Name
33,750	Nitrate Compounds
3450	Nickel Compounds
2850	Arsenic Compounds
2459	Zinc Compounds
2263	Copper Compounds
1850	Selenium Compounds
1300	Cyanide Compounds
1000	Ammonia
1000	Xylene (mixed isomers)
750	Toluene
750	Ethylbenzene

TRANSFERS TO PUBLICLY OWNED TREATMENT WORKS

POTWs are publicly owned wastewater treatment plants designed to treat sanitary sewage. They may also receive industrial wastewater. TRI “transfers to POTWs” identify the annual total amount of TRI chemicals discharged to POTW facilities.

Total releases to POTWs decreased from 1.3 million pounds in 2002 to 1.2 million pounds in 2003.

Table 15 identifies the top 10 facilities that released chemicals to POTWs during 2003.

Table 15	
Utah 2003 TRI Top 10 Facility Transfers to POTWs	
Lbs/Year	Facility Name
228,633	EASTON TECHNICAL PRODUCTS
212,586	JOHNSON MATTHEY
158,029	COMPEQ INTERNATIONAL
133,556	DANNON COMPANY, THE
104,266	TYCO PRINTED CIRCUIT GROUP, LP., LOGAN DIVISION
78,160	GENEVA NITROGEN LLC
58,725	FAIRCHILD SEMICONDUCTOR
55,682	NESTLE USA - PREPARED FOODS DIVISION, INC.
46,900	DYNO NOBEL INC., LEHI SITE B
44,807	MEADOW GOLD DAIRY

Table 16 below lists top chemical transfers to POTWs during 2003. Nitrate compounds accounted for about 74% of all releases to POTWs in 2003, and are primarily from Easton Technical Products, Johnson Matthey, and the Dannon Company.

Table 16	
Utah 2003 TRI Top 10 Chemicals Transferred to POTWs	
Lbs/Year	Chemical Name
939,370	Nitrate Compounds
158,617	Ammonia
76,324	Nitric acid
53,666	Glycol Ethers
13,403	Formaldehyde
9054	Toluene
6434	Benzene
5495	Xylene (mixed isomers)
4697	Diethanolamine
691	Copper Compounds

TRI-reported releases to POTWs do not include information concerning the rate of release or concentration of chemicals in the release. However, State and Federal law requires industrial facilities exceeding federally established chemical concentrations in wastewater to operate industrial pretreatment equipment to reduce such concentrations below harmful levels before discharging to the POTWs.

UTAH FACILITY TRANSFERS TO OTHER OFF-SITE LOCATIONS

Transfers to “other off-site” locations are transfers of TRI chemicals to facilities other than POTWs. Often these facilities include chemical recyclers and waste disposal sites. If the chemical is disposed of at these facilities, it is considered a release to the environment. The material transferred may or may not be classified a “hazardous waste”, but it contains a listed TRI chemical.

Table 17 lists the top 10 facilities that transferred chemicals to off-site locations in 2003. Lynrus Aluminum Products transferred over 13 million pounds of lead compounds off-site in 2003. The total poundage of TRI chemicals transferred off-site increased from 11.9 million pounds in 2002 to 40 million pounds in 2003. This represents a 307% increase in chemicals transferred off-site.

The top 10 facilities transferring chemicals off-site during 2003 are shown in Table 17.

Table 17	
Utah 2003 TRI Top 10 Facilities Transferring Chemicals Off-Site	
Lbs/Year	Facility
13,197,229	LYNRUS ALUMINUM PRODUCTS
10,490,715	CERROWIRE & CABLE CO.
8,195,104	NUCOR STEEL - A DIV. OF NUCOR CORP
2,182,342	CLEAN HARBORS ARAGONITE, LLC.
939,632	ATK THIOKOL INCORPORATED
590,641	TYCO PRINTED CIRCUIT GROUP, LP., LOGAN DIVISION
516,242	COMPEQ INTERNATIONAL
454,500	E.A. MILLER
407,638	JORDAN RIVER GALVANIZING
283,732	IBA S & I, INC.

Table 18 lists the top 10 chemicals transferred off-site. Lynrus Aluminum Products transferred over 13 million pounds of lead compounds in 2003. Copper and copper compounds, zinc compounds, and lead compounds comprise the bulk of the remaining chemicals transferred to off-site facilities during 2003.

Table 18	
Utah 2003 TRI Top 10 Chemicals Transferred to Off-Site Facilities	
Lbs/Year	Chemical Name
13,312,988	Lead
10,602,972	Copper
7,862,777	Zinc Compounds
1,449,428	Copper Compounds
1,138,063	Lead Compounds
830,623	Aluminum (fume or dust)
761,554	Chromium Compounds
596,769	Ammonia
501,130	Manganese Compounds
288,684	Ethylene glycol

Figure 8 displays how chemicals were being managed after being transferred from Utah facilities. About 59% of TRI chemicals transferred off-site in 2003 were transferred for treatment, while 29% of the total were transferred for recycling. The remaining 12% of chemicals were transferred for disposal.

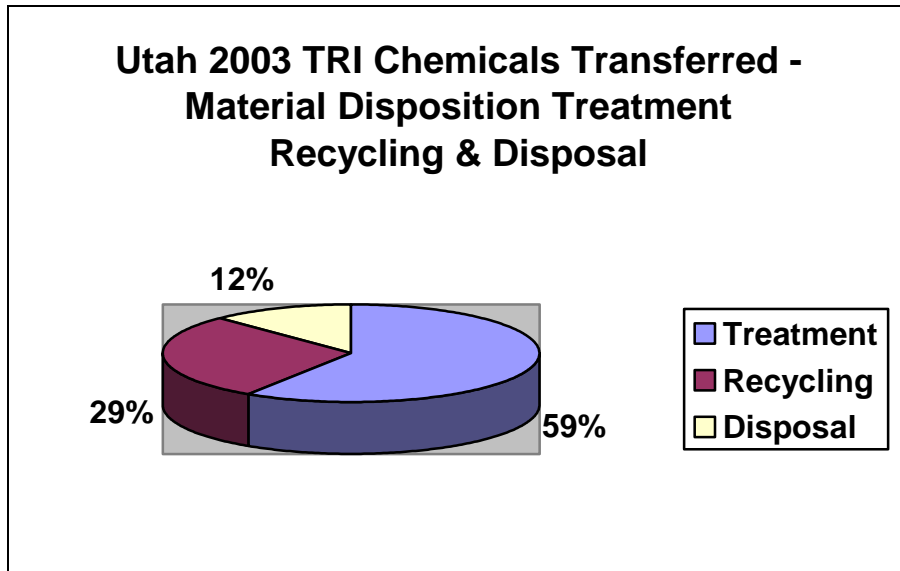


Figure 8

TRI chemicals transferred off-site may have been transferred to facilities inside or outside of Utah. Figure 9 depicts the percentages of chemicals transferred to various states. About 72% of the 40 million pounds of TRI chemicals transferred off-site in 2003 were transferred to facilities in Utah. Approximately 22% of TRI chemicals transferred off-site were transferred to facilities in Idaho.

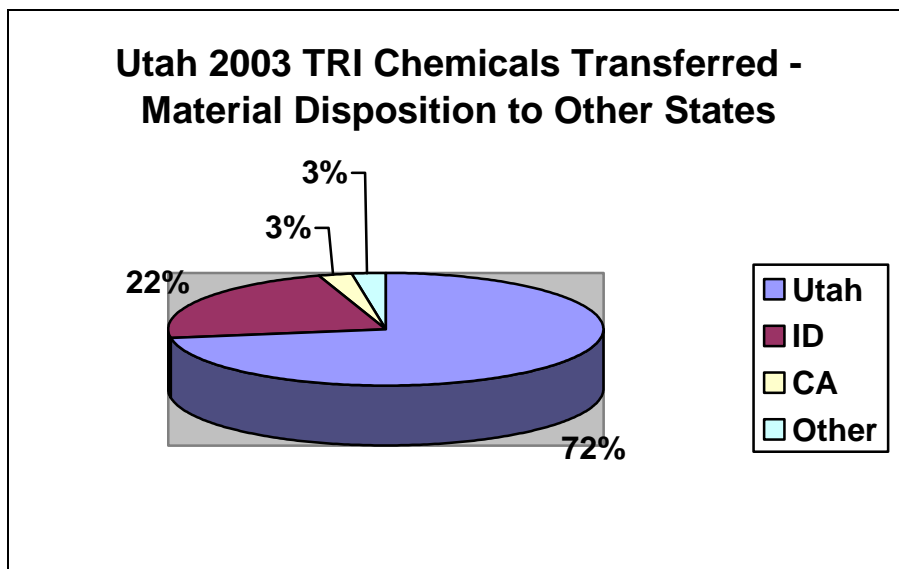


Figure 9

PERSISTENT BIOACCUMULATIVE TOXIC (PBT) CHEMICALS

In October 1999 EPA published a final rule (64 FR 58666) adding seven chemicals and two chemical compound categories to the list of toxic chemicals subject to reporting under EPCRA Section 313 that meet the criteria for persistence and bioaccumulation. Dioxin and dioxin-like compounds and polycyclic aromatic compounds (PACs) were the two chemical compound categories added.

EPA also lowered the reporting threshold on certain other toxic chemicals. Under the 1999 rule, EPA lowered the reporting thresholds for the dioxin and dioxin-like compounds chemical category to 0.1 gram.

Table 19 shows the 17 facilities in Utah reporting releases of dioxin and dioxin-like compounds and the amount of these chemicals released by each facility.

Table 19 Utah 2003 TRI - Facilities PBT Dioxin and Dioxin-like Compounds Releases (Units in Grams)			
Facility	Total Air	Total Land	Total-Release
US MAGNESIUM, LLC	46.00	4300.00	4346.00
BONANZA POWER PLANT	3.23	0.00	3.23
INTERMOUNTAIN POWER GENERATING STATION	1.92	6.62	8.54
SUNNYSIDE COGENERATION ASSOCIATES	0.75	0.00	0.75
ASH GROVE CEMENT COMPANY	0.71	0.00	0.71
PACIFICORP HUNTER PLANT	0.70	0.00	0.70
PACIFICORP HUNTINGTON PLANT	0.49	0.00	0.49
KENNECOTT UTAH COPPER MINE, CONCENTRATORS, & POWER PLANT	0.40	0.00	0.40

HOLCIM (US) INC. DEVIL'S SLIDE PLANT	0.25	0.00	0.25
GRAYMONT WESTERN US INC., CRICKET MTN LIME PRODUCTION	0.12	0.00	0.12
PACIFICORP CARBON PLANT	0.11	0.00	0.11
CHEVRON PRODUCTS COMPANY- SALT LAKE REFINERY	0.06	0.00	0.06
ALCOA EXTRUSIONS, INC.	0.04	0.00	0.04
CLEAN HARBORS ARAGONITE, LLC.	0.04	0.00	0.04
KENNECOTT UTAH COPPER SMELTER & REFINERY	0.00	0.00	0.00
WESTERN ZIRCONIUM	0.00	0.12	0.12
TESORO REFINING AND MARKETING COMPANY	0.00	0.00	0.00
TOTALs	54.80	4306.74	4361.54

For reporting year 2003, 17 facilities in Utah reported a total release of 4,362 grams of dioxin and dioxin-like chemicals. The total amount of dioxin and dioxin-like chemicals reported released in 2002 was 2,648 grams. This represents a 64.8% increase. The majority of releases (98.7%) were reported as releases to land with the remaining percentage reported as releases to air. No dioxins were reported being released to surface water. Most of the increase is attributable to an increased estimate at US Magnesium between 2002 and 2003. The increase may not reflect an actual increase of releases of these chemicals but rather is based on the availability in 2003 of better data on which to calculate estimated releases.⁶

⁶ DEQ personal communication with USM environmental management personnel May 5 & 6, 2005.

SUMMARY

In a summary comparison to reporting year 2002, releases of TRI chemicals in Utah during reporting year 2003 changed as follows:

- *Total On and Offsite Releases* increased by 37.3% (67.4 million pounds) to 248.2 million pounds.
- *Total Releases to Land* increased by 48.7% (75.2 million pounds) to 229.7 million pounds. The amount of raw ore mined by Kennecott and introduced into processing increased which resulted in increased output to the process effluent waste streams. Kennecott reported that a zone mined from the Kennecott Barney's Canyon Mine contained an increased level of lead, which contributed to higher amounts of lead in waste rock. Increased releases of copper were reported due to a combination of increased effluent to the tailings impoundment and lower efficiency in copper recovery from that effluent stream.
- *Total Releases to Air* decreased by 51% (9.4 million pounds) to 9.1 million pounds. Hydrochloric acid (aerosol forms only) replaced chlorine as the top chemical released to air. ATK Thiokol's testing of solid rocket motors contributed to the increase of hydrochloric acid aerosols. U.S. Magnesium's installation of improved process technology over the past several years has resulted in a decrease in chlorine emission releases. The technological advances have decreased the generation of chlorine and improved chlorine recovery and reuse efficiencies.
- *Total Releases to Surfaces Water* decreased by 9.9% (6,200 pounds) to 56,978 pounds.
- *Total Transfers to Publicly Owned Treatment Works* decreased by 3.6% (47,400 pounds) to 1.27 million pounds.
- *Transfers to Other Offsite* facilities such as treatment, storage & disposal facilities, which typically include chemical recyclers and waste disposal facilities, increased by 22.9% (1.7 million pounds) to 9.3 million pounds.
- The most notable PBT chemical category is dioxin and dioxin-like compounds. Except, as described below, federal regulations require that chemicals subject to TRI reporting be reported in pounds. Dioxin and dioxin-like compounds are unique in that it is the only chemical/chemical category throughout the TRI program in which the releases are reported in grams. Releases of PBT chemicals, dioxin and dioxin-like compounds, increased by 66.2% from 2,648 grams in 2002 to 4,362 grams in 2003 with 99% reported as releases to land.