

Self-guided training manual

# Training Manual South Australia Clandestine Drug Laboratory Management

(Assessment and Remediation)

Health Protection Programs



Government  
of South Australia

SA Health

## Preface

This training manual is intended to support the application of the Practice Guideline for the Management of Clandestine Drug Laboratories under the *South Australian Public Health Act 2011* (the Practice Guideline)

## Disclaimer

This training manual does not aim to replace the practice guideline, the National Clandestine Drug Laboratory Remediation Guidelines (the National Guidelines) nor other endorsed guidelines but should be used in conjunction with other endorsed guidelines.

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## Guidance Manual Objectives

- To provide an overview of the South Australian Public Health (Clandestine Drug Laboratories) Policy 2016 and its application for the clan lab notification and remediation process.
- To improve the knowledge of environmental health officers and suitably qualified experts on the application of the National Guidelines and Practice Guideline for the management and remediation of clandestine drug laboratories in South Australia.
- To improve the knowledge and competence of environmental health officers with the interpretation and critical analysis of site assessment and validation reports.

## Acronyms and abbreviations

Authorised officer	as defined under division 5 of the <i>South Australian Public Health Act 2011</i>
Clan labs	Clandestine drug laboratories
EHO	Environmental Health Officer
EPA	Environment Protection Authority (South Australia)
HPP	Health Protection Programs (SA Health)
HSA	Housing Safety Authority
ILs	Investigation levels
RAP	Remediation action plan
SAPOL	South Australia Police
SAILIS	South Australian integrated land information system
SQE	A suitably qualified expert with experience in the fields of environmental engineering, environmental science, environmental health or occupational hygiene and who is in possession of tertiary qualifications in one of these disciplines from a recognised educational institution
The Act	<i>South Australian Public Health Act 2011</i>
The EP Act	<i>South Australian Environment Protection Act 1993</i>
The National Guidelines	National Clandestine Drug Laboratory Remediation Guidelines published by the Australian Government
The Policy	South Australian Public Health (Clandestine Drug Laboratories) Policy 2016
The Practice Guideline	Practice Guideline for the Management of Clandestine Drug Laboratories under the <i>South Australian Public Health Act 2011</i>

## Roles and Responsibilities

Roles and Responsibilities	
Premises / premises owner	<p>The individual or company that is in possession of title or owners' rights for land, building, vehicle and other items that is used or has been used for any of the following activities:</p> <ul style="list-style-type: none"> <li>• Unlawful manufacture of any controlled drug</li> <li>• An attempt to unlawfully manufacture any controlled drug</li> <li>• Storage of chemicals, equipment or waste materials used to unlawfully manufacture a controlled drug</li> </ul>
South Australian Police (SAPOL)	<p>SAPOL responds to all reports of suspected clandestine drug laboratories (clan labs).</p> <p>Responsible for:</p> <ul style="list-style-type: none"> <li>• Managing the crime scene and making it safe</li> <li>• Safely collecting evidence on the nature of the operation to determine if a drug related offence has occurred in a suspected clan lab site</li> <li>• Informing the Local Public Health Authority (council) of the discovery</li> <li>• Providing a notification report to SA Health and the relevant Local Public Health Authority (council).</li> </ul>
Local Public Health Authority (council)	<p>The relevant Local Public Health Authority (council) for the area, responsible for the administration of the <i>South Australian Public Health Act 2011</i> (the Act), and its' subordinate regulations and policies. Responsible for:</p> <ul style="list-style-type: none"> <li>• Ensuring compliance with the Clandestine Drug Laboratories Policy 2016 (the Policy) and associated guidelines.</li> <li>• Preventing uninformed purchase of unresolved clan lab properties by members of the public by flagging the premises on the council's property record system.</li> <li>• Critically assessing the quality of site assessment and validation reports in accordance with the Practice Guideline and National Guidelines.</li> <li>• Ensuring adequacy of and compliance with the remediation action plan as recommended in the site assessment report.</li> </ul>
Health Protection Programs (HPP) (SA Health)	<p>Responsible for the development, implementation, and oversight of the Policy and the Practice Guideline, and:</p> <ul style="list-style-type: none"> <li>• Ongoing monitoring of the implementation of the Policy.</li> <li>• Provision of support and technical advice.</li> <li>• Flagging properties on the South Australian</li> </ul>

	integrated land information system (SAILIS) to complement action taken by councils to prevent uninformed purchase of unresolved clan lab properties by members of the public.
Housing Safety Authority (HSA)	Responsible for updating the following public registers with the aim of alerting potential occupants, renters and buyers of substandard issues with a premises through the use of: <ul style="list-style-type: none"> <li>• <a href="#">Substandard Property Register</a>.</li> <li>• SAILIS.</li> </ul>
Suitably Qualified Expert (SQE)	A suitably qualified expert (SQE) who is in possession of experience and tertiary qualifications in the fields of environmental engineering, environmental science, environmental health or occupational hygiene from a recognised educational institution.  Responsible for: <ul style="list-style-type: none"> <li>• Conducting a site assessment, compiling and presenting the details in a site assessment report.</li> <li>• Notifying the Environment Protection Authority (EPA) of actual or potential serious environmental harm or site contamination of underground water in accordance with the Environment Protection Act 1993 (the EP Act).</li> <li>• Preparing the remediation action plan (RAP).</li> <li>• Recommending clean up/ wash up methodology of the clan lab premises</li> <li>• Conducting a site validation and compiling and presenting the details in a validation report.</li> </ul>
Professional / Industrial Cleaner	A person or organisation who is experienced in the cleaning of contaminated areas, items and safe disposal of hazardous materials. Responsible for: <ul style="list-style-type: none"> <li>• The clean-up/ wash up of contaminated clan lab premises</li> <li>• Their safety during the clan lab clean up/ wash up process</li> <li>• Implementing the remediation action plan developed by the SQE.</li> </ul>



## 1. What is a Clandestine Drug Lab?

Clandestine drug laboratories (clan labs) are premises or vehicles in which unlawful manufacture or attempted manufacture of controlled drugs such as methamphetamine have occurred or where chemicals, equipment or waste materials related to unlawful manufacture of a controlled drug have been located. Clan labs have been found in rural, regional, and metropolitan locations.

Drugs produced unlawfully in clan labs typically includes but not limited to –

- 3,4-methylenedioxymethylamphetamine (MDMA) (Ecstasy),
- Amphetamine,
- Ephedra
- Cannabis oil extraction,
- Fentanyl,
- Heroin,
- Gamma-hydroxybutyrate (GHB) (Fantasy),
- Methamphetamine (Crystal meth or Ice),
- Met cathinone,
- Phencyclidine (PCP, Angel dust),
- Psilocybin (magic mushrooms)

## 2. Background

Clan labs have emerged as a public health problem in developed countries worldwide. According to a United Nations Office on Drugs and Crime (UNODC) report, the majority of clan labs detected (approx. 99%) manufactured amphetamine-type stimulants (ATS), with limited data available on the manufacturing of other forms of illicit drugs in illegal laboratories (UNDOC 2017).

This is similar to Australian trends, with clan labs involved in the manufacture of ATS accounting for 68.5% of clan labs detected in 2017-18 where the drug being manufactured was able to be determined (ACIC 2019a).

The size and production capability of laboratories varies from large laboratories or “super labs” producing approximately 4.5 kg of methamphetamine per production cycle to smaller “box labs” producing as little as 28g or less (ACIC 2019a).

Clan labs range from crude, makeshift operations using simple processes, to highly sophisticated operations using technically advanced processes, equipment and facilities. Irrespective of their size or level of sophistication, the corrosive and hazardous nature of many of the chemicals used in clan labs pose significant risks to the community. Many of the chemicals are extremely volatile and in addition to contaminating the laboratory premises, they can also contaminate the surrounding environment, including soil, water and air (EMCDDA and Europol 2016; UNODC 2016).

As shown in Figure 1, the number of clan labs detected nationally has declined since peaking at 809 detections in 2011-2012 (ACIC 2019a).

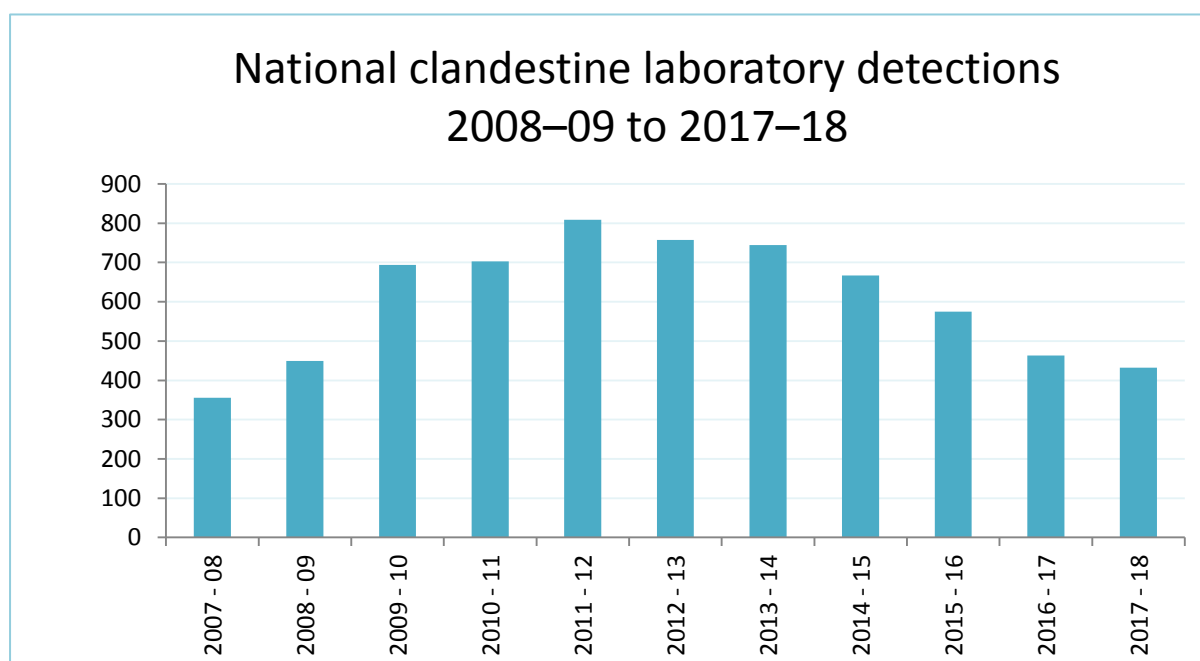


Figure 1: National clan lab detections, 2008–09 to 2017–18

In 2016–17, South Australia, Tasmania and the Northern Territory reported increases in the number of detected clan labs, while New South Wales, Victoria, Queensland, Western Australia and the Australian Capital Territory reported decreases (ACIC 2019a). Table 1 shows the number of clan labs detected across the states and territories from 2007 to 2018.

Table 1: Number of clan lab detections, by State and Territory, 2007–08 to 2017–18

Year	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
2007 - 2008	51	76	121	69	30	2	1	6	356
2008 - 2009	67	84	148	65	78	0	7	0	449
2009 - 2010	82	113	297	71	118	1	12	0	694
2010 - 2011	87	63	293	75	171	11	2	1	703
2011 - 2012	90	99	379	58	160	15	7	1	809
2012 - 2013	105	113	330	56	136	9	8	0	757
2013 - 2014	98	114	340	80	96	5	11	0	744
2014 - 2015	99	161	236	71	84	5	10	1	667
2015 - 2016	83	144	234	69	40	1	3	1	575
2016 - 2017	56	135	150	81	33	3	5	0	463
2017 - 2018	86	98	141	78	25	2	2	0	432

The majority of clan labs detected in Australia are addict-based laboratories, which typically only use basic equipment and simple procedures followed by the small scale and medium sized laboratories respectively (ACIC 2019a).

In the 2019 National Wastewater Drug Monitoring Program report, South Australia had the highest average capital city consumption of methylamphetamine, the highest average regional consumption of cannabis, and together with Queensland the highest average regional consumption of fentanyl in the country (ACIC 2019b).

## 2.1 Locations

Clan labs have been found in very different settings including:

- Residential premises (e.g. domestic dwellings, sheds, garages, Airbnb, rental properties, motel rooms, hotel rooms, etc.)
- Commercial/ industrial areas (e.g. warehouses)
- Vehicles (e.g. trucks, caravans, cars)
- Public places
- Rural and regional areas.

## 2.2 Operational processes involved in a clan lab

Illicit drug manufacture carried out in clan labs may involve any or all of the following processes:

**Extraction** – Active chemical ingredients are extracted from a chemical preparation or plant, using a chemical solvent to produce a finished drug or a precursor chemical. Examples of extraction include the extraction of precursor chemicals (pseudoephedrine) from pharmaceutical preparations (cold and flu tablets), or the extraction of morphine from opium.

**Conversion** – A raw or unrefined drug product is changed into a more sought-after product by altering the chemical form. Examples include converting methylamphetamine base into crystalline methylamphetamine hydrochloride.

**Synthesis** – Raw materials are combined and reacted under specific conditions to create the finished product through chemical reactions. Synthetic drugs such as MDMA or ecstasy and lysergic acid diethylamide (LSD) are created through this process.

**Tableting** – the final product is converted into dosage units. An example is pressing MDMA powder into tablets.

## 2.3 Substances used in illicit drug manufacture

The process of manufacturing illicit drugs involves the use of chemical substances, which can be categorised into the following groups -

**Precursors** – considered the starting materials for illicit drug manufacture. Through chemical reactions, the precursor's molecular structure is modified to produce a specific illicit drug. For example, precursors such as ephedrine and pseudoephedrine are converted to methylamphetamine.

**Reagents** – substances used to cause a chemical reaction that modify the precursor's molecular structure. For example, when the reagent acetic anhydride is mixed with the precursor phenyl-2-propanone (P2P), the resulting compound is methylamphetamine.

**Solvents** – substances added to the chemical mixture to ensure effective mixing by dissolving precursors and reagents, diluting the reaction mixtures, and separating and purifying other chemicals. For example, acetone and hydrochloric acid are used in heroin production.

## 2.4 Methods used in illicit drug manufacture

A number of factors, including the skill of the person and the availability of precursors, influences the method used in illicit drug manufacture.

In Australia, ATS, specifically methylamphetamine, is the predominant drug manufactured in detected clan labs. The manufacturing methods and precursors used to manufacture ATS vary.

Nearly 70% of clan labs in South Australia engage in the manufacture of ATS (ACIC 2019a) which includes:

- 3,4-methylenedioxymethylamphetamine (MDMA) (ecstasy)
- Amphetamine
- Methamphetamine

Methamphetamine accounts for 93% of ATS manufactured in clan labs in South Australia.

## 2.5 Common methods used in the manufacture of methamphetamine

Common methods used in the manufacture of methamphetamine include:

- Birch Reduction Method (Nazi method)
- Red Phosphorus-based Methods
- Hypophosphorus-based Methods
- P2P-based Methods

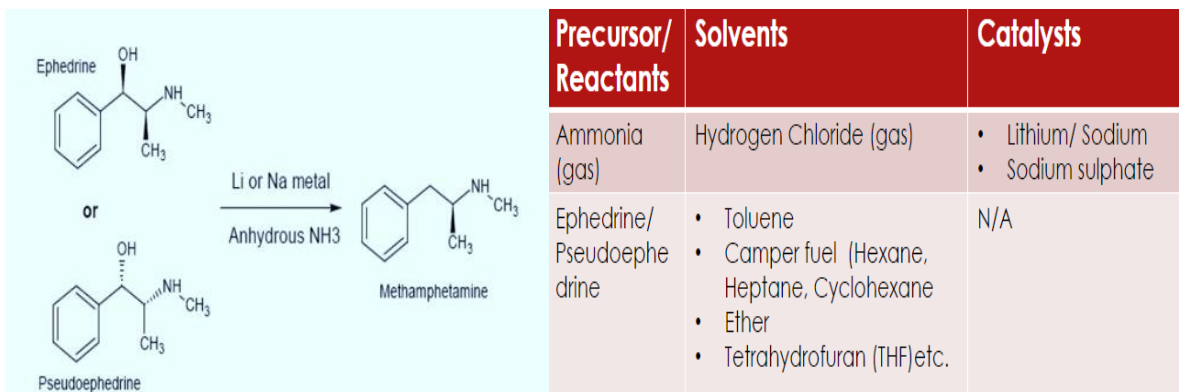
### **Birch Reduction Method (Nazi method)**

The Birch reduction method is one of several popular ephedrine/pseudoephedrine-based methamphetamine manufacturing processes. It uses ephedrine or pseudoephedrine from over the counter cold medicine, where it is found as an ingredient in various medications such as Sudafed (Man, Stoeber and Walus, 2009).

The Birch method requires the use of a catalyst such as sodium or lithium metal. The lithium or sodium metal is first dissolved in liquid ammonia, forming a blue solution. After the ephedrine or pseudoephedrine free base has been extracted from the tablets, it is dissolved in tetrahydrofuran (THF) or ether.

The dissolved ephedrine/pseudoephedrine solution is added to the ammonia solution over a span of 10 minutes. The reaction proceeds for 10-20 minutes, after which it is quenched by adding water. During this process the ammonia evaporates, and more water is added to dissolve the salts of lithium.

After this process has completed, the water layer is separated off from the ether layer. The ether layer is dried using anhydrous sodium sulphate, and the hydrochloride salt of methamphetamine is obtained by bubbling hydrogen chloride gas through the solution. The hydrochloride salt crystals are filtered and dried (Man, Stoeber and Walus, 2009).



### Red Phosphorus-based Methods

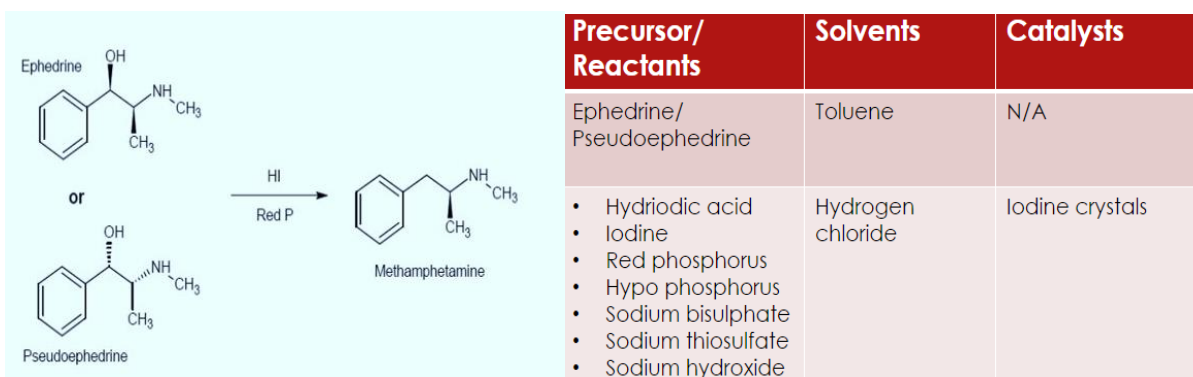
The principal chemicals are ephedrine or pseudoephedrine, iodine, and red phosphorus. The required hydriodic acid in this variation of the hydriodic acid/red phosphorus acid method is produced by the reaction of iodine in water with red phosphorus acid.

Ephedrine hydrochloride, red phosphorus, and hydriodic acid are added to a flask. A by-product from in situ hydriodic acid production is phosphine, a toxic gas. The mixture is boiled under reflux for one day, and the progress of the reaction can be monitored by observing the consumption of red phosphorus.

After the mixture is cooled and diluted with water, red phosphorus is filtered out using conventional coffee filters or equivalent. The filtered solution should be golden in colour. If the solution is reddish in colour, there may be residual iodine in the solution, which can be reduced to iodide by adding sodium bisulphate or sodium thiosulfate.

Next, the solution is made strongly alkaline by adding lye or sodium hydroxide. A layer of free base methamphetamine forms and will separate to the top of the aqueous solution. To extract the free base methamphetamine, toluene is added, and the methamphetamine-toluene solution is separated from the rest of the mixture.

Hydrogen chloride is bubbled through the methamphetamine-toluene solution to crystallise the free base methamphetamine into the hydrochloride form of methamphetamine (Man, Stoeber and Walus, 2009).



## Hypophosphorus-based Methods

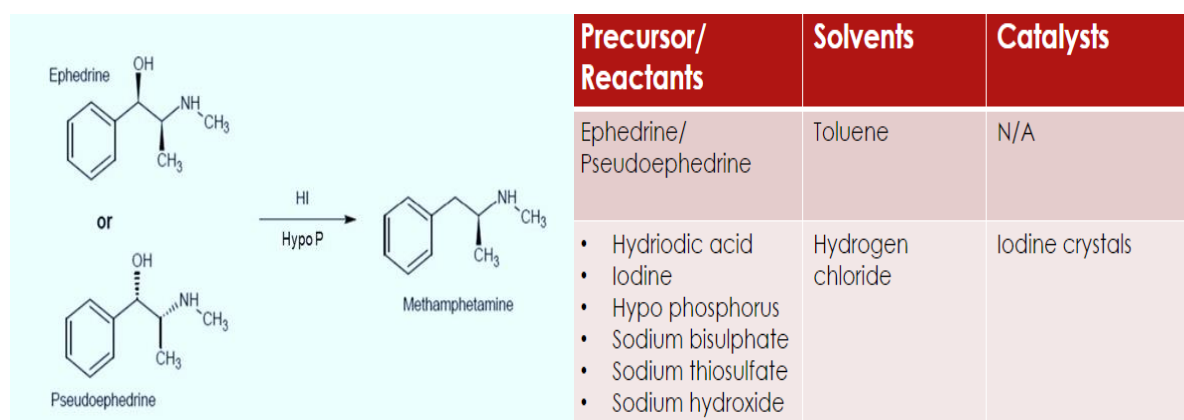
The principal chemicals are ephedrine or pseudoephedrine, iodine, and hypo phosphorus. The required hydriodic acid in this variation of the hydriodic acid/hypo phosphorus acid method is produced by the reaction of iodine in water with red phosphorus acid.

Ephedrine hydrochloride, hypo phosphorus, and hydriodic acid are added to a flask. A by-product from in situ hydriodic acid production is phosphine, a toxic gas. The mixture is boiled under reflux, and the progress of the reaction can be monitored by observing the colour change.

After the mixture is cooled and diluted with water, it should be golden in colour. If the solution is reddish in colour, there may be residual iodine in the solution, which can be reduced to iodide by adding sodium bisulphate or sodium thiosulfate.

Next, the solution is made strongly alkaline by adding lye or sodium hydroxide. A layer of free base methamphetamine forms, and will separate to the top of the aqueous solution. To extract the free base methamphetamine, toluene is added, and the methamphetamine-toluene solution is separated from the rest of the mixture.

Hydrogen chloride is bubbled through the methamphetamine-toluene solution to crystallise the free base methamphetamine into the hydrochloride form of methamphetamine (Man, Stoeber and Walus, 2009).



## P2P Based Method

The key reaction for methamphetamine production through the P2P method is the P2P Leuckardt-Wallach reaction. It is assumed that the operator will already have the two primary precursors: phenylacetone and N-methylformamide.

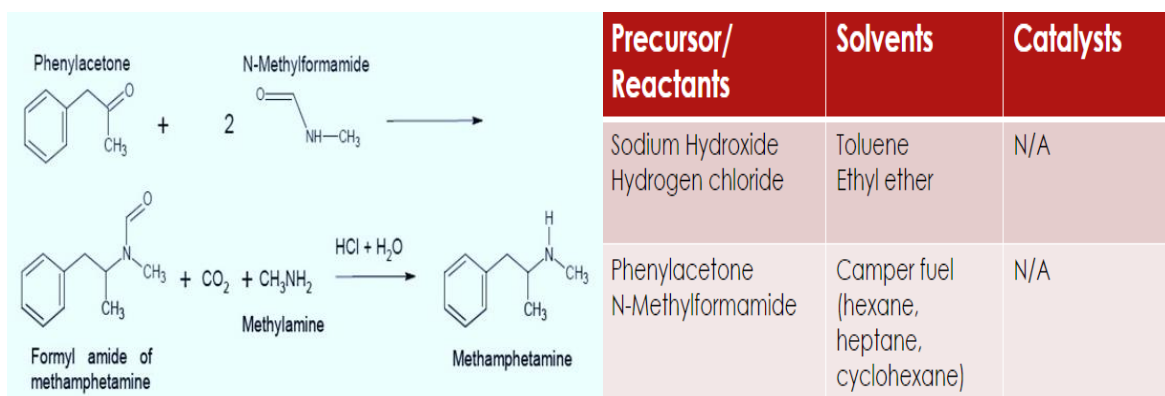
A mixture of P2P and N-methylformamide is prepared, using 4 to 6 moles of N-methylformamide for every mole of phenylacetone. The mixture is carefully heated to between 105 °C and 110 °C, which is the temperature at which the reaction starts to occur.

The reaction mixture takes on an amber colour. The temperature is moderately increased after 1-2 hours to keep the reaction going, which is monitored through the amount of gas formation. The bubbles being formed are carbon dioxide, a by-product.

After the N-methylformamide recovery process, the red methamphetamine formyl amide solution is mixed with hydrochloric acid and gently heated. The mixture turns black

producing methamphetamine hydrochloride and formic acid. The black reaction mixture is slowly added to a solution of sodium hydroxide in order to neutralize the excess acid and convert methamphetamine hydrochloride into free base, resulting in a brown methamphetamine free base layer that will separate above the sodium hydroxide solution.

Toluene is then added to extract the free base, and the methamphetamine-toluene layer is separated from the rest of the mixture and distilled, yielding a small volume of clear to pale yellow methamphetamine. The free base methamphetamine is converted into crystalline methamphetamine hydrochloride using hydrogen chloride gas. The crystals are filtered and dried (Man, Stoeber and Walus, 2009).





## 2.6 Contamination and exposure effects

During the manufacture of methamphetamine, various chemical compounds are produced as by-products during various stages of the manufacturing process. They are present in the air as volatile organic compounds, residues on surfaces within the premise, or in liquid wastes which are often discarded into drains, or outside (to soil or water).

### Exposure effects

The potential exposure effects of a clan lab will vary depending on the:

- chemicals a person is exposed to
- concentration of chemicals a person is exposed to
- duration of a person's exposure
- health status of the person exposed.

Depending on the exposure to clan labs, the impact on human health could be immediate, acute or chronic.

**Immediate:** burns, trauma and large-scale tissue damage sudden release of toxic, corrosive materials and poisonous gases.

**Acute:** skin, eye and respiratory irritation, dizziness, headache and insomnia associated with short term, high level exposures (Ministry of Health 2010; Wright 2016).

**Chronic:** neurochemical changes in some parts of the brain; cardiovascular effects including increased heart rate and blood pressure (Wright, Edwards & Walker 2016).

Much of the information available on chronic exposures to methamphetamine is derived from therapeutic and illegal drug use, and not from environmental exposures.

### 3. South Australian Public Health (Clandestine Drug Laboratories) Policy 2016

*The South Australian Public Health (Clandestine Drug Laboratories) Policy 2016* (the Policy) is a formal policy under the *South Australian Public Health Act 2011* (the Act) that automatically declares a notified clan lab to constitute a public health risk.

The objective of the Policy is to apply the objects and principles of the Act through the assessment and remediation of notified clan labs.

The Policy deems a notified clan lab to be a risk to health on a precautionary basis. This allows legal notices to be served by authorised officers under the Act that remain in force until the required assessment; remediation and validation processes have been conducted.

#### **Procedures to manage a clan lab**

In order to identify and manage the public health risks of a clan lab the relevant Local Public Health Authority (council) shall where applicable have regard to the procedures set out in the Practice Guideline for the Management of Clandestine Drug Laboratories under the *South Australian Public Health Act 2011* (the Practice Guideline) and appendix 1 of the National Clandestine Drug Laboratory Remediation Guidelines (the National Guidelines).

#### **What does the Policy say about responding to clan labs?**

The Policy aims to assist authorised officers to address the public health risks related to clan labs. It does this by deeming the existence of a notified clan lab to be a risk to health on a precautionary basis. This allows legal notices to be served under the Act that remain in force until the required assessment; remediation and validation processes have been conducted.

Any enforcement action taken by authorised officers to manage the public health risks associated with clan labs should be consistent with the principles set out in Part 2 of the Act, the procedures set out in the Practice Guideline and appendix 1 of the National Guidelines.

The Policy can be found online [here](#)

## 4. South Australian Police Notification

South Australian Police (SAPOL) responds to all reports of suspected clan labs, manage the crime scene and make it safe. SAPOL and Forensic Science SA collect samples of evidentiary value for prosecution purposes. Identified Incriminatory and contaminated items may be seized as evidence or processed and packaged for transport and disposal by a chemical transport contractor.

SAPOL and Forensic Science SA have extensive experience and knowledge in the investigation of clan labs. However, they are not responsible for the assessment and remediation of any environmental contamination which may be present on the site.

When SAPOL are investigating and in attendance at a clan lab, an authorised officer from the relevant Local Public Health Authority (council) will be contacted via telephone and verbally notified of the discovery. As the investigation is in its infancy at this stage, details provided at this time are likely to be limited. However, to assist in the public health investigation, where practicable, SAPOL may invite authorised officers to attend the premises for the purpose of conducting a site visit.

It should be noted that circumstances may not always permit this to occur (e.g. when a clan lab is discovered outside of normal office hours) and SAPOL will use their discretion as to when to verbally notify the relevant Local Public Health Authority.

To maintain appropriate standards of work health and safety, authorised officers must adhere to instructions provided by SAPOL during the site visit. In most cases a site visit will need to be performed on the same day the verbal notification is received. Regardless of whether an authorised officer attends the site at the same time as SAPOL, a written notification report will usually be provided to the relevant Local Public Health Authority within 48 hours of the clan lab detection.

A copy will also be forwarded to SA Health for the purpose of data collection and trend monitoring.

SAPOL will safely collect evidence and authorise destruction of all contaminated items. A list of items to be destroyed is usually provided to SA Health and the relevant Local Public Health Authority.

## 5. The Clandestine Laboratory Site Remediation Process

The four-phase site remediation process described in the National Guidelines is summarised below within the context of the Act and the Policy. The flow chart shown in Appendix B also summarises this process.

**Phase 1 - Trigger for assessment**

**Phase 2 - Preliminary assessment and action**

**Phase 3 - Site assessment and remediation**

**Phase 4 – Validation**

## 5.1 Phase One – Trigger for Assessment

SAPOL and forensic chemists gather evidence on the nature of the operation to determine if a drug related offence has occurred in a suspected clan lab site, after which SAPOL informs the council regarding any potential environmental contamination. Such notification can take one of two forms.

- A. If the potential environmental contamination is of apparent imminent danger to the environment, or the nature of observed contamination is sufficiently widespread or of a nature that immediate action is warranted, SAPOL may contact the relevant Local Public Health Authority by telephone while still present at the site.
- B. If the potential environmental contamination is not considered to be serious, a formal notification will be relayed to the appropriate council shortly after the police have left the site. Dependant on operational constraints, notification should ideally be issued within 24 hours of the completion of site processing.

SAPOL notification will include the: address of the clandestine laboratory, exact location, nature of premise, status of occupancy, identified potential hazards or threats, description (if known) of synthesis method(s) suspected, inventory of identified chemicals seized (destruction list), presence of children residing at the premises or indications of children and the contact information of the notifying police officer.

While SAPOL's objective is to render the site safe, SAPOL are not responsible for or experienced in the mitigation of environmental contamination.

*Refer to the National Guidelines for phase 1 pg. 5*

## 5.2 Phase Two - Preliminary assessment and action

The phase 2 process described in the National Guidelines involves determining whether to conduct a site inspection. Upon receipt of the SAPOL notification of a clandestine laboratory, the EHO will examine the information provided in the notification form and obtain additional information if necessary from the SAPOL officer who submitted the notification.

A visit by the EHO to the site is optional but highly recommended and will often identify additional environmental hazards. Site visits should be conducted at the same time as the SAPOL investigation. The EHO who attends the site must ensure that their personal safety is maintained at all times.

If a site inspection was not performed, an EHO may elect to proceed directly to phase 3 based on SAPOL's notification.

### **EHO's response**

- Assess and examine information in the SAPOL notification
- Obtain additional information from reporting SAPOL officer if necessary
- Contact the premise owner and formally confirm their long term intentions for the premises (i.e. whether they wish to retain it for human habitation, demolish it, or use it for another purpose)
- Begin preparation to issue a sec.92 notice for a site assessment.

*Refer to the Practice Guideline for phase 2 pg.11, and the National Guidelines for phase 2 pg. 7*

***For the purpose of this training manual, a mock SAPOL notification with corresponding site assessment and validation reports have been created and they will be referred to throughout this training manual.***

Please double click on the icon below for a mock SAPOL Notification



SAPOL Notification

## Workshop 1.

As the investigating EHO, you have just received the above SAPOL notification with no further information. What actions will you take?

### Considerations

- Refer to the Policy and Practice Guideline
- Is a site investigation necessary?
- Identify and contact the property owner
- What further information is necessary and how will you obtain it?
- Will you issue a Section 92 notice under the *South Australian Public Health Act 2011* (Refer to template in Appendix C of the Practice Guideline)?

## 5.3 Phase 3 – Site assessment and remediation

The authorised officer has received the SAPOL notification, has reviewed and examined the information, may have conducted a site inspection (if required), and has confirmed the owner's long term intended use of the premises.

The Policy aims to support authorised officers to mitigate the public health risks related to clan labs. The policy deems the existence of a notified clan lab on a premise to be a risk to health on a precautionary basis. This allows legal notices to be issued under the Act that remain in force until the required assessment, remediation and validation processes have been satisfactorily conducted.

Regardless of the category stated in the SAPOL notification (see page 9 of the Practice Guideline for further explanation on clan lab category), the authorised officer can use their powers under the Act to ensure that any risk to public health is adequately managed by the owner. This will typically involve the issue of a notice to secure compliance pursuant to section 92 of the Act. [Refer to Appendix D of the Practice Guideline for Template Notice – Site Assessment](#)

The notice may include the requirement to:

- A. Prevent occupancy of the premises.
- B. Engage a suitably qualified expert to undertake an assessment of the chemical contamination of the premises.

The following documents should be attached to the notice:

- the assessor's summary section from the SAPOL notification report
- the [suitably qualified expert's fact sheet](#)
- the [home owner's fact sheet](#).



When notices are used, EHOs should have regard for:

- the requirements described in section 92(5)(f) of the Act
- the information contained within the Practice Guideline
- the four-phase site remediation process described in chapter 2 of the National Guidelines.

### **Emergency notices**

In certain circumstances the premises may pose an immediate health risk. If an EHO is of the opinion that urgent action is required, an emergency notice may be issued under section 92(6) of the Act.

An emergency notice can be issued orally and may include a requirement to prevent occupancy of the premises until the assessment and remediation process has been undertaken. An emergency notice must be followed up by a written notice within 72 hours as described in section 92(8) of the Act.

### **Site assessment**

In South Australia, only a suitably qualified expert (SQE) can conduct a clan lab site assessment and validation. A SQE is a person with experience in the fields of environmental engineering, environmental science, environmental health, or occupational hygiene and who is in possession of tertiary qualifications in one of these disciplines from a recognised educational institution.

SQE are expected to conduct the site assessment and report the findings in accordance to the guidance provided in [chapter 5 of the National Guidelines](#).

The EHO is expected to review the site assessment report. The site assessment report must contain the following information:

1. **Sampling program** - How the assessment was undertaken
2. **Sampling test results** of all suspected contaminants
3. **Remediation action plan (RAP)** – appropriate follow up actions based on the nature of the risks and intended future use of the premises based on sampling results and findings from the site assessment by the SQE.

### **Sampling program - checking for surface contamination inside a building**

A sampling program serves to determine the existence and the extent of any contamination, given the nature of clan labs and the contamination generated through their operation; the SQE conducting the site assessment may apply both systematic sampling and professional judgement.

## EHO's review of a site assessment report

### **Considerations:**

1. Were samples collected through wipe or swab within 100cm<sup>2</sup> areas of non-porous surfaces such as mirrors, bench tops, painted walls, and metal surfaces etc.?
2. Were a minimum of five samples taken inside the building?
3. Were blanks taken at regular intervals? The number of blanks should equate to approximately 10 per cent of the total number of samples.
4. Were samples taken from areas that showed contamination? (visible stains, chemical storage areas, heat source etc.)
5. Have samples been taken from surfaces used in the drug manufacturing process? If those surfaces have been removed, were samples taken from the closest and most practicable area as close as practicable to that area should be sampled.
6. Were samples taken from ventilation ducts (if present) closest to the area of drug manufacture? In most circumstances a swab sample should be sufficient.
7. Were samples taken from room(s) or area(s) inhabited by a child/ children less than 16 years of age?
8. Were samples analysed by a NATA accredited lab?
9. Was a copy of original laboratory result provided?
10. Were pictures of different areas of the premise provided?

Refer to the EHO checklist in Appendix A for more details on reviewing a site assessment report.

## **Checking for volatile organic compounds**

If initial reports from SAPOL or site visit indicates a suspicion of volatile organic compounds (VOC) contamination inside the premise.

### **Considerations:**

1. Was Diffusive sampling method" used for the analysis of VOCs?
2. Were samples taken from each room where a chemical process was thought to have taken place?
3. Were samples taken from rooms where chemicals or equipment were thought to have been stored?
4. Any room where there is evidence of spillage or staining should be sampled.

The SAPOL notification report or site visit may indicate suspicion of wastewater, surface water, ground water, and soil contamination. The EHO checklist in Appendix A provides guidance on how to review the assessment of the above sections in a site assessment report.

## Sampling test results

Assessing the chemical hazards related to a clan lab is based on the Investigation Levels (ILs) described in the National Guidelines (page 28). An IL is the concentration of a contaminant above which requires further assessment or the development of an appropriate remediation action plan.

*Table 2: Summary of Investigation Levels (ILs) – Assessment of Former Clandestine Lab Sites*

Key Chemical	Residential (A)			Recreational (E)	Commercial/Industrial (F)			Environmental #	
	Indoor Criteria		Outdoor	Outdoor	Indoor Criteria		Outdoors	Outdoors	
	Surface (µg/100cm <sup>2</sup> )	Air (mg/m <sup>3</sup> )	Soil (mg/kg)	Soil (mg/kg)	Surface (µg/100cm <sup>2</sup> )	Air (mg/m <sup>3</sup> )	Soil (mg/kg)	Soil (mg/kg)	Water (mg/L)
Methamphetamine	0.5	b	5	5	10	b	45	x	x
MDMA	7	b	60	60	130	b	600	x	x
Pseudo/Ephedrine	600	b	6000	6000	10000	b	50000	x	x-
Ammonia	a	0.1	1800	1800	a	0.3	10000	x	0.9AFM*
Iodine	20	0.0008	2	2	450	0.003	6	4 <sup>U</sup>	x
Bromide	2000	0.0008	2	2	50000	0.003	4	10 <sup>U</sup>	x
Phosphorus	0.07	b	0.6	0.6	2	b	7	x	ΔFM**
N-Methylformamide	10	b	120	120	270	b	1200	x	x
Methylamine	a	0.004	70	70	a	0.01	600	x	x
Nitroethane	a	0.4	4400	4400	a	1	20000	x	x
Boron and compounds	1800	b	3000 (N)	6000 (N)	40000	b	15000 (N)	0.5 <sup>U</sup>	0.37AF, 5.1AM
Mercury (inorganic)	35	b	15 (N)	30 (N)	800	b	75 (N)	1 (NE)	0.006AF, 0.004AM
Lithium	46	b	230	230	1000	b	5700	2 <sup>U</sup>	0.014 <sup>U</sup>
Benzaldehyde	1500	0.4	6300	6300	35000	1	35000	0.6 <sup>D</sup>	0.01 <sup>D</sup>
Phosphine	a	0.0004	c	c	a	0.001	c	x	x
Safrole and isosafrole	16	0.0002	1	1	16	0.001	6	0.4 <sup>U</sup>	x
Chloroform	a	0.1	240	240	a	0.4	1400	1.2 <sup>U</sup> , 170 <sup>R</sup>	0.37AFM
Dichloromethane	a	1	120	120	a	4	3300	4 <sup>U,D</sup>	4AFM
Benzene	a	0.0095 (A)	1 (S)	1 (S)	a	0.0095 (A)	1 (S)	210 <sup>R</sup>	0.95AF, 0.5AM
Toluene	a	0.4 (A)	130 (S)	130 (S)	a	0.4 (A)	130 (S)	1.4 (S)	0.18AFM
Ethylbenzene	a	26	50 (S)	50 (S)	a	80	50 (S)	3.1 (S)	0.08AF, 0.005AM
Xylenes	a	0.9 (A)	25 (S)	25 (S)	a	0.9 (A)	25 (S)	14 (S)	0.2 to 0.35AFM
<b>TPH</b>									
C6-C9 (aliphatic)**	a	0.8	1800	1800	a	3	4000	130 <sup>F</sup>	x
C10-C14	a	0.2	1000 (S) C10-C36,	1000 (S) C10-C36,	a	0.7	1000 (S) C10-C36,	150 <sup>F</sup>	x
C15+	140	b	90 (N)	180 (N)	3000	b	450 (N)	400 <sup>F</sup>	x
pH	6.5-8.5	b	6.5-8.5	6.5-8.5	6.5-8.5	b	6.5-8.5	x	(6 to 9) A**

[Refer to pg. 28 of the National Guidelines](#)

If contamination results from the samples taken during the site assessment are higher than the acceptable investigation levels as shown in the table above, a remediation action plan must be developed and implemented.

## Remediation action plan

Before undertaking the remediation, the suitably qualified expert (SQE) who conducted the sampling and assessment of contamination of the premise, must prepare a remediation action plan (RAP) consistent with the National Guidelines (section 5.4). The plan should be based on the findings of the initial police investigation and the assessment report.

The broad purpose of a RAP is to establish remediation goals to ensure contaminated sites, once remediated, will be suitable for their proposed use and will not pose an unacceptable risk to human or environmental health and delineate the evidence clearly to support the RAP. This should document in detail all the procedures and plans that will be implemented to reduce risks to acceptable levels as well as establish environmental safeguards to complete the remediation in an environmentally acceptable manner.

The RAP should provide guidance to a professional cleaner on the site information, remediation sequence, methodology, techniques, extent of remediation required, remediation options/ hierarchy of remediation for structures, and specific remediation methods for specific areas as required (wastewater, surface water, and soil contamination)

The EHO checklist in Appendix A provides further guidance on reviewing a remediation action plan.

### **EHO's response to site assessment report**

The outcome of the site assessment will determine the required action. This outcome could be either of the following -

#### **a. Site contamination – below Investigation Levels (ILs)**

If the site assessment report shows that contamination is below ILs and remediation is not required, it is recommended that the premises be generally cleaned following the recommendations by the SQE provided in the site assessment report as a guide.

The compliance notice can be revoked by appropriate authority and premise owner notified in writing.

#### **b. Site contamination – above Investigation Levels (ILs)**

If the site assessment report shows that contamination is above ILs, a second notice to secure compliance pursuant to section 92 of the Act should be issued to the premise owner. The notice should include the requirement to undertake the following actions:

1. Require site remediation consistent with both the Practice Guideline and the National Guidelines
2. Require a written validation report from a SQE. The report must confirm that the remediation of chemical contamination undertaken at the premises has rendered the premises fit for its intended use and has been consistent with both the Practice Guideline and the National Guidelines.

#### [Refer to Appendix E of the guideline for Template Notice – Remediation and Validation](#)

In the case where the premise is heavily contaminated, and remediation is not achievable or economically viable, demolition is recommended.

## Site Remediation

The premise owner is expected to engage a professional/industrial cleaner that is independent of the suitably qualified expert to remediate the premises in accordance with the recommendations in the RAP.

In the case of methamphetamine contamination, detailed information on the remediation sequence, methodology, techniques, and contaminant specific best practices are contained within the [Voluntary Guidelines for Methamphetamine Laboratory Clean-up](#) document produced by the United States Environmental Protection Agency (US EPA).

Once the remediation is completed, the premise owner must engage a SQE who is independent of the professional or industrial cleaner to conduct a site validation.

### EHO's response

- Check that the site assessment was conducted by a SQE
- Review site assessment report (use EHO checklist in Appendix A as a guide).
- Revoke compliance notice if contamination is below ILs.
- Issue a second compliance notice if contaminations exceed ILs.

## Workshop 2.

As the investigating EHO you issued the section 92 site assessment notice and you have just received the site assessment report from the property owner. Assess the report and decide what actions you will take.

**Please double click on the icon below for a mock site assessment report**



Site Assessment Report

### **Considerations:**

- Refer to the Policy and Practice Guideline
- Was the site assessment conducted by a SQE?
- Did the report detail an appropriate sampling program and provide justification for target areas?
- How many samples were taken and were they taken as per the National Guidelines?
- Where applicable, was consideration given for the following?
  - Testing of Volatile Organic Compounds (VOCs)
  - Wastewater contamination
  - Sampling of soils, surface water and ground water
- Were samples collected and analysed according to a suitable method?
- Were samples processed by an appropriate laboratory?

## 5.4 Phase 4 – Site validation

Following remediation, a site must be ‘validated’ to ensure that the objectives stated in the RAP have been achieved. A SQE must confirm the remediation process undertaken has been effective as demonstrated by post remediation samples being below the ILs set out in the National Guidelines pg.28. Ideally, the same SQE should conduct the site validation, if not, the site assessment report must be provided to the SQE engaged to conduct the site validation.

The details of the site validation are compiled and presented in a validation report (post remediation report); this should include the following but not be limited to (see the National Guidelines 6.1):

1. A general inspection of the site to check for re-staining or odours.
2. Re-sampling of surfaces from which initial samples were taken (samples above ILs).
3. Sampling of areas which are expected to have frequent contact e.g. kitchens and bathrooms.
4. A combination of swab sampling and sampling for VOCs where required.

A copy of the validation report must be provided to the Local Public Health Authority by the premise owner. This report can be used as evidence to demonstrate compliance with the requirements of the notice. All documentation received in relation to the notice should be retained on the premises file.

### **EHO’s review of a Validation report**

The EHO is required to review the information provided in accordance with the National Guidelines. Consideration should be given to the following while reviewing the validation report.

#### **Considerations:**

1. Was the validation conducted by a suitably qualified expert?
2. Were samples taken from areas that were above investigation levels in the site assessment report?
3. Was justification provided for areas sampled?
4. Were samples analysed by a NATA accredited lab?
5. Was a copy of original laboratory results provided?
6. Was a summary of findings included in the report?
7. Is further remediation necessary?
8. Were pictures of the different parts of the premise provided?

The EHO checklist in Appendix A provides further guidance on reviewing a Validation report.

**Note:** A SQE may provide a clearance certificate in addition to a validation report; the clearance certificate does not replace the validation report.

### **EHO's response to a validation report.**

If the remediation was deemed unsuccessful, further remediation is required before the site can be deemed fit for purpose. The notice requirements must remain in place until the remediation has been successfully achieved and validated by a SQE.

If the validation report has confirmed the remediation to be successful and the premise is fit for intended purpose, the EHO may conduct an inspection to visually confirm the recommended action has taken place. Visual confirmation will be largely based on the results of the site assessment but may include the absence of staining and/or the removal of contaminated items.

The following actions should be taken:

1. Remove notice(s) on the premises
2. Notify the premise owner
3. Notify HPP of the successful remediation of the premises.

HPP will remove the flag placed on the premises in SAILIS and notify the Housing Safety authority (HSA) of the successful remediation of the premises.

#### **EHO's response**

- Check that the validation was conducted by a SQE
- Review validation report (use EHO checklist in Appendix A as a guide).
- Remove notice if remediation has been successful and premise is fit for intended use.
- Notify premise owner and HPP.

### Workshop 3.

As the investigating EHO, you have just received the validation report from the property owner. What actions will you take?

**Please click on the icon below for a mock validation report**



Validation Report

#### **Considerations:**

- Refer to the Policy and Practice Guideline
- Was the site validation conducted by a suitably qualified expert?
- Did the report detail a sampling program and provide justification for target areas?
- Was the cleaners report provided or a summary thereof?
- Was re-sampling of surfaces from which initial samples were above Investigation Levels (ILs)?
- Were samples collected and analysed according to a suitable method?
- Were samples processed by an appropriate laboratory?
- Were post remediation sampling results below ILs?
  - If not, activate the contingency plan for remediation failure.



## Further reading and resources

Double click on the presentation below to view.



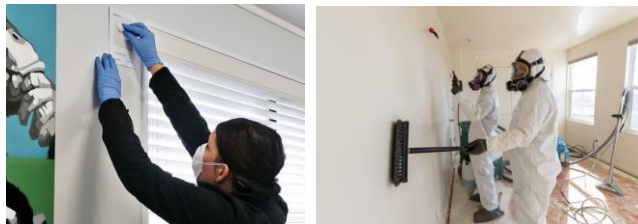
### Phase 1 – Identification and Reporting

Health Protection Programs



### Phase 3 – site assessment and remediation

Health Protection Programs





## Phase 4 – Site Validation

Health Protection Programs



## Concluding a Clan Lab Notification

Health Protection Programs



## Appendix A Environmental Health Officer's Checklist

### Clandestine drug laboratory checklist for Environmental Health Officers (EHOs)

	Introduction	Yes	No	Comments
1	Property owner understands the property has been contaminated due to the activities of a clandestine drug laboratory, and will be unsuitable for its purpose until successful remediation	<input type="checkbox"/>	<input type="checkbox"/>	
2	Public health Fact sheet " <a href="#">A clandestine drug laboratory was detected on my property – what happens now?</a> " has been explained and given to property owner.	<input type="checkbox"/>	<input type="checkbox"/>	
3	Property owner understands who a suitably qualified expert is, their role and involvement in the remediation process of the property.	<input type="checkbox"/>	<input type="checkbox"/>	

	Surface contamination inside a building <i>If surface contamination has been suspected or identified inside the building, the below points should guide and inform sampling. (more details can be seen in the National Guidelines 5.2.4)</i>	Yes	No	Comments
1	Samples have been collected through wipe or swab within 100cm <sup>2</sup> areas of non-porous surfaces such as mirrors, bench tops, painted walls, and metal surfaces etc.	<input type="checkbox"/>	<input type="checkbox"/>	
2	A minimum of five samples have been taken inside the building	<input type="checkbox"/>	<input type="checkbox"/>	
3	Blanks have been taken at regular intervals. The number of blanks should equate to approximately 10 per cent of the total sample number	<input type="checkbox"/>	<input type="checkbox"/>	
4	Ensure areas that show evidence of contamination should be sampled	<input type="checkbox"/>	<input type="checkbox"/>	
5	Ensure surfaces used in the drug manufacturing process should be sampled. If those surfaces have been removed, an area as close as practicable to that area should be sampled	<input type="checkbox"/>	<input type="checkbox"/>	
6	Confirm that ventilation ducts (if present) closest to the area of drug manufacture have been sampled. In most circumstances a swab sample should be sufficient.	<input type="checkbox"/>	<input type="checkbox"/>	
7	Ensure rooms or areas inhabited by a child/ children less than 16 years of age are sampled at least once.	<input type="checkbox"/>	<input type="checkbox"/>	
8	No sample has been taken from areas behind furniture or appliances,	<input type="checkbox"/>	<input type="checkbox"/>	
9	No sample has been taken from surfaces that appear to have been recently cleaned	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Checking for Volatile Organic Compounds</b>		<b>Yes</b>	<b>No</b>	<b>Comments</b>
<i>If volatile organic compounds have been suspected or identified inside the building, the below points should guide and inform sampling, (more details can be seen in the National Guidelines 5.2.5)</i>				
<b>1</b>	Ensure each room where a chemical process was thought to have taken place have been sampled	<input type="checkbox"/>	<input type="checkbox"/>	
<b>2</b>	Rooms where chemicals or equipment was thought to have been stored have been sampled.	<input type="checkbox"/>	<input type="checkbox"/>	
<b>3</b>	Each room where there is evidence of spillage or staining have been sampled	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Wastewater contamination</b>		<b>Yes</b>	<b>No</b>	<b>Comments</b>
<b>1</b>	Is there any evidence that the wastewater from the clandestine laboratory activity flows into a septic tank?	<input type="checkbox"/>	<input type="checkbox"/>	
<b>2</b>	Ensure all chambers of the septic tank are pumped out and the contents are taken to a wastewater processing facility.	<input type="checkbox"/>	<input type="checkbox"/>	
<b>3</b>	Ensure a minimum of one soil sample from the septic bed has been analysed.	<input type="checkbox"/>	<input type="checkbox"/>	

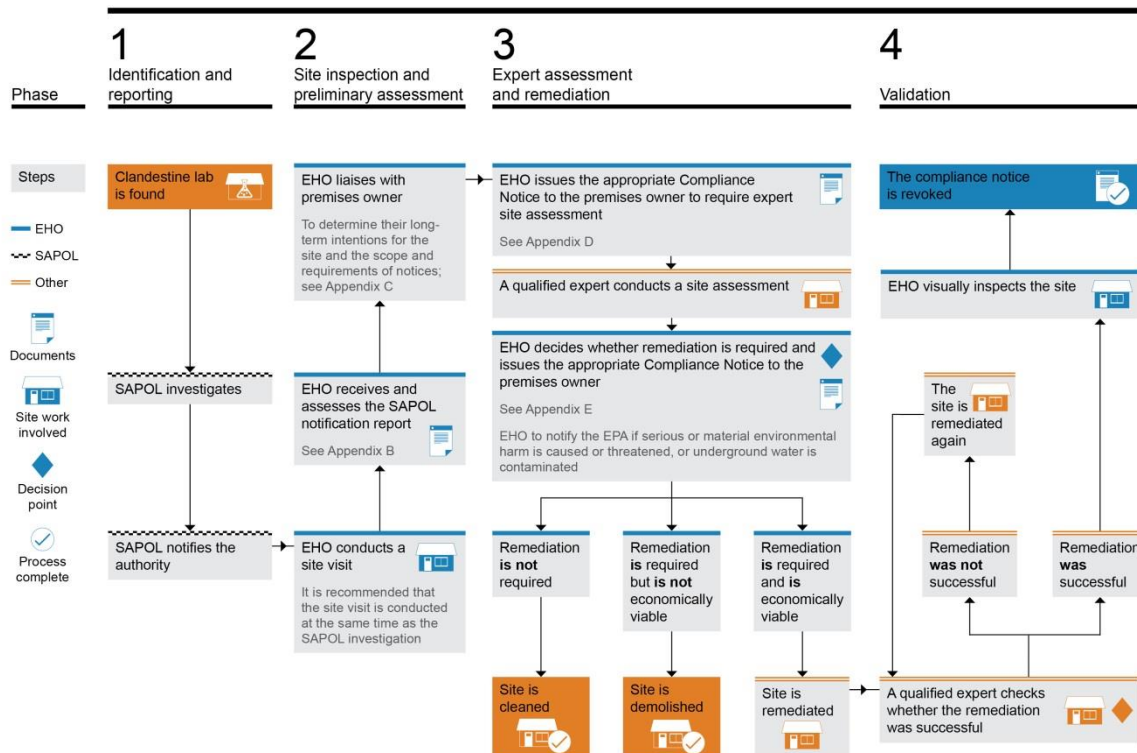
<b>Sampling soils, surface water and groundwater</b>		<b>Yes</b>	<b>No</b>	<b>Comments</b>
<i>If sampling soils, groundwater, and surface waters, the below points should guide and inform sampling, (more details can be seen in the National Guidelines 5.2.7)</i>				
<b>1</b>	Ensure any soil that shows evidence of contamination is sampled	<input type="checkbox"/>	<input type="checkbox"/>	
<b>2</b>	Ensure At least one sample is taken from the septic bed (tank) if present on the property	<input type="checkbox"/>	<input type="checkbox"/>	
<b>3</b>	If there is no evidence of contamination, at least two soil samples should be taken from the property, close to well-travelled paths.	<input type="checkbox"/>	<input type="checkbox"/>	

**Remediation Action Plans (RAPs)** are developed to address the issue of site contamination and remediation options and form a part of the contaminated site investigation process as required. This should document in detail all of the procedures and plans that will be implemented to reduce risks to acceptable levels as well as establish environmental safeguards to complete the remediation in an environmentally acceptable manner.

<b>Remediation Action Plans (RAPs)</b> <i>The preparation of a RAP for clandestine laboratory sites requires the following components be addressed, (more details can be seen in the National Guidelines 5.4)</i>		<b>Yes</b>	<b>No</b>	<b>Comments</b>
<b>1</b>	Site information	<input type="checkbox"/>	<input type="checkbox"/>	
<b>2</b>	Site characterisation	<input type="checkbox"/>	<input type="checkbox"/>	
<b>3</b>	Remediation goal	<input type="checkbox"/>	<input type="checkbox"/>	
<b>4</b>	Extent of remediation required	<input type="checkbox"/>	<input type="checkbox"/>	
<b>5</b>	Remediation options/ hierarchy of remediation for structures	<input type="checkbox"/>	<input type="checkbox"/>	
<b>6</b>	Remediation options- environmental	<input type="checkbox"/>	<input type="checkbox"/>	
<b>7</b>	Building decontamination management plan	<input type="checkbox"/>	<input type="checkbox"/>	
<b>8</b>	Environmental Management Plan	<input type="checkbox"/>	<input type="checkbox"/>	
<b>9</b>	Proposed testing for validation	<input type="checkbox"/>	<input type="checkbox"/>	
<b>10</b>	Contingency plan for remediation failure	<input type="checkbox"/>	<input type="checkbox"/>	
<b>11</b>	Site Management Plans	<input type="checkbox"/>	<input type="checkbox"/>	

<b>Site validation</b> <i>Following remediation, a site must be 'validated' to ensure that the objectives stated in the RAP have been achieved. The details of the site validation are compiled and presented in a Validation Report, this should include</i>		<b>Yes</b>	<b>No</b>	<b>Comments</b>
<b>1</b>	A general inspection of the site to check for re-staining or odours	<input type="checkbox"/>	<input type="checkbox"/>	
<b>2</b>	Re-sampling of surfaces from which initial samples were taken	<input type="checkbox"/>	<input type="checkbox"/>	
<b>3</b>	Sampling of areas which are expected to have frequent contact e.g. Kitchens and bathrooms	<input type="checkbox"/>	<input type="checkbox"/>	
<b>4</b>	A combination of swab sampling and sampling for VOCs where required	<input type="checkbox"/>	<input type="checkbox"/>	
<b>5</b>	Post remediation sampling results which are within the scope of Investigation Levels (ILs) set out in Appendix 1 of <a href="#">the National Clandestine Drug Laboratory Remediation Guidelines</a>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>6</b>	If No has been ticked in the above point 5, activate the contingency plan for remediation failure detailed in the Remediation Action Plans	<input type="checkbox"/>	<input type="checkbox"/>	

# Appendix B Clandestine Drug Laboratory Assessment and Remediation Flow Chart



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## For more information

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