

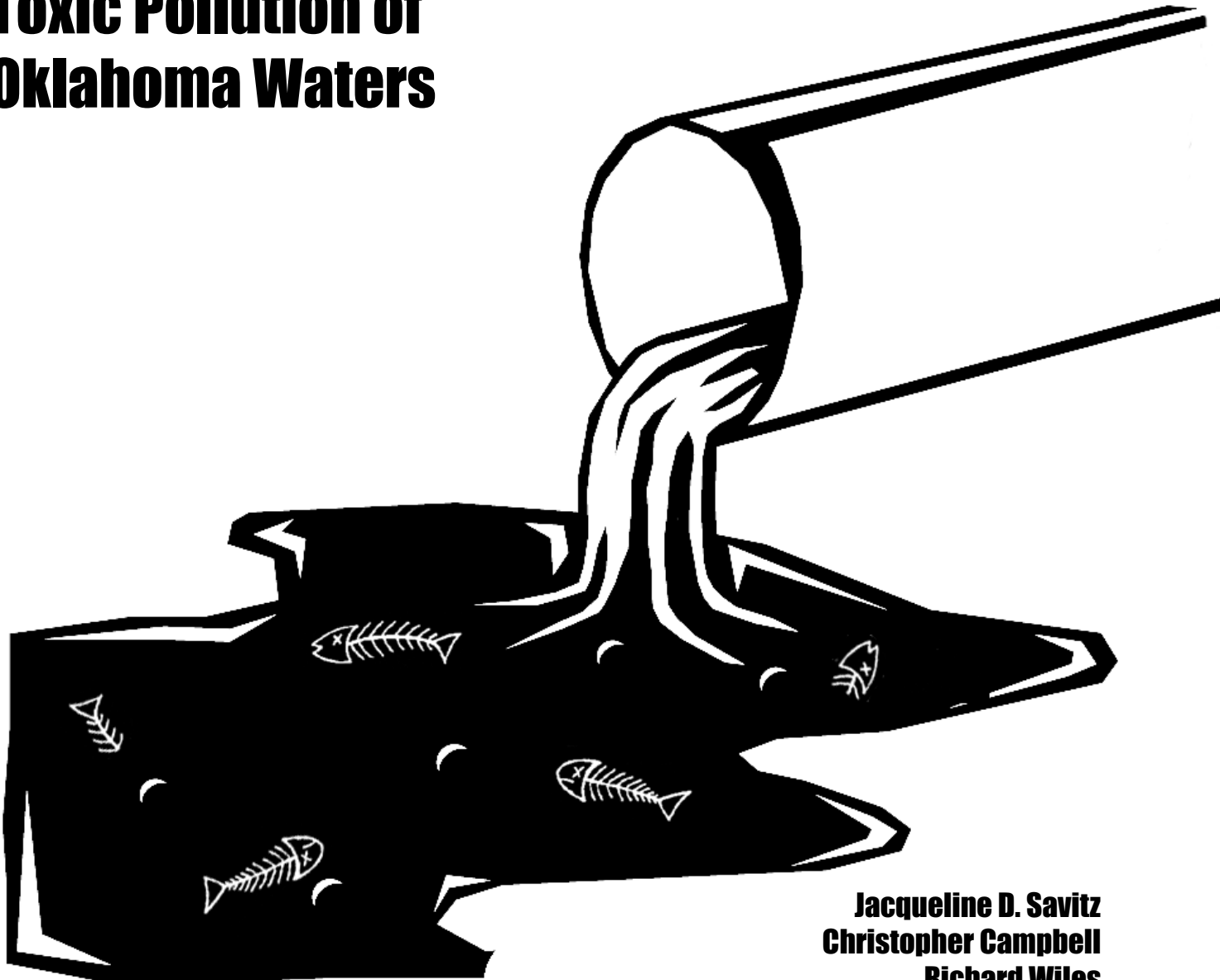


The State PIRGs



Dishonorable Discharge

Toxic Pollution of Oklahoma Waters



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Toxic Pollution of Oklahoma Waters

Executive Summary

Most Oklahoma citizens would be surprised to learn that scores of businesses and facilities across the state *legally* dump tons of toxic chemicals into the state's rivers, streams, lakes, and bays. Many of these same polluters flush millions more pounds of toxic substances down the drain to sewage treatment plants that taxpayers pay to operate and maintain. None of the toxic chemicals sent to publicly financed sewage treatment systems are reported as pollution by the EPA, even though a great deal of the toxic load eventually finds its way to Oklahoma streams and rivers.

The citizens of Oklahoma have a right to know about any pollution of their water, air or land that may pose a risk to human health or the environment. The goal of *Dishonorable Discharge* is to inform the public about the massive level of toxic pollution of the waters in their state, and point out the need for more comprehensive reporting of toxic chemical use, transport, and pollution, in Oklahoma and nationwide.

Factories and other industrial facilities dumped more than 2.3 million pounds of toxic substances directly into Oklahoma's waters between 1990 and 1994, according to a new analysis of the federal Toxics Release Inventory (TRI) (Table 1). Oklahoma ranked 33rd among the states in toxic water pollution reported over those five years. Because of weaknesses and loopholes in federal pollution laws, most, if not all of these toxic discharges are perfectly legal.

As large as they are, these figures substantially underestimate toxic releases to waters and the environment because the TRI requires reporting of only about 340 of the 73,000 chemicals in commerce. The TRI also exempts certain industries from reporting, including utilities, sewage treatment plants, municipal incinerators, and manufacturing facilities with fewer than ten employees.

In addition, 829,000 pounds of toxic materials were flushed to sewage treatment plants in Oklahoma from 1990 through 1994 (Table 1.) EPA estimates that twenty-five percent of all discharges nationwide flow through sewage treatment plants untreated (EPA 1995). Applying this 25 percent estimate to Oklahoma raises the total amount of toxics dumped to the state's waters to an estimated 2.5 million pounds (Table 1).

The Verdigris River received the greatest amount of toxic water pollution in Oklahoma from 1990-1994, a total of 1,040,000 pounds, followed by the North Canadian River, Sand Creek, and the Arkansas River (Table 2). The ten most polluted waterways in Oklahoma received 2,250,000 pounds of toxic pollution between 1990 and 1994, 99.2% percent of the total in the State.

The top three facilities reporting the most toxic pollution of Oklahoma's waters over this period were Terra Nitrogen in Catoosa, which dumped 1,040,000 pounds of toxic

chemicals, followed by Terra Nitrogen Corp., and Total Petroleum Inc. in the towns of Woodward, and Ardmore, respectively (Table 3). The toxic chemicals dumped in the greatest amounts were ammonium nitrate solution, a total of 1,200,000 pounds, followed by ammonia, and diethanolamine (Table 4).

Sinclair Oil Corporation dumped the most carcinogens into Oklahoma's waters, a total of 3,300 pounds, followed by Fort Howard Corporation and National Standard Company (Table 8). The Arkansas River received the greatest amount of cancer-causing toxic chemicals in Oklahoma, a total of 7,200 pounds, followed by Boomer Creek and the Verdigris River (Table 7).

Fort Howard Corporation dumped the greatest amount of persistent toxic metals in Oklahoma's waters, a total of 24,000 pounds, followed by Sinclair Oil Corporation and National Standard Company (Table 8). The Arkansas River received the greatest amount of persistent toxic metals, a total of 33,000 pounds, followed by Boomer Creek and the Verdigris River (Table 7).

Sinclair Oil Corporation dumped the greatest amount of toxic chemicals that cause reproductive damage or birth defects into Oklahoma's waters, a total of 1,000 pounds, followed by National Standard Company and Conoco Ponca City Refinery (Table 8). The Arkansas River received the greatest amount of toxic chemicals that cause reproductive damage or birth defects, a total of 2,000 pounds, followed by Boomer Creek and the Soldier Creek (Table 7).

These discharges to Oklahoma's waters include only those wastes released by companies physically located in Oklahoma. Many waterways receive additional pollution from sources outside of the state. Information on toxic water pollution in other states can be found in EWG's state reports series, and in the national report, *Dishonorable Discharge*.

Recommendations

Americans have a right to know about any use, transport, or release of toxic substance in their communities that might pose a risk to human health or the environment. Required reporting under the TRI provides only a small portion of this information. Much more complete reporting is needed. Americans also have a right to know about toxic chemicals in the products they buy that may pose a risk to them and their children.

Full accounting of the use of toxic materials reveals many low cost opportunities for pollution prevention. In New Jersey, state officials estimate that every dollar spent on such materials accounting practices generates five to eight dollars in increased efficiency (GAO 1994). Without materials accounting industry will miss many opportunities for substantial low cost reductions in pollution, and the public and policy makers will be unable formulate strategies that most effectively reduce exposure to toxic substances in the environment and consumer products.

We recommend:

- Timely implementation of the EPA's proposed expansion of industries and facilities required to report toxic releases under the TRI.
- Expansion of TRI reporting requirements to include full materials accounting for any facility or industry that uses or releases a toxic substance that may pose a risk to human health and the environment.

Dishonorable Discharge

Toxic pollution of rivers, lakes, streams, and bays is a serious problem in all 50 states. Twenty five years after the passage of the Clean Water Act, nearly forty (40) percent of America's rivers, lakes, and coastal waters remain unsafe for fishing, swimming or basic recreation (EPA 1996b). In Oklahoma, over 84,00 acres of lakes surveyed have elevated levels of toxic chemicals (EPA 1995b). The pollution that fouls these waterways costs the state's economy millions of dollars in tourism, fishing, and development revenues that otherwise could be earned on or near these waters were they not so polluted (EPA 1996b).

Dishonorable Discharge Underestimates Toxic Pollution

The Toxics Release Inventory (TRI) provides a rough estimate of a small portion of the toxic chemicals that flow into America's waters. The toxic discharges reported in this study are based on TRI reported toxic releases to waterways and so-called "transfers" of toxics to publicly owned treatment works (POTWs) — the term of art that industry and the EPA use when an industrial facility dumps toxic chemicals into the local sewer.

The figures reported in *Dishonorable Discharge* dramatically underestimate the total amounts of toxic compounds that have been discharged, dumped, or made their way into rivers and lakes across the country over the past five years.

About 90¹ percent of all toxic discharges coming out of pipes into water (so-called point source discharges) are not reported to the TRI. This is because the TRI requires reporting on only about 343² of some 73,000 chemicals used in commerce, and because the TRI exempts many polluters (utilities, certain industries, and those with fewer than ten employees) from reporting requirements (EPA 1996).

About half of all toxics that pollute rivers come from surface runoff and air deposition, as opposed to pipes. Comprehensive accounting of this "nonpoint source" pollution is not available for all rivers on a national basis.

Taking all of the limitations of the existing information into account, Environmental Working Group believes that an accurate estimate of the total load of toxic pollution in many rivers and lakes over the past five years might be 20 times greater than the amounts reported here.

Hiding Toxics in the Sewer

The EPA does not include so-called "transfers" of toxic chemicals to sewer systems as an official "release" of a toxic chemical into the environment (EPA 1996). At the same time, the EPA estimates that 25 percent of all toxic chemicals transferred to sewers from industrial facilities pass through treatment and into the waterways that receive wastewater (EPA 1995).

Transfers of toxic chemicals to publicly owned treatment works (POTWs) — otherwise known as sewage treatment plants — were four times greater in 1994 than the amount of toxic chemicals released directly to water that are reported in the entire TRI that year. To estimate the total amounts of toxic substances dumped into Oklahoma’s waters, we used EPA’s assumption that 25 percent of all toxic chemicals transferred to POTWs pass-through untreated³. Table 1 presents the EWG estimate of toxic chemicals assumed to be discharged by the POTWs in Oklahoma. Estimates of toxic discharges from POTWs to specific rivers and bodies of water could not be accurately estimated because the sewage treatment plants are not required to report to the TRI.

Assuming a 25 percent flow-through also does not permit discharge estimates for individual toxic chemicals that flow through the sewer system into waterways. In reality some chemicals flow through POTW’s untouched, while others are removed and held in the sludge, broken down in treatment, or allowed to evaporate into the ambient air as toxic pollutants.

How Toxic is Toxic?

Some 340 substances were required to be reported to the EPA for the years analyzed in this report. According to the EPA:

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

- Significant adverse acute health effects at concentration levels that are reasonably likely to exist beyond facility boundaries as a result of continuous, or frequently recurring releases;
- In humans — cancer; teratogenic effects; or serious irreversible reproductive dysfunction, neurologic disorders, heritable genetic mutations, or other chronic health effects;
- A significant adverse effect on the environment because of its toxicity, its toxicity and persistence in the environment, or its toxicity and tendency to bioaccumulate in the environment of sufficient seriousness to warrant reporting under EPCRA section 313” (EPA 1996).

For most of the TRI chemicals, federal regulators and scientists have a disturbingly incomplete understanding of the long term toxic effects on the environment or human health. The vast majority of compounds reported in the TRI are not fully studied, even though they have triggered one of the above criteria.

Toxic discharges and runoff to water are a serious and largely unaddressed environmental and human health problem. Most, if not all of the pollution reported in Dishonorable Discharge is legal. Current pollution control laws like the Clean Water Act (CWA), the Resource Conservation and Recovery Act (RCRA), and the Toxic Substances Control Act (TSCA) do little to move the nation towards reducing the toxic pollution cited in this report. In effect, these laws issue pollution licenses or exemptions from regulations.

One of the more glaring exemptions may be the so-called “domestic sewage exclusion” under RCRA, whereby toxic contaminants sent to sewage treatment plants escape otherwise applicable federal hazardous waste regulations. This accounts for the huge amounts of toxic chemicals that were dumped down the drain by American industry and end up in the nation’s rivers and streams. Another major source of toxic pollution of waters is agricultural pesticides. The runoff of pesticides from agricultural fields is not regulated under any federal law, and is not tabulated by the TRI nor included in this report. About 1.1 billion pounds⁴ of pesticides were used in the United States in 1993 alone (Aspelin 1994).

Dishonorable Discharge is based on data collected by the U.S. Environmental Protection Agency’s Toxics Release Inventory (TRI) for the reporting years 1990 through 1994, which includes the most recent data available. It includes the releases of only 343 chemicals from about 27,000 manufacturing facilities. The limitations of these data have been described above.

Analyzing Discharges by Body of Water

Discharges from TRI facilities were assigned to a given waterway based on the “receiving stream” reported to the EPA. Most waterways reported as “tributary” streams were included with their respective rivers in this report when it was possible to link them. For purposes of this analysis, toxic release data for major rivers themselves are tabulated separately, not summed as part of larger watersheds. For example, a “Tributary to the Mississippi River” was counted as Mississippi River, while the Missouri River was not, even though it eventually joins the Mississippi just above St. Louis. Small streams receiving large quantity discharges (such as Gravelly Run in Virginia and Clear Creek in Colorado) were reported individually, just as they are recorded in the TRI. State-level reports only include discharges to a given river from facilities that are physically located in this state, not discharges from facilities located in other states upstream.

Reporting Toxics Dumped Down the Drain

Enormous quantities of toxic chemicals are discharged to waterways via sewer systems. These so-called “transfers” of toxic chemicals to publicly owned treatment works (POTWs) totaled more than 250 million pounds in 1994, compared to 66 million pounds of direct discharges to waters reported in that same year. While the EPA does not count these transfers as environmental releases in the TRI, the Agency estimates that an average of 25 percent of these transfers flow through sewer systems into receiving waters (EPA 1995).

To better illustrate the amount of toxic chemicals that actually make it into the nation’s waters each year, we assumed that on average 25 percent of the toxic chemicals transferred to POTWs (a.k.a. sewers) by a reporting facility, ultimately pass through the sewage treatment plant untreated and in most cases are discharged to receiving waters.

Toxic chemical releases through POTWs were estimated statewide, but were not attributed to specific rivers at the state level due to the difficulty of verifying the receiving waters. Environmental Working Group will attempt to identify receiving waters more precisely future reports. All other analyses including facility discharges and top chemicals reflect direct discharges only, and not POTW release estimations.

Total discharges of persistent toxic metals, known or possible carcinogens, and chemicals known to cause reproductive effects, were calculated for specific rivers

based on information characterizing the toxic properties of these substances previously published by the EPA, the State of California, and the State of New Jersey, as well as other toxicological literature (Environmental Protection Agency, 1996; California Code of Regulations; New Jersey Department of Health; and Dixon, 1986). EPA's inclusion of known, probable, and possible carcinogens is based on determinations made by the Occupational Safety and Health Administration (OSHA), the National Toxicology Program (NTP), and the International Agency for Research on Cancer (IARC) (EPA 1996). Lists of chemicals included are found in the Appendix.

Notes

¹Estimate based on EPA report (National Sediment Contaminant Point Source Inventory: Analysis of Release Data for 1992. Final Draft.) (EPA, 1995) where data from TRI were compared to the Permit Compliance System (PCS) Database and found to represent only about 9%, at most, of discharges reported in PCS. Estimates from the GAO indicate that PCS regulates only 23% of all toxic water pollution (GAO, 1994).

²The exact number of chemicals required varies with the year. In 1994, 343 chemicals were reported. EPA has recently expanded the inventory to include about 650. These data, to be reported for 1995, will be available in 1997.

³EPA uses this factor since it is unlikely to greatly overestimate or underestimate the exact treatment efficiency (EPA 1995). This number will vary for any specific chemical; however it estimates pass through for chemicals as a whole, and is not applied to specific chemicals in this report.

⁴This value refers to pesticide active ingredients. The total volume of pesticide products, including so-called inert ingredients is far higher.

Appendix

Carcinogens

1,1,2,2-Tetrachloroethane	beta-Propiolactone	Michler's ketone
1,1-Dimethylhydrazine (UDMH) (alar trans. prod.)	Bis (2-chloroethyl) ether	Mustard Gas
1,2-Dibromo-3-chloropropane (DBCP)	Bis(chloromethyl) ether	N-Nitroso-N-ethylurea
1,3-Butadiene	Bromodichloromethane	N-Nitroso-N-methylurea
1,3-Dichloropropylene	Bromoform	N-Nitrosodi-n-butylamine
1,3-Propane sultone	Cadmium	N-Nitrosodi-n-propylamine
1,4-Dioxane	Cadmium compounds	N-Nitrosodiethylamine
1-Amino-2-methylantraquinone	Captan	N-Nitrosodimethylamine
1-Naphthylamine	Carbon tetrachloride	N-Nitrosodiphenylamine
2,4,6-Trichlorophenol	Chlordane	N-Nitrosomethylvinylamine
2,4-Diaminoanisole	Chloroethane (Ethyl chloride)	N-Nitrosomorpholine
2,4-Diaminoanisole sulfate	Chloroform	N-Nitrososarcosine
2,4-Diaminotoluene	Chloromethyl methyl ether	N-Nitrosopiperidine
2,4-Dinitrotoluene	Chlorophenols	Nickel
2-Acetylaminoanthraquinone	Chlorothalonil	Nickel compounds
2-Aminoanthraquinone	Chromium	Nitrotriacetic acid
2-Methylaziridine (Propyleneimine)	Cupferron	Nitrofen
2-Naphthylamine	D&C Red No. 19	Nitrogen mustard (Mechlorethamine)
2-Nitropropane	DDVP (Dichlorvos)	ortho-Anisidine
3,3'-Dichlorobenzidine	Di -(2-ethylhexyl)phthalate	ortho-Anisidine hydrochloride
3,3'-Dimethoxybenzidine (ortho-Dianisidine)	Dichloromethane (Methylene chloride)	ortho-Toluidine
3,3'-Dimethylbenzidine	Diepoxybutane	ortho-Toluidine hydrochloride
4,4'-Diaminodiphenyl ether (4,4'-Oxydianiline)	Diethyl sulfate	p-Aminoazobenzene
4,4'-Methylene bis(2-chloroaniline)	Dimethyl sulfate	p-Cresidine
4,4'-Methylene bis(N,N-dimethyl) benzenamine	Dimethylcarbamoyl chloride	p-Dichlorobenzene
4,4'-Methylenedianiline	Direct Black 38	p-Nitrosodiphenylamine
4,4'-Thiodianiline	Direct Blue 6	Pentachlorophenol
4-Aminobiphenyl (4-aminodiphenyl)	Direct Brown 95	Polybrominated biphenyls
4-Dimethylaminoazobenzene	Epichlorohydrin	Polychlorinated biphenyls
4-Nitrobiphenyl	Ethyl acrylate	Propylene oxide
5-Nitro-o-anisidine	Ethylene dibromide	Saccharin
Acetaldehyde	Ethylene dichloride (1,2-Dichloroethane)	Safrrole
Acetamide	Ethylene oxide	Styrene
Acrylamide	Ethylene thiourea (EBDC trans prod.)	Styrene oxide
Acrylonitrile	Ethyleneimine	Tetrachloroethylene (Perchloroethylene)
Allyl chloride	Formaldehyde	Thioacetamide
Aniline	Hexachlorobenzene	Thiourea
Arsenic	Hexachloroethane	Toluene-2,4-diisocyanate
Arsenic compounds	Hexamethylphosphoramide	Toluene-2,6-diisocyanate
Asbestos	Hydrazine	Toxaphene (Polychlorinated camphenes)
Auramine	Hydrazine sulfate	Trichloroethylene
Benzene	Hydrazobenzene (1,2-Diphenylhydrazine)	Tris(2,3-dibromopropyl)phosphate
Benzidine [and its salts]	Isosafrole	Urethane (Ethyl carbamate)
Benzotrichloride	Lead	Vinyl bromide
Benzyl chloride	Lead compounds	Vinyl chloride
Beryllium and beryllium compounds	Lindane	Vinyl trichloride (1,1,2-Trichloroethane)
Beryllium compounds	Methyl iodide	

Persistent Toxic Metals

Antimony & Antimony Compounds
 Arsenic & Arsenic Compounds
 Barium & Barium Compounds
 Beryllium & Beryllium Compounds
 Cadmium & Cadmium Compounds
 Chromium & Chromium Compounds
 Cobalt & Cobalt Compounds
 Copper & Copper Compounds
 Lead & Lead Compounds
 Manganese & Manganese Compounds
 Mercury & Mercury Compounds
 Nickel & Nickel Compounds
 Selenium & Selenium Compound
 Silver & Silver Compounds
 Thallium & Thallium Compounds
 Zinc & Zinc Compounds

Chemicals that Affect Reproduction

1,2-Dibromo-3-chloropropane
 Cadmium
 Carbon disulfide
 Diethylhexyl phthalate
 o-Dinitrobenzene
 m-Dinitrobenzene
 p-Dinitrobenzene
 Ethylene glycol monoethyl ether
 Ethylene glycol monomethyl ether
 Ethylene oxide
 Hexamethylphosphoramide
 Lead
 Styrene
 Toluene
 Trichloroethylene
 Xylene(mixed isomers)
 o-xylene
 m-xylene
 p-xylene
 Di-n-butyl phthalate
 Glycol ethers
 Mercury Compounds
 Mercury
 Benzene
 Aluminum
 Arsenic
 Nickel
 Lindane
 Vinyl Chloride

Source: Environmental Working Group. Compiled from California Proposition 65, EPA's TRI Public Data Release, New Jersey Department of Health, Hazardous Substances Fact Sheets, and Toxic Responses of the Reproductive System (Dixon 1986).

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Oklahoma

Toxic pollution of Oklahoma waters (1990-1994)

Table 1. Total reported toxic pollution of Oklahoma waters (1990-1994).

Direct Water Discharges	2,271,397 Pounds
Estimated Sewer Discharges‡	207,329 Pounds
Total Discharges to Waters	2,478,726 Pounds

Table 2. Oklahoma waters receiving the greatest amounts of toxic pollution (1990-1994).

River or Water Body	Toxic chemical release to waterbody (pounds)
Verdigris River	1,042,000
North Canadian River	318,550
Sand Creek	245,297
Arkansas River	234,190
Skeleton Creek	118,820
Garland Creek	101,280
Pryor Creek	92,348
Turkey Sandy Creek	57,641
Unnamed Tributary To Bird Creek	38,510
Unnamed Tributary To Mingo Creek	5,550

Table 3. Polluters reporting the greatest amounts of toxic chemicals discharged to Oklahoma waters (1990-1994).

Facility	City	Toxic chemical release to waters (pounds)
Terra Nitrogen	Catoosa	1,041,297
Terra Nitrogen Corpn.	Woodward	318,550
Total Petroleum Inc.	Ardmore	245,297
Farmland Ind. Inc.	Enid	118,820
Weyerhaeuser Co.	Valliant	101,280
Wil-Gro Fertilizer	Pryor	92,348
Sinclair Oil Corp.	Tulsa	78,441
Conoco Ponca City Refinery	Ponca City	77,412
Kerr-McGee Refining Corp.	Wynnewood	61,176
Sun Refining & Marketing Co.	Tulsa	43,442

Table 4. Toxic chemicals discharged in the greatest amounts to Oklahoma waters (1990-1994).

Chemical	Toxic chemical release to waters (pounds)
Ammonium nitrate (solution)	1,204,048
Ammonia	709,898
Diethanolamine	138,230
Ethylene glycol	103,500
Catechol	32,420
Methanol	18,298
Zinc compounds	15,690
Barium compounds	15,156
Sulfuric acid	5,361
Chloroform	2,980

Table 5. Polluters reporting the greatest amounts of toxic chemicals discharged to Oklahoma sewage treatment facilities (1990-1994).

Facility	City	Toxic chemical release to sewers (pounds)
Gulfstream Aerospace Techs.	Bethany	237,563
Meadow Gold Dairies Inc.	Tulsa	120,240
Chromium Plating Co.	Tulsa	60,400
3M	Weatherford	55,740
Gold Spot Dairy	Enid	55,000
Hiland/Gilt Edge Dairy	Norman	50,828
Oklahoma Graphics	Oklahoma City	37,400
Mobil Chemical Co.	Shawnee	35,920
Goodyear Tire & Rubber Co.	Lawton	23,660
Brunswick Marine Power	Stillwater	17,110

‡ Total discharges of toxic chemicals to sewer systems in Oklahoma was 829,319 in 1990-94. EPA estimates that 25% of all toxic discharges to sewers pass through sewage treatment plants to receiving waters (EPA 1995).

* This polluter did not report any discharges to water in 1994. See Table 9 for year to year pollution figures.

Source: Environmental Working Group. Compiled from U.S. Environmental Protection Agency, Toxics Release Inventory 1990-1994.

Oklahoma

Toxic pollution of Oklahoma waters (1990-1994). Carcinogens, persistent toxic metals, and reproductive toxins

Table 6. Total carcinogens, persistent toxic metals, and reproductive toxins** discharged into Oklahoma waters (1990-1994).**

Carcinogens	10,032 Pounds
Persistent Toxic Metals	45,683 Pounds
Reproductive Toxins	3,191 Pounds
Total (see note)	50,437 Pounds

Note: The sum of carcinogens, persistent toxic metals, and reproductive toxins listed in Table 6 may be larger than the total because a chemical may be in one or more categories, i.e. a chemical may be both a carcinogen and a reproductive toxin. Chemicals were counted only once for the total in Table 6.

Table 7. Oklahoma waters receiving the greatest amounts of carcinogens, persistent toxic metals, and reproductive toxins** (1990-1994).**

Waters receiving the greatest amounts of carcinogenic chemicals in Oklahoma (1990-1994).**

River or Water Body	Carcinogens** released to waters (lbs.)
Arkansas River	7,168
Boomer Creek	943
Verdigris River	594
Skeleton Creek	560
Soldier Creek	370

Waters receiving the greatest amounts of persistent toxic metals in Oklahoma (1990-1994).

River or Water Body	Persistent toxic metals released to waters (lbs.)
Arkansas River	32,937
Boomer Creek	3,493
Verdigris River	3,256
Rock Creek	2,872
Hickory Creek	750

Waters receiving the greatest amounts of reproductive toxins in Oklahoma (1990-1994).**

River or Water Body	Reproductive toxins** released to waters (lbs.)
Arkansas River	1,846
Boomer Creek	943
Soldier Creek	201

Table 8. Polluters reporting the greatest amounts of carcinogens, persistent toxic metals, and reproductive toxins** discharged to Oklahoma waters (1990-1994).**

Top dischargers of carcinogenic chemicals to Oklahoma waters (1990-1994).**

Facility	City	Carcinogens** released to waters (lbs.)
Sinclair Oil Corp.	Tulsa	3,285
Fort Howard Corp.	Muskogee	2,980
National Standard Co.	Stillwater	943
Conoco Ponca City Refinery	Ponca City	780
Farmland Ind. Inc.	Enid	560

Top dischargers of persistent toxic metals to Oklahoma waters (1990-1994).

Facility	City	Persistent toxic metals released to waters (lbs.)
Fort Howard Corp.	Muskogee	23,500
Sinclair Oil Corp.	Tulsa	5,164
National Standard Co.	Stillwater	3,493
Terra Nitrogen	Catoosa	3,097
TDK Ferrites Corp.	Shawnee	2,872

Top dischargers of reproductive toxins to Oklahoma waters (1990-1994).**

Facility	City	Reproductive toxins** released to waters (lbs.)
Sinclair Oil Corp.	Tulsa	1,036
National Standard Co.	Stillwater	943
Conoco Ponca City Refinery	Ponca City	521
Sun Refining & Marketing Co.	Tulsa	269
U.S. Air Force	Tinker Afb	203

* This polluter did not report any discharges to water in 1994. See Table 9 for year to year pollution figures.

** Carcinogens and reproductive toxins defined by the State of California Proposition 65, EPA's TRI Public Data Release and other literature. See full report for references.

Source: Environmental Working Group. Compiled from U.S. Environmental Protection Agency, Toxics Release Inventory 1990-1994.

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The Verdigris River in Oklahoma

Total toxic pollution reported (1990-1994): 1,042,000 Pounds

Table 1. Polluters discharging the greatest amounts of toxic chemicals to the Verdigris River in Oklahoma (1990-1994).

Facility	City	Toxic chemical release to water (pounds)
Terra Nitrogen	Catoosa	1,041,297
Asec Mfg.	Catoosa	639

Table 2. Toxic chemicals discharged in the greatest amounts to the Verdigris River in Oklahoma (1990-1994).

Chemical	Toxic chemical release to waterbody (pounds)
Ammonium nitrate (solution)	849,000
Ammonia	185,200
Methanol	3,750
Copper compounds	1,250
Zinc compounds	868
Nickel compounds	563
Nitric acid	536
Chromium compounds	500
Mixtures and other trade names	250

‡ The sum of carcinogens, persistent toxic metals, and reproductive toxins listed in Table 3 may be larger than the total because a chemical may be in one or more categories. Chemicals were counted only once for the total in Table 3.

* This polluter did not report any discharges to water in 1994. See Table 9 for year to year pollution figures.

** Carcinogens and reproductive toxins defined by the State of California Proposition 65, EPA's TRI Public Data Release and other literature. See full report for references.

Table 3. Total carcinogens, persistent toxic metals, and reproductive toxins** discharged to the Verdigris River in Oklahoma (1990-1994).**

Carcinogens	594 Pounds
Persistent Toxic Metals	3,256 Pounds
Reproductive Toxins	16 Pounds
Total‡	3,264 Pounds

Table 4. Polluters reporting the greatest amounts of carcinogens, persistent toxic metals, and reproductive toxins** discharged to the Verdigris River in Oklahoma (1990-1994).**

Top dischargers of carcinogens to the Verdigris River in Oklahoma (1990-1994).**

Facility	City	Carcinogens** released to water (lbs)
Terra Nitrogen	Catoosa	500

Top dischargers of persistent toxic metals to the Verdigris River in Oklahoma (1990-1994).

Facility	City	Persistent toxic metals released to water (lbs)
Terra Nitrogen	Catoosa	3,097
Asec Mfg.	Catoosa	103

Top dischargers of reproductive toxins to the Verdigris River in Oklahoma (1990-1994).**

Facility	City	Reproductive toxins** released to water (lbs)

The North Canadian River in Oklahoma

Total toxic pollution reported (1990-1994): 318,550 Pounds

Table 1. Polluters discharging the greatest amounts of toxic chemicals to the North Canadian River in Oklahoma (1990-1994).

Facility	City	Toxic chemical release to water (pounds)
Terra Nitrogen Corpn.	Woodward	318,550

Table 2. Toxic chemicals discharged in the greatest amounts to the North Canadian River in Oklahoma (1990-1994).

Chemical	Toxic chemical release to waterbody (pounds)
Ammonium nitrate (solution)	275,700
Ammonia	41,600
Methanol	1,250

‡ The sum of carcinogens, persistent toxic metals, and reproductive toxins listed in Table 3 may be larger than the total because a chemical may be in one or more categories. Chemicals were counted only once for the total in Table 3.

* This polluter did not report any discharges to water in 1994. See Table 9 for year to year pollution figures.

** Carcinogens and reproductive toxins defined by the State of California Proposition 65, EPA's TRI Public Data Release and other literature. See full report for references.

Table 3. Total carcinogens, persistent toxic metals, and reproductive toxins** discharged to the North Canadian River in Oklahoma (1990-1994).**

Carcinogens	0 Pounds
Persistent Toxic Metals	0 Pounds
Reproductive Toxins	0 Pounds
Total‡	0 Pounds

Table 4. Polluters reporting the greatest amounts of carcinogens, persistent toxic metals, and reproductive toxins** discharged to the North Canadian River in Oklahoma (1990-1994).**

Top dischargers of carcinogens to the North Canadian River in Oklahoma (1990-1994).**

Facility	City	Carcinogens** released to water (lbs)

Top dischargers of persistent toxic metals to the North Canadian River in Oklahoma (1990-1994).

Facility	City	Persistent toxic metals released to water (lbs)

Top dischargers of reproductive toxins to the North Canadian River in Oklahoma (1990-1994).**

Facility	City	Reproductive toxins** released to water (lbs)

Sand Creek in Oklahoma

Total toxic pollution reported (1990-1994): 245,297 Pounds

Table 1. Polluters discharging the greatest amounts of toxic chemicals to Sand Creek in Oklahoma (1990-1994).

Facility	City	Toxic chemical release to water (pounds)
Total Petroleum Inc.	Ardmore	245,297

Table 2. Toxic chemicals discharged in the greatest amounts to Sand Creek in Oklahoma (1990-1994).

Chemical	Toxic chemical release to waterbody (pounds)
Diethanolamine	138,200
Ammonia	106,220
Phenol	370
Cobalt compounds	360

‡ The sum of carcinogens, persistent toxic metals, and reproductive toxins listed in Table 3 may be larger than the total because a chemical may be in one or more categories. Chemicals were counted only once for the total in Table 3.

* This polluter did not report any discharges to water in 1994. See Table 9 for year to year pollution figures.

** Carcinogens and reproductive toxins defined by the State of California Proposition 65, EPA's TRI Public Data Release and other literature. See full report for references.

Table 3. Total carcinogens, persistent toxic metals, and reproductive toxins** discharged to Sand Creek in Oklahoma (1990-1994).**

Carcinogens	43 Pounds
Persistent Toxic Metals	450 Pounds
Reproductive Toxins	43 Pounds
Total‡	450 Pounds

Table 4. Polluters reporting the greatest amounts of carcinogens, persistent toxic metals, and reproductive toxins** discharged to Sand Creek in Oklahoma (1990-1994).**

Top dischargers of carcinogens to Sand Creek in Oklahoma (1990-1994).**

Facility	City	Carcinogens** released to water (lbs)

Top dischargers of persistent toxic metals to Sand Creek in Oklahoma (1990-1994).

Facility	City	Persistent toxic metals released to water (lbs)
Total Petroleum Inc.	Ardmore	450

Top dischargers of reproductive toxins to Sand Creek in Oklahoma (1990-1994).**

Facility	City	Reproductive toxins** released to water (lbs)

The Arkansas River in Oklahoma

Total toxic pollution reported (1990-1994): 234,190 Pounds

Table 1. Polluters discharging the greatest amounts of toxic chemicals to the Arkansas River in Oklahoma (1990-1994).

Facility	City	Toxic chemical release to water (pounds)
Sinclair Oil Corp.	Tulsa	78,441
Conoco Ponca City Refinery	Ponca City	77,412
Sun Refining & Marketing Co.	Tulsa	43,442
Fort Howard Corp.	Muskogee	33,925
Rogers Galvanizing Co.	Tulsa	779
Ozark-Mahoning*	Tulsa	110

Table 2. Toxic chemicals discharged in the greatest amounts to the Arkansas River in Oklahoma (1990-1994).

Chemical	Toxic chemical release to waterbody (pounds)
Ammonia	190,847
Barium compounds	14,605
Zinc compounds	9,909
Chloroform	2,980
Chromium	2,775
Phenol	2,530
Barium	1,606
Manganese compounds	1,300
Chromium compounds	1,300
1,2,4-Trimethylbenzene	1,008

‡ The sum of carcinogens, persistent toxic metals, and reproductive toxins listed in Table 3 may be larger than the total because a chemical may be in one or more categories. Chemicals were counted only once for the total in Table 3.

* This polluter did not report any discharges to water in 1994. See Table 9 for year to year pollution figures.

** Carcinogens and reproductive toxins defined by the State of California Proposition 65, EPA's TRI Public Data Release and other literature. See full report for references.

Table 3. Total carcinogens, persistent toxic metals, and reproductive toxins** discharged to the Arkansas River in Oklahoma (1990-1994).**

Carcinogens	7,168 Pounds
Persistent Toxic Metals	32,937 Pounds
Reproductive Toxins	1,846 Pounds
Total‡	36,707 Pounds

Table 4. Polluters reporting the greatest amounts of carcinogens, persistent toxic metals, and reproductive toxins** discharged to the Arkansas River in Oklahoma (1990-1994).**

Top dischargers of carcinogens to the Arkansas River in Oklahoma (1990-1994).**

Facility	City	Carcinogens** released to water (lbs)
Sinclair Oil Corp.	Tulsa	3,285
Fort Howard Corp.	Muskogee	2,980
Conoco Ponca City Refinery	Ponca City	780

Top dischargers of persistent toxic metals to the Arkansas River in Oklahoma (1990-1994).

Facility	City	Persistent toxic metals released to water (lbs)
Fort Howard Corp.	Muskogee	23,500
Sinclair Oil Corp.	Tulsa	5,164
Sun Refining & Marketing Co.	Tulsa	1,864
Conoco Ponca City Refinery	Ponca City	1,610
Rogers Galvanizing Co.	Tulsa	779

Top dischargers of reproductive toxins to the Arkansas River in Oklahoma (1990-1994).**

Facility	City	Reproductive toxins** released to water (lbs)
Sinclair Oil Corp.	Tulsa	1,036
Conoco Ponca City Refinery	Ponca City	521
Sun Refining & Marketing Co.	Tulsa	269

Source: Environmental Working Group. Compiled from U.S. Environmental Protection Agency, Toxics Release Inventory 1990-1994.

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Skeleton Creek in Oklahoma

Total toxic pollution reported (1990-1994): 118,820 Pounds

Table 1. Polluters discharging the greatest amounts of toxic chemicals to Skeleton Creek in Oklahoma (1990-1994).

Facility	City	Toxic chemical release to water (pounds)
Farmland Ind. Inc.	Enid	118,820

Table 2. Toxic chemicals discharged in the greatest amounts to Skeleton Creek in Oklahoma (1990-1994).

Chemical	Toxic chemical release to waterbody (pounds)
Ammonia	103,750
Methanol	13,100
Ammonium nitrate (solution)	1,000
Formaldehyde	560
Zinc compounds	410

‡ The sum of carcinogens, persistent toxic metals, and reproductive toxins listed in Table 3 may be larger than the total because a chemical may be in one or more categories. Chemicals were counted only once for the total in Table 3.

* This polluter did not report any discharges to water in 1994. See Table 9 for year to year pollution figures.

** Carcinogens and reproductive toxins defined by the State of California Proposition 65, EPA's TRI Public Data Release and other literature. See full report for references.

Table 3. Total carcinogens, persistent toxic metals, and reproductive toxins** discharged to Skeleton Creek in Oklahoma (1990-1994).**

Carcinogens	560 Pounds
Persistent Toxic Metals	410 Pounds
Reproductive Toxins	0 Pounds
Total‡	970 Pounds

Table 4. Polluters reporting the greatest amounts of carcinogens, persistent toxic metals, and reproductive toxins** discharged to Skeleton Creek in Oklahoma (1990-1994).**

Top dischargers of carcinogens to Skeleton Creek in Oklahoma (1990-1994).**

Facility	City	Carcinogens** released to water (lbs)
Farmland Ind. Inc.	Enid	560

Top dischargers of persistent toxic metals to Skeleton Creek in Oklahoma (1990-1994).

Facility	City	Persistent toxic metals released to water (lbs)
Farmland Ind. Inc.	Enid	410

Top dischargers of reproductive toxins to Skeleton Creek in Oklahoma (1990-1994).**

Facility	City	Reproductive toxins** released to water (lbs)

Garland Creek in Oklahoma

Total toxic pollution reported (1990-1994): 101,280 Pounds

Table 1. Polluters discharging the greatest amounts of toxic chemicals to Garland Creek in Oklahoma (1990-1994).

Facility	City	Toxic chemical release to water (pounds)
Weyerhaeuser Co.	Valliant	101,280

Table 2. Toxic chemicals discharged in the greatest amounts to Garland Creek in Oklahoma (1990-1994).

Chemical	Toxic chemical release to waterbody (pounds)
Ethylene glycol	64,240
Catechol	32,420
Ammonia	4,600

‡ The sum of carcinogens, persistent toxic metals, and reproductive toxins listed in Table 3 may be larger than the total because a chemical may be in one or more categories. Chemicals were counted only once for the total in Table 3.

* This polluter did not report any discharges to water in 1994. See Table 9 for year to year pollution figures.

** Carcinogens and reproductive toxins defined by the State of California Proposition 65, EPA's TRI Public Data Release and other literature. See full report for references.

Table 3. Total carcinogens, persistent toxic metals, and reproductive toxins** discharged to Garland Creek in Oklahoma (1990-1994).**

Carcinogens	0 Pounds
Persistent Toxic Metals	0 Pounds
Reproductive Toxins	0 Pounds
Total‡	0 Pounds

Table 4. Polluters reporting the greatest amounts of carcinogens, persistent toxic metals, and reproductive toxins** discharged to Garland Creek in Oklahoma (1990-1994).**

Top dischargers of carcinogens to Garland Creek in Oklahoma (1990-1994).**

Facility	City	Carcinogens** released to water (lbs)

Top dischargers of persistent toxic metals to Garland Creek in Oklahoma (1990-1994).

Facility	City	Persistent toxic metals released to water (lbs)

Top dischargers of reproductive toxins to Garland Creek in Oklahoma (1990-1994).**

Facility	City	Reproductive toxins** released to water (lbs)

Pryor Creek in Oklahoma

Total toxic pollution reported (1990-1994): 92,348 Pounds

Table 1. Polluters discharging the greatest amounts of toxic chemicals to Pryor Creek in Oklahoma (1990-1994).

Facility	City	Toxic chemical release to water (pounds)
Wil-Gro Fertilizer	Pryor	92,348

Table 2. Toxic chemicals discharged in the greatest amounts to Pryor Creek in Oklahoma (1990-1994).

Chemical	Toxic chemical release to waterbody (pounds)
Ammonium nitrate (solution)	78,348
Ammonia	14,000

‡ The sum of carcinogens, persistent toxic metals, and reproductive toxins listed in Table 3 may be larger than the total because a chemical may be in one or more categories. Chemicals were counted only once for the total in Table 3.

* This polluter did not report any discharges to water in 1994. See Table 9 for year to year pollution figures.

** Carcinogens and reproductive toxins defined by the State of California Proposition 65, EPA's TRI Public Data Release and other literature. See full report for references.

Table 3. Total carcinogens, persistent toxic metals, and reproductive toxins** discharged to Pryor Creek in Oklahoma (1990-1994).**

Carcinogens	0 Pounds
Persistent Toxic Metals	0 Pounds
Reproductive Toxins	0 Pounds
Total‡	0 Pounds

Table 4. Polluters reporting the greatest amounts of carcinogens, persistent toxic metals, and reproductive toxins** discharged to Pryor Creek in Oklahoma (1990-1994).**

Top dischargers of carcinogens to Pryor Creek in Oklahoma (1990-1994).**

Facility	City	Carcinogens** released to water (lbs)

Top dischargers of persistent toxic metals to Pryor Creek in Oklahoma (1990-1994).

Facility	City	Persistent toxic metals released to water (lbs)

Top dischargers of reproductive toxins to Pryor Creek in Oklahoma (1990-1994).**

Facility	City	Reproductive toxins** released to water (lbs)

Turkey Sandy Creek in Oklahoma

Total toxic pollution reported (1990-1994): 57,641 Pounds

Table 1. Polluters discharging the greatest amounts of toxic chemicals to Turkey Sandy Creek in Oklahoma (1990-1994).

Facility	City	Toxic chemical release to water (pounds)
Kerr-McGee Refining Corp.	Wynnewood	57,641

Table 2. Toxic chemicals discharged in the greatest amounts to Turkey Sandy Creek in Oklahoma (1990-1994).

Chemical	Toxic chemical release to waterbody (pounds)
Ammonia	56,481
Chlorine	1,000

‡ The sum of carcinogens, persistent toxic metals, and reproductive toxins listed in Table 3 may be larger than the total because a chemical may be in one or more categories. Chemicals were counted only once for the total in Table 3.

* This polluter did not report any discharges to water in 1994. See Table 9 for year to year pollution figures.

** Carcinogens and reproductive toxins defined by the State of California Proposition 65, EPA's TRI Public Data Release and other literature. See full report for references.

Table 3. Total carcinogens, persistent toxic metals, and reproductive toxins** discharged to Turkey Sandy Creek in Oklahoma (1990-1994).**

Carcinogens	20 Pounds
Persistent Toxic Metals	0 Pounds
Reproductive Toxins	75 Pounds
Total‡	75 Pounds

Table 4. Polluters reporting the greatest amounts of carcinogens, persistent toxic metals, and reproductive toxins** discharged to Turkey Sandy Creek in Oklahoma (1990-1994).**

Top dischargers of carcinogens to Turkey Sandy Creek in Oklahoma (1990-1994).**

Facility	City	Carcinogens** released to water (lbs)

Top dischargers of persistent toxic metals to Turkey Sandy Creek in Oklahoma (1990-1994).

Facility	City	Persistent toxic metals released to water (lbs)

Top dischargers of reproductive toxins to Turkey Sandy Creek in Oklahoma (1990-1994).**

Facility	City	Reproductive toxins** released to water (lbs)

Unnamed Tributary To Bird Creek in Oklahoma

Total toxic pollution reported (1990-1994): 38,510 Pounds

Table 1. Polluters discharging the greatest amounts of toxic chemicals to Unnamed Tributary To Bird Creek in Oklahoma (1990-1994).

Facility	City	Toxic chemical release to water (pounds)
H & L Tooth Co.*	Tulsa	38,500

Table 2. Toxic chemicals discharged in the greatest amounts to Unnamed Tributary To Bird Creek in Oklahoma (1990-1994).

Chemical	Toxic chemical release to waterbody (pounds)
Ethylene glycol	38,500

‡ The sum of carcinogens, persistent toxic metals, and reproductive toxins listed in Table 3 may be larger than the total because a chemical may be in one or more categories. Chemicals were counted only once for the total in Table 3.

* This polluter did not report any discharges to water in 1994. See Table 9 for year to year pollution figures.

** Carcinogens and reproductive toxins defined by the State of California Proposition 65, EPA's TRI Public Data Release and other literature. See full report for references.

Table 3. Total carcinogens, persistent toxic metals, and reproductive toxins** discharged to Unnamed Tributary To Bird Creek in Oklahoma (1990-1994).**

Carcinogens	10 Pounds
Persistent Toxic Metals	10 Pounds
Reproductive Toxins	10 Pounds
Total‡	10 Pounds

Table 4. Polluters reporting the greatest amounts of carcinogens, persistent toxic metals, and reproductive toxins** discharged to Unnamed Tributary To Bird Creek in Oklahoma (1990-1994).**

Top dischargers of carcinogens to Unnamed Tributary To Bird Creek in Oklahoma (1990-1994).**

Facility	City	Carcinogens** released to water (lbs)

Top dischargers of persistent toxic metals to Unnamed Tributary To Bird Creek in Oklahoma (1990-1994).

Facility	City	Persistent toxic metals released to water (lbs)

Top dischargers of reproductive toxins to Unnamed Tributary To Bird Creek in Oklahoma (1990-1994).**

Facility	City	Reproductive toxins** released to water (lbs)

Unnamed Tributary To Mingo Creek in Oklahoma

Total toxic pollution reported (1990-1994): 5,550 Pounds

Table 1. Polluters discharging the greatest amounts of toxic chemicals to Unnamed Tributary To Mingo Creek in Oklahoma (1990-1994).

Facility	City	Toxic chemical release to water (pounds)
McDonnell Douglas*	Tulsa	5,300
Rockwell Intl. Corp.*	Tulsa	250

Table 2. Toxic chemicals discharged in the greatest amounts to Unnamed Tributary To Mingo Creek in Oklahoma (1990-1994).

Chemical	Toxic chemical release to waterbody (pounds)
Sulfuric acid	5,300
Ethylene glycol	250

‡ The sum of carcinogens, persistent toxic metals, and reproductive toxins listed in Table 3 may be larger than the total because a chemical may be in one or more categories. Chemicals were counted only once for the total in Table 3.

* This polluter did not report any discharges to water in 1994. See Table 9 for year to year pollution figures.

** Carcinogens and reproductive toxins defined by the State of California Proposition 65, EPA's TRI Public Data Release and other literature. See full report for references.

Table 3. Total carcinogens, persistent toxic metals, and reproductive toxins** discharged to Unnamed Tributary To Mingo Creek in Oklahoma (1990-1994).**

Carcinogens	0 Pounds
Persistent Toxic Metals	0 Pounds
Reproductive Toxins	0 Pounds
Total‡	0 Pounds

Table 4. Polluters reporting the greatest amounts of carcinogens, persistent toxic metals, and reproductive toxins** discharged to Unnamed Tributary To Mingo Creek in Oklahoma (1990-1994).**

Top dischargers of carcinogens to Unnamed Tributary To Mingo Creek in Oklahoma (1990-1994).**

Facility	City	Carcinogens** released to water (lbs)

Top dischargers of persistent toxic metals to Unnamed Tributary To Mingo Creek in Oklahoma (1990-1994).

Facility	City	Persistent toxic metals released to water (lbs)

Top dischargers of reproductive toxins to Unnamed Tributary To Mingo Creek in Oklahoma (1990-1994).**

Facility	City	Reproductive toxins** released to water (lbs)