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## 1,2,3,-Trichloropropane

### Announcement

The Division of Drinking Water uses subscription email lists to notify interested parties of upcoming activities related to development of new drinking water-related regulations. You may subscribe to a list to receive information about upcoming drinking water regulations, by following these steps:

- Click on the link [http://www.waterboards.ca.gov/resources/email\\_subscriptions/](http://www.waterboards.ca.gov/resources/email_subscriptions/), and select "State Water Resources Control Board."
- Fill in the contact information with your email address and full name.
- Select the category "Drinking Water" and then select the first box "Drinking Water Program Announcements." You may select other categories, as well.
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### Background

In 1999, we established a 0.005-micrograms per liter ( $\mu\text{g/L}$ ) drinking water [notification level](#) for 1,2,3-trichloropropane (1,2,3-TCP). This value is based on cancer risks derived from laboratory animals studies (US EPA, 1997). The notification level is at the same concentration as the analytical reporting limit, as described below. Certain [requirements and recommendations](#) apply if 1,2,3-TCP is detected above its notification level.

The 1,2,3-TCP notification level was established after its discovery at the Burbank Operable Unit (OU) — a southern California Superfund hazardous waste site — because of concerns that the chemical might find its way into drinking water supplies. It had been found in several drinking water wells elsewhere in the state at that time. Subsequently 1,2,3-TCP was found in more drinking water sources (see below).

1,2,3-TCP causes cancer in laboratory animals (US EPA, 2009). It is reasonably anticipated to be a human carcinogen (NTP, 2014), and probably carcinogenic to humans, based on sufficient evidence of carcinogenicity in experimental animals (IARC, 1995). In 1999, 1,2,3-TCP was added to the list of chemicals [known to the state to cause cancer](#) [Title 22, California Code of Regulations, Section 12000].

One of our precursors, the Department of Health Services (CDHS), in its [2001 monitoring guidance \(PDF\)](#), described 1,2,3-TCP as having various industrial uses and historic pesticide uses, with the primary possible contaminating activity appearing to be hazardous waste sites. Its industrial uses, according to NTP (2014), have been as a paint and varnish remover, cleaning and degreasing agent, and a cleaning and maintenance solvent, and as a chemical intermediate. Its association with past pesticide uses includes its presence in dichloropropenes (as a byproduct/impurity) and in the manufacture of D-D (a dichloropropane-dichloropropene mixture), used as a soil fumigant (IARC, 1995). Additional information is available from US EPA (2014).

### Monitoring Requirements, Analytical Methods, and Monitoring Results

In 2001, to obtain information about the presence of 1,2,3-TCP in drinking water sources, we adopted a [regulation](#) that included it as an unregulated contaminant for which monitoring is required (UCMR). For this monitoring, the Department of Public Health's Sanitation and Radiation Laboratories (SRL) — now the Drinking Water and Radiation Laboratories (DWRL) — developed protocols for analytical methods for 1,2,3-TCP at levels comparable to the notification level of 0.005  $\mu\text{g/L}$ . Monitoring under the UCMR regulation was to have been completed by the end of 2003. Some water systems continue their monitoring for 1,2,3-TCP.

SRL's methods, which were published in February 2002, have [Environmental Laboratory Accreditation Program](#) (ELAP) test method designations, [Purge and Trap GC/MS](#) (SRL 524M-TCP) and [Liquid-Liquid Extraction GC/MS](#) (SRL 525M-

TCP), that are capable of 1,2,3-TCP quantification at the DLR. The two SRL methods and EPA Method 504.1, [are certified by ELAP for Field of Testing 104](#), Volatile Organic Testing of Drinking Water. [Click here for a current list of laboratories that are certified by ELAP for these methods \(PDF\)](#).

Through 2013, [detections of 1,2,3-TCP in two or more samples \(Excel, 1.7MB\)](#) were reported in 372 active and standby sources, belonging to 92 water systems in 17 counties (see Table 1).

Though monitoring for 1,2,3-TCP had occurred from 1989 through the 1990s under earlier UCMR regulations, fewer than 20 sources had reported detections. This likely reflected the less sensitive analytical method available at that time and the reporting limit of 0.5 µg/L.

Though the UCMR testing is no longer required, the Division of Drinking Water recommends – when analyses for 1,2,3-TCP are performed – that water systems' laboratories use the more sensitive analytical methods for 1,2,3-TCP, in order to enable better characterization of the presence of the chemical in drinking water sources.

The [water quality monitoring database is available here](#).

### Future Regulation of 1,2,3-TCP

Given the number of sources with 1,2,3-TCP detections (also see [UCMR monitoring results](#)), CDPH's Drinking Water Program (now the Division of Drinking Water) considered this chemical to be a good candidate for future regulation (*i.e.*, establishment of a drinking water standard, also known as a maximum contaminant level or MCL). Thus, in July 2004 we requested a public health goal (PHG) from the Office of Environmental Health Hazard Assessment ([OEHHA](#)).

In September 2007, OEHHA released a draft PHG (0.0007 µg/L) and technical support document, and in January 2009, a revised draft technical support document. In August 2009, [OEHHA established a 0.0007-µg/L PHG for 1,2,3-TCP](#).

Until an MCL for 1,2,3-TCP is established, we will continue to use the 0.005-µg/L [notification level](#) to provide information to local governing agencies and consumers.

**Table 1. Sources (Active and Standby) Reporting 1,2,3-TCP Detections and Their Peak Concentrations\***

NOTE: these data are draft - they will change with subsequent updates.

County (ID)	TOTAL Sources	<0.0051 µg/L	0.0051 - 0.05 µg/L	0.051 - 0.5 µg/L	0.51 - 5.0 µg/L	5.1 - 50 µg/L	>50 µg/L	No. of Systems
Kern (15)	111	.	49	57	5	.	.	17
Los Angeles (19)	52	2	31	13	3	2	1	15
Fresno (10)	56	.	43	11	2	.	.	11
Tulare (54)	43	2	31	9	.	1	.	9
Merced (24)	25	.	6	11	8	.	.	10
San Bernardino (36)	22	.	17	3	2	.	.	6
Riverside (33)	19	.	17	2	.	.	.	4
San Joaquin (39)	10	.	5	5	.	.	.	3
San Mateo (41)	10	.	7	3	.	.	.	3
San Diego (37)	8	.	1	6	1	.	.	2

Stanislaus (50)	7	.	5	2	.	.	.	4
Monterey (27)	3	1	1	1	.	.	.	2
Sacramento (34)	2	.	1	1	.	.	.	2
Butte (4)	1	.	1	.	.	.	.	1
Madera (20)	1	.	1	.	.	.	.	1
Santa Cruz (44)	1	.	1	.	.	.	.	1
Solano (48)	1	.	.	.	.	1	.	1
<b>TOTAL</b>	<b>372</b>	<b>5</b>	<b>217</b>	<b>124</b>	<b>21</b>	<b>4</b>	<b>1</b>	<b>92</b>

\*Sources with two or more reported detections, through 2013. "Sources" includes active and standby sources and may include either raw or treated drinking water wells and surface water sources, distribution systems, blending reservoirs, and other sampled entities. For this table, we've excluded inactive, abandoned and destroyed sources. Also excluded are agricultural sources, monitoring wells, or more than one representation of the same source (e.g., a source with both a raw and treated entry, or with a distribution system or blending reservoir is counted as a single source), and sources with only a single detection.

[All detections are included in the reported 1,2,3-TCP detections \(Excel. 1.7MB\).](#)

## References

- ATSDR, 2011. [Addendum to the Toxicity Profile for 1,2,3-Trichloropropane \(PDF\)](#), Agency for Toxic Substances and Disease Registry, Centers for Disease Control, August 2011. Other information on 1,2,3-TCP from ATSDR is [here](#).
- IARC, 1995. [1,2,3-Trichloropropane \(PDF\)](#), IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, [Volume 63. Dry Cleaning, Some Chlorinated Solvents, and Other Industrial Chemicals](#), International Agency for Research on Cancer.
- NTP, 2014. [1,2,3-Trichloropropane \(PDF\)](#), in [Report on Carcinogens, 13th Edition](#); U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, October.
- OEHHA, 2009. [Public Health Goal for 1,2,3-Trichloropropane in Drinking Water \(PDF\)](#), August 2009.
- US EPA, 1997. Health Effects Advisory Summary Tables (HEAST), FY 1997 Update, US Environmental Protection Agency, Solid Waste and Emergency Response, 9200.6-303 (97-1), EPA-540-R-97-036, July 1997.
- US EPA, 2009. [Toxicological Review of 1,2,3-Trichloropropane \(PDF\)](#) in Support of Summary Information on the Integrated Risk Information System (IRIS), US EPA. September 2009. [IRIS summary is here](#).
- US EPA, 2014. [Technical Fact Sheet – 1,2,3-Trichloropropane \(TCP\)](#), Office of Solid Waste and Emergency Response, EPA-505-F-14-007. January 2014.

## Additional Information

[Information for Drinking Water Systems](#)

[More on Chemicals and Contaminants in Drinking Water](#)

(Updated 5/3/16)