



Summary: Sampling and Analytical Quality Plan, Ash Residue in Morwell Roof Cavities Project

Senversa prepared a Sampling and Analytical Quality Plan (SAQP) in order to document the strategy and sampling methodology for testing that will be done as part of the *Ash Residue in Morwell Roof Cavities Project*.

The SAQP provided details of:

- how houses will be selected for testing;
- the proposed 'control' site and how it was selected;
- the methods that will be used for collection of samples;
- the chemical testing that will be performed on the ash samples; and
- procedures that will be used to ensure data quality.

Key aspects of the SAQP are summarised below.

Selection of Houses

Due to the large number of people that expressed interest in having their ceiling dust tested, not all houses can be tested. Within Morwell, 50 properties were selected for testing to represent a number of factors that may affect the amount of ash which is present in the roof cavity. These include:

- **Distance from the fire:** a map of the volunteered houses was overlaid with satellite images of the smoke plume and EPA's particulate monitoring at the time of the mine fire, and houses were selected within the plume both close to and at a range of distances from the fire. This will allow assessment of any differences in the amount or composition of ash with distance from the fire.
- **Age of the house:** older houses might have more gaps in the ceilings and walls than more modern houses. Houses were therefore selected from a range of age groups. This will allow assessment of differences in the amount or composition of ash between older and newer houses.
- **Building materials:** there are a variety of building types in Morwell. Houses have been chosen to represent different building materials to detect any differences caused by roofing materials (for example corrugated iron versus tiles) or walls (for example brick versus weatherboard).

By sampling a range of different house types and locations, Senversa will be able to understand how the test results vary between different houses and draw conclusions about other houses, even if they were not sampled.

Selection of Control Site

The purpose of collecting samples from a control site is to determine if the ash and/or other dust within roof cavities in Morwell is different to similar houses which were not impacted by the Hazelwood Mine Fire. An ideal control site should be outside the area affected by the mine fire, but should have similar house types and be similar distances to other sources of dust in roof cavities (e.g. major roads, power plants, industrial emissions).



Senversa has selected Rosedale as a control site. This town has been chosen because:

- it is still within the Latrobe Valley and might be expected to have seen some effects from mining and power generation; and
- based on satellite photos of the smoke plume and air monitoring carried out by the Latrobe Valley Air Monitoring Network during the 2014 coal mine fire, ash and/or smoke does not appear to have reached Rosedale during the Hazelwood Coal Mine Fire.

Samples will be taken from 10 houses in Rosedale and results compared with those from Morwell.

Collection of Roof Cavity Samples

Dust samples will be taken from the roof cavity using a small spatula or vacuum cleaner. A drop cloth will be used at the base of the ladder to catch any dust falling from the roof cavity. A second person will be holding the ladder while the sampling is underway. Any dust which falls from the roof cavity during this sampling will be cleaned up.

The person taking samples from the roof cavity will be wearing some protective clothing – a dust coverall, a dust respirator and gloves.



Collection of Indoor Swab Samples

Senversa will also take indoor swab samples from places where dust has accumulated (e.g. tops of cupboards or door frames) from two locations at each house. The sampler will mark out or measure the area for sampling and wipe the surface with a sampling cloth.

While swab samples will be taken from all selected properties, some samples might not be tested at the laboratory. This is because it is not yet known if there will be enough dust for testing inside properties.

Sampling Records

The following information will be recorded at each property:

- Photos and videos of the sampling locations and other features.
- A rough plan of the layout of the property including sampling locations.
- A description of the roof cavity dust.
- Details of any relevant features near the property e.g. major roads, industry etc. and general questions about the house.



Laboratory Testing

Senversa has reviewed a large amount of scientific reports and papers, including EPA Victoria's test results for the ash, to understand the chemicals that should be tested. Based on this review, ash samples will be analysed for the following chemicals:

- 18 metals: antimony, arsenic, boron, barium, beryllium, cadmium, cobalt, chromium, copper, lead, manganese, mercury, nickel, selenium, strontium, titanium, vanadium and zinc. The literature review carried out by Senversa found that these trace elements may be present in brown coal ash at elevated concentrations. Other trace elements may also be present, however not at concentrations greater than those in natural soils and rocks.
- Polycyclic aromatic hydrocarbons (PAHs). These are organic (carbon based) chemicals commonly found during burning of coal, wood etc.
- For selected houses where there is enough ash residue for more testing, samples will also be tested for a form of chromium known as hexavalent chromium. While the ash sampling and analysis conducted by EPA during the fire did not identify that this or other forms of chromium were present in ash at concentrations of potential concern for human health, the literature review identified that hexavalent chromium may be present in coal ash at low concentrations, and the hexavalent form of chromium is more toxic than other forms.

The ash testing will be conducted by laboratories that are accredited by the National Association of Testing Authorities (NATA) for these analyses.

Data Quality

In order to ensure that the test results are of good quality, some additional samples will be taken and the laboratory results will be reviewed. These procedures are standard practice to make sure that the sampling and lab testing is undertaken correctly, and include:

- Collection and analysis of duplicate samples from one out of every 20 houses to determine if the laboratories are able to get the same results when testing a sample more than one time. Some samples will also be sent to a second laboratory, to assess whether the results differ between two different laboratories.
- Collection and analysis of 'blank' samples to determine if any of the samples are getting contaminated during the testing or transport process.
- Review of laboratory data which indicates whether their testing methods are working properly, and whether the results are accurate.

Reporting

Once Senversa has received all the testing results from the laboratories, the results will be reviewed and reports prepared. The owner of each house sampled will receive an individual report with the testing results for the property. This will include some information to explain what the results mean. The results will be discussed with owners in person or by telephone.

Senversa will also prepare a larger report summarising and interpreting the results for all properties, including those in Rosedale (the control location). This report will assess any differences in results between Morwell and the control location, and between houses with varying attributes (e.g. weatherboard and corrugated iron vs brick and tile).

The report will also assess potential health risks posed by brown coal ash residue in roof cavities, and provide recommendations for further testing or other work, if required.

Senversa will respect the privacy of those participating in the study. Names, addresses or photos that can identify people or individual properties will not be published (other than in individual property reports, which will not be made public).