

26 August 2021

640.30188-L01-v2.0-20210826 (Factsheet).docx

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PRECIS

Residents living near the Kealba landfill have raised concerns for their health because of odours understood to be emitted from works undertaken at the landfill to remediate hotspots that have developed deep under the landfill.

In response to these concerns, Barro engaged SLR to prepare a Human Health Risk Assessment (**HHRA**) to help the community understand the adverse health effects potentially associated with exposure to substances in the air near the landfill. This HHRA is not a health study monitoring specific individual health responses in the community. Instead, it predicts whether chemicals in the air could be responsible for odour or result in short- or long-term health effects.

The HHRA was undertaken by assessing the measured data collected by Barro for 77 toxic and/or odorous volatile (and semi-volatile) organic compounds (referred to as **VOCs**). The 77 VOCs were assessed because these form the standard analytic suite measured by laboratories when gathering information about air emissions. This data was collected over the course of 18 months of monitoring at the northern and western boundary of the landfill.

The HHRA assessed the VOC data against the relevant Australian and international health based guidelines listed in the report. As a result of this assessment, the HHRA found that the 77 VOCs are unlikely to be responsible for odour or cause health effects. However, SLR (and Barro) recognises that there may be other compounds in the air that may be causing odour outside of the 77 VOCs tested. Therefore, Barro is undertaking further odour assessments at the landfill and these assessments are ongoing.

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Volatile Organic Compounds (VOC) at the Kealba Landfill

Community Fact Sheet – VOC Sampling Program and Human Health Risk Assessment

A Human Health Risk Assessment (HHRA) was undertaken to address community concerns about adverse health effects potentially associated with odorous substances in the air near the Kealba landfill. The landfill owner (Barro Group Pty Ltd) has hired independent consultants (Golder Associates) to sample and test the air at the landfill boundary for volatile (and semi-volatile) organic compounds (VOC) and then engaged SLR Consulting Australia to prepare a HHRA report based on those results. VOCs are carbon-containing chemicals that can be found in air and are often released from industrial facilities.

The VOC Sampling Program

Sampling of outdoor air is occurring at the northern and southern boundary of the landfill every two to three days. Air samples are sent to a commercial laboratory for testing which involves analysis of 77 VOCs that include petroleum hydrocarbons, refrigerant gases, chlorinated hydrocarbons, brominated hydrocarbon compounds as well as other VOCs routinely included in these test reports.

Out of a total of 292 air samples tested, VOCs found most frequently include two refrigerant gases, Freon 11 and Freon 12. In about 10% of samples several petroleum hydrocarbons (including benzene) have also been measured. This is consistent with expectations for air samples collected from suburban Melbourne since these VOCs are regularly found in urban air.

In less than 1% of samples, two chlorinated hydrocarbons (trichloroethene and tetrachloroethene) and a solvent (2-butanone) were measured.

What was the result of the Human Health Risk Assessment?

The purpose of the HHRA is to evaluate whether any of the VOCs measured at the landfill boundary may affect the health of nearby residents. After careful consideration of the air sample test results for VOCs by an SLR expert in toxicology and risk assessment, it was concluded that none of the 77 VOCs included in the monitoring program are likely to be responsible for any short term (acute) health effects, long-term (chronic) health effects or effects on amenity (odour and irritation) that residents surrounding the site are experiencing. This is because for the VOCs that were measured, when compared with environmental and public health guidelines, the VOC air concentrations are:

- Lower than odour thresholds meaning they cannot be smelt by the majority of people.
- Lower than irritation thresholds meaning they are unlikely to cause sensory irritation, which is typically experienced by people as itchy eyes or a tingling nose.
- Lower than acute air guideline values so they are not expected to cause illness in the short-term (hours to days). They are also not expected to aggravate asthma at the concentrations measured.
- Lower than chronic air guideline values so they are not expected to cause illness in the long-term (many years). Indeed, most VOCs were measured infrequently which means long-term exposure to the VOCs is not occurring.

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- Estimated to make no measurable contribution to cancer risk above that experienced on average in the community. Benzene is being detected at levels consistently present in the air across metropolitan Melbourne and is unlikely sourced from the landfill but rather due to vehicular traffic. This means that any cancer risk associated with exposure to benzene is no different to that which one would experience from living in suburban Melbourne without exposure from other sources.

This also means that the odours detected in the community around the landfill are likely to be associated with substances which are not the subject of the current assessment by SLR which is limited to VOCs.

How do we know that the air guideline values are protective?

The health-based air guideline values used in the HHRA, which are widely accepted by environmental and health agencies, incorporate large safety factors and are typically based on “no effect levels” in animals or humans. This means that for a person to get sick from exposure to these chemicals, exposure concentrations would need to be hundreds of times higher than the guideline values. As stated above the test results are below the guideline values.

Do we know the source of measurable VOCs at the landfill boundary?

It is the view of the SLR expert toxicologist and risk assessor that the landfill was unlikely to be the source of the most frequently measured VOCs, namely two freon gases and the petroleum hydrocarbons. This is because these VOCs are regularly measured in outdoor air in Melbourne at the levels found at the landfill boundary. The petroleum hydrocarbons are most likely associated with vehicular traffic (and there are busy arterial roads close to the landfill). The freon gases are most commonly from refrigerant gases and may be associated with the widespread use of refrigerators and air conditioning equipment.

Is any other work being done?

Air sampling is continuing at the landfill boundary and the commercial laboratory have been requested to lower reporting limits (the lowest concentration a VOC can be measured at) in future sampling programs, so far as is reasonably practicable.

An odour assessment is being conducted separately to determine whether any other substances may be present in the air (beyond those VOCs considered above) that may be responsible for odours.