

Volatile Organic Compounds, (VOCs)

Volatile Organic Compounds (VOC's) refer to an entire group of EPA regulated and unregulated compounds. These Compounds derive from various sources such as fuels, solvents and even chlorination by-products. They are all organic, (Carbon-containing) and reactive, (volatile). Below is a list of Compounds and their maximum "safe" level were applicable that are included in the standard VOC drinking water profile, (EPA Method 524).

Volatile Organic Compounds (VOC) by EPA Method 524, MCL = µg/l, (parts/billion)

<u>EPA MCL</u>		<u>EPA MCL</u>			
5	Benzene	1000	Toluene	Dibromomethane	1,2,3-Trichlorobenzene
5	Carbon Tetrachloride	700	Ethylbenzene	m,p-Xylene	n-Propylbenzene
600	1,4-Dichlorobenzene	10000	Total Xylenes	o-Xylene	n-Butylbenzene
5	1,1-Dichloroethene	100	Styrene	1,1-Dichloropropene	Naphthalene
5	1,2-Dichloroethane		Methylene Chloride	trans-1,3-Dichloropropene	Hexachlorobutadiene
200	1,1,1-Trichloroethane		1,2,4-Trichlorobenzene	cis-1,3-Dichloropropene	Isopropylbenzene
5	Trichloroethene		1,1,2-Trichloroethane	1,1,2,2-Tetrachloroethane	1,2,3-Trichloropropane
2	Vinyl Chloride		Chloromethane	1,3-Dichloropropane	1,3,5-Trimethylbenzene
100	trans-1,2-Dichloroethene		Bromomethane	2,2-Dichloropropane	p-Isopropyltoluene
70	cis-1,2-Dichloroethene		Dichlorodifluoromethane	2-Chlorotoluene	tert-Butylbenzene
5	1,2-Dichlorobenzene		Trichlorofluoromethane	4-Chlorotoluene	sec-Butylbenzene
5	1,2-Dichloropropane		Chloroethane	Bromobenzene	Bromochloromethane
100	Tetrachloroethene		1,1-Dichloroethane	1,2,4-Trimethylbenzene	1,1,1,2-Tetrachloroethane
	Chlorobenzene		1,3-Dichlorobenzene		
		100	Total Trihalomethanes,(THM's):		
			consists of Bromodichloromethane, Bromoform, Chloroform,		
			Dibromochloromethane		

Bold = Regulated VOC's
Plain = Unregulated VOC's

Source: VOC's are not naturally occurring compounds. If they are present in drinking water, it is due to pollution either intentional or unintentional. Leaking underground fuel storage tanks, and chlorination by-products caused when municipality-added chlorine combines with organic molecules are the two most common groups of volatile contaminants found in drinking water.

Health Effects: Due to the wide range of compounds in VOC's, health effects vary widely. A lot of the compounds in this list are suspected carcinogens, (cancer-causing agents). Some of the parameters could be fatal if consumed in high enough concentrations. Fortunately, since these substances are so volatile, they are usually detected by taste or odor before harmful levels are consumed.

Home Damage Effects: Wells that contain VOC's are usually condemned. While treatment systems do exist to remove Volatile Organic Compounds, a contaminated well significantly reduces property values.

How to Fix Contaminated Water:

1. Activated Carbon Systems- Granular or block activated carbon removes VOC's through a physical process known as adsorption. While these systems are very effective at removing the pollutants, they do not dispose of it. Therefore, these systems concentrate VOC's in the carbon and need to have carbon change-outs performed regularly.