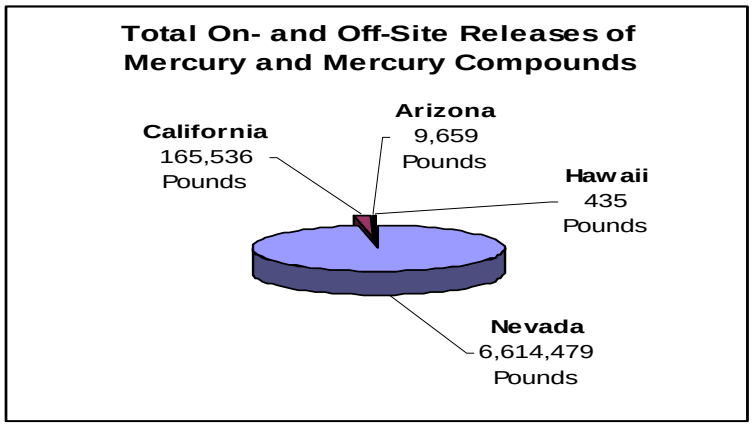
Mercury and Mercury Compounds Report: 2003 Toxics Release Inventory

U.S. EPA Region 9
Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations

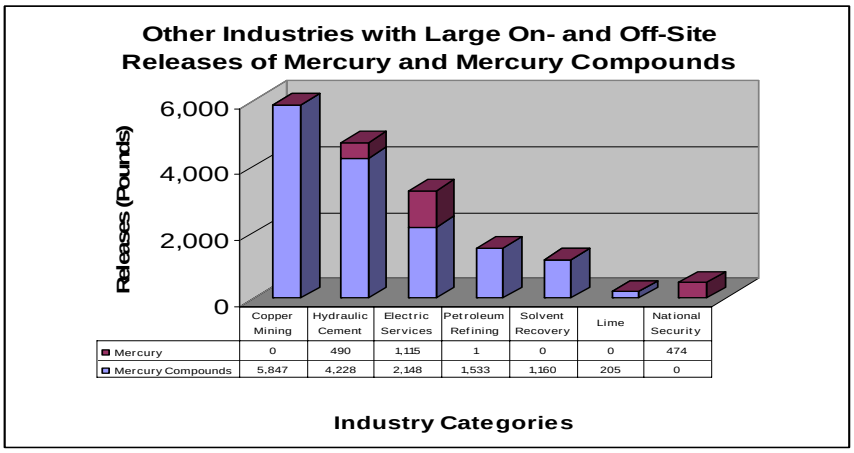
Table 1

Industries with Largest On- and Off-Site Releases		
Industry	**Pounds**	
	Mercury Compounds	**Mercury**
Gold Mining	6,585,852	63
Hazardous Waste	162,562	111
Silver Mining	23,520	0

A)



B)



The 2003 Data for Mercury and Mercury Compounds

EPA has made public the 2003 data on toxic chemicals that were released* to the air, water and land within the Pacific Southwest Region. This information comes from the Toxics Release Inventory (TRI), a federal community right-to-know program.

In the year 2000, TRI was expanded to include additional persistent, bioaccumulative and toxic (PBT) chemicals, and to require reporting for these chemicals at lower thresholds, ranging from 0.1 grams to 100 pounds. PBT pollutants are toxic chemicals that persist in the environment and bioaccumulate in food chains, thus posing risks to human health and ecosystems.

**Release is defined as the amount of a toxic chemical released on-site (to air, water, underground injection, landfills and other land disposal), and the amount transferred off-site for disposal.*

Mercury and Mercury Compounds Toxics Release Inventory Fact Sheet May 2005

While mercury and mercury compounds have been on the list of reportable chemicals since 1987, for the year 2000 the reporting threshold was drastically lowered (from 25,000 pounds manufactured or processed, and 10,000 pounds otherwise used to 10 pounds manufactured, processed, or otherwise used). As a result, additional facilities are required to report releases of mercury and mercury compounds.

For year 2003, mercury compounds accounted for 99.98% of on-site releases of mercury and mercury compounds, and 97.41% of the off-site releases. When compared to releases of mercury compounds, only a small percentage of elemental mercury was released.

A Note on Risk

It is important to note that release should not be directly equated with risk. To evaluate risk, release data must be combined with information about chemical toxicity, site-specific conditions, and exposure. In addition, these data do not indicate whether a facility is violating environmental laws. Many of the substances reported through this program are subject to state and federal regulations designed to protect human health and the environment.

Industries

A facility is subject to TRI reporting requirements if it: has 10 or more full-time employees; is classified under a reportable Standard Industrial Classification (SIC) code; and manufactures, processes, or otherwise uses any of the listed toxic chemicals in amounts greater than the threshold quantities. For most chemicals (excluding PBTs) the thresholds are 25,000 pounds for manufactured or processed, and 10,000 pounds for otherwise used.

Manufacturing industries have been reporting their releases since 1987 and federal facilities started reporting in 1994. In 1998, seven additional industry sectors began reporting their toxic chemical releases for the first time. These sectors are metal and coal mining, electricity generation, commercial hazardous waste treatment, solvent recovery, petroleum bulk terminals, and wholesale chemical distributors.

Releases

As shown in Table 2, there was an overall 41% increase in on- and off-site releases of mercury and mercury compounds for the year 2003.

Table 2
On and Off-Site Releases

Release Media	Reporting Year		Percent Change
	2002	2003	
Air	15,347	11,749	-23
Land	4,786,407	6,746,892	41
Water	28	16	-43
Undg Inj *	1.11	4.16	275
Off-Site	8,600	31,448	266
Total	4,810,382	6,790,109	41

* Underground Injection

The increase of total releases is mostly attributable to land releases at two Nevada mines. Total releases at Barrick Goldstrike Mines increased by 64% and Newmont Mining Corp. Twin Creeks Mine increased total releases by 55%. By reporting an 83% reduction in air emissions of mercury compounds, Jerritt Canyon Mine, in Elko Nevada, is primarily responsible for the decrease in air emissions.

The TRI data for 2003 show that, with the exception of Hawaii, Region 9 states continue to rank higher than most states in the U.S. for releases of mercury and mercury compounds. In a state-by-state comparison Nevada, California, Arizona and Hawaii ranked 1, 2, 15 and 47, respectively for total on- and off-site releases of mercury and mercury compounds. Nevada ranked number 1, reporting 6,614,479 pounds of on and off-site releases of mercury and mercury compounds. No mercury releases were reported in Region 9's Pacific Island Territories, and Table 3 gives the total pounds of mercury and mercury compounds reported in Region 9.

Table 3
Mercury and Mercury Compound Releases (in pounds) by State

State	Air	Land	Under Ground Injection	Water	Off-Site
Arizona	1,867	6,522	0	0	1,270
California	4,707	130,868	0	3	29,958
Hawaii	367	0	3	4	61
Nevada	4,808	6,609,502	1	9	159

2003 Data for Reporting Industry Sectors

A review of the TRI data shows that approximately 97% of mercury and mercury compound releases in the Region comes from the metal mining industry. The other 3% can be attributed to hazardous waste facilities, hydraulic cement manufacture, electricity generation, petroleum refineries, solvent recovery, and others. A detailed summary of releases by industry sector is provided in Table 4.

Table 4
Mercury and Mercury Compound Releases (in pounds) by Industry Sector

Industry	Air	Land	Water	Off-Site
Gold Mining	4,551	6,581,194	9	159
Hazardous Waste	45	134,344	0	28,284
Silver Mining	11	23,510	0	0
Copper Mining	81	5,766	0	0
Hydraulic Cement	4,141	563	0	14
Electricity Generation	2,331	894	0	38
Petroleum Refining	465	1	6	1,059
Solvent Recovery	0	0	0	1,160
Limestone	26	179	0	0
National Security	0	0	0	474

Metal Mining

In the Pacific Southwest Region, 27 metal mines reported over 6 million pounds of on-site mercury and mercury compound releases, most of which were released on-site to land. Mercury and mercury compounds may be processed as a trace constituent in metal ores or recovered as a by-product from gold ores.

Many mines extract, move, store, process, and dispose of large amounts of waste rock and ore materials which often contain low concentrations of naturally occurring metals. The vast majority of this material is placed in surface impoundments or on the land, and the metals are reported as on-site releases to land. This previously buried material is exposed to potential leaching by rain, snow, and acid mine drainage, and must be carefully managed and monitored to prevent any surface water or groundwater contamination.

There are also air releases from ore processing and metal refining operations. For air releases of mercury and mercury compounds, copper mines reported a total of 81 pounds, silver mines reported 11 pounds, and gold mines reported a total of 4,551 pounds.

Hazardous Waste Disposal

Land disposal of 134,344 pounds of mercury and mercury compounds were reported to be released into permitted landfills. Hazardous waste disposal facilities also reported 45 pounds of air releases.

Cement Manufacturing

Mercury may be processed or otherwise used as a trace element in raw materials and fuels in the manufacture of portland cement. These facilities reported 4,141 pounds of releases to the air, and 563 pounds of on-site land releases.

Electricity Generation

Only facilities that burn coal or oil to generate electricity commercially are required to report to the Toxics Release Inventory Program. Mercury compounds may be formed during the combustion process. These facilities reported 2,331 pounds of air releases and 894 pounds of land releases.

Petroleum Refineries

Mercury and mercury compounds may be processed or otherwise used as trace components in crude oil. Air releases totaling 465 pounds were reporting by these facilities.

Table 5 shows the 10 counties with the highest on-site releases of mercury and mercury compounds

Table 5
Top Region 9 Counties for On-site Releases in 2003

County	Pounds Released
Elko, Nevada	4,318,565
Humboldt, Nevada	1,841,962
Eureka, Nevada	271,589
Lander, Nevada	128,710
Kings, California	119,475
Pershing, Nevada	23,476
White Pine, Nevada	22,976
Kern, California	13,413
Nye, Nevada	6,410
Yavapai, Arizona	4,921

Table 6 shows the 10 facilities with the highest on and off-site releases of mercury and mercury compounds

Table 6
Top Facilities for Total On- and Off-Site Releases

Facility Name	City, State	Pounds Released
Barrick Goldstrike Mines, Inc.	Elko, Nevada	4,240,944
Newmont Mining Corp. Twin Creeks Mine	Golconda, Nevada	1,660,588
Newmont Mining Corp. Carlin South Area	Carlin, Nevada	200,724
Newmont Mining Corp. Lone Tree Mine	Valmy, Nevada	131,017
Cortez Gold Mines	Cresent Valley, Nevada	128,427
Chemical Waste Management, Inc.	Kettleman City, California	119,577
Jerritt Canyon Mine	Elko, Nevada	76,952
Newmont Mining Corp. Carlin North Area	Carlin, Nevada	71,024
Glamis Marigold Mining Co.	Valmy, Nevada	34,629
Coeur Rochester Inc.	Lovelock, Nevada	23,237

On-line Access

For national information on data releases, see:
http://www.epa.gov/tri

The TRI data is available through Envirofacts Warehouse, EPA's premier internet site for distributing environmental information at:
http://www.epa.gov/enviro

or the TRI Explorer tool:
http://www.epa.gov/triexplorer

For general information on the Toxics Release Inventory, including reporting requirements for businesses, go to:
http://www.epa.gov/region09/toxic/tri

For more information on the EPA's PBT Chemicals Program, go to:
http://www.epa.gov/opptintr/pbt/

Information and Assistance

Region 9 staff will answer questions and assist you in learning more about the TRI Program in Region 9.

U.S. EPA Region 9
Nancy Sockabasin, TRI Coordinator
(415) 972-3772