

## MEDIA BACKGROUNDER

# Aamjiwnaang Bucket Brigade Sample Report

February 20, 2008

An air sample taken by two members of the Aamjiwnaang Bucket Brigade east of the intersection of 40 highway and Churchill Road in the evening on January 15, detected high levels of five toxic chemicals. Chloromethane, benzene, chlorobenzene, ethylbenzene and isoprene were detected in the air sample at levels that exceed health guidelines and legal limits in the United States.

<i>Chemicals detected in sample</i>	<i>Amount detected micrograms per cubic meter (ug/m<sup>3</sup>)</i>	<i>Possible source (according to the National Pollution Registry Inventory)</i>
Chloromethane	130	Lanxess East
Benzene	9.9	Suncor Refinery, Nova Chemicals, Shell Refinery, Imperial Oil Chemicals and Imperial Oil Refinery
Chlorobenzene	60	No facilities in the area have reported releases of chlorobenzene to the NPRI in the last two years of reporting. It is also possible that the chlorobenzene is a breakdown product of a different chemical that may have been released.
Ethylbenzene	5.5	Nova Chemical sites, Suncor, Shell, Imperial Oil Refinery and Imperial Oil Chemical Plant
Isoprene	600	Lanxess East & West, Nova Corunna

**Chloromethane**- Chloromethane is also known as methyl chloride. It is a clear, colorless gas. It has a faint, sweet odor that is noticeable only at levels that may be toxic. It is heavier than air, and it is extremely flammable.

Exposure to high levels of chloromethane can cause serious problems to your nervous system, including convulsions and coma. It can also affect the liver, kidneys, and heart. Lower exposures can also cause staggering, blurred or double vision, dizziness, fatigue, personality changes, confusion, tremors, nausea, or vomiting. These symptoms can last for several months or years. Exposure to chloromethane can harm the liver and kidneys. It could also affect the heart rate and blood pressure.

The reported level of chloromethane at 130 ug/m<sup>3</sup> exceeds the US Environmental Protection Agency Region Six Screening level of 1.10 ug/m<sup>3</sup>. Chloromethane at this

level also exceeds the long term Texas Effects Screening Level of 103 ug/m<sup>3</sup>. The Texas ESL "Long-term" refers in most cases to duration of one year. Chloromethane also exceeded the state of Louisiana's Annual Standard of 55.5 ug/m<sup>3</sup> and the Agency for Toxic Substances and Disease Registry Chronic Minimal Risk Level, 59.8 ug/m<sup>3</sup>.

**Benzene**- Benzene is a colorless liquid with a sweet odor. It evaporates into the air very quickly and dissolves slightly in water. It is highly flammable and is formed from both natural processes and human activities.

Some industries use benzene to make other chemicals that are used to make plastics, resins, and nylon and other synthetic fibers. Benzene is also used to make some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides. Natural sources of benzene include emissions from volcanoes and forest fires. Benzene is also a natural part of crude oil, gasoline, and cigarette smoke.

Breathing very high levels of benzene can result in death, while high levels can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. The major effect of benzene from long-term exposure is on the blood. Benzene causes harmful effects on the bone marrow and can cause a decrease in red blood cells leading to anemia. It can also cause excessive bleeding and can affect the immune system, increasing the chance for infection.

Long-term exposure to high levels of benzene in the air can cause leukemia, particularly acute myelogenous leukemia, often referred to as AML. This is a cancer of the blood forming organs. The Department of Health and Human Services has determined that benzene is a known carcinogen. **The International Agency for Research on Cancer and the EPA has determined that benzene is carcinogenic to humans.**

Benzene in the sample exceeded the US EPA Region 6 Screening Level of .250 ug/m<sup>3</sup>, the Texas Effects Screening Level of 3 ug/m<sup>3</sup>, the state of North Carolina's legally enforceable annual standard of .120 ug/m<sup>3</sup> and the Agency for Toxic Substances and Disease Registry's Intermediate Minimal Risk Level of 4.79 ug/m<sup>3</sup>.

**Chlorobenzene**- Chlorobenzene is a colorless, flammable liquid with an aromatic, almond-like odor. Some of it will dissolve in water, but it readily evaporates into air. It does not occur naturally in the environment.

Animal studies indicate that the liver, kidney, and central nervous system are affected by exposure to chlorobenzene. Effects on the central nervous system from breathing chlorobenzene include unconsciousness, tremors, restlessness, and death. Longer exposure has caused liver and kidney damage. The limited data available indicate that chlorobenzene does not cause birth defects or infertility.

The amount of chlorobenzene detected in the sample exceeded the Texas Effects Screening Level of 46 ug/m<sup>3</sup>.

**Ethylbenzene**- Ethylbenzene is a colorless, flammable liquid that smells like gasoline. It is naturally found in coal tar and petroleum and is also found in manufactured products such as inks, pesticides, and paints. Ethylbenzene is used primarily to make another chemical, styrene. Other uses include as a solvent, in fuels, and to make other chemicals.

Exposure to high levels of ethylbenzene in air for short periods can cause eye and throat irritation. Exposure to higher levels can result in dizziness. Irreversible damage to the inner ear and hearing has been observed in animals exposed to relatively low concentrations of ethylbenzene for several days to weeks.

Exposure to relatively low concentrations of ethylbenzene in air for several months to years causes kidney damage in animals. **The International Agency for Research on Cancer has determined that ethylbenzene is a possible human carcinogen.**

**Isoprene-** Isoprene is a common synonym for the chemical compound 2-methylbuta-1,3-diene (in the same chemical family as known cancer causing 1,3 Butadiene). It is commonly used in industry, is an important biological material, and can be a harmful environmental pollutant and toxicant when present in excess quantities.

At room temperature, isoprene is a colorless liquid that is highly flammable and easily ignited. It can form explosive mixtures in air and is highly reactive, capable of polymerizing explosively when heated. It is most readily available industrially as a by-product of the thermal cracking of naphtha or oil. About 95% of isoprene production is used to produce a synthetic version of natural rubber.

Isoprene is a suspected cancer-causing chemical and can cause irritation to the eyes, nose and throat. Isoprene detected in the sample exceeds the short term and long-term Texas Effects Screening Level 1.4 ug/m<sup>3</sup> and 14 ug/m<sup>3</sup>, respectively.

All health information is from the Agency for Toxic Substances for Disease Registry, a division of the United States Center for Disease Control.

It is important to note that the sample reveals the exposure of the public to multiple harmful chemicals for which there are no health-based standards. While that is recognized that exposure to several harmful chemicals simultaneously have greater impacts than single chemical exposures, no standards have been developed to reflect this fact. It is reasonable to assume that multiple chemical exposures are more serious than any of the single health impacts cited.

## **Sources of Levels of Concern**

Some government agencies have developed standards and screening levels for toxic chemicals in the air based on health information about the chemicals. These agencies are listed below, with a brief description of the methods used in establishing their levels.

### **EPA Region 6 Screening Levels**

These levels are based on existing studies of chemical health effects. They levels are calculated for residential (as opposed to workplace) exposures. They reflect the risks of exposure to a certain level of the chemical. The levels listed as screening levels correspond to pre-determined levels of risk from exposure: either 1 in a million cancer risk or a "hazard quotient" of 1 for non-cancer effects, whichever corresponds to a lower concentration. These screening levels are not legally enforceable.

### **Texas Effects Screening Levels**

These levels are based on existing studies of chemical health effects. Below these levels, no adverse health effects are thought likely to occur. They reflect the experimentally-determined levels at which the chemicals caused adverse effects in study populations of people or animals, combined with safety factors to account for the differences among human populations and between humans and animals.

"Short-term" refers to exposure duration of one hour. "Long-term" refers in most cases to duration of one year; for benzene and ethylene dichloride, it indicates a 24-hour period.

These levels reflect both cancer and non-cancer effects. They are not legally enforceable.

### **Louisiana Ambient Air Quality Standards**

These levels are legally enforceable standards in Louisiana, developed through Louisiana's regulatory process. They are found in Table 51.2 of Title 33, Part III.

They are based on health effects information about the chemicals: the eight-hour standard modifies occupational exposure levels to be appropriate for residential exposures; the annual standard is based on EPA procedures for calculating cancer risks.

### **North Carolina Ambient Air Standards**

These levels are legally enforceable standards in North Carolina, developed through North Carolina's regulatory process.

They are based on health effects information about the chemicals.

### **ATSDR (Agency for Toxic Substances and Disease Registry) Minimal Risk Levels**

These levels are based on existing studies of chemical health effects. Exposure at these levels is said to pose "minimal risks" of adverse health effects. The levels were derived from the experimentally-determined levels at which the chemicals caused adverse effects in study populations of people or animals, combined with uncertainty factors to account for the differences among human populations and between humans and animals.

"Acute" exposure is defined as up to two weeks, "Intermediate" as between two weeks and one year, and "Chronic" as longer than a year.

These levels reflect only non-cancer health effects. They are not legally enforceable.

*This report was compiled by Ruth Breech, Program Director, Global Community Monitor with assistance by Ada Lockridge, Aamjiwnaang Environment Committee Chair and Dr. Elaine MacDonald, Senior Scientist, Ecojustice (formerly Sierra Legal Defence Fund).*