

Appendix

Top 10 Most Toxic Active Industrial Facilities in Allegheny County Reporting Air Pollution to TRI, 2016

Rank	Facility Name	RSEI Hazard-Based Results, in toxicity-weighted pounds
1	Cheswick Power Plant	7,189,230,053
2	ATI Flat Rolled Products	3,788,384,841
3	USS-Clairton Plant	2,487,800,808
4	ATI Powder Metals	1,914,910,009
5	Valspar Coatings	1,565,650,579
6	Universal Stainless and Alloy Products	1,437,970,519
7	BPI Inc. – McKees Rocks PA Plant	814,874,014
8	Harsco Metals	799,597,853
9	Pressure Chemical Company	298,120,711
10	McConway & Torley Foundry	293,529,499

Top 10 Most Toxic Active Industrial Facilities in Allegheny County Reporting Air Pollution to TRI in 2016, by Facility and RSEI Hazard-Based Result¹

Rank	Facility Name and Chemicals Emitted	Total Pounds Released to Air, 2016	RSEI Hazard-Based Results, in toxicity-weighted pounds
1	Cheswick Power Plant	139,579	7,189,230,053
	ARSENIC COMPOUNDS	328	4,920,000,000
	BARIUM COMPOUNDS	125	875,000
	CHROMIUM COMPOUNDS (EXCEPT CHROMITE ORE MINED IN THE TRANSVAAL REGION)	208	1,609,920,064
	COPPER COMPOUNDS	66	99,000
	DIOXIN AND DIOXIN-LIKE COMPOUNDS	0.0008	1,182,099
	HYDROCHLORIC ACID (1995 AND AFTER "ACID AEROSOLS" ONLY)	9,760	1,756,800
	HYDROGEN FLUORIDE	4,109	1,027,250
	LEAD COMPOUNDS	417	9,591,000
	MANGANESE COMPOUNDS	392	4,704,000
	MERCURY COMPOUNDS	18	213,600
	NICKEL COMPOUNDS	224	208,320,000

	SULFURIC ACID (1994 AND AFTER "ACID AEROSOLS" ONLY)	123,278	431,473,000
	VANADIUM COMPOUNDS	71	9,940
	ZINC COMPOUNDS	583	58,300
2	ATI Flat Rolled Products	6,665	3,788,384,841
	CHROMIUM COMPOUNDS (EXCEPT CHROMITE ORE MINED IN THE TRANSVAAL REGION)	1,361	1,755,689,961
	COBALT COMPOUNDS	77	1,309,000,000
	COPPER COMPOUNDS	149	223,500
	HYDROGEN FLUORIDE	1,199	299,750
	LEAD COMPOUNDS	170	3,910,000
	MANGANESE COMPOUNDS	1,088	13,056,000
	NICKEL COMPOUNDS	759	705,870,000
	NITRIC ACID	879	237,330
	ZINC COMPOUNDS	983	98,300
3	USS-Clairton Plant	792,212	2,487,800,808
	1,2,4-TRIMETHYLBENZENE	2	1,160
	ACETONITRILE	300	17,400
	AMMONIA	224,000	7,840,000
	ANTHRACENE	283	934
	BENZENE	25,000	700,000,000
	BENZO(G,H,I)PERYLENE	412	8,232,400
	BIPHENYL	271	216,800
	CARBON DISULFIDE	26,200	131,000
	CRESOL (MIXED ISOMERS)	2,400	13,920
	CYANIDE COMPOUNDS	8,833	38,865,200
	DIBENZOFURAN	682	0
	DICYCLOPENTADIENE	1	18,000
	ETHYLBENZENE	34	30,260
	ETHYLENE	15,400	8,624
	HYDROCHLORIC ACID (1995 AND AFTER "ACID AEROSOLS" ONLY)	158,000	28,440,000
	HYDROGEN CYANIDE	18,800	82,720,000
	HYDROGEN SULFIDE	197,500	355,500,000

	LEAD	48	1,115,040
	MERCURY	4	47,520
	METHANOL	62,000	11,160
	NAPHTHALENE	7,480	89,760,000
	NITRATE COMPOUNDS	1,200	756
	PHENANTHRENE	2,663	0
	PHENOL	30,025	540,450
	POLYCYCLIC AROMATIC COMPOUNDS	1,654	1,174,261,900
	PROPYLENE	2,560	3,072
	PYRIDINE	5	5,000
	STYRENE	215	753
	TOLUENE	5,800	4,060
	XYLENE (MIXED ISOMERS)	440	15,400
4	ATI Powder Metals	292	1,914,910,009
	CHROMIUM	59	862,580,009
	COBALT	52	884,000,000
	NICKEL	181	168,330,000
5	Valspar Coatings	5,767	1,565,650,579
	1,2,4-TRIMETHYLBENZENE	59	34,220
	CERTAIN GLYCOL ETHERS	279	50,220
	DIISOCYANATES	4,473	1,565,550,000
	TOLUENE	505	354
	XYLENE (MIXED ISOMERS)	451	15,785
6	Universal Stainless and Alloy Products	1,146	1,437,970,519
	CHROMIUM	291	1,251,300,019
	COPPER	101	151,500
	LEAD	27	621,000
	MANGANESE	534	6,408,000
	NICKEL	193	179,490,000
7	BPI Inc. – McKees Rocks PA Plant	795	814,874,014
	CHROMIUM COMPOUNDS (EXCEPT CHROMITE ORE MINED IN THE TRANSVAAL REGION)	44	813,560,014

	NICKEL COMPOUNDS	1	1,209,000
	VANADIUM COMPOUNDS	750	105,000
8	Harsco Metals	277	799,597,853
	CHROMIUM COMPOUNDS (EXCEPT CHROMITE ORE MINED IN THE TRANSVAAL REGION)	42	776,580,013
	LEAD COMPOUNDS	0	1,840
	MANGANESE COMPOUNDS	213	2,556,000
	NICKEL COMPOUNDS	22	20,460,000
9	Pressure Chemical Company	7,377	298,120,711
	CHLOROFORM	3,635	298,070,000
	DICHLOROMETHANE	1,204	43,344
	N-HEXANE	1,300	6,500
	TOLUENE	1,238	867
10	McConway & Torley Foundry	1,097	293,529,499
	CHROMIUM COMPOUNDS (EXCEPT CHROMITE ORE MINED IN THE TRANSVAAL REGION)	40	51,599,999
	COPPER COMPOUNDS	41	61,500
	LEAD COMPOUNDS	16	368,00
	MANGANESE COMPOUNDS	750	9,000,000
	NICKEL COMPOUNDS	250	232,500,000

Methodology

Toxics Release Inventory (TRI)

The data used in this analysis came from the TRI Basic Plus data file for 2016, downloaded from <https://www.epa.gov/toxics-release-inventory-tri-program/tri-basic-plus-data-files-calendar-years-1987-2016> on 19 January 2018. This analysis only looked at releases from facilities that were located in Allegheny County, PA, and reported non-zero values for “total air emissions.”

Identifying Health Effects of Chemicals

Health effects for chemicals were identified from individual chemicals’ pages at the Agency for Toxic Substances and Disease Registry (ATSDR), Centers for Disease Control and Prevention, “ToxFAQs,” Toxic Substances Portal, accessed at www.atsdr.cdc.gov/toxfaqs/index.asp on 24 January 2018. Some chemicals are categorized differently by TRI than by ATSDR. Specifically, the ATSDR ToxFAQs only list polycyclic aromatic hydrocarbons (PAHs) as a group and do not list the health impacts of individual chemicals within that category, while TRI reports releases of each specific chemical in that group. When a facility reported releases of multiple PAHs, we indicated in the health impacts chart that PAHs can be carcinogenic, rather than identifying one specific chemical as being carcinogenic.

A small number of chemicals listed in TRI releases for Allegheny County do not have ATSDR pages. We checked these chemicals against the state of California's Proposition 65 list of hazardous chemicals, downloaded from <https://oehha.ca.gov/proposition-65/proposition-65-list> on 25 January 2018. Propylene and quinoline are the two chemicals that are not in ATSDR but are listed as carcinogenic by the state of California.

Calculating RSEI Hazard-Based Results

EPA's Risk-Screening Environmental Indicators (RSEI) system provides information on the relative toxicity of specific chemicals emitted by facilities, allowing comparisons between facilities that emit different amounts of different toxic chemicals.

Different chemicals have different relative toxicities; the EPA calculates toxic weighting factors for individual chemicals using information about chronic human health effects of exposure to them. All the RSEI toxic weighting factors used in our calculations come from the EPA's "RSEI Toxicity Weighting Spreadsheet v2.3.5" downloaded at <https://www.epa.gov/rsei/rsei-toxicity-data-and-calculations> on 25 January 2018. The factors used for each release were chosen following the EPA's "Toxicity Weight Selection, by Result and Media" table.² In the RSEI Toxicity Weighting Spreadsheet, the correct toxicity weight for air releases is labelled as the "Inhal Tox Score (ITS)."

The EPA calculates RSEI hazard total for facilities that report to TRI, but these calculations are not immediately available. For example, as of February 2016, the most recent EPA-calculated RSEI hazard data use 2015 numbers. We chose to calculate these hazard scores in order to use the most recent available data on toxic releases reported to TRI.

For most chemicals, calculating the RSEI hazard-based result requires multiplying the pounds released by the correct toxicity weight for that chemical.³ To match the correct toxicity weight to each chemical, we linked the chemicals in the RSEI Toxicity Weighting Spreadsheet with the chemicals released in the 2016 TRI data by CAS number. There were a few types of pollutants for which this calculation involved an extra step:

- **Dioxin:** TRI reports dioxin releases in grams, rather than in pounds. There was only one facility in Allegheny County that reported any air releases of dioxin in 2016 (Cheswick Power Plant). We converted their reported release to pounds by dividing by 453.6 before multiplying it by the Inhal Tox Score for dioxin.
- **Metals:** TRI tracks releases of elemental metals and metal compounds separately, while RSEI lists just one toxicity weight for each metal and its compounds, and labels it with the CAS number of the elemental metal.⁴ Therefore, whenever TRI reported releases of a metal compound, we used the toxicity weight that had the CAS number of the elemental metal. The pollutants this applied to were arsenic compounds, barium compounds, chromium compounds, cobalt compounds, copper compounds, lead compounds, manganese compounds, mercury compounds, nickel compounds, silver compounds, vanadium compounds and zinc compounds.
- **Chromium:** For chromium, the process is slightly different, because facilities that emit chromium typically emit a combination of two types, or valences, of the element: chromium (III), also called trivalent chromium, and chromium (VI), also called hexavalent chromium. Trivalent chromium has "a very low toxicity," according to the EPA's RSEI model methodology documentation, and therefore is assumed to have no toxicity in the RSEI model.⁵ Hexavalent chromium is the only valence included in the model; EPA bases each facility's ratio of trivalent to hexavalent chromium emitted on estimates from the 2011 National Emissions Inventory.⁶ Estimates of each facility's chromium speciation were available through the EPA's EasyRSEI tool.⁷ The EasyRSEI tool only has data through 2015, but because chromium speciation estimates are based off of 2011 numbers, it could still be used for this purpose. To calculate RSEI hazard results for chromium releases, the total air emissions were multiplied by the speciation ratio and then by the toxicity weight.

Ranking the Facilities

For this analysis, we selected the 10 active facilities in Allegheny County that, for 2016 chemical releases reported to TRI, generated the highest RSEI Hazard-Based Result. One facility, the Koppers Inc. Clairton Tar Plant, ranked within the top 10 most toxic facilities according to the 2016 TRI dataset, but was excluded because it closed in late 2016. As a result, the McConway and Torley Foundry, which was the 11th most toxic facility in 2016, but the 10th most toxic currently *active* facility, was added to the list.

TRI by its nature is not a comprehensive database of polluters. Reports to TRI are required of facilities with 10 or more full-time-equivalent employees, in certain industries, that emit more than certain threshold amounts of toxic chemicals.⁸ As a result, this method of ranking facilities necessarily under-represents or omits releases from four categories of facilities that produce air pollution:

- Facilities that employ fewer than 10 full-time-equivalent employees.
- Facilities in industries that are not required to report to TRI.⁹
- Facilities in industries that are required to report to TRI but whose toxic emissions are below the threshold amount above which reporting would be required.
- Facilities that emit pollutants that are dangerous to human health but for which reporting is not required to TRI, such as fine particulate matter, sulfur oxides, nitrogen oxides and precursors to ozone. Emissions from some of these facilities may be reported in Allegheny County Health Department documents, which track these pollutants.

Identifying and Quantifying Nearby Populations

The facilities' locations were taken from the latitude and longitude they reported to TRI. Census data used were from the 2010 decennial Census, because it is the most recent Census data containing details down to the block level, which provides the greatest level of detail of populations and their locations. Data were gathered for Allegheny County and the counties immediately bordering it: Armstrong, Beaver, Butler, Washington and Westmoreland. The neighboring counties were included because some of the facilities are near Allegheny County's boundaries.

A shapefile with U.S. Census block population data and boundaries in Pennsylvania was downloaded from <https://www.census.gov/geo/maps-data/data/tiger-line.html> on 28 January 2018. The specific file downloaded was the "Special Release – Census Blocks with Population and Housing Unit Counts" file from the 2010 census. This file contained census blocks for the full state of Pennsylvania. Census blocks in Allegheny and its bordering counties were identified by Census county code, found at https://www2.census.gov/geo/docs/reference/codes/files/st42_pa_cou.txt.

Using ArcGIS software, the areas of all Census blocks in those counties were calculated, and then the areas of those sections of Census blocks that were within three miles of each facility's location were calculated. The proportion of those areas to each other was applied to each block's population count and then summed by facility, to arrive at an estimated number of people who live within three miles of each facility. This calculation assumes uniform distribution of population throughout each Census block. The final population count was rounded to the nearest 100, to reflect the uncertainty in the calculation.

Notes

¹ The Koppers Inc. Clairton Tar Plant would have been ninth on this list, but it was removed because the facility is no longer active. In 2016, the facility reported 8,075 pounds of total air releases, with a RSEI hazard result of 336,644,738 toxicity-weighted pounds.

² Environmental Protection Agency, *RSEI Toxicity – Data and Calculations*, 19 January 2017, archived at <http://web.archive.org/web/20180124155435/https://www.epa.gov/rsei/rsei-toxicity-data-and-calculations>.

³ Environmental Protection Agency, *EPA’s Risk-Screening Environmental Indicators (RSEI) Methodology*, July 2015, https://www.epa.gov/sites/production/files/2015-08/documents/rsei_methodology_v2_3_3_0.pdf, ES-7.

⁴ *Ibid.*, ES-6.

⁵ Environmental Protection Agency, *Technical Appendix A: Toxicity Weights for TRI Chemicals and Chemical Categories*, https://www.epa.gov/sites/production/files/2017-01/documents/technical_appendix_a-toxicity_v2.3.5.pdf, A-3.

⁶ See note 4.

⁷ Downloaded from <https://www.epa.gov/rsei/get-easyrsei>.

⁸ Environmental Protection Agency, *Basics of TRI Reporting*, 22 June 2015, archived at <http://web.archive.org/web/20150806170922/http://www2.epa.gov/toxics-release-inventory-tri-program/basics-tri-reporting>.

⁹ A list of the industries that are required to report to TRI can be found at Environmental Protection Agency, *Is My Facility’s Six-Digit NAICS Code a TRI-Covered Industry?*, 13 December 2017, archived at <http://web.archive.org/web/20180221151444/https://www.epa.gov/toxics-release-inventory-tri-program/my-facilitys-six-digit-naics-code-tri-covered-industry>.