



# Peace River Geology Report

## Fact sheet

This fact sheet provides an overview of the findings of a study on the types and amounts of odorous gases associated with oil sands designated heavy oil and bitumen in the Peace River area.

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### **Why was this study done?**

This study is in response to a recommendation by the panel looking into odours and emissions from heavy oil and bitumen operations in the Peace River Oil Sands (PROS) Area in Alberta. One of the panel's findings was that there was not enough data on the geology and petroleum chemistry of the heavy oil and bitumen in this area.

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### **What is the goal of the study?**

The goal of the study was to identify the geology (such as rock type, location in the ground, and how and where the oil is contained in the rocks), method of production, and the chemistry of the heavy oil and bitumen and determine if any of these might contribute to higher amounts of odorous gases being released.

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### **What was sampled?**

The study analyzed oil and gas samples mainly from wells in the PROS area. Samples from Athabasca and Cold Lake Oil Sands Areas and light oil from key source rocks (geological formations where oil is formed underground) were also analyzed to compare to the Peace River area samples. Gas emitted from liquid samples was also analyzed when heavy oil and bitumen samples were heated to different temperatures.

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### **What did the study conclude?**

Based on the samples analyzed, the research findings suggest that in the PROS area, the depth, type of oil (heavy oil and bitumen), and heating of the oil are key factors contributing to increased odorous compounds, and not location.

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The Alberta Energy Regulator ensures the safe, efficient, orderly, and environmentally responsible development of hydrocarbon resources over their entire life cycle. This includes allocating and conserving water resources, managing public lands, and protecting the environment while providing economic benefits for all Albertans.



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## **What are odorous compounds?**

Odorous compounds are gases that have concentrations strong enough to be detected by the nose. The lowest concentration where the gas can be detected by the nose as an odour is called the odour threshold. For this study, we considered a compound to have the potential to be more odorous if it exceeded the odour threshold many times.

Some compounds associated with natural oil and gases tend to be odorous. This study looked at two groups: reduced sulphur compounds (RSCs) and volatile organic compounds (VOCs).

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## **The study concludes that heavy oil and bitumen in the PROS area have high levels of odorous compounds while in the ground. Does that mean the samples have a stronger odour in the air?**

This study focused on identifying the possible sources of the odours and did not look at the concentrations of odorous gases in the air. The concentrations of the potentially odorous compounds are likely much higher in this study than what would be measured in air because the samples were taken from the well.

Determining how odorous the gases are when diluted in air and how far those odours travel is beyond the scope of this study.

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## **Did the study find that the exposure to the odours was harmful?**

This study did not consider any health effects related to human exposure to any of the compounds because this was not within the scope of this project. Given this, the AER continues to regulate and influence industry performance to address residents' ongoing concerns, which includes working with our regulatory partners to mitigate issues beyond the AER's authority.

We are committed to protecting the public and the environment, monitoring and responding to energy-related incidents.

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