Oil Refineries, your health and the environment: what you need to know

What is an oil refinery?

Oil refineries convert crude oil, coal, or natural gases into fuel (including petrol, diesel, paraffin, kerosene). There are various processes involved which include heating and chemical reactions. In SA there are five large refineries – Caltex (in Cape Town), Engen (in Durban), NATREF in Sasolburg, and the Shell and BP combined SAPREF refinery (also in Durban).

Oil refineries pollute

- Oil refineries pollute our air, water, and land.
- Our **air** is polluted by up to 100 pollutants emitted from the stacks and leaking equipment at refineries.
- Our **land** is polluted by the large amount of harmful waste from refineries which needs to be dumped.
- Our **water** is polluted by the fallout from air pollution and by refineries discharging chemical pollutants into waterways. Accidental oil spills also pollute the groundwater and open waterways.

Air pollution

Oil refineries cause smog and air pollution. South African refineries currently pollute at unacceptable, unhealthy levels. Oil refineries emit about 100 chemicals every day. These include metals like lead which makes it hard for children to learn. They also include very small dust particles called PM10, that get deep into our lungs and harms our ability to breathe. Finally, refineries emit many gases like sulphur dioxide (SO_2), nitrogen oxide (NO_2), carbon dioxide, carbon monoxide, methane, dioxins, hydrogen fluoride, chlorine, benzene and others.

The health effects

Many of the gases emitted by refineries are harmful to humans, and can cause permanent damage and even death. They can cause respiratory problems (such as asthma, coughing, chest pain, choking, and bronchitis), skin irritations, nausea, eye problems, headaches, birth defects, leukaemia, and cancers. Young children and the elderly are the worst affected. A study done in Durban showed that school children at a school situated next to a refinery suffered between 30% - 40% more respiratory problems than children living more than 10 km away. There are many ways for a refinery to reduce the amount of pollution it causes. However, this usually requires the refinery to install some equipment. However, refinery companies do not want to spend money on reducing pollution unless they are forced to do so.

Sulphur dioxide (SO_2)

Crude oil and coal both contain relatively high quantities of sulphur. (Natural gases contain much less sulphur and therefore are safer.) When crude oil or coal is heated at the refinery to produce fuel, the sulphur is converted into a gas called sulphur dioxide. This is a colourless gas with a very

strong smell, like rotten eggs. Exposure to very high concentrations of SO_2 (for example, when there are accidental leaks at a refinery) can result in painful irritation of the eyes, nose, mouth and throat, difficulty in breathing, nausea, vomiting, headaches and even death. Some of the health effects from daily exposure to outdoor levels of SO_2 are tight chests, worsening of asthma and lung disease, and narrowing of air passages in the throat and chest. People with asthma are more sensitive to SO_2. Exposure to SO_2 can provoke asthma attacks. SO_2 mixes easily in water, including moisture in the air to form an acid. Acid rain and early morning dew causes much damage to metals, stones, and the environment. Burning of coal in domestic coal stoves also causes SO_2.

What is a safe level of SO_2 exposure?

The amount of SO_2 that SA refineries are allowed to emit is well above what is considered to be a healthy level by the World Health Organisation. SA refineries are allowed to emit up to 82, 000 kg per day. In contrast oil refineries in some countries in Europe produce as little as 2 000 kg a day.

What are fugitive emissions?

Fugitive emissions are the air pollution which escapes through leaks in the equipment. Very often the amount of pollution coming from fugitive emissions is higher than the amount coming out of the stacks. In SA, refineries are not required to monitor fugitive emissions.

How clean are SA fuels?

SA refineries often use low quality crude oil that has high levels of sulphur. When this is refined it produces higher levels of SO_2 pollution.

Common accidents at refineries

Accidental fires, explosions, and chemical and gas leaks are common at refineries. Such accidents cause higher than usual amounts of pollution, which may result in more acute exposure to pollutants and greater health impacts.

Laws and regulations governing refineries

The Atmospheric Pollution Prevention Act, No 45 of 1965, is the main law governing air pollution. The Act is very outdated and needs to be revised to be in line with international standards. In terms of this Act, no one may operate a refinery without having a registration certificate (or permit) from DEAT. The permit sets a limit to the amount of pollution that the refinery is allowed to emit. If the refinery emits more than the permit allows it to, then it is breaking the law and can be punished. Presently, SA refineries do not have to actually measure their air emissions but may simply estimate or calculate the amount they are emitting through their stacks. These estimates do not include fugitive emissions. Remember that very often pollution from fugitive emissions can by higher than the emissions coming out of the stacks.

TAKING ACTION

What can you do as a community to work with industry and government to make refinery operations safe and clean?

Some of the actions you could take include:

- call a community meeting
- do a health survey of your neighbours
- get data on air pollution levels in your area
- ask for the company to provide details of all accidents, fires, explosions, and worker injuries at the plant recruit technical or legal experts
- send out a community press release
- talk to workers in the plant
- talk to your local political representatives or councillors
- call *groundWork*

WHO TO CONTACT:

- *groundWork:* 033-3425662 or **email us**
- Legal Resources Center Dbn: 031-3017572; Pretoria: 012-323 7673; Cape Town: 021-4238285 **(http://www.lrc.org.za/**)
- Group for Environmental Monitoring : 011- 4037666
- **South Durban Community Environmental Alliance**: 031-261 1991 **http://www.sdcea.co.za**
- Table View Residents Association: 083 703 0183
- Chief Air Pollution Control Officer, DEAT: 012-310 3458
- ENGEN: 0800 33 0099
- SAPREF: 0800 33 0090
- CALTEX: 021- 5083911
- Sasolburg All hours complaints number: 016-976 0032

The information pamphlet has been developed from *groundWork's* experiences working with refinery communities in South Africa, in particular with the South Durban Community Environmental Alliance, the Table View Residents' Association, and the Sasolburg community. For more information contact:

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