REPORTING OF METHAMPHETAMINE AND PRECURSORS ON WIPES
TECHNICAL NOTE

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This Technical Note has been updated to take account of the New Zealand Standard for Testing and decontamination of methamphetamine-contaminated properties (NZS 8510) announced by Standards New Zealand on 29 June 2017.

Background

'The New Zealand Standard for Testing and Decontamination of Methamphetamine-contaminated Properties' (NZS 8510:2017) was published by Standards New Zealand in June 2017. This standard serves as a guide to reduce the risk of harm to people living in properties where there is methamphetamine contamination. Within the standard are the procedures required to test properties for contamination along with describing the steps needed for decontamination of affected properties. These procedures include screening, detailed sampling, testing, and decontamination of houses with potential contamination. This standard supersedes the set of interim guidelines released by the Ministry of Health in October 2016. The standard also replaces 'The NZ Guidelines for Remediation of Clandestine Methamphetamine Laboratory Sites', published by the Ministry of Health in 2010, because it has been designed to be relevant to properties contaminated by the use (but not manufacture) of methamphetamine.

The NZS 8510 standard describes the following acceptable levels for areas of a property tested according to the procedures described in the standard:

1. An individual **high-use area** in an affected property should have a level at or below 1.5µg/100cm^2. Any high-use areas exceeding 1.5µg/100cm^2 are considered contaminated.
    - *A high-use area is defined as "an area in a property that can be easily accessed and is regularly used by adults and children." Examples of high-use areas include living areas and garages.*
2. An individual **limited-use area** in an affected property should have a level at or below 3.8µg/100cm^2. Any limited-use areas exceeding 3.8µg/100cm^2 are considered contaminated.
    - *A limited-use area is defined as "an area that is likely to be accessed only by adults and for short periods of time." Examples of limited-use areas include crawl spaces and wall cavities.*

Sampling for Methamphetamine

The methods for methamphetamine sampling and analysis described in NZS 8510, where testing is carried out by a laboratory, are based on the NIOSH 9111 standard. This comes from the National Institute of Occupational Safety & Health in the USA, and is widely accepted as the benchmark for sampling and analysing samples for methamphetamine (and its precursors).
https://www.cdc.gov/niosh/docs/2003-154/pdfs/9111.pdf

The NIOSH 9111 method is based on swabbing a 100 cm^2 (10 cm x 10 cm square area) with a cotton gauze material (either a 7.5 x 7.5 cm/12 ply wipe or a 10 x 10 cm/8 ply wipe made of cotton gauze or equivalent). Methanol is the main solvent used on the gauze for recovery of methamphetamine

and precursor residues from typical building material surfaces, though isopropanol can also be used.

Analytica provides methamphetamine sampling kits which conform to the requirements of NIOSH 9111, and is accredited by IANZ to undertake analysis of samples using a method that also conforms to NIOSH 9111. These kits are compliant with the requirements outlined in NZS 8510.

There are three phases of sampling for methamphetamine contamination outlined in NZS 8510:

1. Screening Assessment
2. Detailed Assessment
3. Post-Decontamination Assessment

Analytica provides kits and analysis options suitable to all three of these phases for testing, as described further below.

The 4 Sample Collection Options, & Interpreting Results From Them

The following is a summary of the 4 sampling options available, and a guide to interpretation of the results.

1. Individual Analysis of Discrete Samples:

This option provides individual test results for locations in a property, and can be used for all three phases of sampling (see 'Sampling for Methamphetamine' above).

Sampling equipment: This testing involves using a single Discrete kit per area sampled. A Discrete kit consists of a single cotton gauze swab, infused with methanol, supplied in a sealed screw cap polypropylene container. This is accompanied by a pair of latex gloves and a cardboard sampling template (10cm x 10cm).

Sampling procedure: The sampler selects an appropriate sampling location, and places the 10 cm x 10 cm template on the selected surface. The methanol soaked swab is removed from its sample container and is used to wipe (following the NIOSH 9111 method) the 10 cm x 10 cm area defined by the template. It is then placed back into its sample container, which is clearly labelled with the sample identification. The sample identification is also recorded onto the chain of custody (COC) document then the sample container is sent to the laboratory for analysis (along with the COC document and any other samples collected).

The locations and areas that should be sampled are outlined in NZS 8510. The requirements are different for each of the three sampling phases (see 'Sampling for Methamphetamine' above).

Laboratory testing procedure: Each swab is analysed individually by the laboratory.

Interpreting Results: Results are reported as µg/sample (refer to Appendix A for an example report) and can be directly compared with the levels described in NZS 8510 if the sampler has swabbed 100 cm^2.

- The reason we do not report as µg/100cm^2 is that as a laboratory we do not know the actual area that was swabbed when collecting the sample. The laboratory can correctly report total µg/sample, and leaves the sampler to interpret the results based on the sampling technique they have used.

2. Laboratory Composite Analysis of Discrete Samples:

This approach allows for up to ten Discrete samples to be initially screened as a group to determine whether there is evidence of methamphetamine being present. A low result means you can be confident that there are no areas that were sampled which exceed the NZS 8510 levels. However, a Laboratory Composite of Discrete Samples result cannot be directly compared with the levels described in NZS 8510 (please see comments on Interpreting Results below).

The major benefit of Laboratory Composite analysis is that individual samples are collected and available at the lab for follow up testing in the event of a high result (without a second visit to a property for sample collection), while avoiding the high initial cost of individually testing all samples. A Laboratory Composite of Discrete samples can be used for the Screening Assessment and the Post-Decontamination Assessment outlined in NZS 8510 (see 'Sampling for Methamphetamine' above). *Note:* Discrete samples that are retested from a Laboratory Composite may be able to be used to contribute to the Detailed Assessment outlined in NZS 8510 (see 'Sampling for Methamphetamine' above) depending on how they have been collected during the Screening Assessment.

Sampling equipment: As with Individual Analysis of Discrete Samples

Sampling procedure: As with Individual Analysis of Discrete Samples

Laboratory testing procedure: Samples are prepared individually for analysis, as per the Individual Analysis of Discrete Samples. However, prior to analysis a sub-sample of the extract from up to 10 Discrete samples is combined into a single composite sample by the laboratory. This is tested, with the result representing **the average of the samples included in the composite**, reported as µg/sample (see Appendix B for an example report).

A Theoretical Maximum Level is also displayed on the Laboratory Composite report. This value is calculated from the average result of the composite and the number of samples combined into that composite group. Interpretation of this is described below under 'Interpreting Results'.

Interpreting Results: This average result ***cannot*** be directly compared with the relevant guideline, because it is an average of multiple sampling locations. To interpret the composite test result, a Theoretical Maximum Level is used to assess the total amount of residue that could be present in any one sample, if all other samples had no detectable amounts of residue in them. The Theoretical Maximum Level should be interpreted as a 'worst case scenario' - if it exceeds the allowable level specified for any one location in NZS 8510 then the samples should be retested to work out which (if any) of these samples are actually above the allowable level.

3. Individual Analysis of Field Composite Samples:

This approach allows for samples from up to 5 locations to be combined together by the sampler in the field, and tested as one sample at the laboratory. Individual analysis of a Field Composite sample can only be used for the Screening Assessment outlined in NZS 8510. It is not suitable for the Detailed Assessment or the Post-Decontamination Assessment as the analysis is not specific to individual locations. A Field Composite result cannot be directly compared with guideline levels (please see comments on Interpreting Results below).

As there are no individual samples available for follow up testing, a further sampling visit will be required to collect Discrete samples for Individual Analysis if there are significant residues found in the Field Composite sample.

Sampling equipment: This testing involves using a single Field Composite kit to sample up to 5 locations. A Field Composite kit consists of 5 cotton gauze swabs, infused with methanol, supplied in a sealed screw cap polystyrene container. A second sample container is provided to place the swabs in following sampling. The kit also contains a pair of latex gloves and 5 x cardboard sampling templates (each 10cm x 10cm).

Sampling procedure: As with Individual Analysis of Discrete samples, except that up to 5 swabs are placed into a single sample container following sampling.

Laboratory testing procedure: Field Composite samples are prepared and analysed as a single sample. The results reported by this method are reported as µg/sample (see Appendix C for example report) and represent **the total of all residues from the swabs in the sample**. For example, if 5 sites of 100 cm^2 are sampled then the result represents total µg/500 cm^2.

Interpreting Results: This total result ***cannot*** be directly compared with the levels described in NZS 8510, because it is a total of multiple sampling locations (not just one 100 cm^2 area). When considering the result, a 'worst case' scenario should be assumed, which is that all the residues measured in the sample may be from a single location.

For example, if a Field Composite of 5 swabs is taken from a carpeted property where methamphetamine may have been used recreationally, the level for high-use areas is 1.5µg/100 cm^2. A Field Composite result of >1.5 µg/sample may represent one sample which contains >1.5 µg/100 cm^2 (with the rest being at or below the detection limit). Follow up Individual Analysis of Discrete samples will be needed to confirm.

4. Laboratory Composite Analysis of Field Composite Samples:

This approach allows for up to two Field Composite samples (total of 10 cotton swabs) to be initially screened as a group to determine whether there is evidence of methamphetamine being present. A low result means you can be confident that there are no areas that were sampled which exceed the NZS 8510 levels. However, a Laboratory Composite of Field Composite Samples result cannot be directly compared with the levels described in NZS 8510 (please see comments on Interpreting Results below).

The benefit of Laboratory Composite analysis over Individual Analysis of Field Composite samples is that up to two Field Composite samples (max. 10 locations) can be screened together at the lab, avoiding the high initial cost of individually testing all samples. In the event of a high result, the two samples can be retested separately to obtain results for each of the Field Composite samples, but the Field Composite samples cannot be broken down further to give individual results. A Laboratory Composite of Field Composite samples can only be used for the Screening Assessment outlined in NZS 8510. It is not suitable for the Detailed Assessment or the Post-Decontamination Assessment as the analysis is not specific to individual locations.

Sampling equipment: As with Individual Analysis of Field Composite Samples

Sampling procedure: As with Individual Analysis of Field Composite Samples

Laboratory testing procedure: Samples are prepared individually for analysis, as per the Individual Analysis of Field Composite Samples. However, prior to analysis a sub-sample of the extract from up to 2 Field Composite samples is combined into a single composite sample by the laboratory. This is tested, with the result representing **the average of the samples making up the composite**, reported as µg/sample (see Appendix B for an example report).

A Theoretical Maximum Level is also displayed on the Laboratory Composite report. This value is calculated from the average result of the composite and the number of samples combined into that composite group. Interpretation of this is described below under 'Interpreting Results'.

Interpreting Results: This average result ***cannot*** be directly compared with the relevant guideline, because it is an average of multiple sampling locations. To interpret the composite test result, a Theoretical Maximum Level is used to ascertain whether any sample may be over the relevant NZS 8510 level. The Theoretical Maximum Level should be interpreted as the 'worst case scenario' - if it exceeds the allowable level specified for any one location in NZS 8510 then the 2 samples can be retested to work out which (if any) of the Field Composite samples are actually above the allowable level (as per the Interpretation of Individual Analysis of Field Composite Samples described above). Or the sampler can return to the property to collect more Discrete samples for individual analysis.

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