

Information About Polluting Substances

About Health Limits and Detection Limits

"Health limits" refer to how much of a substance it is unsafe to breathe in. The limit is the "dividing line" between safe and unsafe amounts.

"Detection limits" are the smallest amount of a substance that a monitor can "see" in the air. When the amount of a polluting substance is lower than the detection limit, the monitor will not be able to measure it, or even show that it is there. Detection limits should be lower than health limits, to make sure that monitors can show when amounts of a polluting substance are unsafe, but they are not always.

Different government groups pick different safe and unsafe amounts of polluting substances. It can be difficult to decide which standards to use. Air Watch Bay Area assumes that lower amounts of chemicals are always better for people's health. For this reason, we use the lowest limit among standards from several different government groups.

"Chronic exposure" is being in contact with something over a long period of time. Many people who live near Bay Area refineries have chronic exposure to certain types of air pollution. For this reason, we list chronic health limits for some types of pollution.

	Detection Limits <i>(ppb unless noted otherwise)</i>		Health Limits <i>(ppb unless noted otherwise)</i>		
	Community	Fenceline	Limit	Type	Source
Benzene	0.5	5	1	8 hour/Chronic	OEHHA
Black Carbon*	0.05 µg/m3	-	5 µg/m3	Chronic	OEHHA
Ethylbenzene	0.5	-	60		ATSDR
Hydrogen Sulfide	2	30	8	Chronic	OEHHA
Toluene	0.5	5	70	Chronic	OEHHA
Xylene	0.5	5	50	Chronic	ATSDR
Sulfur Dioxide	-	5	75	1 hour	NAAQS
PM 2.5	-	-	35 µg/m3	24 hour	NAAQS
PM 10	-	-	150 µg/m3	24 Hour	NAAQS

*given similarity, used the diesel exhaust standard

Benzene [ben-zeen]

Benzene is a liquid used in making chemicals. It is in both coal and petroleum. Coming into contact with benzene can cause eye and skin irritation, headaches, dizziness, drowsiness, confusion, and shaking. Being exposed to benzene over a longer time can cause bone marrow damage and blood diseases, as well as cancers like leukemia. The chronic health limit for benzene is 1 part per billion (ppb). For benzene, AWBA uses the health limit from the California Office of Environmental Health Hazard Assessment.

Toluene [tol-yoo-een]

Toluene occurs naturally in crude oil. It is used to make products like plastics, rubbers, and paint. It can lead to irritation of the eyes and nose, confusion, headache, anxiety, dizziness, and insomnia. More serious effects include kidney and liver damage. It may be linked to infertility. The chronic health limit for toluene is 70 ppb. AWBA uses the health limit from the California Office of Environmental Health Hazard Assessment.

Ethylbenzene [eth-uhl-ben-zeen]

Ethylbenzene is found in coal tar and petroleum, as well as gasoline and paints. Exposure to high levels for a short time can lead to eye and throat irritation. Higher levels can cause dizziness. Long periods of low exposure can cause kidney damage. It may also cause permanent inner ear damage. Ethylbenzene may cause cancer, according to the International Agency for Research on Cancer. The chronic health limit for ethylbenzene is 60 ppb. AWBA uses the health limit from the Agency for Toxic Substances and Disease Registry.

Xylene [zahy-leen]

Xylene is found in petroleum and tar. It is often used in printing and making rubber and leather products. Exposure to high levels of xylene for any amount of time can cause headaches, lack of coordination, confusion, and dizziness. Exposure to very high levels even for a short time can cause skin, eye, nose, and throat irritation, as well as lung problems and difficulty breathing, difficulty with memory, and liver and kidney changes. The chronic health limit is 50 ppb. AWBA uses the health limit from the Agency for Toxic Substances and Disease Registry.

Black Carbon

Black carbon makes up a significant amount of the fine particles in the air (particulate matter). Black carbon comes from incompletely burned fuels, including coal, petroleum-based fuels, and plant-based fuels. Scientists have not yet agreed on how black carbon affects health. But black carbon probably leads to increased asthma attacks, breathing problems, and problems with the heart and blood vessels, such as high blood pressure. Black carbon also probably leads to more emergency room visits. The current chronic health limit is 5 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). AWBA uses the health limit from the California Office of Environmental Health Hazard Assessment.

Hydrogen Sulfide

Hydrogen sulfide is easy to recognize because of its rotten egg smell. It is in crude petroleum and natural gas. Short-term effects include nausea, watering eyes, headaches, sleeplessness, breathing problems, digestive upset, and tiredness. Longer-term issues are chronic headaches, poor attention span and memory, problems with the heart and blood vessels, and asthma. The chronic health limit is 8 ppb. AWBA uses the health limit from the California Office of Environmental Health Hazard Assessment.

Sulfur Dioxide

Sulfur dioxide comes from burning coal and oil at industrial plants, and from copper smelting. Short-term exposure can cause lung problems and burning of the nose and throat. Longer-term effects are decreased lung function and chronic asthma. The EPA reviews its standard for safe levels of sulfur dioxide every 5 years. Currently the health limit is at 75 ppb over a 1-hour period. AWBA uses the health limits from the EPA's National Ambient Air Quality Standards (NAAQS).

Particulate Matter 2.5 (PM 2.5)

PM_{2.5} is the abbreviation used for particles in the air that are smaller than 2.5 microns in diameter. (One human hair is about the width of thirty particles of this size side-by-side.) The most dangerous type of particulate matter for health is PM 2.5, or fine particles, because they are small enough to travel deep inside the lungs, irritating them and worsening chronic lung diseases.

PM_{2.5} can also affect how the heart works and cause blood clots that can lead to heart attacks. It also makes it easier to catch viruses and bacterial infections. This can lead to pneumonia for certain people, such as children and older people. The health limit for PM_{2.5} is 35 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) over a 24-hour period. AWBA uses the health limits from the EPA's National Ambient Air Quality Standards (NAAQS).