5. PRODUCTION, IMPORT/EXPORT, USE, AND DISPOSAL

5.1 PRODUCTION

Table 5-1 lists the facilities in each state that manufacture or process toluene, the intended use, and the range of maximum amounts of toluene that are stored on site. There are currently 2,198 facilities that produce, process, or use toluene in the United States. The data listed in Table 5-1 are derived from the Toxics Release Inventory (TRI15 2016). Only certain types of facilities were required to report. Therefore, this is not an exhaustive list.

Toluene is produced from the catalytic reforming of refinery streams, with part of the catalytic reformate converted to benzene-toluene-ethylbenzene-xylene (BTEX). Approximately 15% of the toluene produced is separated out of pyrolysis gasoline during the manufacture of ethylene and propylene, ~4% is from separation of coal tar, and ~1% is recovered as a byproduct of styrene manufacture. However, while the largest concentrations of toluene are recovered from catalytic reformate or pyrolysis gasoline, most of the toluene produced is unrecovered (Ozokwelu 2006).

Toluene is widely used and is produced by a large number of domestic chemical and petroleum companies. The 18 companies that currently produce or supply toluene in the United States are: Alon USA Energy, Inc.; BASF FINA Petrochemicals LP, BP America, Inc.; CITGO Petroleum Corporation; ConocoPhilips; The Dow Chemical Company; Equistar Chemical, LP; ExxonMobil Chemical Company; Flint Hills Resources LP; Frontier El Dorado Refining Company; Houston Refining LP; HOVENSA, LLC; Husky Energy Inc.; Marathon Petroleum Company LLC; Shell Chemical LP; Sunoco, Inc.; Total Petrochemicals USA, Inc.; and Valero Energy Corporation (SRI 2010).

5.2 IMPORT/EXPORT

U.S. general imports of toluene in 2012 were estimated at 430 million pounds (195,000 metric tons) (USITC 2013b). Exports during the same year were estimated at 670 million pounds (300,000 metric tons) (USITC 2013a).

5.3 USE

All nonisolated toluene is used in a BTEX mixture added to gasoline to improve octane ratings. Nearly half of the isolated toluene is used to produce benzene from hydrodealkylation processes. Twenty percent

Table 5-1. Facilities that Produce, Process, or Use Toluene

State[a]	Number of facilities	Minimum amount on site in pounds[b]	Maximum amount on site in pounds[b]	Activities and uses[c]
AK	7	10,000	499,999,999	1, 3, 4, 5, 6, 7, 9, 12, 13
AL	45	100	9,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
AR	21	0	49,999,999	1, 2, 3, 5, 6, 7, 9, 10, 11, 12, 14
AZ	22	100	49,999,999	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12
CA	112	0	499,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
CO	25	0	999,999,999	1, 2, 3, 5, 7, 8, 9, 10, 11, 12, 13
CT	23	100	49,999,999	1, 5, 7, 9, 10, 11, 12
DE	7	1,000	9,999,999	1, 2, 3, 7, 9, 10, 11, 12, 13, 14
FL	43	100	49,999,999	1, 2, 3, 5, 7, 9, 10, 11, 12, 14
GA	53	0	9,999,999	1, 5, 6, 7, 8, 9, 10, 11, 12, 13
GU	2	1,000	9,999,999	7, 9
HI	9	100	9,999,999	1, 2, 3, 4, 5, 6, 7, 9, 12, 13, 14
IA	42	100	9,999,999	1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, 14
ID	4	100	9,999,999	7, 8, 9, 11
IL	114	0	999,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
IN	91	0	499,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
KS	41	0	999,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14
KY	46	1,000	49,999,999	1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
LA	82	0	999,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
MA	44	1,000	49,999,999	1, 2, 4, 5, 7, 8, 9, 10, 11, 12
MD	16	1,000	49,999,999	1, 5, 6, 7, 9, 10, 11, 12
ME	5	100,000	49,999,999	2, 3, 4, 7, 9, 12
MI	99	0	49,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
MN	33	1,000	49,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
MO	50	100	9,999,999	1, 5, 7, 8, 9, 10, 11, 12, 14
MP	2	100	9,999,999	7, 9
MS	29	0	499,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
MT	7	10,000	49,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14
NC	65	0	9,999,999	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
ND	14	100	49,999,999	1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 14
NE	22	100	99,999	1, 2, 3, 5, 7, 9, 10, 11, 12, 13, 14
NH	6	100	999,999	2, 3, 7, 8, 10, 11, 12
NJ	44	1,000	99,999,999	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14
NM	8	100	49,999,999	1, 3, 4, 6, 7, 9, 11, 12
NV	11	100	9,999,999	1, 5, 7, 9, 10, 11, 12
NY	68	0	499,999,999	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 14

Table 5-1. Facilities that Produce, Process, or Use Toluene

State[a]	Number of facilities	Minimum amount on site in pounds[b]	Maximum amount on site in pounds[b]	Activities and uses[c]
OH	140	0	99,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
OK	35	0	49,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
OR	24	0	49,999,999	1, 5, 7, 8, 9, 10, 11, 12
PA	94	100	499,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
PR	12	10,000	99,999,999	2, 3, 5, 6, 7, 8, 9, 10, 13
RI	11	1,000	49,999,999	1, 5, 7, 9, 10, 11, 12
SC	43	0	9,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
SD	10	1,000	999,999	7, 9, 10, 11
TN	63	100	9,999,999	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
TX	260	0	499,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
UT	16	0	99,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 12
VA	47	0	49,999,999	1, 2, 5, 6, 7, 8, 9, 10, 11, 12
VI	2	100,000	9,999,999	1, 5, 9, 12
VT	2	1,000	99,999	7, 10, 12
WA	25	100	99,999,999	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
WI	60	0	9,999,999	1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 13
WV	20	0	49,999,999	1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
WY	8	10,000	49,999,999	1, 2, 3, 4, 6, 7, 8, 9, 10, 12, 13, 14

[a]Post office state abbreviations used.
[b]Amounts on site reported by facilities in each state.
[c]Activities/Uses:

1. Produce
2. Import
3. Onsite use/processing
4. Sale/Distribution
5. Byproduct
6. Impurity
7. Reactant
8. Formulation Component
9. Article Component
10. Repackaging
11. Chemical Processing Aid
12. Manufacturing Aid
13. Ancillary/Other Uses
14. Process Impurity

Source: TRI15 2016 (Data are from 2015)

of toluene is used in the production of xylene, 12% is used as a solvent in paints, coatings, gums, resins, rubber, and vinyl organosol, and 10% is used for miscellaneous use, such as for the synthesis of organic chemicals, for use as a denaturant, and for the production of drugs that may be abused. The other 8% is used in the production of toluene diisocyanate (TDI) (Ozokwelu et al. 2006; HSDB 2010).

5.4 DISPOSAL

Toluene is regulated by the Resource Conservation and Recovery Act (RCRA) as a hazardous waste (U220 and F005-spent solvents including toluene) and is therefore subject to RCRA regulations as stated in 40 CFR 261.33 (see Chapter 8). These regulations include standards for storage, transport, and disposal of toluene.

Toluene, or a combination of solvent containing toluene at 10% by volume before use, is regulated by federal laws (State of California 2005). The spent toluene, or toluene that is no longer available except after reprocessing, contains additional constituents that prevents its reuse as a solvent (U.S. DOE 1991). Toluene can be disposed of by controlled incineration. Toluene is a good candidate for liquid injection incineration, rotary kiln incineration, and fluidized bed incineration. Toluene may also be disposed of by atomizing it in a suitable combustion chamber. After treatment at a spill site or waste management facility, toluene sludge can be disposed of at a secure landfill (HSDB 2010).

According to data from the TRI, 1,122,841 pounds of toluene were transferred off-site in 2012, including releases to publically owned treatment works (POTW) (TRI15 2016).

Toluene is listed as a toxic substance under Section 313 of the Emergency Planning and Community Right to Know Act (EPCRA) under Title III of the Superfund Amendments and Reauthorization Act (SARA) (EPA 2006). Disposal of wastes containing toluene is controlled by a number of federal and state regulations (see Chapter 8).