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Standard Practice for the Assessment of Contamination at Suspected Clandestine Drug Laboratories

INTRODUCTION

This standard guide was introduced to bring uniformity to the process of sample collection and assessment of contamination at clandestine drug laboratories in general and clandestine methamphetamine laboratories in particular.

This standard is issued under the fixed designation X XXXX; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1. The purpose of this standard practice is to describe good and customary procedures for the assessment of contamination at suspected clandestine laboratories.

1.2. This standard practice is not intended to supercede the professional judgment of law enforcement personnel in the collection of evidentiary material for criminal proceedings or professional Industrial Hygienists cognizant of sampling theory and operating with specific data quality objectives (DQOs) other than those presented here.

1.3. This standard practice presumes that the user has a fundamental understanding of field investigative techniques related to the scientific process, and sampling plan development and implementation. This standard establishes the hypotheses to be tested in order to characterize residual methamphetamine related contaminants.

1.4. The purpose of this Standard is to provide a standard format to assess the characterization of contamination at clandestine laboratories.

1.5. *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish*

appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

2.1. ASTM Documents

2.1.1. ASTM Method D3278-96e1 *(October 1997), Standard Test Methods for Flash Point of Liquids by Setaflash Closed Tester.*

2.1.2. ASTM Method D93-02a (December 2002), *Standard Test Methods for Flash Point by Pensky-Martens Closed Tester.*

2.1.3. ASTM D5730-04 *Standard Guide for Site Characterization for Environmental Purposes With Emphasis on Soil, Rock, the Vadose Zone and Ground Water*

2.1.4. ASTM E1727-05 *Standard Practice for Field Collection of Soil Samples for Subsequent Lead Determination*

2.1.5. ASTM D4700-91(1998)e1 *Standard Guide for Soil Sampling from the Vadose Zone*

2.1.6. ASTM Method D5756-02 (November 2002), *Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Mass Concentration*

2.1.7. ASTM Method D6044-96 (2003), *Standard Guide for Representative Sampling for Management of Waste and Contaminated Media*

2.1.8. ASTM Method D6051-96 (2001), *Standard Guide for Composite Sampling and Field Subsampling for Environmental Waste Management Activities*

2.1.9. ASTM Method D6311-98 (2003), *Standard Guide for Generation of Environmental Data Related to Waste Management Activities: Selection and Optimization of Sampling Design*

2.1.10. ASTM E1188 *Standard Practice for Collection and Preservation of Information and Physical Items by a Technical Investigator*.

2.2. **Non-ASTM Documents**

2.2.1. Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup, EPA-560/5-86-017 (May 1986)

2.2.2. *Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup* Midwest Research Institute's publication titled (referenced in 40 CFR § 761.130).

2.2.3. Guidance for the Data Quality Objectives Process, EPA QA/G-4 EPA/600/R-96/055 (September 1994)

2.2.4. RCRA Waste Sampling Draft Technical Guidance Planning, Implementation, and Assessment EPA530-D-02-002 (August 2002)

2.2.5. Colorado State Board Of Health Department Of Public Health And Environment Regulation 6 CCR 1014-3 *Regulations Pertaining to the Cleanup of Methamphetamine Laboratories* (Adopted January 19, 2005)

2.2.6. US EPA *Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods*, EPA Publication SW-846

2.2.7. EPA Environmental Investigations Standard Operating Procedures and Quality Assurance (EISOPQA) Manual.

2.2.8. National Institute for Occupational Safety and Health (NIOSH), U.S. Department of Health and Human Services (DHHS), NIOSH Manual of Analytical Methods (NMAM), 4th. Ed., DHHS (NIOSH) Publication No. 94-113 (August, 1994), 1st supplemental publication 96-135 (1996), 2nd supplement publication 98-119 (1998): Method 6009, Mercury (Issue 2, August 1994).

2.2.9. NIOSH Method 9100, Lead in Surface Wipe Samples (Issue 2, May 1996)

3. Terminology

3.1. ASTM Standard Definitions

3.1.1. Reserved

3.2. Standard-Specific Terms

This section provides definitions, descriptions of terms and a list of acronyms for many of the terms specific to this standard practice.

3.2.1. Building means a structure which has the capacity to contain, and is designed for the shelter of, man, animals, or property, or place adapted for overnight accommodations of persons or animals, whether or not a person or animal is actually present. Building includes manufactured homes, campers, trailers, recreational vehicles, boats and mobile homes.

3.2.2. Bulk Sample - sample of physical material collected for analysis.

3.2.3. Chemical storage area means any area where chemicals associated with the processing of controlled substances are stored or have come to be located.

3.2.4. Cleanup level means the numerical value, established in this Standard, that causes the consultant to determine if an area is compliant or noncompliant based on the results of sampling conducted in accordance with this standard.

3.2.5. Collocates- QA/QC samples that share the same spatial, but not necessarily the same temporal parameters. Collocated samples are not necessarily collected using the same methods of sampling or analysis. Collocates are qualitative positive controls.

3.2.6. Compliant – The decision levels indicate the decision statement (Section 7.2.3) has been met.

3.2.7. Component sample means any individual sample that forms a portion of a composite discrete sample.

3.2.8. Consultant means an Industrial Hygienist, or other qualified professional, who is not an employee, agent, representative, partner, joint venture participant, shareholder, parent or subsidiary company of the contractor.

3.2.9. Contaminant means a chemical residue associated with the processing of controlled substances that may present an immediate or long-term threat to human health and the environment.

3.2.10. Controlled substances are defined by the United States Controlled Substances Act (CSA), Title II of the Comprehensive Drug Abuse Prevention and Control Act of 1970.

3.2.11. Cooking area means any area where controlled substance processing is occurring or has occurred.

3.2.12. Data Quality Objectives (DQOs)- Qualitative and quantitative statements derived from the "DQO Process" (see below) that clarify assessment objectives, define the appropriate type of data, and specify the tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions.

3.2.13. Data Quality Objectives Process- A quality management tool based on the Scientific Method to facilitate the planning of environmental data collection activities. The DQO Process enables planners to focus their planning efforts by specifying the intended use of the data (the decision), the decision criteria ("ab/normal," "un/acceptable," "anticipated" levels of contamination) and the sampler's tolerable decision error rates. The products of the DQO Process are the DQOs (see above).

3.2.14. Decision level means that concentration, relative to the cleanup level, that shall be used to distinguish between compliant and non-compliant areas.

3.2.15. Decontamination means the process of reducing the level of contamination to the lowest practical level using currently available methods. At a minimum, decontamination must reduce contamination of specified substances below either the extant regulatory limits or the concentrations specified by this Standard.

3.2.16. Discrete sample means any single sample or composite of samples that results in a single reported analytical result.

3.2.17. Drug laboratory for the purposes of this Standard is synonymous with "methamphetamine laboratory" and means the areas where unauthorized controlled substances, their precursors or wastes, have been manufactured, processed, used, cooked, disposed, or stored and all proximate areas that are likely to be contaminated as a result of such manufacturing, processing, cooking, use, disposing, or storing.

3.2.18. Field blank – Sample collection media that has been handled in every respect like a

normal sample, but with which no sample has actually been collected. The field blank (designated as "BX") is a quantitative negative control.

3.2.19. Field duplicate – A QA/QC sample of identical methodology collected contemporaneously alongside another sample. The field duplicate (frequently designated "Dup") is a qualitative positive or negative control.

3.2.20. Flagged – Data from samples that are "flagged" exhibit some parameter that is out of tolerance with this Standard. Flagged data or flagged samples may or may not exhibit sufficient confidence to be used, however, the totality of the integrity of the sample has been compromised in some manner. Flagged data may be used with caution.

3.2.21. Functional space means a space where the spread of contamination may be expected to occur relatively homogeneously, compared to other functional spaces. The functional space may be a single room or a group of rooms, designated by a consultant who, based on professional judgment, considers the space to be separate from adjoining areas with respect to contaminant migration. Other typical examples of functional spaces include a crawl space, an attic, and the space between a dropped ceiling and the floor or roof deck above.

3.2.22. Independent means that a person is not an employee, agent, representative, partner, joint venturer, shareholder, or parent or subsidiary company of another person.

3.2.23. Individual sewage disposal system or ISDS means an absorption system of any size or flow or a system or facility for treating, neutralizing, stabilizing, or disposing of sewage which is not part of or connected to a sewage treatment works.

3.2.24. Industrial Hygienist: Extant state or local regulations respected, Industrial Hygienist means an individual who has obtained a baccalaureate or graduate degree in industrial hygiene, biology, chemistry, engineering, physics, or a closely related physical or biological science from an accredited college or university sufficient in the cognate sciences to provide the ability and competency to (a) anticipate and recognize the environmental factors and stresses associated with work and work operations and to understand their effects on individuals and their well-being; (b) evaluate, on the basis of training and experience and with the aid of quantitative measurement techniques, the magnitude of such environmental factors and stresses in terms of their ability to impair human health and well-being;(c) Prescribe methods to prevent, eliminate, control, or reduce such factors and stresses and their effects. Extant State or local regulations respected, any individual who has practiced industrial hygiene within the scope of the meaning of industrial hygiene prior to January 1, 1995, is exempt from the degree requirements set forth in this section.

3.2.25. Media means the physical material onto which a sample substrate is collected. Media includes cotton gauze, glass fiber filters, MCE membranes, etc.

3.2.26. Methamphetamine means dextro-methamphetamine, levo-methamphetamine, and unidentified isomers of the same, any racemic mixture of dexto/levo methamphetamine, or any mixture of unidentified isomers of methamphetamine. The term includes derivatives, conjugates, oxides, and reduced forms of the basic structure associated with CAS registration number 537-46-2. For the purposes of this Standard, this term also includes amphetamine (CAS 300-62-9), ephedrine (CAS 299-42-3), and pseudoephedrine (CAS 90-82-4).

3.2.27. Microvacuum sample or Vacuum sample means a non-airborne sample collected from a known surface area of a porous surface or material using standard microvacuum sampling techniques as described in this standard.

3.2.28. PARCC – A QA/QC acronym used to describe five decisional parameters of analytical data: Precision, Accuracy, Representativeness, Comparability, and Completeness. There parameters are used to determine if the data meet the DQOs.

3.2.29. Person means any individual, public or private corporation, partnership, association, firm, trust or estate; the state or any executive department, institution, or agency thereof; any municipal corporation, county, city and county, or other political subdivision of the state; or any other legal entity whatsoever which is recognized by law as the subject of rights and duties.

3.2.30. Preliminary assessment means an evaluation of a property to determine the current condition, including the nature and extent of observable or detectable contamination, chemical storage and disposal pursuant to this Standard.

3.2.31. Property means anything that may be the subject of ownership or possession, including, but not limited to, land, buildings, structures, vehicles and personal belongings (clothes, toys, jewelry, appliances, money, documents, etc.).

3.2.32. Publicly owned treatment works or POTW means a publicly owned domestic wastewater treatment facility. The term also means the municipality, as defined in 502(4) of the Clean Water Act, 33 U.S.C. § 1362(4), which has jurisdiction over the indirect discharges to and the discharge from such treatment works.

3.2.33. Readily Visible, Readily Observable - describes items, components and/or systems that are conspicuous and that may be observed visually during the site inspection that does not rely on extraordinary measures in order to access, remove materials, or conduct exploratory probing. Inspection of these items should not require the use of

special protective clothing or the use of special equipment to access.

3.2.34. Sampling Design Error - the error due to observing only a limited number of the total possible values that make up the population being studied. It should be distinguished from errors due to imperfect selection; bias in response; and errors of observation, measurement, or recording.

3.2.35. Substrate means the material being collected. Substrates may include soils, water, painted surfaces, carpet debris, unidentified powders, dust, etc.

3.2.36. Swab Sample – synonymous with "wipe sample.".

3.2.37. Vehicle means any mobile object which otherwise meets the definition of a building.

3.2.38. Waste disposal area means any area where chemicals used or generated in the processing of controlled substances are disposed or have come to be located.

3.2.39. Wipe sample means a surface sample collected by wiping a sample media on the surface being sampled in accordance with this Standard.

Note: This Standard is not an all inclusive list of permissible sampling techniques.

4. Significance and Use

4.1. Concern over exposures to contaminants as a result of controlled substance use and production has greatly increased since the early 1990s. When methamphetamine is smoked, between 80% (1) and half (2) of the substance is released from the user's pipe. Of that material which is inhaled an additional 10% (3) to 337% (4) is further released in to the surrounding environment. Recent work (5) indicates that a single use of methamphetamine, by smoking, would result in an average residential area ambient airborne concentration of methamphetamine ranging from 35 micrograms per cubic meter (µg/m3) to over 130 µg/m3. These authors found that smoking methamphetamine just once in the residence will result in the surfaces being contaminated with methamphetamine and occupants will be exposed.

4.2. Furthermore, it is also now known that merely entering a clandestine laboratory where methamphetamine has been smoked or processed, can result in significant exposures to the casual occupant. (6)

4.3. Standardized characterization of contamination is missing from the international community and such characterization has the potential of being a very useful tool in a variety of investigations, including but not limited to, building assessments, property transactions, criminal investigations and human exposure assessments.

4.4. This standard practice is intended for use on a voluntary basis by professionals experienced in sampling theory for the collection of data, pursuant to established data quality objectives, focusing on the presence/absence of controlled substance related contamination.

4.5. Nothing in this Standard is intended to supercede local, State or Federal regulations. It is the responsibility of the user to assure that all local, State and Federal regulations related to sample collection and controlled substances related activities are being met.

4.6. This Standard will provide a systematic and repeatable procedure that will result in consistency of characterization thus addressing, but not quantifying, systematic errors, making comparisons between different data sets more tenable and making comparisons to reference values more tenable.

4.7. In the drafting of this Standard, it has been assumed, that the execution of its provisions is entrusted to personnel who are appropriately qualified and/or experienced in sampling theory.

4.8. This Standard, when properly executed, may also be used for the enumeration of other types of specified contaminants that were airborne and/or may have partitioned or plated out onto surfaces.

4.9. Clandestine controlled substance laboratories present unique hazards that may be beyond the expertise and training of many professionals otherwise experienced in environmental assessments. Such hazards frequently include encounters with armed criminals, purposely made anti-personnel devices such as fragmentation bombs, grenades, booby-traps (explosive devices, secondary incendiary devices, hidden electrical triggers, refrigerator bombs, trip wires, razors, needles, poisonous snakes, and biological hazards (7)). These devices are not passive environmental hazards but are purposely built threats intended on killing or maiming meth-lab evaluators and assessors. Specialized training in law enforcement techniques, and personal safety may be required prior to the assessment of clandestine laboratories. Specialized training and personal protection equipment (such as proper firearms training) and monitoring equipment may be appropriate to address the unique hazards presented at clandestine laboratories.

5. Preliminary Assessment- Property

5.1. A preliminary assessment shall be conducted by the consultant prior to the commencement of any property decontamination. Information gained during the preliminary assessment shall be the basis for property decontamination and clearance sampling. Contractors and consultants shall use appropriate personal protective equipment and monitoring devices during the preliminary assessment. Access to the property should be coordinated with local law enforcement officials and shall be limited to those with appropriate training and personal protective equipment. Information collected during the preliminary assessment shall include, but not be limited to, the following:

5.1.1. Property description including physical address, legal description, number and type of structures present, description of adjacent and/or surrounding properties, and any other observations made.

5.1.2. Review of available law enforcement reports that provide information regarding the processing method, chemicals present, cooking areas, chemical storage areas, and observed areas of contamination or waste disposal.

5.1.3. Identification of structural features that may indicate separate functional spaces, such as attics, false ceilings and crawl spaces, basements, closets, and cabinets.

5.1.4. Identification of manufacturing and processing methods presumed or suspected based on observations and law enforcement reports.

5.1.5. Identification of chemicals used, based on observations, law enforcement reports, and knowledge of manufacturing method(s).

5.1.6. Identification and documentation of areas of contamination. This identification may be based on visual observation, law enforcement reports, proximity to chemical storage areas, waste disposal areas, or cooking or processing areas, or based on professional judgment of the consultant; or the consultant may determine that assessment sampling is necessary to verify the presence or absence of contamination. If the consultant determines that assessment sampling is necessary, such sampling shall be conducted in accordance with the sampling protocols presented in Section 7.

5.1.7. Identification and documentation of chemical storage areas.

5.1.8. Identification and documentation of waste disposal areas.

5.1.9. Identification and documentation of cooking or other processing areas.

5.1.10. Identification and documentation of controlled substance usage areas.

5.1.11. Identification and documentation of signs of contamination such as staining, etching, fire damage, or outdoor areas of dead vegetation.

5.1.12. Inspection of plumbing system integrity and identification and documentation of potential disposal into the sanitary sewer or an individual sewage disposal system

(ISDS). If the consultant determines that field screening and/or sampling of an ISDS is necessary to determine if lab wastes have been discarded into an ISDS, such field screening and/or sampling shall be conducted in accordance with the field screening and sampling protocols found in Section 7.5.4 of this Standard. Sample analysis shall be conducted in accordance with the method requirements presented in Appendix B.

5.1.13. Identification of adjacent units and common areas where contamination may have spread or been tracked.

5.1.14. Identification and documentation of ventilation systems including common ventilation with adjacent units or common areas.

5.1.15. Photographic documentation of property conditions, including cooking areas, chemical storage areas, waste disposal areas, and areas of obvious contamination.

6. Preliminary Assessment – Personal Items

6.1. Personal property such as clothing, toys, numismatics, appliances, etc. are known to become contaminated during the casual use of methamphetamine (8) and/or the production and processing of controlled substances and must either be properly assessed in accordance with this Standard or decontaminated to the cleanup levels specified in Section 8.2 of this Standard, unless otherwise specified by State or local regulations.

6.2. Personal property that will not be discarded must be sampled in accordance with procedures described below and in Section 7 of this Standard. Discrete samples must be collected from each individual item, except as provided in Section 7.

7. Sampling Protocols

7.1. Sampling Theory

The type of sampling used for stationary structures and vehicles described in this protocol is a type of sampling recognized as “authoritative” sampling. Authoritative sampling is a nonstatistical sampling design that does not assign an equal probability of being sampled to all portions of the population. Consultants using this protocol should have *a priori* knowledge of the property to be assessed and a knowledge of the method of use and clandestine production of controlled substances. The *a priori* knowledge, in the hands of a competent consultant, permits immediate inclusion/exclusion of sampling areas, based on professional judgment. As such, the weight of validity of the data gathered with authoritative sampling is largely dependent on the knowledge and competency of the consultant.

With authoritative sampling, it is not possible to accurately estimate the concentration *variance* within a property as a whole. Also, due to its potentially subjective component, the use of authoritative sampling to demonstrate compliance with a regulatory standard is generally not advisable except in those cases that are anticipated for this Standard (small volumes of waste and where contaminants in the property under study is either well above or well below the cleanup level). ASTM recognizes (Ref. 2.1.9) two types of authoritative sampling: judgmental sampling and biased sampling; both of these sampling theories are used in this protocol.

7.1.1. Judgmental Sampling: The goal of judgmental sampling is to use process and site knowledge to choose one or more sampling locations to represent the highest contaminant concentration within the context of the sampling area. Judgmental sampling designs can be extremely useful and cost-effective *if* the consultant choosing the sampling locations has sufficient knowledge of the history of the laboratory under study. It is recognized that this sampling method is not entirely objective since the consultant choosing the sampling locations could possibly and/or intentionally distort the sampling by a prejudiced selection, or if their knowledge in the laboratory in question is inadequate. In those cases, judgmental sampling can lead to incorrect results being presented to the consultant.

7.1.2. Biased Sampling - *Biased* sampling is the type of authoritative sampling that intends not to estimate average concentrations or typical properties, but to estimate "worst" or "best" cases (as described in ASTM D6051-96 (2001)). As described later in this protocol, the aim of the consultant performing post-decontamination sampling is to demonstrate the worst case scenario in the clandestine laboratory. The term "biased," as used here, refers to the collection of samples with expected high concentrations. For example, a sample taken at the source of the actual "cook," known release, process area, use area, spill or storage area could serve as an estimate of the "worst-case" concentration found in that functional space. This information would be useful in identifying the contaminant and estimating the maximum level of contamination likely to be encountered during a cleanup. Biased sampling, while having the ability to cost-effectively generate information, has similar philosophical disadvantages to that of judgmental sampling.

7.2. **Hypothesis Testing**

The foundation for the usefulness of any sampling protocol rests upon the establishment of appropriate data quality objectives (DQOs). Without such DQOs, sampling occurs in a vacuum and the strength of the results of the sampling may be extremely limited.

The DQOs are, in turn, driven by a thought process that proceeds from defining the problem, then quantifying the degree of the problem, defining what decisions are to be made based on the

resulting data, and the degree of quality needed to ensure that the decision goals can be met. All sampling has error; all analysis has error. No realistic sampling and analysis protocol has a 100% guarantee of definitively characterizing any area or condition. Therefore, a realistic sampling and analysis protocol is one that minimizes error, and optimizes cost effectiveness, while increasing the probability that the DQOs will be met.

This sampling protocol begins with the end in mind; it is based on asking specific questions, and conducting sampling and analysis to answer those questions. In general, this protocol will rely heavily on maximizing the use of existing law enforcement, investigation, analytical and historical information (including process knowledge), thus reducing unnecessary, costly data-gathering activities, while at the same time ensuring that building occupants and the public are not placed at unnecessary risk due to residual contamination. The protocol is not a substitute for professional judgment, but must be utilized by cognizant professionals in the application of their professional skills. Neither is this Standard a "cook-book" recipe that if followed, complete characterization is guaranteed, and risks are assumed to be zero. The evaluation of any specific area must necessarily be based on the totality of the circumstances.

This protocol has been divided into two distinct sets of DQOs; one for the preliminary (pre-decontamination sampling) and one for the post-decontamination sampling. The essential difference between the two lies in the hypotheses that are being tested.

7.2.1. Pre-decontamination sampling: In pre-decontamination assessments, the question that is being asked is: "Is there evidence of the presence of controlled substances in this area?" The assumption (hypothesis) is that the area is clean i.e. "compliant," and data will be collected to find support for the hypothesis. Data (such as samples) are collected to "prove" the area is compliant. Sampling, if it is performed, is conducted in the areas potentially containing the highest possible concentrations of contaminants. Any data that disproves the hypothesis, including police records, visual clues of production, storage, or use or documentation of drug paraphernalia being present, is considered conclusive, and leads the consultant to accept the null hypothesis and declare the area non-compliant. The strength of evidence needed to reject the hypothesis is low, and is only that which would lead a reasonable person, trained in aspects of clandestine laboratories, to conclude the presence of controlled substances, its precursors as related to processing, or waste products.

7.2.2. Post Decontamination sampling: In post decontamination assessments, the question that is being asked is: "Does this contain contaminants in excess of the decision threshold?" The hypothesis is the area is non-compliant, and data is collected to test the hypothesis. In theory, the ability to prove the hypothesis necessarily becomes more difficult as the area becomes cleaner; and virtually impossible to prove in an

area that is completely devoid of contamination. The lack of data supporting the hypothesis leads the consultant to accept the null hypothesis and conclude that the area is compliant. Therefore, the role of the consultant in post decontamination sampling, is not to demonstrate that the area is "clean," but rather, using bias sampling, to diligently attempt to prove, that the area is not clean. The strength of evidence needed to accept the null hypothesis is great; and failure to support the hypothesis results in increased confidence that risks have been greatly reduced.

7.2.3. Decision Statement: If, based on the totality of the circumstances, the consultant finds that insufficient evidence exists to support the hypothesis that any given area is non-compliant, that area shall be deemed to be "compliant," and shall be released. If objective sampling data collected pursuant to this Standard indicates contamination is less than the cleanup level, that data may be used as *prima facie* evidence that insufficient evidence exists to support the hypothesis that any given area is non-compliant.

7.3. **General Requirements**

7.3.1. Except as provided in Section 7.3.3, assessment sampling shall be conducted as part of the preliminary assessment to characterize the nature and extent of contamination. Assessment sample laboratory analysis shall be conducted in accordance with Appendix B of this Standard.

7.3.2. Sample collection and the preservation of information will generally comply with Ref. 2.1.9

7.3.3. As provided in Section 5.1 of this Standard, the consultant may determine that some areas should be deemed to be contaminated based on data other than assessment sampling. Areas that are deemed to be contaminated do not need to be sampled as part of the preliminary assessment.

7.3.4. Post-decontamination clearance sampling shall be conducted to verify that cleanup standards have been met. Sample collection and laboratory analysis shall be conducted in accordance with the procedures set forth in Section 7 and Appendices A1 and B of this Standard.

7.3.5. Sample handling, including labeling, preservation, documentation, and chain-of-custody, shall be conducted in a manner consistent with the requirements of the analytical method being used.

7.3.6. Analytical methods shall be based on the compound of interest. Sample analysis shall be conducted in accordance with the method requirements presented in Appendix B of this Standard.

7.3.7. If the property has an ISDS, evaluation and sampling of the ISDS shall be conducted in accordance with Section 7.5.4 of this Standard. The investigation and cleanup of soil, surface water and groundwater contamination resulting from disposal of lab wastes into an ISDS shall be conducted in accordance with applicable state and federal rules and regulations.

7.3.8. Quality Control/Quality Assurance (QA/QC) samples, including sample blanks, field duplicates, matrix spike and matrix spike duplicates, shall be collected and/or analyzed as specified in the sampling and analysis protocols presented in Section 9 of this Standard. Laboratory QA/QC shall be conducted in a manner that ensures that the DQOs are met.

7.3.9. To prevent any real or potential conflicts of interest, consultants conducting preliminary assessments and post-cleanup assessments must be independent of the company or entity that will subsequently conduct the drug lab cleanup. Except:

7.3.9.1. Consultants need not be independent of the company or entity that will subsequently conduct the drug lab cleanup if both the consultant and the cleanup entity are employees of the property owner, provided the property owner was not involved in drug manufacturing that resulted in contamination of the property.

7.4. Location and Number of Samples

7.4.1. Locations of samples shall be based on information gathered during the preliminary assessment. Samples shall be collected from:

7.4.1.1. Areas expected to have the highest levels of contamination, such as cooking areas, use areas, processing areas, chemical storage areas, and waste disposal areas.

7.4.1.2. Accessible areas where contamination may have migrated, such as adjacent rooms or units, common areas, ventilation systems and septic systems.

7.4.2. The number and type of samples shall be based on the size of the area or material, the chemical or contaminant of interest, and the purpose of the sample (i.e., initial assessment or final clearance).

7.4.3. Discrete sampling is required in all cases, except as provided in 7.4.4 of this Standard.

7.4.4. Composite sampling may only be conducted in situations where contamination is expected to be relatively evenly dispersed throughout a given area, and composite

sampling will provide an accurate representation of the area sampled, as described in Appendix A1.

7.4.5. Buildings and Structures

Except as provided in Section 7.4.5.4, the required samples for any functional space shall be composed of no fewer than three discrete samples. Should composite samples be collected, each composite shall consist of no greater than five discrete samples collected in accordance with the procedures outlined in the section in this appendix on Composite Sampling.

Where the drug laboratory is located in a structure other than a single-family dwelling, the potential of fugitive emissions must be considered. For example, if the functional space was located in an hotel room, and evidence of contamination extended into the corridor, the elevator, the lobby, and one adjacent room, there would be four separate functional spaces to evaluate: 1) The primary hotel room, 2) the corridor/elevator complex 3) the lobby, 4) the adjacent hotel room.

Except as provided in Section 5.1, each functional space exhibiting indicia of contamination shall be sampled. For example, where a single-family dwelling meets the definition of a drug laboratory, and an associated detached garage contains indicia of contamination, the dwelling and the garage shall be evaluated separately.

For drug laboratories whose structural floor plan is not greater than 1,500 square feet, surface sampling shall be collected according to the following schedule: (Exception: for pre-decontamination scenarios, any and all other data may be used in lieu of sampling to reject the hypothesis and deem the area to be contaminated.)

7.4.5.1. For any given *functional space*, at least 500 cm_2 of surface shall be sampled, unless the area is assumed to be non-compliant.

7.4.5.2. At least 1,000 cm_2 of total surface area must be sampled for any single laboratory identified.

7.4.5.3. An additional 100 cm_2 must be sampled for every additional 500 square feet of structural floor space.

7.4.5.4. No fewer than five discrete samples shall be collected from any laboratory.

7.4.6. Vehicles

For drug laboratories in vehicles, surface sampling shall be collected according to the following schedule. (Exception: for pre-decontamination scenarios, any and all other data may be used in lieu of sampling to reject the hypothesis and deem the area to be contaminated.)

7.4.6.1. A minimum of 500 cm2 of surface shall be sampled, unless the area is assumed to be noncompliant.

7.4.6.2. An additional 100 cm2 must be sampled for every 50 square feet of structural floor space for any large vehicle, such as a recreational vehicle, motor home, trailer, or camper.

7.4.6.3. No fewer than three discrete samples shall be collected from any laboratory identified in a vehicle.

7.4.6.4. The required sample area shall be composed of no fewer than three discrete samples. Should composite samples be collected, each composite shall consist of no greater than five component samples collected in accordance with the procedures outlined in the section in this appendix on Composite Sampling.

7.5. Sampling Procedures

7.5.1. Non-Porous Surfaces

7.5.1.1. Wipe Samples: Wipe sampling shall be used to determine the extent of contamination on non-porous surfaces. Wipe sampling shall not be used to demonstrate that cleanup levels have been met on porous surfaces. Wipe samples shall be collected in accordance with the procedures set forth below for either discrete or composite samples. Sample media may consist of one of the following:

7.5.1.2. Gauze material, including Johnson & Johnson cotton squares or equivalent.

7.5.1.3. Pharmaceutical grade, (USP or greater) isopropyl alcohol or USP (or greater) methanol.

7.5.1.4. Filter paper, including Whatman 40, 41, 42, 43, 44, 540, 541, Ahlstrom 54, VWR 454, S&S WH Medium, or other filter paper with equivalent performance.

7.5.1.5. The following procedure is for collecting wipe samples from non-porous surfaces:

1. Prepare a rough sketch of the area(s) to be sampled.

2. Attach disposable templates or masking tape to the area(s), or otherwise delineate the boundaries of the surface to be sampled, being careful not the touch the area within the template. The sample area selected shall not be less than 100 cm^2, unless otherwise required by the consultant's *a priori* DQOs.

3. The sample media should be wetted with distilled water or solvent (isopropyl alcohol or methanol) to enhance collection efficiency.

4. Use a new set of clean, non-powdered impervious gloves for each sample to avoid contamination of the sample media by previous samples and to prevent contact with the substance.

5. Press the sample media down firmly, but not excessively, with the fingers, being careful not to touch the sample surface with the thumb. Blot rough surfaces uniformly instead of wiping. Wipe smooth surfaces as described below.

6. Wiping may be done by one of the following methods:
   a. Square method: Start at the outside edge and progress toward the center of the surface area by wiping in concentric squares of decreasing size.
   b. "S" method: Wipe horizontally from side-to-side in an overlapping "S"-like pattern as necessary to completely cover the entire wipe area.

7. Without allowing the sample media to come into contact with any other surface, fold the sample media with the sampled side in.

8. Use the same sample media to repeat the sampling of the same area. If using the "S" method, the second pass shall be sampled by wiping with overlapping "S"-like motions in a top-to-bottom direction.

9. Fold the sample media over again so that the sampled side is folded in. Place the sample media in a sample container, cap and number the container, and note the number at the sample location on the sketch. Include notes with the sketch giving any further description of the sample.

10. At least one sample media blank, treated in the same fashion but without wiping, should be submitted for every 10 samples collected.

11. At least one field duplicate per lab.

7.5.1.6. When collecting composite samples, the procedure outlined above shall be used with the following exceptions:

1. A single pair of gloves may be used to collect all component samples that will be part of a composite sample. However, a new pair of gloves must be used for each discrete sample.

2. All component samples that make up a composite sample must be placed in one sample container.

7.5.2. Porous Surfaces

7.5.2.1. Vacuum Sampling

Vacuum sampling shall be used to determine the extent of contamination on porous surfaces, including carpeting, drapery, upholstery, clothing, and other soft goods. Vacuum samples shall be collected in accordance with procedures for sample collection described in Section 9 of Ref. 2.1.6.

Vacuum samples will be analyzed for controlled substances and/or derivatives in accordance with analytical methods described in Appendix B of this regulation.

Wipe sampling of porous surfaces may be conducted during the preliminary assessment, in lieu of vacuum sampling, in order to obtain a qualitative (absence or presence) identification of a chemical.

7.5.3. Outdoor Environments

For laboratories with outdoor components, or laboratories which are exclusively outdoors, the following sampling shall be performed when conditions indicate the potential for soil contamination. Sampling shall be conducted in accordance with the grid sampling method as described in Ref. 2.2.1 and 2.2.2. Surface samples shall be taken to a depth of no greater than 8 cm. Sample volume should be at least 100 cm^3 and no more than 250 cm^3. (Guidance on soil sampling can be found in Ref. 2.1.3, 2.1.4, 2.1.5 and 2.2.7). Additional subsurface samples may be required. Other outdoor surfaces should be evaluated based on best professional judgment. Wipe samples and destructive samples may be required.

7.5.4. Individual Sewage Disposal Systems (ISDS)

7.5.4.1. Purpose - The purpose of this section is to raise the level of awareness for the assessment of ISDSs and to establish a protocol for field screening and sampling ISDSs to determine if wastes associated with drug laboratories have been discarded in the ISDS.

The most common types of drug lab wastes that might be expected in an ISDS include:

1. Organic, aromatic, nonpolar solvents such as toluene, xylenes, paint thinner, white gas, etc.
2. Polar organic solvents such as ethanol and methanol;
3. Corrosives (e.g., sulfuric acid, muriatic acid, sodium hydroxide solutions); and,
4. Mixtures with residual ephedrine, methamphetamine, iodine or red phosphorus.
5. Reactive metals (lithium, sodium, potassium).
6. Heavy metals (particularly lead and mercury).

Field screening and sample collection shall be conducted to confirm or deny the presence of

controlled substance waste, and to ensure proper disposal of any controlled substances waste identified.

7.5.4.2.Field Screening

7.5.4.2.1. Field screening of septic tanks shall be conducted if there is evidence that drug lab wastes may have been discarded into an ISDS. Evidence of drug lab waste disposal into an ISDS includes, but is not limited to, the following:

1. Witness statements;
2. Stained or etched sinks, bathtubs, toilets;
3. Chemical odors coming from the ISDS plumbing or tank;
4. Visual observations of unusual conditions within the septic tank ("dead tank"); or, stressed or dead vegetation in a leach field.

Initial field screening shall consist of the following:

1. Monitoring the septic tank for volatile organic compounds (VOCs) using a photoionization detector (PID), flame ionization detector (FID), semiconductor detector or similar.
2. Testing the pH of liquid in the septic tank.

Additional field screening may be conducted, at the discretion of the consultant, to further investigate the possible presence of drug lab waste.

7.5.4.3.Sample Collection

7.5.4.3.1. If field screening indicates that the ISDS has been impacted by drug lab wastes, samples shall be collected from the septic tank to determine if the liquids in the tank contain a hazardous waste. The instructions for the correct usage of the sampling devices shall be followed. Samples shall be collected according to the requirements of the analytical method being used and the following protocol:

1. Prior to sampling, the number of chambers in the septic tank must be known.

2. Samples from single chamber tanks shall be collected from the baffle on the outlet end of the tank.

3. Samples from multi-chambered tanks shall be collected from the baffle on the outlet end of chamber one.

4. Samples must be representative of the wastes found in the septic tank. Sampling procedures may include the use of drum thieves, sludge judges or equivalent equipment.

5. Remove access cover from the first (or only) chamber and locate outlet baffle.

6. Move any floating surface matter away from the insertion point of the sampling device. Do not collect any floating matter in the sampling device.

7. Insert the sampling device into the tank, lowering it until it hits the bottom.

8. Trap the sample inside the sampling device.

9. Remove the sampling device and fill the laboratory supplied sample containers. The specific volume and type of sample container will be determined based on the type of analysis desired. For VOC analysis, two 40ml vials shall be filled, leaving no headspace.

10. Replace access cover at the completion of sample collection.

11. Samples may be collected in laboratory preserved bottles, or in unpreserved bottles. If the samples are collected in unpreserved bottles, the laboratory must be notified that the samples are unpreserved.

12. Sample containers shall be placed in a cooler with enough ice or ice packs to maintain a temperature of 4° C.

13. A Chain of Custody Record shall be maintained from the time of sample collection until final disposition. Every transfer of custody shall be noted and signed for and a copy of the record shall be kept by each individual who has signed it. Samples shall be sealed, labeled, and secured.

14. All sample documents shall be retained for the project record.

7.5.4.4.Quantitative Analysis

7.5.4.5. If field screening is indicative of a clandestine lab waste stream, the following analysis shall be conducted to determine if an ISDS has been impacted by clandestine labs wastes, and if the septic tank contains a characteristic hazardous waste:

1. VOCs using Method 8260B (Ref.2.2.6).

2. Ignitability/flash point by any of the following methods: Method 1010 (Ref. 2.2.6) Pensky-Martens Closed Cup Tester (Ref. 2.1.2), or Setaflash Closed Cup Tester (Ref. 2.1.1).

3. Corrosivity by Method 9040 (Ref. 2.2.6) or Method 1110 (Ref. 2.2.6).

4. Reactivity by Method 9014/9034 (Ref. 2.2.6)

If evidence suggests hazardous waste has been discarded in the ISDS, an investigation of potential environmental contamination of soil, surface water and groundwater resulting from the disposal of lab wastes into an ISDS shall be conducted in accordance with appropriate local and State regulations and Reference 2.2.7.

7.6. Composite Samples

7.6.1. Where composite samples are collected, they shall be collected pursuant to the provisions found in A1, Appendix A to this Standard.

7.6.2. Composite samples of personal items may be collected in accordance with the following procedure. Composite samples must be taken from items constructed of like materials that are contained within the same individual functional space (e.g., clothing from a bedroom closet may be sampled as a composite, fabric furniture within a living room may be sampled as a composite, draperies within an individual room may be sampled as a composite, non-porous goods such as wood or metal tables, shelves, cabinets, etc. in the same room may be sampled as a composite, etc.). A composite sample is considered representative of contaminant levels on all personal property of that type material within the same functional space. No more than 5 individual items may be included in any one composite sample. Should analysis of composite samples from multiple items indicate contaminant levels in excess of the cleanup level, all items comprising the composite sample will be considered to be in excess of cleanup levels.

8. Clean-up Criteria

8.1. **General Provisions**

Although it is not the purpose of this Standard to establish an health based threshold for contamination below which no adverse health effects are observed, in the absence of regulatory cleanup criteria, the applicability of sampling becomes limited at best, and useless at worst. In the absence of established or consensus toxicological NOELs (no observable [adverse] effect levels) or LOELs (lowest observable [adverse] effect levels), prudent application of existing clean-up levels becomes a necessity. At the time this Standard was prepared, several States in the United States had established recommended clean-up guidelines for residual contaminants associated with clandestine labs. None of the methamphetamine-based guidelines were based on toxicological assessments and only one of those was based on actual tenable published risk modeling (Ref (9)).

The application of this Standard is not incumbent on any one particular clean-up concentration and can be used with any selected concentration, referred to as the "decision level." However, in an effort to provide guidance to the user of this Standard, and in the absence of local, or State requirements, this Standard includes suggested decision levels for consideration by the consultant. The suggested concentration presented here reflects current state-of-knowledge and standard industry practice. (9)(Ref. 2.2.5)

8.2. **Decision Levels (non-mandatory).** All properties should meet some specified *a priori* decision level for controlled substances and other anticipated clandestine lab contaminants. The following decision levels may be used to determine if a property is significantly contaminated or to determine if a property has been adequately decontaminated. These decision levels may also be used during the preliminary assessment to demonstrate that a property, or portion of a property, is not contaminated. Additional decision levels that may be applied to a property shall be based on information gained during the preliminary assessment.

8.2.1. Surface wipe samples and vacuum samples for methamphetamine shall not exceed a concentration of 0.5 µg /100 cm^2.

8.2.2. If there is evidence of iodine contamination on materials or surfaces that will not be removed during decontamination, surface wipe samples for iodine shall not exceed a concentration of 22 µg/100 cm^2.

8.2.3. If the preliminary assessment indicates the phenyl-2-propanone (P2P) method of methamphetamine manufacturing was used:

8.2.3.1. surface wipe samples for lead shall not exceed a concentration of 4.0 µg /100cm^2

8.2.3.2. vapor samples for mercury shall not exceed a concentration of 1.0 µg /m^3.

9. Quality Assurance/Quality Control

Specific QA/QC samples should be part of the sampling plan, and will be dictated by the DQOs. However, in general, unless contradicted by specific DQOs:

9.1. One field blank shall be submitted for each sampling suite. To ensure the integrity of the blank, the blank shall not be identified to the laboratory.

9.2. One duplicate shall be submitted to the laboratory. To ensure the integrity of the blank, the black shall not be identified to the laboratory.

9.3. **Spikes:** Reserved (at this time, spiking is only available through a limited number of sources).

10. Documentation

10.1. A final report shall be prepared by the consultant to document the preliminary assessment and the post decontamination assessment (if any) and demonstrate that the property has been properly assessed pursuant to this Standard. For post-decontamination purposes, the documentation shall demonstrate the decision levels listed in Section 8.2 above of this Standard have been met. The preliminary assessment and/or post decontamination report shall include, (where applicable), the following:

10.1.1. Property description including physical address, legal description, ownership, number and type of structures present, description of adjacent and/or surrounding properties, and any other observations made.

10.1.2. Description of manufacturing methods and chemicals used, based on observations, law enforcement reports and knowledge of manufacturing method.

10.1.3. If available, copies of law enforcement reports that provide information regarding the manufacturing method, chemicals present, cooking areas, chemical storage areas, and observed areas of contamination or waste disposal.

10.1.4. A description of chemical storage areas, with a drawing documenting location(s).

10.1.5. description of waste disposal areas, with a drawing documenting location(s).

10.1.6. A description of cooking or processing areas, with a drawing documenting location(s).

10.1.7. A description of areas with signs of contamination such as staining, etching, fire damage, or outdoor areas of dead vegetation, with a drawing documenting location(s).

10.1.8. The results of inspection of plumbing system integrity and identification of sewage disposal mechanism.

10.1.9. A description of adjacent units and common areas where contamination may have spread or been tracked.

10.1.10. Identification of common ventilation systems with adjacent units or common areas.

10.1.11. . A description of the sampling procedures used, including sample collection, handling, and QA/QC.

10.1.12. A description of the analytical methods used and laboratory QA/QC requirements.

10.1.13. A description of the location and results of initial sampling (if any), including a description of sample locations and a figure with sample locations and identification.

10.1.14. Photographic documentation of pre- and/or post-decontamination property conditions, (as appropriate) including cooking, processing or usage areas, chemical storage areas, waste disposal areas, areas of obvious contamination, sampling and decontamination procedures, and post-decontamination conditions.

10.1.15. Consultant statement of qualifications, including professional certification or qualification as an industrial hygienist or consultant as defined in 3.2.8, and description of experience in assessing clandestine labs.

10.1.16. Certification of procedures and results, and variations from this Standard.

10.1.17. For post decontamination reports, in addition to the above requirements, the final documentation shall include:

10.1.17.1. A description of the known or believed decontamination procedures used and a description of each area that was decontaminated.

10.1.17.2. A description of the removal procedures believed to be used and a description of areas where removal was conducted, and the materials removed.

10.1.17.3. A description of the encapsulation procedures used (if any) and a description of the areas and/or materials where encapsulation was performed.

10.1.17.4. A description of the waste management procedures believed to be used, including handling and final disposition of wastes.

10.1.17.5. A description of the location and results of post-decontamination samples, including a description of sample locations and a figure with sample locations and identification.

10.1.18. A certification statement signed and dated by the consultant in one of the following forms, as appropriate:

10.1.18.1. “I do hereby certify that I conducted a preliminary assessment of the subject property in accordance with Section 5 of this Standard.”

10.1.18.2. “I do hereby certify that I conducted a preliminary assessment of the subject property in accordance with Section 5 of this Standard and that I conducted post-decontamination clearance sampling in accordance with Section 7 of this standard. I further certify that the property has been decontaminated as evidenced by testing I conducted.”

10.1.18.3. "I do hereby certify that I conducted a preliminary assessment of the subject property in accordance with Section 5 of this Standard. I further certify that the cleanup standards established by local or State regulation have been met as evidenced by testing I conducted."

10.2. **Labeling**

10.2.1.1. To ensure proper correlation between sampling result and sampling location/time, each sample shall have a unique sample identification.

10.2.1.2. The sample identification can be any sequence of alphanumerics that are not repeated anywhere in the sampler's logbooks, records or reports as used to identify a sample.

10.2.1.3. If the samples are marked with a manufacturer's unique cassette number, that value may be used.

10.2.1.4. If a custom identifier is used, the use of the sample date in the sample identification will reduce the probability of a repetitive identifier, and allow for rapid data retrieval.

10.2.1.5. Field blanks, collocates, field duplicates, spikes, and other QA/QC samples shall not bear any outward indication or marking that reveals the nature of the sample.

10.2.1.6. The sample information shall be logged or recorded in permanent fashion on a field sheet or logbook prior to attachment to the sample container.

10.2.1.7. All samples shall be marked with their unique identifier using indelible, non-smearing ink.

10.2.1.8. The analytical data from any sample not meeting these requirements shall be flagged by the person collecting the sample or interpreting the data.

APPENDIX A

(Mandatory Information)

A. COMPOSITE SAMPLING

A1 General Provisions

Composite sampling is permitted by this Standard, as described herein. The consultant may not use composite sampling unless, in their professional judgment, contamination is expected to be relatively evenly dispersed throughout a given area, such that the sampling will accurately represent the conditions of the drug laboratory within the context of the DQOs. If compositing is used, then the composite shall consist of no greater than five component samples. Any composite sampling must consist of like media, matrices or substrates. The mixing of media, matrices or substrates is not permitted. All component samples, from which any discrete composite is formed must be of equal volume (for liquids), equal surface area (for surface wipe sampling or vacuum sampling) or equal weight (for solids).

Composite sampling may be implemented using one of the following sampling designs. The consultant shall chose the sampling design based upon the specific conditions of the drug laboratory being assessed.

A2 Simple Random Composites

Figure A1(below) illustrates a simple random composite sampling design. In this figure, the sampled area could represent any surface or media about which a decision must be made (such as a series of walls, or carpeting or even contaminated soils).

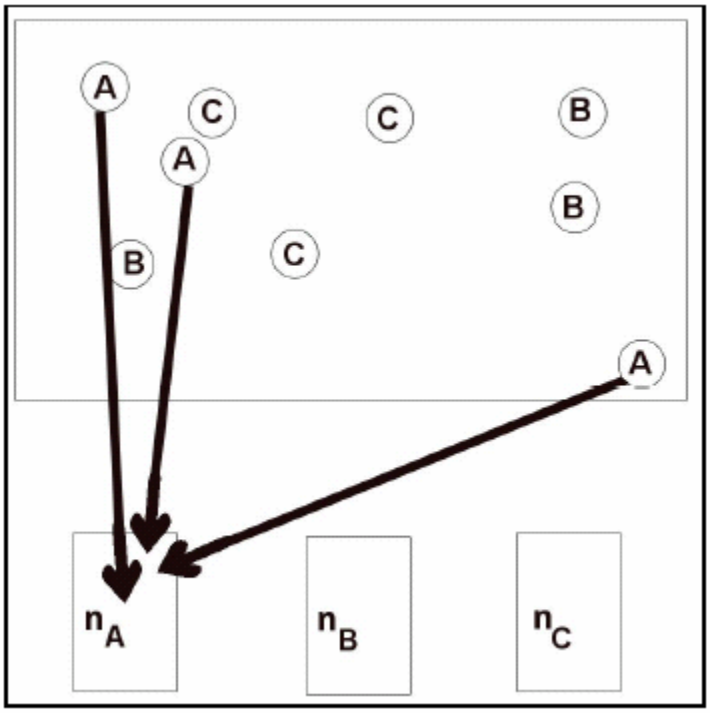

Figure A1
Example of Random Sample Composites

In the above example, nine component samples (n*g=9) are composited into three samples for submission to a laboratory (XA, XB, XC). The individual sample locations can be selected by any number of methods such as those as described in Ref. 2.1.8. or the "system of halves," as described in 40 CFR § 761.306, may also be used.

An example of the "system of halves" is provided below and illustrated in Figure A2.

1. Select the surface which represents the area of highest possible contamination
2. Divide the area in half with an imaginary line in any direction
3. Assign each half "heads" or "tails"
4. Flip a coin
5. Divide the "winning side" in half with an imaginary line in any direction
6. Flip a coin
7. Continue dividing the "winning" side until the winning side is between 100 cm^2 and 200 cm^2 and collect the wipe sample from that area
8. The method is repeated for each component (g) of the composite

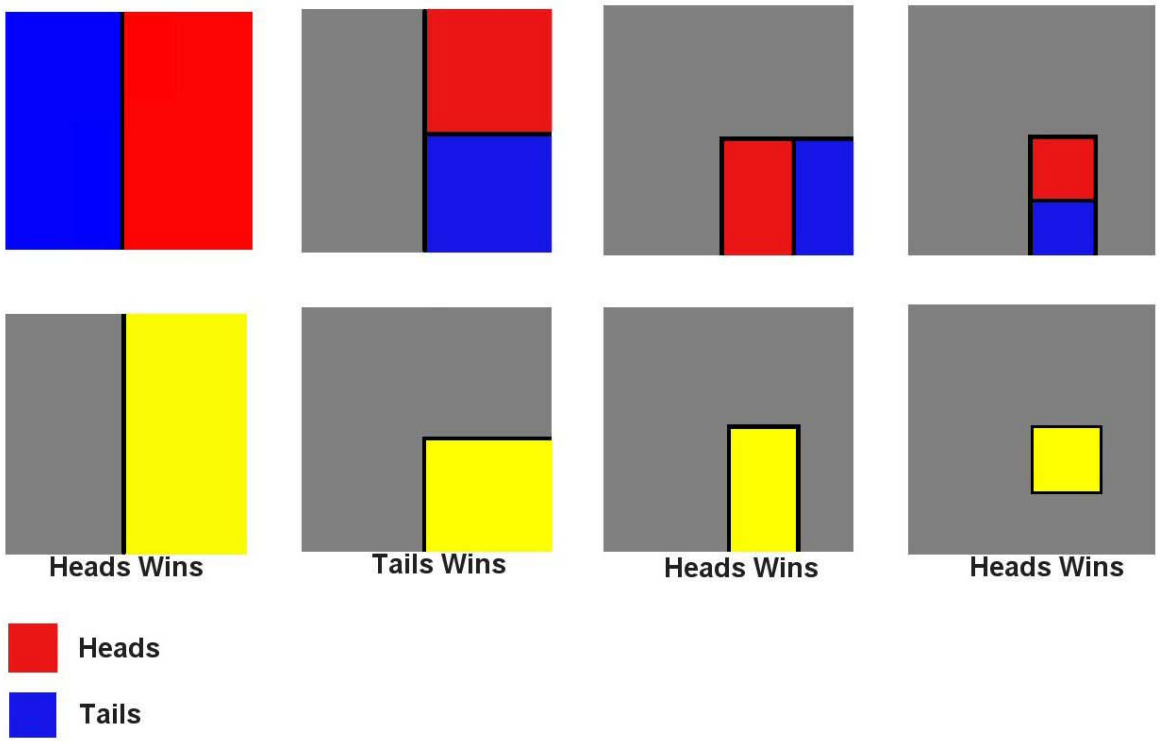

Figure A2

A3 Systematic Composite Sampling

A systematic composite sampling design is illustrated in Figure A3. Each component sample collected at the "A" locations is pooled and mixed into one composite sample. The process is then repeated for "B," "C," "D" locations and so on. The relative location and size of each individual field sample (such as "A") should be the same within each block.

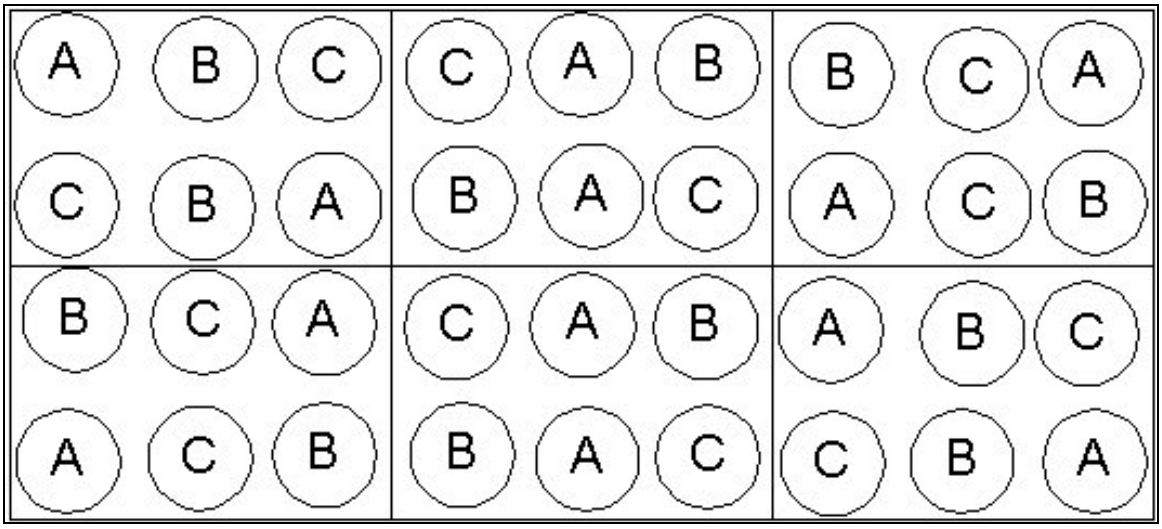

Figure A3
Example "A" of Systematic Sample Composites

A second type of systematic composite involves collecting and pooling samples from *within* a grid (See Figure A4).

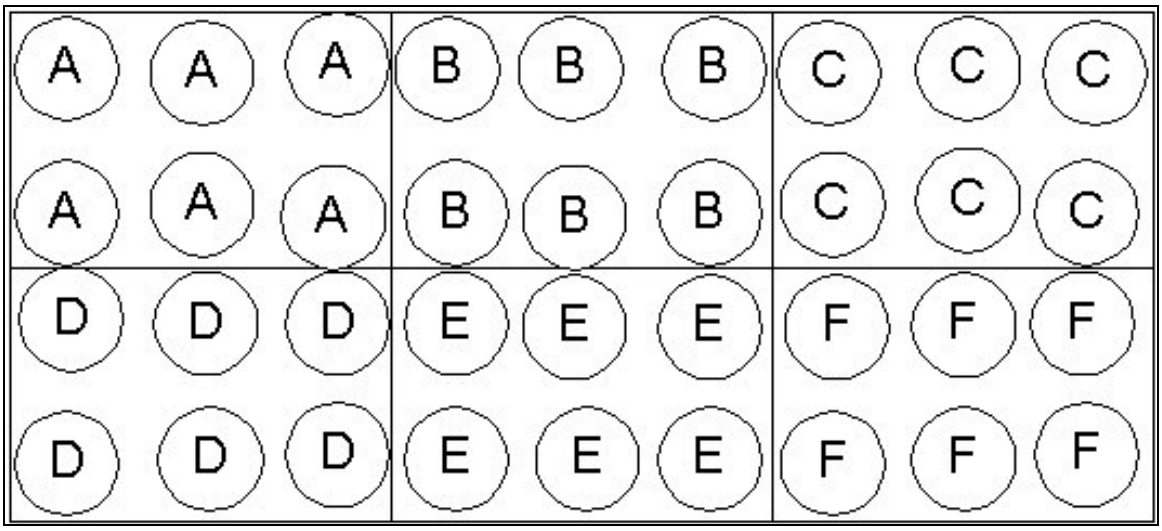

Figure A4
Example "B" of Systematic Sample Composites

For both assessment and post-decontamination sampling, either simple random composite sampling or systematic composite sampling may be used where contamination is expected to be relatively evenly dispersed throughout a given area, as described above, except the consultant shall selectively choose sample locations that represent the highest potential contamination, in accordance with the hypothesis being tested.

Appendix B

(MANDATORY INFORMATION)

ANALYTICAL METHODS

B Purpose

The purpose of this appendix is to establish standard analytical methods and procedures for use in identifying and quantifying contaminants resulting from the manufacture, storage or disposal of clandestine related chemicals and wastes. At the preparation of this Standard, validated methods for controlled substances were under development by various US Federal agencies. Upon publication of those validated methods, they will automatically become acceptable pursuant to this Standard.

B1 Analytical Methods

Except as provided in Section B above, the following analytical methods shall be used to determine the concentrations of chemicals in samples collected at properties used as clandestine drug labs:

1. Analysis of wipe samples and microvacuum samples for controlled substances shall be conducted using a Listed Laboratory (Ref. 2.2.5) or any other laboratory which participates in a nationally recognized quality assurance programme and includes controlled substances as part of that programme or has a documented quality assurance programme that would be considered compliant with Federal QA/QC programmes described elsewhere (Ref. 2.2.6) or a laboratory that uses forensic applications employing an isotopic dilution approach with the d-5, d-8, or d-14 deuterated methamphetamine as an internal standard, and external calibration with authentic methamphetamine.

2. Analysis of wipe samples and microvacuum samples for iodine shall be conducted using Method 9021 or Method 6020 (Ref. 2.2.6).

3. Analysis of wipe samples for lead shall be conducted using Method 9100 (Ref. 2.2.8.)

4. Analysis of vapor samples for mercury shall be conducted using Method 6009 (Ref. 2.2.8). Real time monitoring by cold vapor atomic absorption or Jerome gold film technologies may also be used.

The analytical methods specified in Section 7.5.4.4 shall be used to characterize liquid wastes associated with clandestine labs.

REFERENCES

(1) Cook CE, *Pyrolytic Characteristics, Pharmacokinetics, and Bioavailability of Smoked Heroin, Cocaine, Phencyclidine, and Methamphetamine* (From: Methamphetamine Abuse: Epidemiologic Issues and Implications Research Monograph 115, 1991, U.S. Department Of Health And Human Services Public Health Service Alcohol, Drug Abuse, and Mental Health Administration National Institute on Drug Abuse

(2) Cook CE, Jeffcoat AR, Hill JM, et al. *Pharmacokenetics of Methamphetamine Self-Administered to Human Subjects by Smoking S-(+)-Methamphetamine Hydrochloride*. Drug Metabolism and Deposition Vol. 21 No 4, 1993 as referenced by Martyny JW, Arbuckle SL, McCammon CS, Erb N, *Methamphetamine Contamination on Environmental Surfaces Caused by Simulated Smoking of Methamphetamine* (The publication of this study is currently pending. Copies of the study are available from the Colorado Alliance for Drug Endangered Children.)

(3) Cook CE, Jeffcoat AR, Hill JM, Pugh DE, et al *Pharmacokinetics of methamphetamine self-administered to human subjects by smoking S-(+)-methamphetamine hydrochloride* Drug Metabolism and Disposition, Vol 21, No. 4, pp. 717-723, 07/01/1993

(4) Harris DS, Boxenbaum H, Everhart ET, Sequeira G, et al, *The bioavailability of intranasal and smoked methamphetamine, Pharmacokinetics and Drug Disposition,* 2003;74:475-486.)

(5) Martyny JW, Arbuckle SL, McCammon CS, Erb N, *Methamphetamine Contamination on Environmental Surfaces Caused by Simulated Smoking of Methamphetamine* (The publication of this study is currently pending. Copies of the study are available from the Colorado Alliance for Drug Endangered Children.)

(6) Martyny JW, Erb N, Arbuckle SL, Van Dyke MV, *A 24-Hour Study to Investigate Chemical Exposures Associated with Clandestine Methamphetamine Laboratories*, August 11, 2005, Copies of the study are available from the National Jewish Medical Research Center, Denver Colorado and the United States Department of Justice Community Oriented Policing Services.

(7) Connell CP, Rocky Mountain HIDTA (Office of National Drug Control Policy) Clandestine Laboratory Training Program, Colorado Department of Public Safety, Division of Criminal Justice; (contract lectures from Forensic Applications Consulting Technologies, Inc., 2006).

(8) Deputy CP Connell, *Industrial Hygiene Retrospective Exposure Assessment*, Unpublished Criminal Investigation Documentation, 11th Judicial District, Colorado, November 11, 2004.

(9) Colorado State Board Of Health Department Of Public Health And Environment *Support For Selection Of A Cleanup Level For Methamphetamine At Clandestine Drug Laboratories* (February, 2005)