



GUIDELINES FOR ASSESSMENT AND REMEDIATION OF PROPERTIES CONTAMINATED BY METHAMPHETAMINE LABORATORY ACTIVITIES

For Use Throughout Santa Clara County
Authority Cited: California Health and Safety Code (HSC)

A. Introduction

1. Clandestine laboratories (Clan Labs) which illegally manufacture methamphetamine are periodically discovered in Santa Clara County and subsequently seized by law enforcement personnel. While officials arrange for the removal of chemicals and process equipment for evidence, portions or all of the property may be highly contaminated with precursor chemicals and/or the final drug products.
2. As required by California Health and Safety Code (HSC) Section (§) 25400.35, this document has been developed to establish procedures for the assessment and remediation of clandestine methamphetamine manufacturing sites within Santa Clara County. These procedures are to be followed by property owners and authorized contractors to develop and implement an appropriate remediation strategy, and by County authorities to evaluate work plans and assessments in a manner consistent with best available practices.
3. This document has been peer-reviewed by other county health and environmental agencies within California and technical experts in the Clan Lab remediation industry noted on Appendix III, and is consistent with HSC Chapter 6.9.1, Article 6.
4. California Health and Safety Code is available on the Internet at www.leginfo.ca.gov/calaw.html.

B. Authority

Pursuant to HSC §25400.17(b), the Santa Clara County Health Officer has delegated authority for regulatory oversight of Clan Lab contaminated properties to Santa Clara County Department of Environmental Health's Hazardous Materials Compliance Division (HMCD).

C. Determination of Contamination and Notification

1. Upon notification from law enforcement or other sources that a Clan Lab has been discovered, HMCD will:
 - a. Respond and post the property in a conspicuous location within 48 hours after notification. HMCD may not limit posting to the room where the cooking occurred within the occupancy (e.g., bedroom, kitchen) since experience has indicated that contamination is rarely limited to the specific area of the cooking process. Depending on the apparent extent of contamination, HMCD may post adjacent units of apartments, hotels, and other nearby building units. If the Clan Lab activity was limited to outbuildings such as sheds or garages, they may be posted without impacting the residence. Anyone disturbing or destroying a posted notice is subject to a civil penalty in an amount of up to \$5,000.00.

- b. Perform an inspection of the property and surrounding area within five (5) working days of notification. The inspection will include, but not be limited to obtaining evidence of hazardous chemical use or storage and documenting evidence of any chemical stains, cooking activity, and release or spillage of hazardous chemicals.
2. If HMCD determines that the property is not contaminated, HMCD will complete the following actions:
 - a. Within three (3) working days of making the determination, remove all notices posted at the property and prepare written documentation that includes findings and conclusions.
 - b. Within ten (10) working days of preparing written documentation that the property is not contaminated, send a copy of this document to the property owner and to the local code enforcement agency that has jurisdiction.
 3. If HMCD determines that the property is contaminated, HMCD will complete the following actions within ten (10) working days of making the determination:
 - a. If the property is real property, record with the Santa Clara County Clerk Recorder's office a lien on the property.
 - b. Issue to all known occupants of the property and to all persons who have a recorded right, title, estate, lien, or interest in the property an Order prohibiting use or occupancy of the property pursuant to HSC §25400.22(a)(4).
 - i. A copy of this Order will be provided to the appropriate local code enforcement agency.
 - ii. Within one (1) working day of the issuance of the Order, a copy of the Order will be posted in a conspicuous place on the property.

D. Property Restrictions

1. Properties used as Clan Labs will typically be found with a lab-like setting, including containers of chemicals and manufacturing equipment. While these materials will be removed by a law enforcement-sponsored contractor, experience indicates that, until proven otherwise, contamination from the drug manufacturing process must be assumed to remain. Typical areas of contamination include sinks, toilets, bathtubs, floors, walls, ceilings, carpets, drapes, furniture, and ventilation systems (i.e., heating and air conditioning systems).
2. Entry into posted area(s) of the property is prohibited unless specifically approved in writing by HMCD.
3. No personal belongings, furniture, or other items shall be removed from the tagged property until released by HMCD. Such release is not likely to occur until the Preliminary Site Assessment (PSA) has been reviewed and approved by HMCD.
4. Anyone completing an unauthorized entry or removal is subject to a civil penalty in an amount of up to \$5,000.00.

E. Property Owner Responsibilities

1. The property owner and any person(s) occupying a property subject to an Order issued pursuant to HSC §25400.22 shall immediately vacate the affected unit. [HSC § 25400.25(a)]
2. The property owner shall utilize the services of an authorized contractor to remediate the contamination and, within 30 calendar days after receipt of an Order, shall demonstrate to HMCD that such an authorized contractor has been retained for this work. As used in this document, "authorized contractor" means a

person who has been trained or received other qualifications pursuant to HSC §25400.40. [HSC § 25400.26(a)]

3. The property owner or owner's authorized contractor shall submit a Preliminary Site Assessment (PSA) Work Plan (see Section F, below) to HMCD for review. This shall be submitted no later than 30 calendar days after demonstrating to HMCD that an authorized contractor has been retained.
4. The property owner shall complete remediation of all applicable portions of the contaminated property in accordance with HSC Chapter 6.9.1 no later than 90 calendar days after the date that the PSA Work Plan has been approved by HMCD.
5. Until the property owner receives a determination from HMCD that no further action is required to remediate the affected units or site, the following must be complied with:
 - a. All prospective buyers of the property shall be provided with a copy of the Order and must indicate receipt in writing.
 - b. All prospective tenants that have completed an application to rent an affected unit or other property described on the Order shall be provided with a copy of the Order and must indicate receipt in writing.

F. Preliminary Site Assessment (PSA) Work Plan

1. A written PSA Work Plan shall be developed and submitted to HMCD within 30 calendar days after demonstrating to HMCD that an authorized contractor has been retained by the property owner.
2. The PSA Work Plan shall include, but not be limited to the following:
 - a. The physical location of the property.
 - b. A summary of the information obtained from law enforcement, HMCD, and any other involved agency. The summary shall include a discussion of the information's relevance to the contamination, including areas suspected of being contaminated and may include all of the following:
 - i. Duration of lab operation and number of batches cooked and processed.
 - ii. Hazardous chemicals known to have been manufactured at the site.
 - iii. Recipes and methods used for methamphetamine production. Each type of methamphetamine manufacturing process involves chemicals specific to the process. The Red Phosphorus Method is the most common method found in Santa Clara County. However, some Clan Labs have been discovered that used the Ammonia Method (also known as the Birch or Nazi method).¹
 - iv. Chemicals and equipment and their location(s).
 - v. Location of contaminated cooking and storage areas.
 - vi. Visual assessment of the severity of contamination inside and outside of the structure where the Clan Lab was discovered.
 - vii. Assessment of any contamination in adjacent rooms, units, apartments or structures.
 - viii. Disposal methods observed at or near the property (e.g., dumping, burning, burial, venting, and/or drain disposal).
 - ix. A comparison of the chemicals on the manifest with known methods of manufacture in order to identify other potential contaminants.
 - x. A determination as to whether the manufacturing method included the use of chemicals containing mercury or lead (e.g., lead acetate, mercuric chloride, mercuric nitrate).
 - c. A description of the areas to be sampled and the basis for the selection of the areas. This element of the Work Plan must also document the decision process used in determining not to sample particular areas. When identifying potential sample areas, consideration should be given to the following:
 - i. Obviously stained areas.

¹ Information regarding process-specific chemicals is provided in Appendix II, at the end of this document.

- ii. Areas in the immediate vicinity of the manufacturing (cooking) location.
 - iii. Areas where chemicals were found.
 - iv. Adjacent rooms.
 - v. Locations typically accessible for contact by occupants, particularly children.
 - vi. High traffic areas outside of the cooking area.
 - vii. Ventilation systems.
 - viii. Hard and soft surfaces, walls, floors, ceilings and appliances.
 - ix. Areas of potential waste disposal such as sinks, floor drains, bathtubs, showers, and toilets.
 - x. Septic systems (see Section V, below).
- d. Primary areas of potential contamination:
- i. Manufacturing or cooking areas. Contamination in these areas can be caused by spills, boil-over, explosions, or by chemical fumes and gases created during cooking. Affected areas include the following: floors, walls, ceilings, glassware, containers, working surfaces, furniture, carpeting, draperies and other textile products, plumbing fixtures and drains, heating and air conditioning vents.
 - ii. Disposal areas. Indoor areas include sinks, toilets, bathtubs, plumbing traps and floor drains, vents and vent fans, and chimney flues. Outdoor contamination may be caused by dumping or burning on or near soil, surface water, groundwater, sewer or storm systems, septic systems, and cesspools.
- e. Secondary areas of potential contamination:
- i. Locations where contamination may have migrated, such as hallways or high-traffic areas.
 - ii. Common areas in multiple dwellings, and adjacent apartments or rooms, including floors, walls ceilings, furniture, carpeting, light fixtures, blinds, draperies and other textile products.
 - iii. Common ventilation and plumbing systems in hotels and multiple dwellings.
- f. Sampling protocols (see Section H, below), analytical methods (see Section S, below), and laboratories to be used and their relevant certifications/accreditations. During each phase of sample collection, identical procedures must be used to provide a common basis for comparing results.
- g. A description of areas and items that will be remediated in lieu of sampling, if any. In the case of surfaces that are obviously or highly suspected to be contaminated, HMCD will waive sampling requirements for those items or materials that will be removed and disposed of properly. For example, if cooking was conducted in a kitchen and staining is evident, the property owner may decide that it is more cost-effective to simply remove and dispose of the sheet rock, cabinets, appliances, and linoleum rather than spend money on sampling to confirm that the materials are in fact contaminated. It may also be decided to surface wash and/or encapsulate (see Section L, below) all surfaces in a room that appear to have been impacted. (Assessment sampling would not be required for these surfaces, but post-remediation sampling would.) Note that disposal facility's may require sampling of hazardous wastes for profiling purposed, an action over which HMCD has no control.
3. The PSA Work Plan shall be signed by the contractor responsible for the completion of the PSA and by a Certified Industrial Hygienist (CIH), and notarized.

G. Preliminary Site Assessment (PSA) Report

1. After the PSA is completed, a PSA Report shall be prepared and submitted to HMCD.
2. The PSA Report must be thorough and specific in reporting findings and recommendations. If areas or items are contaminated, the report must clearly specify all required remediation actions. Therefore, a recommendation such as, "The stove and all adjacent impacted areas must be cleaned," is insufficient, for it begs the question of what constitutes an "adjacent impacted area." It is important that the PSA sampling

program be designed to provide sufficient data to make specific, rather than vague, recommendations.

3. The PSA Report shall include the following components:
 - a. Location description, including street address, mailing address, and unit or room number of the contaminated property. Also include the legal description, and clear directions for locating the property.
 - b. Name of the owner of record and the owner's mailing address.
 - c. A Site Map of the contaminated property, including floor plans of affected buildings, local drinking water wells, and nearby streams (if potentially impacted) drawn to a scale of 1/4" to 1' unless otherwise directed by HMCD. The map shall show the location of damage and contamination and the location of sampling points used in the PSA. The sampling point locations shall be keyed to the sampling results and remediation recommendations.
 - d. A description of the sampling methods and analytical protocols used in the assessment.
 - e. A description of the sampling results. If providing a narrative, group results by location rather than by analyte. Also include information regarding background samples and results obtained.
 - f. Specific recommendations, including methods, for remedial actions required to meet State Reoccupancy Criteria (see Section R, below).
 - g. A plan for the Post Remediation Site Assessment, including specific sampling requirements and methodologies, and locations at which samples will be obtained.
4. The PSA Report shall be signed by the authorized contractor responsible for the remediation work and by a Certified Industrial Hygienist (CIH), and notarized.
5. If, upon review of the PSA Report, HMCD determines that there is no level of contamination at the site that requires remediation, then HMCD shall take actions specified in Section Q, below.

H. Sampling Protocol

Regulatory agencies have reviewed several sampling methods from a variety of sources, and determined that a standard method based on the "Proposed Surrogate Method" devised by Bruce Lazarus, CIH, will be the benchmark for evaluating sampling protocols. Mr. Lazarus' paper describing this method was published in the Journal of Clandestine Laboratory Investigating Chemists, Volume 10, Number 2. A description of Mr. Lazarus' perspective and the "Surrogate Method" sampling protocol required by HMCD is included in Appendix I, at the end of this document.

I. Wipe Samples and Reporting of Results

1. Wipe samples are, at best, an imprecise sampling technique for which there is little agreement on the "best" method. It is noted that the literature indicates that wipe samples do not collect anywhere near all of the contaminant from a specific sampling area, and that it takes at least three wipes to collect the majority of surface contamination. To control variables, consultants shall use a consistent wipe sample technique throughout the project, and shall describe the specific wipe sample procedures in their reports. Consultants shall follow the sample collection methodology described in Appendix I.
2. Recent work by the Washington Department of Ecology suggests that deionized water is not effective in lifting methamphetamine from sampled surfaces. Samples obtained using methanol as a solvent have shown much better recovery. Therefore, all wipe samples shall use methanol as the wetting/collecting solvent. Consultants are cautioned to use appropriate personal protective equipment when using methanol.
3. HMCD will not accept sample results for which the area of the sample is not recorded. All wipe sample results shall be reported as weight/surface area, in mass/100cm² (mass/ft² for lead). A common

investigation practice is to take several swipes of unknown and inconsistent surface areas for a composite sample. This practice will not be accepted, even if used only to substantiate that contamination exists in a particular area.

4. Mr. Lazarus recommends that a one square foot surface area sample be obtained (see Appendix I). For general wipe sampling, literature and regulatory agencies typically recommend surface areas of either 100 cm² or 1 ft². HMCD requires a surface sample area of 100 cm², as this is consistent with other regulatory agencies for Clan Lab investigations.
5. Sample containers shall be bottles, as described in Appendix I. The use of plastic bags presents a greater opportunity for the contaminant to transfer from the wipe to the sample container than would be the case with a bottle. In most instances, the laboratory will prepare the samples for analysis in the sample containers, allowing any sample transferred to the container wall to be collected.

J. Composite Samples

1. Compositing of samples is a popular means of minimizing analytical costs. However, appropriate sampling and result reporting methods must be followed. In addition, care must be taken when deciding to composite, for a positive lab result may require individual re-sampling of all surfaces represented by that composite sample. Therefore, it is highly recommended that composite samples be reserved for those areas that are anticipated not to be contaminated according to the authorized contractor's judgment.
2. Each sample area composited must be 100 cm². For example, to composite wipe samples of four discrete wall areas in a kitchen, there must be four 100 cm² wipes. Each wipe sample will be done with a #40 Whatman Filter Paper or similar (see Footnote 4, in Appendix I), with compositing accomplished by the lab in the extraction process. **The maximum number of wipe samples that may be composited is four.**
3. Do not use composite sampling combining an area or item that is likely to be contaminated (e.g., obvious staining) with areas unlikely to show contamination such as those that are remote from known cooking areas or HMCD will assume that an attempt was made to dilute the sample results from the likely contaminated areas to below instrument detection limits. Composite sampling should be limited to surfaces that are similar (i.e., walls with walls, etc.).
4. There should be no compositing between appliances (e.g., stove and refrigerator and microwave). The authorized contractor may consider compositing samples within an appliance (e.g., burners, oven, handles, knobs, surface, etc. in a stove), but defining 100 cm² sample areas will be difficult.

K. Gross Remediation

Materials associated with an operating Clan Lab, such as containers of chemicals and lab equipment, should have been removed by the law enforcement-sponsored contractor at the time the lab was seized. If the authorized contractor finds any such materials during the site assessment process, the material shall be left in place and HMCD shall be notified immediately.

L. Residual Remediation

1. **General** – A number of processes can be successfully used to make the property suitable for re-occupancy. Note that the degree to which areas adjoining a space used for cooking activities are significantly contaminated is difficult to predict. Long-term or high volume activities are likely to have impacted adjoining areas. As a result, it is generally most cost effective to assume low-level contamination by non-

volatile materials and rid these and other areas of all potentially contaminated porous materials or items. Such decisions are to be reflected in the PSA Report. All disposal of materials associated with the site remediation process shall be done in accordance with Section U, below.

2. **Airing-Out/Venting** – “Airing-out” is typically conducted by law enforcement personnel during lab processing. Several agencies have advocated the airing-out of a structure during the remediation process as a means to reduce the concentration of volatile solvents and similar materials by volatilization. Some have suggested increasing the air temperature within the structure to 85° F while increasing the ventilation rate for several days prior to remediation. While this practice may well reduce the airborne concentration of solvents and minimize the risk to remediation personnel, HMCD does not accept it as a substitute for removing and properly disposing of items such as porous furnishings and wallboard that have been soaked or otherwise degraded/impacted by solvents.
3. **Air Monitoring** – Several references and jurisdictions suggest the use of air monitoring for both evaluation of a property and for final clearance. HMCD neither supports nor encourages the use of air monitoring for the following reasons:
 - a. For many precursor and waste materials, validated analytical methods do not exist. For materials which have appropriate analytical methods, industrial hygiene sampling methods may not yield a low enough detection limit for evaluation against suggested exposure limits, requiring the use of expensive ambient air monitoring equipment. Direct reading instruments are generally non-specific and have relatively high detection limits.
 - b. Exposure limits for residential occupancies are problematic. Exposure limits established for occupational settings (e.g., PEL, TLV, REL) are inappropriate, as they are designed to protect, to some limited extent, the working population rather than more sensitive members of the population.
 - c. Exposure limits for ambient air, such as California OEHHA’s Toxic Hot Spot limits and the draft Clan Lab clearance limits developed by other states, are based on assumptions that make them far too low for practical use. For example, Colorado assumes occupancy 350 days a year, 24 hours a day, for 30 years. Implicit here is the assumption that the vapor source is steady-state, which would require it to be renewed. The lab is gone, chemicals removed, so a steady-state assumption fails.
 - d. The materials that air monitoring would detect are mostly volatile solvents, and most with vapor pressures above 10 torr. As long as the building has reasonable ventilation, the concentrations should decrease to negligible levels in a fairly short period of time.
 - e. Air monitoring may suggest that there is a problem, but provides little information regarding its source. The effort may be better placed in additional wipe and/or bulk samples.
4. **Removal** –
 - a. Visibly contaminated (i.e., etched or stained) sinks, bathtubs, toilets and similar fixtures are to be removed and disposed of properly.
 - b. Porous materials (e.g., carpeting, suspended ceiling panels, wallpaper, etc.) that can absorb dust, powder, aerosols, and/or vapors from the methamphetamine cooking process shall be removed and disposed of properly. In most cases, the cost of analytical testing, cleaning, and post-testing exceeds the cost of replacement of these articles. While HMCD strongly recommends that this apply to furniture and clothing, it has no authority to require disposal of such property.
 - c. Spray-on (i.e., “Popcorn”) ceiling coatings may contain asbestos and should not be disturbed unless there is gross staining. Any such work must be directed by a Cal/OSHA Certified Asbestos Consultant. A sealant, of the type typically used for asbestos-containing spray-on finishes, should be applied to the ceiling if low concentrations of contaminants are detected.
 - d. Some nonporous and semi-porous surfaces (e.g., floors, countertops, tiles, walls and ceilings) can hold contamination from the methamphetamine cooking process, particularly in areas where cooking,

preparation, and or chemical storage was performed. If a surface has visible contamination or staining, complete removal and replacement of that surface is required. This could include removal and replacement of wallboard, floor coverings, concrete slabs, and countertops. If this is not possible, intensive cleaning (see below) could be attempted. Circumstances that prohibit removal and replacement should be described in the Remediation Work Plan.

- e. Appliances that were in the room in which cooking was conducted must be disposed of since they have too many surfaces to permit demonstration that they are sufficiently clean for food preparation or storage. All appliances associated with food preparation or storage located outside the methamphetamine cooking area must be sampled for analytical testing.
5. **Surface Washing** – Surface washing takes many forms, including pressure washing, detergent-washer washing, solvent (alcohol) washing, steam cleaning, and others. The objective is to remove contaminants to below criteria specified in HSC §25400.16 by an efficient and cost-effective method that generates a minimal waste stream. Note that all wash solutions and rinsewater must be effectively collected for disposal (see Section U, below).
 6. **Encapsulation** – In cases where porous or semi-porous surfaces (e.g., walls, wood flooring, panels, ceiling, concrete) have had levels of contamination that permitted in-situ cleaning instead of removal and replacement, such surfaces shall be encapsulated with an oil-based paint, varnish, or similar sealant. Water-based latex paints appear to have a greater tendency to permit “bleed-through” than oil-based coatings. The sealant is to be applied after surface washing has been completed. After the sealant has cured in accordance with the manufacturer’s instructions, sampling and analysis must be conducted to assure that any remaining contamination is below criteria specified in HSC §25400.16.

M. Ventilation Systems

1. Ventilation systems tend to collect fumes, vapors and dust, and redistribute them throughout a structure. The vents, stove hoods, ductwork, filters and even the walls and ceilings near the ventilation ducts can become contaminated. Absent evidence to the contrary, all air filters in the system shall be replaced, ventilation registers removed and cleaned, and surfaces near inlets and outlets cleaned. Cleaning of system ductwork should be considered, although the efficacy of duct cleaning is subject to debate; US EPA’s article on duct cleaning is available at www.epa.gov/iaq/pubs/airduct.html.
2. In motels, apartments, row-houses or other multiple-family dwellings, a ventilation system may serve more than one unit or structure. These connections must be considered when evaluating remediation and testing procedures. One strategy is to take samples from adjacent or connected areas/rooms/units, working outward from the lab site until samples show results below criteria specified in HSC §25400.16.
3. Anecdotal evidence indicates that rooms adjacent to methamphetamine cooking areas may be impacted by active or passive ventilation (distributing fumes and vapors) or by poor chemical handling and hygiene practices. As is the case with other jurisdictions, HMCD will require evaluation and possible decontamination of areas adjacent to the cooking area. Such areas may include hallways and other high traffic areas, as well as adjacent rooms. The consultant shall consider this in the PSA Work Plan.

N. Impacted Soil and/or Groundwater

1. Impacted soil and/or groundwater will be investigated and remediated under normal regulatory criteria for hazardous waste sites. Oversight of hazardous waste site remediation will be conducted by the California Department of Toxic Substances Control (DTSC). If groundwater may be impacted, oversight may be

shared with the Regional Water Quality Control Board (RWQCB). These agencies may, under certain circumstances, transfer oversight responsibility to HMCD. Responsible parties may have the option of requesting that HMCD provide oversight of voluntary remediation of the hazardous waste site component of the property. Any such oversight will be provided on a fee-for-service basis.

2. The variables associated with hazardous waste site remediation are numerous, and will not be discussed in this document. In the event that the PSA Report identifies potential impacts to soil and/or groundwater, HMCD will work with the property owner and consultant to determine the appropriate path for further assessment and mitigation activities and associated regulatory oversight.

O. Post Remediation Assessment

The purpose of the post remediation assessment is to establish that the property has been cleaned up to a level below criteria specified in HSC §25400.16. This assessment should be conducted by the authorized contractor after remediation has been completed and/or the encapsulant has cured. Sampling protocols for the post-remediation assessment will have been defined in the approved PSA Work Plan. In general, those areas of the property for which the PSA sampling indicated levels above criteria specified in HSC §25400.16, and which were not removed and replaced (e.g., areas encapsulated and/or cleaned) are to be sampled in the same manner used for the PSA. If all sampling results fall below criteria specified in HSC §25400.16, then the remediation work is complete and the authorized contractor can prepare the Final Report. Any areas that fail post-remediation sampling are to be further remediated and then re-sampled.

P. Final Report

1. There are two options for completion of the Final Report:
 - a. If the remedial action consisted solely of removal of contaminated surfaces such as cabinets, floor coverings, sheetrock and similar materials, and post-remediation sampling and assessment is not required by HMCD, then the authorized contractor must provide to HMCD a Final Report certifying that remedial activities have been completed in accordance with the approved PSA Report. This documentation shall include proof of proper disposal of contaminated items and building materials that have been removed from the property as part of the remediation process. *(Note: Any remediation activity other than removal of contaminated surfaces requires post-remediation sampling and assessment.)*
 - b. If the PSA Report includes actions other than removal of contaminated surfaces (e.g., removal of some surfaces, cleaning of others), the authorized contractor must provide a Final Report establishing in detail that the remediation work has been completed in accordance with the approved PSA Report. This documentation shall include proof of proper disposal of contaminated items and building materials that have been removed from the property as part of the remediation process.
2. The Final Report is a technical document that summarizes the work performed as described in the approved PSA Work Plan and PSA Report, and data collected during the Post Remediation Assessment. The Final Report must be signed by the authorized contractor responsible for the completion of the PSA and by a Certified Industrial Hygienist (CIH), and notarized. Components of the Final Report shall include the following:
 - a. Case Narrative;
 - b. Site Description;
 - c. Summary of PSA findings and recommendations;
 - d. Summary and documentation of remedial actions;
 - e. Post-remediation assessment with detailed description and documentation, including lab reports and a

- scaled Site Map keyed to sample locations;
- f. Post-remediation assessment results, with the consultant's analysis and recommendations.

Q. No Further Action (NFA) Determination

If HMCD determines that a property that has been the subject of a PSA Report does not require remediation or has been remediated in accordance with this document and HSC Chapter 6.9.1, HMCD will issue a NFA Determination and complete all required actions in accordance with HSC §25400.27.

R. Reoccupancy Criteria

1. **Methamphetamine** – Property contaminated by Clan Lab activity is safe for human occupancy only if the methamphetamine level is ≤ 1.5 microgram per 100 square centimeters ($1.5 \mu\text{g}/100\text{cm}^2$). [HSC §25400.16]
2. **Lead And Mercury** – When it is suspected that the Clan Lab activity included the use of lead and/or mercury, a property will be considered safe for human occupancy when the following standards have been met:
 - a. The total level of lead is ≤ 20 micrograms per square foot ($20 \mu\text{g}/\text{ft}^2$);
 - b. The total level of mercury is ≤ 50 nanograms per cubic meter of air ($50 \text{ng}/\text{m}^3$).

S. Analytical and Sampling Methods

1. Analytical methods are driven by the analyte, and sampling methods are frequently driven by the analytical method. Analytical methods for wipe and bulk samples are expected to be from the USEPA's Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA publication SW-846); OSHA Sampling and Analytical Methods; NIOSH Analytical Methods; and, in the case of lead, HUD guidelines.
2. Methamphetamine samples shall be analyzed by modified EPA Method 8270. According to State of Washington Department of Ecology-accredited labs, modified Method 8015 is prone to false positives. Wipe samples are to be obtained with 11 cm #40 Whatman Filter Paper (p/n 1440110) or similar wetted with methanol, stored and shipped in appropriate sampling jars.
3. HMCD will not accept field analyses for clearance samples. This includes the use of colorimetric detector tubes, real-time direct reading instruments such as flame ionization and photo ionization detectors, any type of Hazardous Category evaluation, and Marquis/Methamphetamine reagents, pH paper, or similar.

T. Laboratory Requirements

All analyses are to be conducted by analytical laboratories which are accredited (Fields of Testing E114-E117) by the California Dept. of Health Services' Environmental Laboratory Accreditation Program. Note that this list is not limited to labs in California, as California has ELAP reciprocity with several states.

U. Waste Disposal

1. All materials removed from a Clan Lab property as a result of having been impacted/contaminated by Clan Lab activities (i.e., operation, storage, spills, disposal) must receive special handling at the disposal or recycling facility. Examples of such materials are kitchen appliances, drapes, carpets, and building

materials. Items such as appliances and furniture must be rendered unusable prior to disposal.

2. For any disposed of items, HMCD will require an inventory, as well as a waste disposal receipt, to be submitted with the Final Report. For items that are required to be disposed of as hazardous waste, a copy of the Uniform Hazardous Waste Manifest is required.
3. HMCD does not regulate the types of wastes accepted by any landfill as each facility has its own permit requirements to meet, and will likely review Clan Lab debris on a case by case basis. It is up to the contractor to contact the landfill to determine if a specific material removed from a Clan Lab property will be accepted, and the conditions under which it will be accepted.

V. Septic Systems

1. If there is evidence that wastes were dumped down a drain, the consultant will need to work through a process such as the one described in this section to determine whether a septic system was impacted.
2. Evaluate tubs, sinks, toilets and similar for evidence of waste disposal. Staining from hydriodic acid (red/orange) is a good visual indicator.
 - a. If there is no evidence of disposal, the task is complete.
 - b. If there is evidence of disposal, continue to Section V.3.
3. Assuming evidence of disposal, determine whether the property is on septic or sewer system. HMCD and local water quality agencies can assist in this determination.
 - a. If the property is on a sewer system, the task is complete.
 - b. If the property is on a septic system, continue to Section V.4.
4. Obtain a representative sample of the material in the septic tank. Have the sample analyzed for hazardous waste characteristics. Use an ELAP-accredited laboratory appropriate for the analysis.
 - a. If analysis indicates that the sample is non-hazardous, the task is complete.
 - b. If analysis indicates that the sample is hazardous, continue to Section V.5.
5. Using resources such as the State Water Resources Control Board (SWRCB) list of disposal facilities, determine which facility will accept the mixed septic/hazardous waste. Use an appropriately-permitted registered hazardous waste transporter to pump the tank and transport the contents to the accepting facility.
6. Information regarding the positive analysis for hazardous waste characteristics shall be provided to the Santa Clara County Department of Environmental Health's Site Assessment/Mitigation Section, which will evaluate whether remediation action will be required for the leachfield.

APPENDIX I

The Surrogate Method

The County of Sacramento and other regulatory agencies have reviewed a number of sampling methods from a variety of sources, and have determined that a standard method based on the “Proposed Surrogate Method” devised by Bruce Lazarus, CIH, will be the benchmark for evaluating sampling protocols. Lazarus’ paper describing this method was published in the Journal of Clandestine Laboratory Investigating Chemists, Volume 10, Number 2. Most of the material in this Appendix is taken from this article.

It should be noted that few individuals outside of the law enforcement community have Lazarus’ experience in Clandestine Laboratory health risks and assessments. His background as a Certified Industrial Hygienist in the environmental remediation and emergency response industry, as well as his extensive work with Clan Lab investigation and remediation, provide him with a unique perspective for designing a cost-effective investigation process.

In the Surrogate Method, a limited number of laboratory samples are taken from judgmentally selected locations throughout the clandestine laboratory site and analyzed for the target analytes. This design method attempts to balance the necessary cost burden of assessment activities against the public health need to ensure that no significant residual contamination is unknowingly allowed to persist uncorrected. The surrogate approach is based on the following concepts:

1. There is a lack of test methods and reference standards for many of the substances, and especially some of the organic drug compounds, which are associated with clandestine lab activities. In short, one cannot feasibly test for all hazardous materials associated with the cooking process, and even if test methods were available, it would be prohibitively expensive to do so.
2. Some target chemicals tend to be more persistent in the environment, both in porous media and on non-porous surfaces, allowing for latent detection.
3. The presence and concentration variability of target chemicals assessed at laboratory sites is assumed to be representative of similar conditions for the remaining clan lab chemicals not specially analyzed for owing to the reasons outlined above. The premise assumes that if the target analytes are detected in significant concentration, then other clan lab method specific chemicals not analyzed for are also present in concentrations of public health interest. Conversely, if the target analytes are not detected, or detected in very low concentrations, it may be inferred, following this presumption, that chemical not analyzed for are also likely to be not present, or present in concentrations low enough

It is understood that these assumptions define a data gap suitable for future study. However, absent an alternative method that concurrently minimizes the cost of investigation while providing adequate information to indicate potential public health risk, the Surrogate Method is the minimum level of site investigation acceptable to HMCD.

HMCD criteria under the Surrogate Method are as follows:

1. **Sample Types** – A combination of wipe and bulk samples should be taken utilizing this protocol.² Wipe samples should be taken of non-porous surfaces, whereas bulk samples should be taken of porous materials.
 - a. Wipe samples should be taken of sealed concrete (garage floors), vinyl flooring, sealed wood

² In some cases, particularly with painted surfaces, a decision must be made if a wipe sample or bulk sample would be more appropriate to recover and identify potential contamination. To address error associated with mass loading of bulk samples, particularly from painted surface and drywall, it may be appropriate to obtain bulk samples using a surface scraping technique.

surfaces, tile, Formica, bathroom fixtures, appliance surfaces, painted surface of good condition, etc.

- b. Bulk samples should be taken of unsealed or poor condition concrete and wood surfaces, dry wall, painted surfaces of poor condition, carpeting, carpet padding, upholstery, septic waste, and soils.

2. **Sample Locations and Quantities**³ – Take one bulk or wipe sample from the following as associated with each major area of the location suspected by history and/or visual observations as being potentially affected by contamination:

- a. Each major floor surface;
- b. Each major wall surface;
- c. Each major ceiling surface;
- d. Each major home appliance (e.g., refrigerator, oven, microwave, dishwasher, washing machine, dryer, etc.);
- e. Each major cabinet, counter, and/or built-in feature (e.g., kitchen cabinets, counters, vanities, etc.);
- f. Each bathroom and/or kitchen fixture or grouping of fixtures;
- g. Each major furniture grouping.

3. **Collection Procedures** –

- a. **Wipe Samples** – Wipe samples should be obtained using the following protocol unless otherwise instructed by the analytical laboratory. Note that these instructions differ from Lazarus' paper, as lab requirements have been refined.

- i. Use eight-ounce, wide mouth, borosilicate glass jars having phenolic screw top lids with Teflon liners.
- ii. Prepare each sample by placing a 11 cm #40 Whatman Filter Paper (p/n 1440-110) or similar⁴ into each sample jar. Add 5 ml of methanol to each pad and close the jar. Use appropriate personal protective equipment when using methanol.
- iii. Select the surface location to be sampled.
- iv. Squeeze excess methanol from the pad (back into the open jar) before wiping the sample area.
- v. Wipe a one hundred square centimeter (100 cm²) surface area, using a consistent wipe or blot pattern technique (i.e., concentric circle pattern starting in the upper left corner and ending in the center of the area). Use a 10 x 10 cm square template (usually made of Teflon or other material that will not contaminate the sample and is resistant to the solvent).
- vi. Without allowing the filter to contact any other surfaces, fold the filter with the exposed side in, then fold it again. Return the filter to the glass jar and replace the lid.
- vii. Wear disposable Nitrile or PVC gloves for each sample taken. Change gloves between samples.
- viii. Obtain separate wipe samples (separate jar and pads) for each individual analyte, including pH, to be analyzed by the laboratory unless the laboratory explicitly states that multiple analytes can be tested from one pad. Otherwise, if multiple analytes are to be tested, then all wipe samples from a selected location should be of adjacent, contiguous surfaces. Do not re-wipe the same surface.
- ix. Preservation of the samples for inorganic analysis is not normally required unless otherwise specified by the analytical laboratory.
- x. When appropriate, submit a sample blank consisting of a prepared sample jar taken to the field and returned to the laboratory for analysis.
- xi. Label the jar, attach custody seal, and prepare sample for transport to the laboratory.

³ In establishing the number and location of samples at individual property sites, sampling of some locations or items may not be necessary if the need for remediation is apparent by observation or agreement of parties. Examples include fire-damaged surfaces, apparent direct chemical staining or damage, and/or obvious physical damage of an item or feature necessitating removal.

⁴ In some cases, specific to the surface being sampled, it may be preferable to use sterile gauze pads.

- xii. See Section J in the main body of this document for information on compositing samples.
- b. **Bulk Samples** – Bulk samples should be obtained using the following protocol unless otherwise instructed by the analytical laboratory:
 - i. Use 4 ounce or 8 ounce wide mouth borosilicate glass jars having phenolic screw top lids with Teflon liners.
 - ii. Select the media to be bulk sampled.
 - iii. Using an appropriate sampling tool/device, obtain a minimum of 30 grams for each bulk sample unless the analytical laboratory specifies a different quantity of sample.
 - iv. Wear disposable Nitrile or PVC gloves for each sample taken. Change gloves between samples.
 - v. Unless otherwise specified by the analytical laboratory, multiple analytes, including pH, may be analyzed from single bulk sample representing each medium to be evaluated.
 - vi. Sampling tools/device should be cleaned and triple-rinsed with deionized water between each bulk sample or otherwise cleaned following a laboratory-recommended protocol between samples.
 - vii. For scrape samples of paint, etc., a polyethylene tray or similar capture device may be taped to the wall surface below the surface area to be scraped. Collect the sample in the tray and then transfer it to the sample container.
 - viii. Preservation of samples for inorganic analysis is not normally required unless otherwise specified by the analytical laboratory.
 - ix. Bulk samples for organic analysis should be preserved at 4° C (usually applies to septic waste and subsurface soil samples recovered for volatile and semi-volatile hydrocarbon analysis).
- 4. **Target Analytes** – Analytes specified for analysis should be selected based on individual association with specific Clan Lab manufacturing processes, expected persistence in the environment, usefulness of data interpretation, application of available testing methods, laboratory capabilities, and cost of analysis. The following table identifies selected target analytes and test methods appropriate for the most common methamphetamine synthesis routes typically encountered in the United States. This table should be used only as a guide, since it may not be necessary or appropriate to sample and analyze for every analyte.

Target Analytes for Common Methamphetamine Manufacturing Methods⁵

Manufacturing Method	Methamphetamine ⁶	Precursor	Hydrochloric Acid (Chloride)	Essential Chemicals (or by-products) ⁷
Red Phosphorous	Modified EPA Method 8270	Ephedrine by Modified EPA Method 8270	EPA Method 300	Total Phosphorous by EPA Method 6010; ⁸ Iodide by EPA Method 300
Ammonia	Modified EPA Method 8270	Ephedrine by Modified EPA Method 8270	EPA Method 300	Total Lithium or Total Sodium by EPA Method 60103; Total Ammonia by EPA Method 350
Mercuric Chloride	Modified EPA Method 8270	Phenyl-2-Propanone by Modified EPA Method 8270	EPA Method 300	Mercury by EPA Method 7471A; Total Lead by EPA Method 6010

⁵ Approved labs (e.g., ELAP labs) may select methods other than those listed in this table.

⁶ Results for Modified EPA Method 8270 may be semi-quantitative depending on analytical laboratory capabilities.

⁷ Select one or more analytes for sampling and analysis, based on property data and assessment needs.

⁸ Metals analysis may also be performed by EPA Method 6020.

APPENDIX II

Chemicals of Concern

Methamphetamine Methods of Production and Chemicals Typically Used⁹

- **Hydriodic Acid (Ephedrine) Method**
 - Ephedrine
 - Freon
 - Hydriodic Acid
 - Hydrochloric Acid (Muriatic acid)
 - Red Phosphorous
 - Sodium Hydroxide

- **Phenyl-2-Propanone (P-2-P) Method**
 - Aluminum
 - Ether
 - Methyl Alcohol (Methanol)
 - Methylamine
 - Mercuric chloride
 - Phenyl-2-Propanone
 - Sodium hydroxide

- **Sodium Metal (Nazi or Birch) Method**
 - Anhydrous Ammonia
 - Ephedrine
 - Hydrochloric Acid (Muriatic Acid)
 - Lithium (metal)
 - Pseudoephedrine
 - Sodium (metal)

⁹ This list of typical lab chemicals was taken from the CSTI Clandestine Drug Laboratory Chemical Identification training manual. It is only a partial list of chemicals that may be encountered.

APPENDIX III

Resources

Materials used the development of this document include:

Voluntary Guidelines for Methamphetamine Laboratory Cleanup

U.S. environmental Protection Agency (EPA)

Methamphetamine Drug Lab Cleanup Program

Department of Toxic Substances Control (DTSC)

Guidelines for Cleaning Up Former Methamphetamine Labs

Missouri Department of Health and Senior Services

Guidelines for Contamination Reduction and Sampling at Illegal Drug Manufacturing Sites

Washington State Department of Health, Office of Toxic Substances

Illegal Methamphetamine Laboratories

University of Arizona College of Public Health

Clandestine Laboratory Contaminated Properties: Assessment and Remediation Strategies

Lazarus, Bruce, CIH

Journal of Clandestine Laboratory Investigating Chemists, Volume 10, No. 2, April 2000

Clandestine Drug Lab Cleanup Program

Oregon Public Health Services, Environmental Services and Consultation

Cleanup of Clandestine Methamphetamine Labs (Draft)

Colorado Department of Public Health and the Environment

Meth and Clandestine Drug Labs

Minnesota Department of Health

Surface and Dermal Monitoring for Toxic Exposures

Ness, Shirley A.

1994, Van Nostrand Reinhold, New York.