Sour gas and your health

The evidence from years of scientific research tells us that exposure to high concentrations of sour gas can be dangerous to your health. That same research tells us that, at relatively low concentrations, like those being experienced in the communities close to the Cenovus Rush Lake facility, sour gas does not pose a risk to health. Air monitoring in numerous places around the incident indicates that the levels of H2S are hundreds of times lower than levels associated with adverse health impacts. However, those relatively low concentrations are responsible for the odours people have been experiencing.

What is sour gas?
Sour gas is natural gas that contains hydrogen sulphide, commonly referred to as H2S. The term "sour" stems from the fact that H2S has a distinct rotten-egg odour that most people can smell, even at very low levels.

Where is sour gas found?
People often associate sour gas with the oil and gas industry. However, there are many other sources of H2S, some natural, some man-made. These include:
- Manure
- Swamps and bogs
- Sloughs
- Compost heaps
- Sanitary sewers, septic systems and outhouses
- Sulphur hot springs

Why does sour gas smell so bad?
The smell is due to the presence of H2S and other sulphur-containing chemicals in the gas. These chemicals have extremely low odour thresholds, meaning that their smell is noticeable even at very low concentrations.

How much is really known about sour gas and health?
Partly due to its prevalence in our environment, the health effects of H2S have been well studied; in fact, more so than many other chemicals, even chemicals that people often take for granted such as household cleaners and personal care products.

Much of what is known about sour gas and health comes from research conducted by scientists working at universities, research institutions and government agencies. The findings from this research are published in medical or scientific journals to help ensure that the information meets the highest standards. This large body of research has contributed to a very good understanding of the health hazards of sour gas.

Can exposure to sour gas affect your health?
Yes, although it depends on the concentrations and frequency of exposure. It also depends on a person's overall health, particularly whether or not the individual suffers from breathing difficulties such as asthma.

Exposure to very high concentrations of H2S can cause light-headedness, dizziness, unconsciousness and possibly death. This combination of symptoms is often referred to as "knockdown." Exposure of this type is almost always confined to workplace settings, usually involving enclosed or confined spaces where H2S can accumulate, such as sewer manholes, sewer pits or ditches and trenches. This is why workers, including those at the Rush Lake facility, must take extra precautions and pay careful attention when working around sour gas.

At low concentrations of H2S, health effects are normally limited to mild, temporary irritation of the eyes as well as discomfort caused by the offensive rotten-egg odour of the gas. People with breathing difficulties, such as asthmatics, may react to even very low concentrations of the gas since it can easily irritate their already-inflamed airways. The H2S concentrations measured off-site, or away from the Rush Lake facility, are below levels at which health effects are expected to occur, including to the more vulnerable individuals in nearby communities.

Some people may respond to the offensive smell of H2S at very low concentrations, even at fractions of a part-per-million. These people are often sensitive to foul odours of any type, and may experience headache, nausea, dizziness and other feelings of discomfort as part of a reflex-type response to the foul smell itself. The response in this case is unrelated to the toxicity of H2S.

What are the effects of long-term exposure?

Based on all available evidence, there is no basis to conclude that long-term exposure to H2S at low concentrations is harmful to health. At low concentrations, H2S is easily detoxified and quickly eliminated from the body, even if the exposure is long term (weeks, months, or even years).

A recent comprehensive review of the scientific literature on the effects of long-term H2S exposure on human health evaluated a range of health outcomes, including respiratory effects, eye irritation, neurological symptoms, cardiovascular outcomes, reproductive and development effects and carcinogenicity. The researchers concluded that the evidence does not support a link between health effects and long-term exposure to H2S.

Is there a safe level of H2S?

Yes. Although H2S can be harmful at high concentrations, we know that as the concentration is lowered, health effects become less and less likely. In fact, apart from the unpleasant and annoying rotten-egg smell, there is little chance of harm at very low concentrations. Below a minimum threshold concentration, exposure to H2S can be safely tolerated, without harming health. The H2S concentrations measured downwind and away from the Cenovus site are well below that threshold.