Analysis of Air Samples Taken During January 15, 2007 Chevron Incident by Contra Costa Hazardous Materials Response Team

Chemical	Dutra Materials Western Drive (ppm*)	Marine & Tewksberry (ppm)	I-580 Toll Booth Plaza (ppm)**
Iso-Butane	0.0103	0.0052	0.0746
N-Butane	0.0169	0.005.9	0.1854
Iso-Pentane	0.0144	0.0032	0.0704
N-Pentane	0.0208	0.0206	0.0617
2-Methylpentane	0.004	0.0028	0.0191
3-Methylpentane	0.002	0.001	0.0122
Hexane	0.0053	0.0014	0.0205
Benzene	0.0019	0.0021	0.0156
Toluene	0.0146	0.0051	0.0165
Xylenes	0.0105	0.0049	0.015
Ethylbenze	0.0037	.0002	0.0054

*ppm – parts per million – 1 ppm = 1 molecule for every 1,000,000 molecules
** This sample was influenced by the automobile traffic traveling on I-580 going through the toll booths and is the reason that it was higher then the other two samples

Dutra Materials is north of I-580 and west of Chevron just off Western Drive. The sample taken at this location was at 7:02 am. The intersection of Marine and Tewksbury is located in North Richmond. The sample was taken at 7:12 am. The final sample was taken at the I-580 westbound tollbooths at 7:20 am.

All of the chemical concentrations that were measured on January 15 during the fire were well below any concentration where there is a recognized level of concern. Benzene is the chemical of greatest concern. Benzene levels have dropped throughout the US over the last decade, but concentrations of about 1 part per million are common in metropolitan areas.

Included with the sampling data are descriptions of the hazards of the above chemicals developed by the EPA for the ConocoPhillips fenceline monitors in Rodeo.

Butane

The problem with butane isn't so much that it's toxic, but that it's explosive at high concentrations. The primary risk of exposure to butane is narcosis, which occurs at high exposure levels. Exposure to 10,000 ppm butane for 10 minutes causes drowsiness, but there are no reports of systemic toxicity or irritation at this level (Gerarde 1963a, as cited in American Conference of Governmental Industrial Hygienists [ACGIH] 1986/Ex. 1-3, p. 10).

In the Bay Area is usually not detected above 1 part per million.

Pentane

Pentane has similar health effects to butane and hexane.

Hexane

Hexane is another component of gasoline that acts as a respiratory tract irritant at low concentrations and a narcotic anesthetic at higher concentration. Safe exposures are below a threshold between 50 ppm (ACGIH) and 500 ppm (OSHA).

Benzene

Benzene is a problem because it is known human carcinogenic. Benzene is common in most gasoline used in the United States, and there could be a quart of Benzene in your gas tank right now. Because of this, Benzene is present in the air in most areas in the United States.

It is regulated at sources by EPA as one of the 161 hazardous air pollutants (HAPs) and it is one of 33 Urban Air Toxics that are priorities for EPA. In most cities, it is one of the top three carcinogens in the air. Levels have dropped throughout the US over the last decade, but concentrations of about 1 part per million are common in metropolitan areas. Benzene is one of the worst of the hazardous air pollutants (HAPs) that USEPA regulates in terms of its health effects. There are no standards set by EPA for this chemical; it is regulated by emission permits at major sources. OSHA recently reduced the dangerous level from 3000 ppm to 500 ppm.

Toluene

Toluene is a common organic solvent that is similar in toxicity to benzene.

It is regulated at sources by EPA as one of the 161 hazardous air pollutants (HAPs). At high concentrations it causes a narcotic anesthesia starting around 200 ppm in air, while levels above 10,000 ppm can be fatal. Safe levels are

below 100 ppm. Long-term exposures are less dangerous than benzene in that toluene is not now suspected to be carcinogenic in humans. The acute toxicity of toluene in animals is however, greater than that of benzene.

Patty (1963b, as cited in ACGIH 1986/Ex. 1-3, p. 578) reports that the lethal doses of toluene and benzene in mice are 10,000 and 14,000 ppm, respectively. The oral LD(50) for toluene in rats is 7.53 ml/kg (Smyth, Carpenter, Weil et al. 1969/Ex. 1-442). Exposure of rats to 2500 or 5000 ppm of toluene caused a temporary decrease in white cell count but no evidence of damage to the blood-forming organs or the liver. Fairhall (1957d, as cited in ACGIH 1986/Ex. 1-3, p. 578) stated that severe toluene exposure can cause a marked drop in the red blood cell count and partial destruction of the blood-forming elements of the bone marrow, but other researchers report that numerous animal studies indicate that toluene is not a bone marrow toxin (Gerarde 1960c, as cited in ACGIH 1986/Ex. 1-3, p. 578). A study by Greenberg, Mayers, Heinmann, and Moskowitz (1942/Ex. 1-325) reported that painters exposed to toluene levels of 100 to 1100 ppm exhibited enlarged livers, a moderate decrease in red blood cell counts, enlarged red blood cells, and absolute lymphocytosis, but no leukopenia. Wilson (1943/Ex. 1-403) observed 1,000 workers exposed to toluene at levels ranging from 50 ppm to 1500 ppm for periods of one to three weeks. One hundred of these workers developed symptoms severe enough to require hospitalization. Levels of 500 ppm are considered immediately dangerous.

Xylenes (O, M, P)

There are three different forms of xylene (ortho, meta, para) that have similar toxicities. Xylene is a common liquid organic solvent, and is a natural component in gasoline. It is regulated at sources by EPA as one of the 161 hazardous air pollutants (HAPs). Safe long-term levels are 100ppm, although even short-term exposures above 1000 ppm are considered dangerous.

Xylenes cause a wide variety of health effects from neurological (dizziness, drowsiness, nausea or headache) to eye, nose and throat irritation, to skin irritation. Studies of workers exposed to xylene revealed headache, fatigue, lassitude, irritability, and gastrointestinal disturbances as the most common symptoms (Gerarde 1960d/Ex. 1-738a). At unspecified exposure levels, Browning (1965b/Ex. 1-1016) also noted gastrointestinal disturbances, in addition to kidney, heart, liver, and neurological damage; blood dyscrasias, some of which resulted in death, were also reported in these workers. A study by Nelson, Enge, Ross et al. (1943/Ex. 1-66), in which human volunteers were exposed to 200 ppm xylene, found eye, nose, and throat irritation in the subjects at this level of exposure .Levels of 900 ppm are considered immediately dangerous.

Ethyl Benzene

Ethyl benzene is of low acute toxicity in general, but at high levels it can produce the same narcotic-like symptoms of benzene and toluene. It is regulated at sources by EPA as one of the 161 hazardous air pollutants (HAPs).

Long-term safe levels have been set at 100 ppm, while levels above 800 ppm are dangerous even in the short-term. The chemical causes respiratory system irritation (eyes, nose, lungs) and a swelling of the lungs that at high levels can be life threatening. Ethyl benzene is also flammable above 1,000 ppm, but health effects are more important. OSHA concludes that workers exposed to concentrations of ethyl benzene above the 100-ppm level, even briefly, are at significant risk of experiencing irritation; the Agency considers this to be a material impairment of health. Accordingly, the Agency is establishing a short-term limit of 125 ppm for a 15-minute period to supplement the existing 100-ppm time-weighted-average limit for ethyl benzene.