



Forensic Services Guide

Washington State Patrol
Forensic Laboratory Services Bureau

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PREFACE

Technological advances constantly create a need to update evidence manuals. Examinations have either been developed or further refined since the last revision of the guide. These examinations require additional considerations for careful evidence handling and protection.

The handbook is organized to provide the following:

- A description of forensic examination services provided by the Forensic Laboratory Services Bureau and the WSP High Tech Crimes Unit. This includes services offered by each functional area work group, the types of analytical techniques used for each evidence analysis, and a list of services we cannot provide. In the case of services we cannot provide, we make every effort to help the investigator find a suitable alternative for analytical needs.
- General guidelines for the collection, preservation, and packaging of physical evidence.
- The procedure for submitting physical evidence.
- Procedures for handling various types of physical evidence.

This guide is not meant to be a comprehensive reference source for the collection and handling of physical evidence. An attempt has been made to briefly highlight the basic principles and requirements for dealing with the more common evidence types. The handbook cannot replace the caution, care, and probing reflection that are the requisites of the thorough, successful investigator. The investigator is encouraged throughout the handbook to call the crime laboratory for assistance. This is probably the best advice that we can provide: The wise investigator seeks counsel.

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INTRODUCTION

FORENSIC LABORATORY SERVICES BUREAU

PO Box 42600
Olympia WA 98504
(360) 596-4120

The Forensic Laboratory Services Bureau of the Washington State Patrol (FLSB), with bureau headquarters in Olympia, consists of three divisions: the Crime Laboratory Division, the Toxicology Laboratory Division and the Impaired Driving Section. The Crime Laboratory Division consists of laboratories in Seattle, Spokane, Tacoma, Marysville, Vancouver, Kennewick, and Olympia. All forensic toxicology services for the State of Washington are conducted at the Toxicology Laboratory located in Seattle. See the Toxicology Laboratory manual (page 97 of this manual) for guidance on collection and submission of samples for this division. The WSP High Tech Crimes Unit has its offices in Olympia. See page 94 for information regarding collection and preservation of computer evidence.

The Washington State Patrol FLSB is mandated by the Legislature to provide criminal justice agencies within the state the scientific investigative support associated with matters of a criminal nature.

This handbook offers a fairly detailed list of services offered in each functional area and methods of analysis typically used in these examinations. Also, the handbook describes the types of services and analyses the FLSB does not provide.

Evidence from all types of crimes is accepted from local, county, and state law enforcement agencies. Other agencies are assisted on a cooperative basis when a special need arises.

The Washington State Patrol FLSB is responsible for providing scientific support and expert testimonies relating to physical evidence from crimes by:

- Assisting at the scenes of crimes.
- Performing scientific examinations and evaluations of physical evidence in order to provide information relevant to criminal investigations.
- Participating in pretrial consultations and by providing reports, charts, graphs, and other exhibits for court purposes.
- Providing expert testimony in court trials, hearings, and depositions.
- Providing training to the criminal justice community in crime scene investigation, the role and significance of physical evidence, and the handling, collection, preservation, and packaging of physical evidence.

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Section One

CRIME LABORATORY DIVISION



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CRIME LABORATORIES AND SERVICES

CRIME LABORATORY DIVISION

2203 Airport Way S, Bldg. A, Suite 250
Seattle, WA 98134
Telephone: (206) 262-6002
FAX: (206) 262-6091

LABORATORIES

Seattle Crime Laboratory

2203 Airport Way S, Bldg. A, Suite 250
Seattle, WA 98134
Telephone: (206) 262-6020
FAX: (206) 262-6033

- Services: Bio/DNA analysis
Crime scene response
Explosives analysis
Fire debris analysis
Firearms/tool marks examination
Integrated Ballistics Information System (IBIS)
Forensic chemistry
Clandestine lab analysis
Controlled substances analysis, including THC Quant
Microanalysis (trace evidence)

CODIS Laboratory

2203 Airport Way S, Bldg. A, Suite 250
Seattle WA 98134
Telephone: (206) 262-6054
FAX: (206) 262-6091

- Services: Management of Statewide CODIS Database
Convicted Offender DNA Typing

Spokane Crime Laboratory

580 W 7th St
Cheney WA 99004
Telephone: (509) 625-5401
FAX: (509) 625-5440

- Services: Bio/DNA analysis
Crime scene response
Explosives analysis
Fire debris analysis
Firearms/toolmarks examination
Forensic chemistry
Controlled substances analysis, including THC Quant
Latent Prints Analysis
Microanalysis (trace evidence)
Questioned Documents

Tacoma Crime Laboratory

2502 112th St E, Room 273
Tacoma WA 98445
Telephone: (253) 538-3207
FAX: (253) 538-3275

- Services: Bio/DNA analysis
Crime scene response
Explosives analysis
Fire debris analysis
Firearms/toolmarks examination
Integrated Ballistics Information System (IBIS)
Forensic chemistry
Clandestine lab analysis
Controlled substances analysis
Microanalysis (trace evidence)

Marysville Crime Laboratory

2700 116th St NE, Suite P
Tulalip WA 98271
Telephone: (360) 654-1201
FAX: (360)654-1213

- Services: Bio/DNA analysis
Crime scene response
Explosives analysis
Forensic chemistry
Clandestine lab analysis
Controlled substances analysis
Microanalysis (trace evidence)

Vancouver Crime Laboratory

1401 Kauffman Ave
Vancouver WA 98660
Telephone: (360) 993-3800
Fax: (360) 993-3899

- Services: Bio/DNA analysis
Crime Scene response
Fire debris analysis
Forensic chemistry
Clandestine lab analysis
Controlled substances analysis, including THC Quant

Kennewick Crime Laboratory

143302 E Law Ln
Kennewick WA 99337
Telephone: (509) 734-7022
FAX: (509) 734-7025

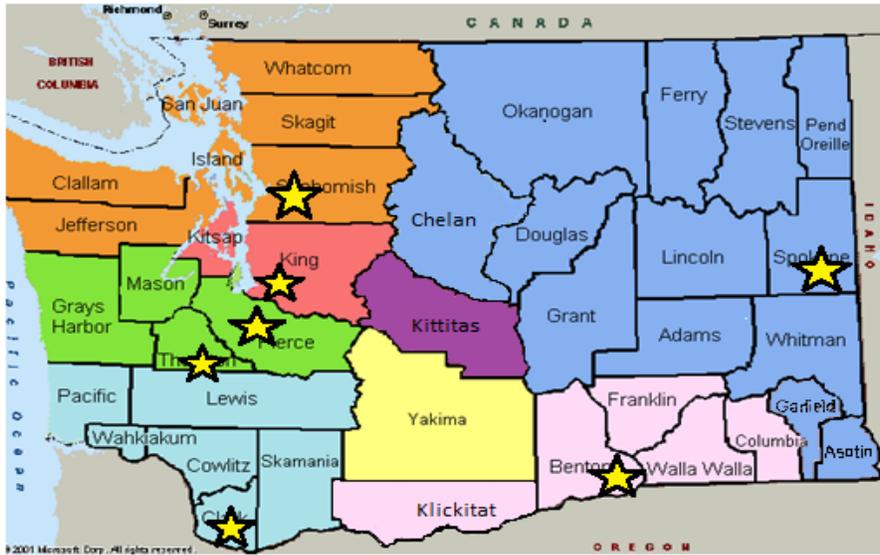
- Services: Controlled substance analysis
Clandestine lab analysis
Forensic chemistry

Olympia Laboratory

3310 Capitol Blvd
PO Box 42608
Olympia WA 98504
Telephone: (360) 596-4525
FAX: (360) 596-4470

- Services: Crime scene response
Latent prints analysis

CRIME LAB AREAS OF RESPONSIBILITY



Service Area	Case Type	Laboratory for Submission
ALL	Toxicology cases	Toxicology Lab – Seattle
ALL	Questioned Documents	Spokane
ALL	Convicted Offender database samples	CODIS - Seattle
Clark, Cowlitz, Lewis, Pacific, Skamania Wahkiakum	Latent Prints	Olympia
	Chemistry & DNA	Vancouver
	Firearms & Microanalysis	Tacoma
Yakima	DNA	Vancouver
	Chemistry	Kennewick
	Firearms, Latent Prints & Microanalysis	Spokane
Benton, Columbia, Franklin, Klickitat, Walla Walla	Chemistry	Kennewick
	DNA, Firearms, Latent Prints & Microanalysis	Spokane
Kittitas	Latent Prints	Spokane
	Chemistry, DNA, Firearms & Microanalysis	Seattle
Grays Harbor, Mason, Thurston, Pierce	Latent Prints	Olympia
	Chemistry, DNA, Firearms & Microanalysis	Tacoma
Clallam, Island, Jefferson, San Juan, Skagit, Snohomish, Whatcom	Firearms	Seattle
	Latent Prints	Olympia
	Chemistry, DNA & Microanalysis	Marysville
Adams, Asotin, Douglas, Chelan, Ferry, Garfield, Grant, Lincoln, Okanogan, Pend Oreille, Spokane, Stevens, Whitman	Chemistry, DNA, Firearms, Latent Prints & Microanalysis	Spokane
King, Kitsap	Latent Prints	Olympia
	Chemistry, DNA, Firearms & Microanalysis	Seattle

PROCEDURES FOR EVIDENCE SUBMISSION

The following procedures should be observed to properly prepare and submit physical evidence to the crime laboratory.

SHIPPING

- Check with your local crime laboratory to determine which state crime laboratory should receive the evidence. Most of the labs examine controlled substances; some types of examinations, i.e. firearms, questioned documents, latent prints are performed only at a specific laboratory. Toxicology evidence is examined at the Seattle location. Refer to the map (p. 11) to identify the appropriate laboratory.
- Choose a suitable evidence container so that the evidence can be securely packed and preserved during shipping. Each evidence item, if possible (see next bullet), **must** be wrapped, uniquely identified, and sealed separately to avoid contamination. Small items of evidence should be over-packaged into a container such as an envelope or plastic bag, no smaller than 5" x 7". Evidence is authenticated by marking it with a unique case identifier such as a case number, and a unique item identifier such as an item number. These identifiers must be on the evidence packaging or on the evidence item itself.
- If the evidence item cannot be fully packaged for submission to the laboratory (examples: a door, car hood, etc.), the area of interest must be protected and preserved when submitted to the laboratory. The submitted item still must have appropriate identifiers such as the case number and unique item number.
- Ensure the evidence containers are sealed, clearly marked, and allow the evidence to be repackaged easily after analysis. Seal the inside container and clearly mark it with the notation "EVIDENCE", the agency name, case number, and item number.
- Pack sealed evidence containers (envelopes, sealed paper bags, etc.) into the shipping container. Choose a shipping container that can be securely packed or wrapped and preserved during shipping. Ensure that sufficient padding material (bubble wrap, Styrofoam peanuts, etc.) is present in the shipping container available to prevent excessive movement of the sealed evidence container. For some sealed evidence items that are large, bulky, or otherwise difficult to pack into a shipping container, it is appropriate to securely wrap that evidence container for shipping. Specific guidance for proper packaging of different types of evidence is provided in subsequent sections.
- Place the completed [Request for Laboratory Examination](#) (Form WSP-3000-210-005) in an envelope and attach to or place inside the shipping container. Do not place the RFLE form inside sealed evidence. Laboratory personnel must be able to retrieve the form without breaking any evidence seals.
- Send the shipping container by U.S. Postal Service or other appropriate carrier to the regional crime laboratory. If using the U.S. Postal Service, send by Registered or Certified Mail with a Return Receipt requested. If using another carrier, request a formal notification of delivery.
- To ship firearms and ammunition, please refer to the requirements of your carrier. Federal regulations require that firearms and ammunition be shipped in separate containers.

NOTE: When threat-related mail is received, the first contact should be the FBI's Weapons of Mass Destruction coordinator. This individual has the responsibility for assessing the threat level and has a team of responders who can assess the nature of the threat, whether explosive, radiological or

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biological. The Crime Lab Division can analyze chemical and explosive materials and residues but is not equipped or trained for radiological or biological material threats.

Once the FBI has screened the evidence it may be submitted to the crime lab for chemical or explosives analysis, if appropriate, or to the Washington State Public Health Department Laboratory in Seattle for biological and radiological analysis.

The FBI Office/Seattle Weapons of Mass Destruction coordinator can be reached at (206) 622-0460.

The Washington State Public Health Laboratory can be reached at (206) 418-5450.

PERSONAL DELIVERY

- Personal delivery is the preferred method when the evidence is difficult to pack for shipping, very fragile, or if the evidence is perishable.
- Evidence concerning headlight filaments will be delivered in person to crime laboratories. See section titled "[Vehicle Lamp Evidence](#)" in the Materials Analysis section of this manual for further details on the proper packaging and handling of this type of evidence.
- Cases involving possible unexploded explosives analysis will be delivered in person to a laboratory that can complete these examinations. The agency will be asked to complete the CLD Explosive Safety and Evidence Checklist before submission ([Explosives Safety Checklist](#)). Note that post-blast evidence only may be shipped provided the investigator contacts the laboratory prior to shipping.
- Personal delivery allows the investigator to discuss the case and its complexities with the forensic scientist. It is advisable to telephone the crime laboratory and arrange for a meeting time with a forensic scientist when the evidence is delivered.
- Remember that sending evidence by messenger increases the length of the chain of custody. Do not send verbal instructions regarding the case with the messenger.

REQUEST FOR LABORATORY EXAMINATION (FORM 3000-210-005)

The Request for Laboratory Examination ([RFLE](#)) is the WSP form used for submitting evidence to the Crime Lab. This form must accompany all submissions of evidence to the crime laboratory. Instructions for the use of this form are printed on page 1 of the 2 page form. The form is available on the CLD website (<http://www.wsp.wa.gov/forensics/crimlabs.htm>) and should be completed electronically.

Some important points to remember when completing this form are as follows:

- Fill in all of the requested information. Incomplete forms cannot be accepted. If a suspect or victim name is unknown, indicate that in the appropriate block on the form.
- Link your current submission with any previous submission(s) from the same case. There is a convenient box near the top of the form for this purpose.
- Always list the most serious offense according to the Uniform Crime Reporting (UCR) system. Other offenses may also be listed.
- The phone number and email address of the investigator are important. The forensic scientist(s) working on the case may need to discuss the case with the investigator.
- List the items in order of priority (most important first and the order in which the requester would like the evidence examined). Use the item numbers (or alpha-numeric name) assigned to the

evidence and a very brief generic physical description to identify the item and its priority. Use the item number to list priority rather than just 1, 2, 3, etc.

- In order to improve the efficiency and effectiveness of the quality forensic services that we provide to your agency, please contact the laboratory prior to submitting cases with 6 or more exhibits of physical evidence. A laboratory scientist will discuss with you the best evidence to submit and priority of each exhibit.

If you have any questions regarding the use of the RFLE (laboratory request) or the submission of evidence, call the crime laboratory serving your area. The addresses and phone numbers of the crime laboratories are listed in the instructions and on pages 8-10 in this manual.

Once the evidence is submitted, the scientist may contact the investigator in order to determine the best approach to the examination of the evidence. If we do not have the analytical capability/resources to complete a specific examination, we will contact the agency with that information and possible solutions. The most effective use of Crime Lab Division resources may not allow us to examine every item submitted. For example, if multiple items are submitted in a single-suspect controlled substance case, only a single item may be analyzed and the agency would not receive pre-notification beyond what is described here. If specific items require analysis or if contact is requested prior to the examination, this should be clearly noted on the RFLE submitted with the evidence. Unless explicitly stated by the agency, submission of the RFLE is acceptance of CLD authority to approve technical deviations from test methods.

Sometimes it will be necessary to shift cases and evidence to one of the other CLD labs to make better use of our available laboratory resources. Each of the laboratories has equal analytical capabilities for evidence that is transferred. This is not considered a contractor/subcontractor relationship for laboratory analysis, since the laboratories have the same capabilities.

If it is necessary for the lab division to use a non-WSP lab, either in a subcontractor relationship or because we do not offer a particular type of analysis, it is our responsibility to contact the submitting agency with this information and what may be expected from this transfer and subsequent analysis.

GENERAL GUIDELINES FOR THE COLLECTION, PRESERVATION, AND PACKAGING OF PHYSICAL EVIDENCE

There are a number of general instructions that will be helpful to the investigator. Evidence requiring special handling will be discussed in the appropriate sections of this handbook.

A few precautions are continually repeated throughout the handbook. The reason for the repetition is that these precautions are important. Failure to observe them may seriously affect the evidence examination and, potentially, the outcome of the case. Precautions regarding bloodborne pathogens are mentioned repeatedly due to the hazards that biological materials present.

Some of the guidelines may vary with your departmental policies. The guidelines here express the manner in which the crime laboratory would prefer physical evidence to be collected, preserved, packaged, and submitted.

PRECAUTIONS

Biohazard Contamination

- The handling of items contaminated with biological fluids and stains presents hazards due to the possible presence of bloodborne pathogens. Hepatitis B (HVB) and AIDS (HIV) are of particular concern to those handling liquid blood or bloodstained items. Special care must be taken when handling such materials. It is strongly advisable to consult your agency "Bloodborne Pathogens Exposure Control Plan," which is required by WISHA (Washington Industrial Safety and Health Act).
- **Infectious evidence—Use universal precautions when handling biological specimens or stains** (i.e., act under the assumption that the specimen or stain contains a dangerous pathogen, particularly HIV or Hepatitis B, and proceed accordingly). Use appropriate protective equipment, such as face, eye, hand, and shoe protection. Pointed and sharp-edged objects must be handled with extreme care. Blind searches are definitely to be avoided. Searchers must not place their hands into any space that is not first visually inspected. Eyes must be protected if splashes are likely to occur.
- Eating, smoking, and the drinking of beverages at the crime scene must be prohibited. Shoes should be protected from blood on the floor or grounds. The tracking of blood beyond the perimeter of the crime scene must be avoided. Careful processing of the crime scene will minimize the risk of contamination of evidence and danger to the investigator.
- Good personal hygiene must be observed. The hands should be washed thoroughly after the removal of protective gloves, even if the gloves are not cut or punctured. Used protective gear must be disposed of in a manner specified by state and federal regulations.
- Any questions should be directed to the following:
Industrial Safety and Health Division, Department of Labor and Industries, Olympia: www.lni.wa.gov.

GENERAL GUIDELINES

- Meet legal requirements before entering the crime scene or collecting evidence.
 - Determine if a search warrant or court order is necessary before proceeding.

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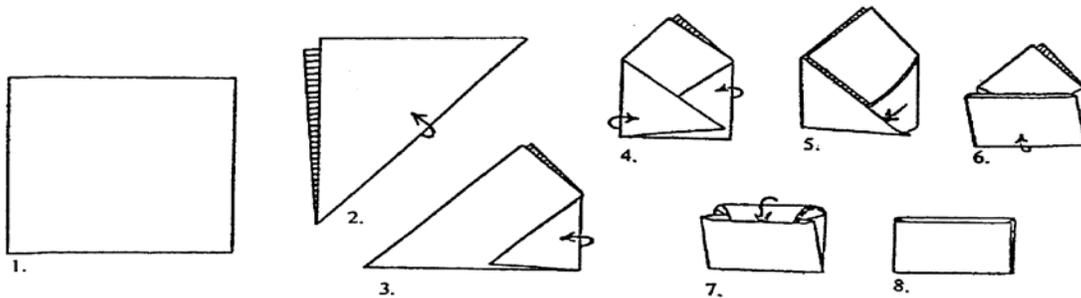
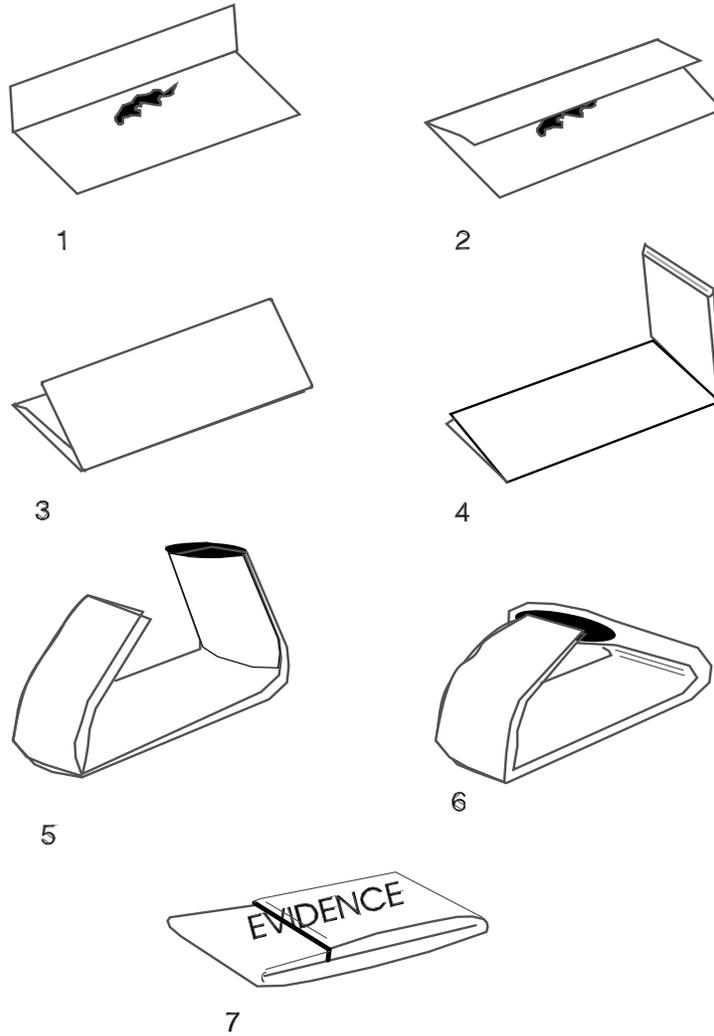
- Maintain a chain of custody. Proper documentation is necessary to prove the chain of possession from the time of collection until entered in evidence in court. It may be necessary to prove the integrity of the evidence at some later time.
- Take extra caution when collecting evidence, especially the first responders to a scene. Use gloves and possibly face masks to prevent contamination of potential biological evidence. Take steps to avoid contamination of latent evidence, such as fingerprints, shoeprints, etc.
- Collect a sufficient number and amount of samples. Remember that most of the time it is difficult, if not impossible, to return to the crime scene for more samples.
 - Collect small items of evidence on clean pieces of paper and fold the paper, seal, and label (see illustrations of paper folds at the end of this section). To avoid loss, seal these smaller items into a larger container such as an envelope or plastic bag no smaller than 5” x 7”.
- Labeling evidence: The following information should be noted on the container or attached tag:
 - Agency name and case number
 - Agency item number (same as listed on the RFLE)
 - Brief description of item
 - Source of item/name of subject (use actual name, not “suspect/victim”)
 - Location (where found)
 - Date/time of collection
 - Name or initials of person collecting item
- Preserving evidence: The general rule is to submit the evidence in the same condition as when collected. As with nearly all rules, there are exceptions. These exceptions are noted in the discussion of each evidence type (e.g., some evidence must be dried, refrigerated, or frozen).
 - The evidence must not be allowed to spoil, deteriorate, evaporate, or in any other manner be diminished in content or evidentiary value.
 - Biological stains, leather goods, plaster casts, and vegetable matter must be thoroughly dry before submission. After drying, this type of evidence is best stored in clean paper containers. Do not use plastic containers, if possible.
- Do not contaminate the evidence: The evidence must be handled in a proper manner so that no extraneous material or substance is added.
 - Place evidence directly into a container. Avoid placing the evidence on a surface, particularly one that is soiled or that may contain material similar to that of the evidence.
 - Handle the evidence as little as possible.
 - Package items separately so that transference of possible contaminants does not occur. Care must be taken to avoid leakage and/or breakage so that liquid samples, such as blood, do not leak on other items of evidence.
 - Protect a stain with a clean piece of paper so that when clothing is folded, the stain will not be transferred to another portion of the clothing. An accidental transfer may cause the forensic scientist to misinterpret the stain pattern.

- Sealing evidence:
 - Use nonremoveable tape or evidence tape to seal evidence. Evidence packages are properly sealed if the evidence inside is protected from loss or contamination and an attempt to enter the package would be noticed. Staples on envelopes or paper bags do not constitute proper seals. The open flaps of envelopes must be sealed with tape, and each strip of tape must be initialed. **The initials must be written across the tape and onto the container surface. It is also a good idea to include the date across the tape seal.** Particular care must be taken when sealing containers with controlled substances.
 - Bottles and jars must be capped tightly to avoid leakage and then sealed with tape. The tape must extend across the top of the lid and down both sides of the body of the container.
 - Take all precautions to avoid the loss of evidence. Package and seal the containers to avoid leakage, tearing, or the sifting of evidence through cracks or small openings. Small packages should be over sealed into an envelope or plastic bag not smaller than 5" x 7". Consider a double package process to protect trace evidence from being lost in a larger outer container.
 - It is not always practical or necessary to seal evidence in a container in order to protect it from loss, cross contamination or deleterious change. For example, containerization and sealing are not necessary for large items such as furniture, doors and windows, and automotive components which cannot be packaged and sealed in a practical manner. In this case, the area of the item that has forensic importance should be covered so that the area is protected. The covering should be clearly marked indicating the specific area of interest.

- Control/Reference samples:
 - Control (reference/known) samples are necessary when comparisons are to be made.
 - The substrate samples to determine whether the material (substrate) on which a stain is found interferes with the stain analysis may be submitted but will only be examined if necessary.

- Shipping evidence:
 - Ship evidence by the U.S. Postal Service using either Registered or Certified Mail. Other common carriers (UPS, FEDEX, etc.) are acceptable methods of shipping. Obtain proof of delivery service when using these services.
 - Federal law requires that firearms and ammunition be shipped in separate shipping containers. Check the requirements for your preferred carrier.
 - Follow special instructions involving the shipment of biological specimens. See the Biological Section of this manual (pages 22-33) or contact your local laboratory.
 - If the evidence is very fragile (such as vehicle lamps) or in some other way difficult to ship, it should be delivered personally.

HOW TO MAKE A PAPERFOLD



CRIME SCENE RESPONSE TEAM

INTRODUCTION

The complexity and demands of a major crime may overwhelm the resources of a law enforcement agency. The necessity to do a thorough and complete investigation is equally incumbent upon all agencies, regardless of resources and training. The Crime Scene Response Team (CSRT) has been established to respond to calls for crime scene assistance from law enforcement agencies within the state. The CSRT consists of forensic scientists and is a free service available for response 24 hours a day.

GOALS AND OBJECTIVES

The CSRT will respond to requests by law enforcement agencies and assist the agency in a thorough assessment and examination of the physical crime scene. This will be accomplished by:

- Responding in an expeditious manner to minimize the loss of evidence.
- Assisting in the processing of the crime scene by the recognition, collection, and preservation of pertinent physical evidence.
- Recording the crime scene in an appropriate manner, including photography, sketching, diagrams, and note-taking.
- Providing reconstruction of events where warranted.
- Providing the requesting agency with a written report.
- Providing expert testimony as needed.

CALLOUT CRITERIA

The CSRT will respond to the following situations:

- Death investigations (except traffic fatalities)
- Sexual Assaults
- Assaults/shootings involving a law enforcement officer
- Other crimes as warranted by circumstance and resources

CALLOUT PROCEDURE

Crime Scene Response Guidelines:

The following are the guidance criteria to be considered by the Crime Laboratory Division Crime Scene Response Coordinator in evaluating calls. These criteria are obviously not exhaustive and consideration of appropriate response will depend both on the nature of the case, the needs of the requesting agency, and the availability of scientists. Whenever appropriate, response will be scheduled for normal business hours. Examples of this would be vehicles which have been secured and impounded or are in police custody.

Before responding to any request, the requesting agency must have secured the scene and obtained a valid search warrant or otherwise legal permission to examine the scene.

Criteria to respond immediately:

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- In the investigation of a homicide where the body (bodies) of the victim (suspect) is still at the scene and the agency needs any of the following: bloodstain pattern analysis, trajectory analysis, latent print evaluation and collection, scene reconstruction, and evidence recognition and collection.
- Where the suspect(s) are unidentified and remain at large, presenting a danger to the public if not identified as soon as possible.
- In the investigation of a serious crime where it is beyond the expertise of the requesting agency to best preserve and collect evidence that may deteriorate due to the weather. Examples of this would be buried or scattered body remains.
- Any investigations that involve the closure of public areas, such as an officer involved shooting on a roadway.

Criteria for Non-response:

- At a scene that has been thoroughly searched by the agency and the Crime Lab is being called to confirm that no further useful forensic evidence is present.
- At a scene where the agency has no good investigative information that the vehicle/residence/location is associated with the crime.
- At a scene where there is no compelling forensic reason to respond. An example of this is searching for hairs/fibers in a vehicle to which it was known that the victim/suspect had prior access.
- At a simple scene where verbal directions on evidence collection and preservation can be given to a Detective/Evidence Officer.

Contact Information:

The requesting law enforcement agency can request assistance from the CSRT in one of the following methods:

- Contacting the local area laboratory.
- Contacting the CSRT Coordinator at (253) 255-3064.
- Contacting the local WSP Communications Center.

The Coordinator will communicate with the requesting agency to assess the agency needs and determine the level of response.

RELATIONSHIP TO REQUESTING AGENCY

The requesting agency will retain the responsibility, authority, control, and direction of the overall investigation.

With the exception of selected items for latent print enhancement, the CSRT will not transport evidence from the scene.

The requesting agency will be kept informed at all times of the status of the crime scene investigation.

The CSRT will not engage in any activity deemed unsafe, unethical, or in violation of accepted crime scene practices, Washington State Patrol regulations, or Washington State laws.

Any requests for information from the news media at the scene will be referred to the requesting agency.

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The CSRT will provide completed reports to the agency. All collected physical evidence will be maintained by the requesting agency.

The team members will be available for court testimony.

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BIOLOGICAL EVIDENCE

INTRODUCTION

The Washington State Patrol Biochemistry/DNA section is responsible for the forensic biochemical analyses of body fluids, stains, and cellular material (not associated with bodily fluids) and the DNA typing of biological evidence.

The majority of examinations begin with a screening procedure to identify the presence of biological material on items of evidence. When biological material has been identified from the screening process, a sample of the material can be taken for DNA analysis. Biological screening can involve a series of chemical tests to indicate the presence of a bodily fluid (Serology), or may be as simple as swabbing an item that has been reportedly touched or contacted in some way. The WSP crime lab system is capable of performing presumptive and confirmatory tests for blood and semen, and presumptive tests for urine, saliva, and feces. Limited “species of origin” testing to determine the possible nonhuman source of a biological stain can be provided for cat (felidae), dog (canidae), deer (cervidae), chicken (phasianidae), swine/pig (suidae) and cow (bovidae). Human DNA analysis (or typing) is the only type of DNA testing performed by the WSP Crime Laboratory. DNA typing is a process that involves chemically removing DNA from cells and applying molecular biology techniques to obtain a DNA profile that can be compared to other profiles. DNA profiles may be obtained from biological evidence items, or from reference/known samples collected from known individuals. DNA can be obtained from many biological sources (e.g. blood, semen, saliva, teeth, bones, hair, organs, skin, urine, and feces). DNA typing performed on biological evidence can be used to include or exclude an individual(s) as a possible source of biological evidence and/or can be compared to the Combined DNA Index System CODIS databank.

While it has been recognized that there is a potential for DNA recovery from touch samples, where the analyst is asked to target DNA from skin cells deposited by handling an item, this kind of evidence can present challenges in trying to interpret the resulting data. Samples that are likely to have been handled by multiple sources (e.g. swabs of door handles or samples which target suspect DNA from handling/pulling on victim’s clothing) can result in complex mixtures of DNA from multiple donors. Analysis of these samples often leads to limited (or no definitive) conclusions regarding inclusion or exclusion of a particular person of interest. As such, the WSP Crime laboratory will normally view these handling/touch samples as ‘samples of last resort’ and they will not be analyzed if other evidence with a higher potential for developing a probative profile is available.

The conclusions drawn from DNA evidence by DNA analysts can help law enforcement investigators:

- Identify a potential perpetrator.
- Exclude individuals not involved in the crime being investigated.
- Reconstruct the events related to the crime.
- Identify the weapon used.
- Locate the crime scene.
- Determine probability of parentage in criminal cases.
- In missing persons and unidentified remains investigations.

CASE ACCEPTANCE GUIDELINES FOR BIOLOGICAL EVIDENCE

In an effort to balance our limited resources with the needs of our customers, the increasing demand for DNA testing requires us to carefully evaluate lab requests that we receive. Despite the most current technologies to improve turnaround time for cases, our system still receives more cases each year than we are able to complete. Consequently, our DNA casework backlog continues to grow across the state.

The following case acceptance guidelines were established to improve our efficiency and promote analysis of evidence that is most likely to yield results. These guidelines will support efforts to improve customer service by reducing the backlogs and providing timely investigative information. There is great importance to and benefit from communication between customers and our DNA staff regarding case submissions.

DNA Case Acceptance Criteria:

- As discussed in the INTRODUCTION above, touch DNA samples rarely provide interpretable or CODIS-eligible profiles. Current laboratory resources cannot support the routine analysis of touch DNA samples (samples collected specifically for skin cells from handling objects). (Note that **wearer** DNA samples are generally not included in the touch category.) Examples of touch DNA samples include firearms evidence (bullets, magazines, cartridge cases, and firearms), swabs collected from firearm evidence, and samples collected from “public” surfaces (surfaces which have been in routine contact with many people). Exceptions may apply for cases involving violent crimes, if there is no other evidence, if applicable reference(s) are provided at the time of submission, and if written authorization is given to complete analysis on the submitted item(s) using the [Authorization for Consumption of DNA Evidence](#) form. Submissions of touch DNA cases should include discussions between customers and DNA staff.
- A “tiered-approach” to evidence submission will improve customer service. Customers should discuss evidence submissions with DNA staff, and first submissions will normally be limited to 5 items (not including reference samples.) These items must be listed on the required [DNA Case Supplemental Information](#) form in order of requested priority. Additional items may be submitted in a second tier through discussion with the DNA scientist or DNA supervisor.
- Property crime submissions will be limited to cases involving substantial property loss, cases that are part of a series, have a sexual component, involve crimes against government agencies, are associated with sentencing enhancements, involve thefts of large quantities of dangerous or hazardous materials, or indicate a public safety threat (the victim is home at the time of occurrence). However, we will discuss and negotiate property crime submissions in cases involving extraordinary circumstances. Property crimes should be limited to the submission of 2 items, and will require the [Authorization for Consumption of DNA Evidence](#) form and any suspect reference samples at the time of submission. Additional items may be submitted in a second tier through discussion with the DNA scientist or DNA supervisor.
- Chapter 247 Laws 2015, Section 1 requires that all law enforcement agencies submit a Request for Laboratory Examination form for all sexual assault examinations kits within thirty days of receipt if consent has been given by the victim or the victim is under the age of eighteen and not emancipated. Evidence associated with active investigations may be submitted at the same time as the Request for Laboratory Examination. For nonactive investigations, a Request for Laboratory

Examination (plus other supporting documentation listed below) should initially be submitted; evidence will only be accepted when requested by a DNA scientist or supervisor.

- Customers might also be asked to provide an [Authorization for Consumption of DNA Evidence](#) form if appropriate, to help expedite analysis. When possible, every effort is made to preserve at least half of the evidence; however, when dealing with limited samples, there may occur a need to consume the evidence during the course of DNA analysis. The WSP Crime Lab requires that the submitting agency (or a prosecutor) provide written authorization to consume the evidence, when needed.
- The customer should provide appropriate contact information (email, phone number) and provide information regarding their availability for an appointment to discuss the submitted DNA request. Please return our inquiry calls or emails within 21 days to avoid cancellation of the lab request and return of the evidence.

Required At the Time of Initial Submission

To improve the quality of customer service, we will request that the following items accompany initial case submissions:

- A case summary or copy of the incident report and the *Sexual Assault Kit Report* form (if applicable). The case information should contain a brief description of where (or who) evidence items came from. (Note that a forensic scientist may still need to contact you to obtain additional information about the case.)
- [DNA Case Supplemental Information](#) form (in addition to the RFLE.) Please indicate the evidence priority on this form.
- Reference samples from victim(s), suspect(s), and elimination/consensual partner(s) are required at the time of submission if possible. If you cannot provide references, please indicate the reason on the [DNA Case Supplemental Information](#) form.
- [Authorization for Consumption of DNA Evidence](#) form (this is required at the time of submission for sexual assault submissions with no charged individual and all property crime submissions.)

Note: The Firearms, Materials Analysis, Questioned Documents, and Latent Print Sections remain unaffected by this policy. For cases involving multiple examinations, this policy will only apply to evidence on which DNA analysis is requested.

TECHNOLOGY UTILIZED

DNA is chemically removed (or extracted) from biological cells. Real Time (RT) polymerase chain reaction (PCR) instruments determine how much DNA is present in the extracted sample (quantitation). Molecular biology techniques are then applied to obtain a DNA typing profile. A specific amount of DNA is then amplified using the PCR process, which targets the 13 core short tandem repeat (STR) loci recommended by the FBI and recognized by the Combined DNA Index System (CODIS), plus D2S1338, D19S433 and Amelogenin (a sex determining locus). Although it may not be possible to obtain results at all loci for every sample, the STR loci that may be examined are: FGA, D8S1179, D21S11, D7S820, CSF1PO, D3S1358, TH01, D13S317, D16S539, D2S1338, D19S433, vWA, TPOX, D18S51, D5S818. The amplified DNA is then run on a capillary based gel electrophoresis instrument, resulting in a DNA

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type for each locus. The typing results at each locus are compiled into what is referred to as a DNA typing profile.

If the amount of DNA in a sample appears insufficient to obtain a profile, the analyst has discretion to not amplify the sample. If multiple samples with similar probative value are quantitated (e.g. sexual assault evidence collection kit swabs), the analyst may choose which sample or samples (if any) to amplify based on case approach considerations, which may include discussions with the submitting agency and/or prosecutor.

Robotic liquid handling systems are used by the laboratory and may be employed during certain steps of the DNA typing process.

Y-STR

Y-STR analysis is similar to the standard DNA service offered, but focuses exclusively on male DNA.

Benefits and Applications:

- Samples where large quantities of female DNA may be obscuring the smaller male DNA component. Examples of appropriate cases and samples include:
 - Sexual assault cases where only digital penetration or penile penetration without ejaculation (or with use of a condom) occurred or when only oral assault occurred.
 - Sexual assault cases where the perpetrator has a low sperm count or is vasectomized.
 - Fingernail clippings from female victims, especially homicide victims, when it is expected that the perpetrator was male and that some sort of struggle may have occurred.
- Cases where a reference sample from a male victim or suspect is unavailable, but a sample from a male relative from the same paternal line is available.
- May be considered for use on cold cases that were previously unsuccessful with standard DNA typing. Please check with the lab that conducted the original testing. The original DNA extracts and/or additional suitable evidence items from the case must be available.

Limitations:

- All males with the same paternal lineage will have the same profile and thus will be indistinguishable from one another (i.e. a Y-STR profile is not unique and cannot identify a specific, single individual).
- Y-STR profiles are not eligible for CODIS so relevant reference samples must be submitted for comparison to any profiles generated before the testing will be attempted.
- Statistical weight of a Y-STR profile is significantly lower than standard DNA testing, so all other samples in a case that are potentially suitable for standard DNA testing should be exhausted before Y-STR testing is attempted.

The Washington State Patrol Crime Laboratory does not currently offer mini-STR typing, mitochondrial DNA typing (mtDNA), single nucleotide polymorphism (SNP) technology, animal DNA typing, or plant DNA typing. The WSP laboratory should be contacted if any of these services are required, and arrangements can be made with a federal or private laboratory to provide these services. Cases that meet certain circumstances may qualify to be worked by a federal agency or a private lab at no cost to the submitting law enforcement agency.

BIOLOGICAL EVIDENCE UNIVERSAL PRECAUTIONS

ALL EVIDENCE ITEMS SUBMITTED FOR BIOLOGICAL TESTING MUST BE HANDLED USING UNIVERSAL PRECAUTIONS

The handling of biological fluids and stains presents hazards due to the possible presence of pathogens. Investigators (and other personnel transporting biological material) must use universal precautions (i.e., treat all evidence objects as sources of pathogens and take appropriate protective actions) when processing or transporting evidence.

Gloves must always be worn when handling potential biological evidence. Gloves must be changed frequently and always between handling evidence items (to avoid contamination between items). Additional personal protective equipment including Tyvek[®] suits, boot covers, masks, etc. may be needed to protect the collector and/or the potential biological evidence. No smoking, eating, or drinking, should be done around potential biological evidence items. Talking over or around potential evidence (such as cell phone conversations) should be avoided. Coughing, sneezing, or spitting around biological evidence should also be avoided.

Good personal hygiene must be observed. The hands should be washed thoroughly after the removal of protective gloves, even if the gloves are not cut or punctured. Used protective gear should be removed when exiting the crime scene and must be disposed of in a manner specified by your agency's Exposure Control Plan and health and state regulations. Please consult your agency Bloodborne Pathogens Exposure Control Plan, which is required by WISHA (Washington Industrial Safety and Health Act).

Any questions regarding health and safety should be directed to local health authorities or to the Industrial Safety and Health Division, Department of Labor and Industries, Olympia, Washington, at www.lni.wa.gov; Safety and Health Hot Line, 1-800-423-7233.

COLLECTION, PRESERVATION, AND SHIPPING OF BIOLOGICAL EVIDENCE

Collection

Evidence may be recovered from many sites: from the crime scene, from an evidence dump site, from a vehicle involved in the crime, from the suspect's body and clothing, and from the victim's body and clothing. In sexual assault cases, evidence such as penile swabbings from a suspect, the suspect's underwear (for victim's DNA), and fingernail/tip samples may be useful evidence. When appropriate, as much evidence as possible should be collected as quickly as possible from the bodies of the victim and suspect. Transitory evidence should be collected as the first priority. Biological evidence is fragile and can easily be destroyed. The recognition and recovery of such evidence must be performed properly by the investigator in order to make the best use of it. Please call your local laboratory for case specific recommendations.

The DNA laboratory should be contacted before any biological evidence is delivered for processing. The first submission of DNA evidence is limited to five items plus reference samples. The laboratory can help determine what evidence should be delivered and how that evidence should be processed to provide the best forensic examination possible. When several forensic disciplines are involved with one item of

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biological evidence, the item may be shipped between WSP laboratories for the examination to be completed in the appropriate order for that item (e.g. latent prints).

It is imperative that the victim receive immediate medical attention. Promptness of an examination will also permit medical personnel to retrieve any physical evidence before being lost through washing or cleansing. Commercial kits are available to assist the attending medical personnel in collecting specimens and controls required by the crime laboratory. The examination should be conducted in a manner which avoids the loss of evidence. The preferred sequence of the examination by medical personnel is to first examine and collect the clothing, then the external areas of the body, and finally the internal areas of the body.

The Harborview Center for Sexual Assault and Traumatic Stress has established guidelines for sexual assault medical evaluations and evidence collection for adults and adolescents. Please see the [Harborview](#) SANE Guidelines (Adult and Adolescent Sexual Assault Medical Evaluation) for more information. For evidence collection related to sexual assault: Sexual Assault Evidence Packaging Handbook.

There are generally three methods of collection recommended by the WSP Crime Lab.

- 1) Collect the entire item.
- 2) Collect a portion of the item.
- 3) Remove the biological material from the item.

Collecting the entire item

The best way to collect an item of biological evidence is generally to collect the entire item. This method of collection allows the laboratory to process the evidence with the potential involvement of several forensic disciplines (e.g. latent prints, materials analysis). It is critical to collect articles of clothing worn immediately after a sexual assault in which the suspect has deposited body fluid evidence on the victim. These may not be the clothing the victim wears to go to the hospital. In some cases it may be important to collect the clothes the suspect was reportedly wearing at the crime scene.

Collecting a portion of the item

If the entire item is not able to be collected because the item is too large (e.g. walls, concrete, flooring), a portion of the entire item may be removed. This method is preferred if it is necessary to preserve a stain pattern on a large item. A large enough area around the stain/pattern should be taken to avoid having the cutting instrument come in close contact with the biological material.

Removing the biological material from the item

Visible staining: If the item (or a portion of the item) is not able to be collected, the visible stain may be transferred off the object by swabbing(s) or scraping.

- **Swabbing:** Moisten a sterile cotton swab with clean water* (not dripping wet, just moist enough to dissolve the stain) and rub the stain. If the stain is small, collect it on a small area of the swab. Collect larger stains on as many swabs as necessary. Use a dry swab afterward to collect any remaining residue. If a moistened swab(s) is used, let it air dry.
- **Scraping:** If the body fluid can be easily flaked off a surface, use a new/sterile scalpel or razor blade and scrape it onto a clean piece of paper. If more than one stain is to be collected, use a new/sterile blade for each scraping. Present day testing is so sensitive that contamination of the blade from the previous stain may be detected. Fold and tape the paper closed.

Non-visible biological material: If the item (or a portion of the item) is not able to be collected, but a non-visible stain or cellular/contact material is suspected to be present, the area may be swabbed. Latent print analysis may need to be considered before an area is generally swabbed.

- If the stain is not visible or to collect cellular/contact material from an item, moisten a sterile cotton swab with clean water* (not dripping wet) and swab the area on the item. Use a dry swab afterward to collect any remaining residue. This technique is referred to as the “wet/dry technique”. If a moistened swab(s) is used, let it air dry.
- The wet/dry swabbing technique should be used for swabbing areas on the body that may have been licked, kissed, or bitten. A nearby substrate sample from the skin may be taken.

Lotions or lubricants: Collect large deposits of oils, lubricants, creams or ointments in a glass test tube or vial. Otherwise, wipe the area of the deposit with a sterile damp swab(s) and follow it with a sterile dry swab(s). Sterile gauze may also be used to collect the deposit. A substrate control may be collected from a deposit-free area, adjacent to the deposit.

*It is always preferable to use sterile, deionized water to moisten swabs. If this is not possible, clean water should be used. Commercially bottled water may be an appropriate option. A control swab, moistened with the water used then air dried, may be submitted.

Preservation

Bacterial action, mold, sunshine, moisture, and warm temperatures can damage the evidentiary value of biological evidence due to the damage or destruction of DNA.

Proper packaging:

- Each item, including each article of clothing, should be packaged separately. Transference of materials between items must be avoided.
- Use clean paper bags, envelopes, cardboard boxes, or some other breathable packaging material to package evidence to avoid the accumulation of moisture inside the package. Do not use plastic bags or containers. The presence of moisture enhances bacterial growth.
- Because resealing generally uses up some of the volume in a bag, do not package objects placed into bags tightly; leave room so the packages can be resealed after examination. Comforters, blankets, pillows, coats, and other large items should be packaged in a way that allows them to be repackaged easily at the end of the forensic examination. Additional items produced during the examination (e.g. DNA extracts, microscope slides, etc.) may also need to be included in the item’s original packaging.
- Label each item with a case number, item number, date, item description, source and/or location.
- Evidence tape or other nonremovable tape should seal any openings. Initial across the tape. The date may also be appropriate to add across the seal. All packaging should have tape over any openings to ensure that small particles are not lost. Only tape or self-adhesive seals should be used. No envelopes should be licked to seal.
- Evidence must be properly packaged and sealed to prevent any loss or contamination.

Proper drying:

Evidence items, stains, and swabs must be thoroughly dried at room temperature without the use of heat. Partially dried items will be subject to bacterial action and mold, destroying their value as evidence.

Generally the best way to preserve biological evidence is dry and frozen. Although freezer storage is preferred, DNA typing results can be obtained from properly dried evidence stored refrigerated or at room temperature for an extended period of time. If freezing is not an option, biological evidence should be stored in a cool, dark, and dry place. Some items that require special packaging consideration are:

- Bottles/containers with liquid: The liquid should be removed using a pipette or by poking a hole in the bottom of the receptacle. Liquid should not be dumped out due to potential biological evidence around the opening/lip/mouth area of the container. The removed liquid may be preserved in a sealable plastic container.
- Condoms: For condoms with a small amount of liquid, the liquid should be allowed to dry before packaging. If the liquid cannot be dried, the condom should be packaged so that the liquid cannot spill out of the condom. A new/sterile twist tie or clamp may be used so biological material from the inside of the condom is not mixed with the biological material on the outside of the condom. Secure the condom in packaging such as a plastic specimen jar or conical tube to keep it upright and leak proof, and then freeze the item.
- Metal objects/rocks: guns, knives, rocks, aluminum baseball bats, etc. should not be frozen, as condensation forms upon removal of these objects from the freezer. These objects should be stored in a cool, dark, dry place.

Shipping

Items must be packaged in a way that will allow them to be handled and transported safely. A few examples include:

- Knives/Firearms/sharp items: should be placed in a new cardboard box and secured with plastic zip-ties. (See the firearms section of this manual for shipping safety procedures for firearms).
- Glass: should be secured in a cardboard box, padded, marked “fragile” and “glass” on the outer packaging.
- Blood tubes: any glass tube packaged for shipping must be cushioned and protected from breaking (this includes tubes used to store sexual assault swabs). Wrap the tube in absorbent material (e.g., enough tissue paper or towels to absorb the contents if it should break) and place in a small, resealable plastic bag. Tape top edges together with evidence tape. Place the bag into a second bag and seal, and then place this into a Styrofoam mailing container and seal container. Styrofoam containers are commercially available. Blood tubes should never be frozen, they may be refrigerated. If liquid blood tubes are included in the sexual assault kit, they should be removed when the kit is placed in freezer storage.

Items should not be marked “biohazard” or “blood” on the outer packaging for shipping.

REFERENCE/KNOWN SAMPLES

A reference/known sample is a taken from an individual under supervised circumstances. A chain of custody must be maintained on the sample from the time of collection. The DNA typing profile obtained from the reference sample is compared to any profiles from the evidence items. The reference sample may be collected by law enforcement, medical staff, or correctional staff. Offender DNA collection kits supplied by the WSP CODIS Crime laboratory should not be used for the collection of DNA reference samples involved in criminal cases. The reference sample should be shipped to the WSP laboratory doing the analysis on the evidence items in the case. Reference samples that arrive separate from and later than the other evidence may cause a delay in the processing of the case. If reference samples are not submitted

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with the initial laboratory request, the request may be cancelled unless other arrangements have been made in advance or sufficient justification is provided on the *DNA Case Supplemental Information form*. “Sufficient justification” may include an inability to obtain reference samples.

A “secondary” reference sample is a personal item (e.g. toothbrush, hair brush, comb) that is believed to be from an individual. This type of reference may be used when a “primary” reference is not available.

The reference samples that should be submitted are dependent on the case circumstances:

- Reference/known samples should be submitted from the victim(s), and suspect(s).
- References may also be required for elimination purposes (e.g. a consensual partner of a sexual assault victim).
- In missing person’s investigations, references may be requested from family members. Family member reference samples submitted to a WSP Crime Laboratory shall be accompanied with a [*Consent for Family Reference Sample Collection, Testing, and CODIS Entry*](#) form (available on the WSP CLD website: <http://www.wsp.wa.gov/forensics/crimlabs.htm>)
- If an evidence sample profile matches to an offender profile in the CODIS database providing an investigative lead, a reference sample will be requested to confirm the “hit.” The following are acceptable reference samples:

Methods of reference sample collection:

- A buccal (saliva) sample on swabs or FTA[®] paper* is the easiest method of collection for known/reference samples. When collecting a buccal sample, the individual’s mouth should be free of food, tobacco, and other substances. It may be appropriate to have the individual rinse and spit before the collection of the sample. The buccal sample can be collected by using 2-4 swabs. Rub and roll the swabs on the gums and inside the cheeks so that the sample collected has thoroughly coated the surface of the swabs. The swabs should be air dried and packaged for submission to the laboratory. If FTA[®] paper collection is also desired, the wet/moist swabs should be blotted and rubbed on the FTA[®] paper before the swabs are dried. The FTA[®] paper should also be air dried and packaged for submission to the laboratory. The swabs and/or the FTA[®] paper must be labeled with the name of the person from whom it was collected, or some case identifier to link the item to the individual.
- A blood sample on FTA[®] paper* may be collected. This type of sample is generally collected by medical staff using a finger lancet or blood draw. Liquid blood is blotted on the FTA[®] paper labeled with the name of the person from whom it was collected, or some case identifier to link the item to the individual. The FTA[®] paper should be dried and packaged for submission to the laboratory. This method of collection is recommended for a victim of sexual assault, especially when an oral assault is alleged.
- Liquid blood presents a biohazard for laboratory staff and is not a recommended method for reference sample submission. If liquid blood submission is the only available option, blood samples must be drawn into lavender-top tubes. (Grey-top tubes are used by the Toxicology lab for alcohol and drug screening. In some cases, typically vehicular assaults and vehicular homicides, you may need to collect blood samples in both types of tubes for separate submission to the crime laboratory and the Toxicology laboratory.). Both the tubes and the packaging must be labeled with the name of the person from whom the blood was drawn.
- Blood may be collected at autopsy. It is recommended that liquid blood be blotted on FTA[®] paper* for submission. If autopsy blood is not available or is in poor condition, other body

tissues can be used for reference/known samples. The crime laboratory should be contacted for recommendations.

*FTA[®] paper is recommended for long term storage of reference samples. Other types of absorbent paper are acceptable, but not recommended.

RETURN OF ITEMS

All DNA work product produced during sample analysis, including remaining DNA extracts from evidence (not reference samples – the extracts will be discarded), microscope slides, and sample cuttings or cellular material not subjected to DNA extraction, will be returned to the submitting law enforcement agency in a new, separate item. These items will be in a preserved format and can be stored at **room temperature** or lower.

The DNA Crime Laboratory Report will indicate the name of the new item in which DNA extracts and/or other work products are returned.

If you have any questions, please call your local crime laboratory. Phone numbers can be found in the Introduction to the Guidebook (pages 8-10).

CODIS PROGRAM

THE COMBINED DNA INDEX SYSTEM (CODIS) PROGRAM

The Washington State Patrol Combined DNA Index System (CODIS) is composed of different categories (or indexes) of samples, including:

- Offender: contains DNA profiles of Washington convicted offenders.
- Forensic: contains DNA profiles generated from crime scene evidence.
- Missing Persons: contains DNA records of missing persons and deduced missing persons.
- Relatives of Missing Persons: contains DNA records from the biological relatives of individuals reported missing.
- Unidentified Humans: contains DNA records from recovered living persons (e.g. children who can't and others who can't or refuse to identify themselves) and recovered dead persons (including body parts and tissues) whose identities are not known.

DNA casework analysts contribute the DNA profiles for all indexes except the Offender Index. If a DNA profile is generated from an evidence sample submitted to any of the DNA casework laboratories, it will be searched against the database if appropriate. Samples eligible for upload to the state CODIS database are automatically searched against the appropriate indexes and may result in an investigative lead for the submitting agency. Investigative leads may be due to a profile in the Forensic Index matching another Forensic Index profile (a forensic hit) or matching a profile in the Offender Index (an offender hit).

All fifty states, the District of Columbia, the U.S. Army Criminal Investigations Laboratory, and Puerto Rico submit eligible DNA profiles to the FBI-sponsored National DNA Index System (NDIS). DNA profiles at NDIS are searched on a regular basis against the appropriate indexes resulting in hits between WA State DNA profiles and profiles submitted by other NDIS participating laboratories across the nation. In addition to the indexes listed above, NDIS maintains additional indexes such as the Arrestee Index and Detainee Index which are populated by entities that have the legal authority to collect DNA samples from these individuals.

Offender DNA samples are collected by law enforcement agencies across the state using collection kits provided at no charge by the CODIS Laboratory. Washington State law allows for the collection of a DNA sample for any person convicted of a felony or any of the following non-felonies:

- Stalking
- Harassment
- Communicating with a minor for immoral purposes
- Assault 4 with sexual motivation
- Custodial misconduct 2
- Patronizing a prostitute
- Sexual misconduct with a minor 2
- Violation of a sexual assault protection order granted under chapter 7.90 RCW
- Anyone required to register as a sex or kidnapping offender

Offender DNA samples should be submitted to the CODIS Laboratory located in Seattle. DNA samples submitted for the purposes of entry into the Offender Index are not considered evidence samples and do not take the place of a suspect reference sample. Offender DNA collection kits should not be used for the

collection of DNA samples involved in criminal cases. If reference samples for a criminal case are submitted using these kits, they may be rejected by the laboratory.

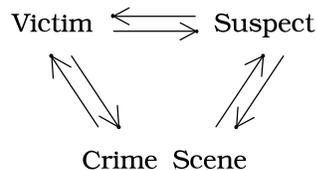
DNA profiles generated for the Offender Index are processed by the forensic scientists of the CODIS Laboratory in Seattle. Profiles generated for this index are entered into CODIS and searched against other appropriate indexes. Eligible offender DNA samples are also submitted to NDIS.

MATERIALS ANALYSIS TRACE EVIDENCE

INTRODUCTION

Small, often microscopic, quantities of material have always been of interest to crime scene investigators. These particles can be the key to a successful investigation. An individual or object leaves behind and/or picks up traces of materials from another person or an environment, however brief and slight the contact. This concept is referred to as Locard's Principle of Exchange.

The diagram illustrates the principle of the exchange of trace evidence between suspect, victim, and the crime scene.



Evidence that results from this exchange can suggest a link between the suspect with the victim and the crime scene. The connection is established by the comparison of trace evidence from a questioned source with samples from a known source (reference/control); for example, in the case of a person being attacked in their home by an intruder, the intruder may leave hairs and fibers on the victim and on the victim's furniture or carpet. Likewise the intruder may take away hairs or fibers from the victim's residence on his clothing or in his shoes. Lastly, since the intruder had to get into and out of the scene there is a possibility of the intruder leaving shoeprints either in the house or outside of the house at a point of entry. The timely collection of evidence to include known samples from the victim, suspect, and the crime scene is critical.

Trace Evidence Procedures Offered by the Materials Analysis Unit

The Washington State Patrol Material Analysis Unit is responsible for the analysis of the following evidence categories:

- Hair
- Glass Identification
- Fabric and Cordage
- Paint and protective coatings
- Tape
- Vehicle lamps
- Impressions
- Physical match
- Soil and geological materials

Building materials
Botanicals
Food and vomit
Miscellaneous materials

The majority of examinations begin with a microscopic approach using stereomicroscopy and polarizing light microscopy (PLM). Chemical and instrumental examinations are typically required depending on the evidence type. Due to the wide variability in the complexity and types of evidence submitted in these cases, a single approach or set of methods and procedures may not adequately address all types of microanalysis casework. However, for most cases submitted, the procedures listed below are routinely employed by Materials Analysis unit personnel. Non-routine cases may require the modification of listed procedures or research into the establishment of new procedures. Should this happen for a particular case, it will be described in the resulting crime laboratory report. Investigative information can be obtained on a case by case basis. Examples include the identification of footwear impressions to a specific make and model, database searching of paint chips to determine vehicle year, make and model, geo-sourcing of specific minerals and particles in soil and the determination of a fiber manufacturer by an examination of a single fiber's cross-sectional shape and chemistry.

At the present time routine gunshot residue analysis (GSR) involving discharged primer particles is not examined in the WSP crime laboratory. Microscopic human hair comparisons are no longer performed in the crime laboratory, although examinations can be conducted to determine somatic origin (body location), animal vs. human, and animal species identification. Please feel free to contact your regional crime laboratory for the analysis of specific evidence or particle types which are not listed. They will be able to advise you of private laboratories that conduct services not offered in the WSP Materials Analysis Unit.

The following information describes general procedures used in each sub-discipline and in what laboratories the specific work is performed. Non-destructive testing of materials is performed when possible, although at times materials may be split or consumed during testing.

Hairs

Materials Analysis scientists are trained to make determinations as to whether the hair is human or animal, examine for investigative leads based on morphological features and whether the hair exhibits characteristics which make it suitable for DNA analysis, nuclear or mitochondrial, using light microscopic methods. Microscopic hair comparisons are not performed in the crime laboratory. Hairs suitable for DNA analysis are transferred to the DNA section for further analysis. Animal hair DNA analysis is not performed in the crime laboratory.

Glass

Forensic glass identification such as tempered, bottled and laminated can be conducted in the crime laboratory. Forensic glass comparisons will be offered as a service in 2016. Forensic glass examinations usually involve the comparison of a questioned glass sample with a known sample from a broken glass source. The analysis can reveal if two samples of glass have a possible common origin or potentially the type of glass in the evidence.

Clothing and Fibers

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Clothing damage assessment and fiber, fabric and cordage examinations are conducted by visual and microscopic methods.

Clothing damage assessment related to firearm's discharge is conducted in the Firearms/Toolmarks Unit of the laboratory.

Fiber examinations are based on microscopic morphological features, the chemical and physical characteristics, and the components that make up dyes and pigments used on fibers. Fiber examinations are performed to characterize, identify and compare fibrous evidence using the following instrumentation and techniques:

- Stereobinocular microscopy
- Comparison polarized light microscope (PLM)
- Fourier Transform Infra-red spectroscopy (FTIR)
- X-ray fluorescence spectroscopy (XRF)
- Microspectrophotometry
- Melting point determinations
- Scanning electron microscopy-energy dispersive spectroscopy (SEM-EDS)
- Cross-sectioning
- Microchemical testing
- Thin layer chromatography (TLC)

Paint and Protective Coatings

Paints and protective coatings are characterized by a variety of macroscopic, microscopic, chemical, and instrumental methods. The information obtained from these determinations can be used to provide investigative information or to compare known and questioned samples. A combination of techniques, which provide discrimination between as many types of paints and coatings as possible, should be used. The following instrumentation and techniques are used in paint analysis:

- Stereobinocular microscopy
- Comparison polarized light microscope (PLM)
- Cross-sectioning
- Scanning electron microscopy-energy dispersive X-ray analysis (SEM-EDS)
- X-ray fluorescence spectroscopy (XRF)
- Fourier Transform Infra-red spectroscopy (FTIR)
- Pyrolysis Gas Chromatography (PGC)
- Microspectrophotometry
- Microchemical tests

Vehicle Lamps

Forensic lamp examinations involve the assessment of vehicle lamp integrity to determine if a lamp was incandescent (on or off) during an accident. The examination process is based primarily on macroscopic and microscopic observations. Microscopic methods used to perform vehicle lamp examinations include stereobinocular microscopy and scanning electron microscopy-energy dispersive spectroscopy (SEM-EDS). Electrical continuity is determined by the use of a multimeter.

Impressions

Most of the impression examinations performed involve comparison of a questioned evidence impression with a known source (shoe, tire, etc.). The process of comparing the questioned impressions to the submitted footwear or tires is usually performed by making 1:1 test impressions (exemplars) of the submitted footwear or tires and comparing these exemplars to the questioned impressions.

A new service known as SICAR - Shoeprint Image Capture and Retrieval Database, is conducted in the Seattle Lab. SICAR is a footwear database which contains manufacturer information including outsole patterns to aid in identifying potential make and/or model of footwear impressions recovered from scenes of a crime.

Physical Match

Physical match analysis is conducted by visual and microscopic methods. A stereomicroscope with transmitted and incident light and a rolling stereomicroscope, all preferably with magnifications up to 100X, are utilized during a physical match analysis. A polarized light microscope may also be necessary for certain portions of the analysis.

Soil and Geological Materials

Soil examinations are performed to characterize, identify and compare soil evidence, which may help to establish an association between individuals, objects and/or locations. The following instrumentation and techniques are used in the analysis of soil:

- Stereobinocular microscopy
- Polarized light microscope (PLM)
- Color comparative analysis
- Sieve analysis
- Particle point counting
- Microchemical tests
- Scanning electron microscopy-energy dispersive spectroscopy (SEM-EDS)
- Infra-red spectroscopy (FT-IR)
- X-ray fluorescence (XRF)

Building Materials

Analytical procedures of building materials such as insulation, wallboard, metals, plastic, roofing, concrete etc. are dictated by the type of material encountered. Wallboard, as an example, is composed of the mineral gypsum with a paper backing, which would involve analytical procedures in the soil and the fiber section. The following instrumentation and techniques are used in the analysis of building materials:

- Stereobinocular microscopy
- Polarized light microscope (PLM)
- Microchemical tests
- Scanning electron microscopy-energy dispersive spectroscopy (SEM-EDS)
- Infra-red spectroscopy (FT-IR)
- X-ray fluorescence (XRF)

Botanicals

Examinations are conducted visually and with the use of a variety of methods including phase contrast light microscopy, fluorescence microscopy and scanning electron microscopy (SEM). Sections may be prepared and mounted for examination of both internal and external features. Identification manuals and keys may be used to aid in identification.

Food and Vomit

Food particles can be found on clothing, shoes, carpeting, countertops, dishware and in vehicles. These traces are identified to the type of food (e.g. meat, bread, spices, and tomato). Vomit samples submitted into the forensic laboratory are of two types: gastric samples collected during autopsy or dried stains on materials such as clothing. If the vomit is received in the liquid state it can be wet sieved through a variety of fine screens catching food particles on the various screens for latter identification. Food and vomit stains are characterized using stereobinocular and polarized light microscopy. Scanning electron microscopy (SEM) may also be used in the characterization of very small particles.

Tape

The examination of tape can provide investigative leads, corroborate statements or events, and associate scenes or a person to a scene.

Tape consists of at least a flexible backing and an adhesive. A variety of tapes is commercially available, such as duct, vinyl electrical, packaging, and masking tape. Overall construction and chemical components will vary between product types and within a single tape type.

Tapes may be found at a variety of crime scenes, such as wrapped around improvised explosive devices (IEDs), used to bind victims, or on threatening letters or envelopes. Based on the types of cases in which they are involved, tape pieces and tape rolls are generally easy to find.

Miscellaneous Materials

Specific procedures for the analysis of all materials in existence are unrealistic. A common sense scientific approach is required when an unknown material is received for analysis. The majority of such cases will go to the Materials Analysis, DNA (e.g. body fluids, fecal material) or Toxicology (e.g. urine) sections. A visual examination of the unknown material is commonly followed by microscopy in order to characterize the unknown as inorganic, organic, botanical, biological, mineral, etc...An examination of the unknown's physical features, including color, crystallinity, granularity, hygroscopic nature, odor, and homogeneity are noted. Optical properties of the unknown including refractive index may be characterized using polarized light microscopy. Microcrystal tests, flame tests, pH and solubility tests can also be performed. The identification of unknowns, inorganic and organic components may require the use of most any analytical instrument in the Materials Analysis section, including but not limited to:

Stereobinocular microscopy
Polarized light microscope (PLM)
Microchemical testing
Melting point determinations
Cross-sectioning methods
Scanning electron microscopy-energy dispersive spectroscopy (SEM-EDS)
X-ray fluorescence spectroscopy (XRF)

Fourier Transform Infra-red spectroscopy (FTIR)
Raman Spectroscopy
Gas Chromatography/Mass Spectrometry (GS-MS)
Microspectrophotometry
Thin layer chromatography (TLC)
Capillary-Electrophoresis (CE)

PRECAUTIONS

- The investigator must use caution to avoid damaging exchange/contamination of evidence at the crime scene. Some exchange is unavoidable; however, it must be controlled and held to a minimum.
- After the incident, the suspect and the victim must not come in contact; clothing from each must be packaged and kept separate. The suspect and/or the victim must not be brought back to the crime scene while it is still being processed. Samples taken from the scene should be packaged separately from the suspect and victim clothing to avoid contamination.
- Special care must be taken not to contaminate or lose any small particles of evidence.
- Avoid damaging any critical areas of the evidence which may have holes, rips, tears, smears, impressions, stains, cuts, or bloodstain patterns. When removing clothing, avoid cutting through these critical areas. If cutting is unavoidable, such as when removing clothing in an emergency room, be sure to take careful notes/photos of the location and appearance of the critical area, and identify the cuts made by medical personnel. Photographs taken before alteration or changes in appearance to the evidence item should be submitted with the items. Remember to use a scale/ruler in the photographs.
- Control/reference samples must be collected as soon as possible to avoid loss and change. If control samples from both the victim and suspect are not both available, contact the crime laboratory to determine what evidence should be submitted. Both control and questioned samples usually must be submitted before any comparisons can be made.
- Damp or wet items, particularly clothing, must be air-dried at room temperature in a secure area over clean paper. An exception to this would be evidence submitted for ignitable liquid analysis (Fire Debris); this evidence should be packaged according to guides on [page 72](#) of this manual. After drying, handle the clothing carefully so that trace evidence is not lost. Wrap the clothing items in clean paper and fold the air-dry collection paper to retain any loose debris. Place the collection paper and wrapped clothing into paper bags for submission to the crime lab. Wrapping the item in paper and folding the air dry collection paper keeps the trace evidence from being lost in the seams of the paper bag. Do not use plastic containers. Avoid contamination.
- It is critical that each item or container be properly sealed and labeled. The label must describe the contents, the item number, the donor or source if known (do not identify the item as from the "victim" or "suspect"- please provide a name), location where found, date, time, and name of person collecting the evidence. The investigator should make notes as to the condition of the evidence and any other observations of value.

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- Do not submit razor or scalpel blades or other sharps without crime lab management approval.
- Do not submit hypodermic needles or syringes with the needles attached without management approval. The crime laboratory will not accept cases which contain needles, regardless of the packaging without prior approval

NOTE: State regulations prohibit the removal of contaminated needles by shearing or breaking [WAC 296-823-14010 and WAC 296-823-18030].

- Proper packaging is particularly important when handling fragile evidence such as paint flakes, glass fragments, head lamps, dental stone casts etc., as described in the following sections.

HAIR

Hair evidence may be found in all types of crimes, especially in crimes where bodily contact has been made, such as in crimes involving homicide, rape, and/or assault.

Significance

Microscopic examination and screening of hair can reveal:

- If the hairs are of human or non-human origin.
- The possible race of the donor and the body area origin of the hair.
- If the hairs were forcibly removed from the body or were naturally shed.
- If the hairs have been cut.
- If the hairs have been chemically treated.
- If the hair has been subjected to trauma, such as high temperatures, flame, or a crushing blow.
- If the hair was damaged by disease.
- If the hair exhibits adhering trace evidence.

Microscopic examination can help to characterize the hair evidence. With the advent of DNA analysis, it is possible to obtain information about the individuality of single hairs, provided there is sufficient sample to examine and a control blood or buccal specimen (or DNA profile) from the possible source is available. Evaluation of the suitability of hairs for DNA analysis will be on a case by case basis.

The species of animal sometimes can be determined from a microscopic examination of hairs. An individual animal cannot be identified by hair comparison.

Collection

- Make detailed notes showing date, time, and location of the collected questioned hairs. Photograph if necessary.
- Combine hairs that are found in the same specific location.
- Do not combine hairs that are collected from different locations. Place the hairs from each location in separate paper containers or plastic bags. Place these small containers into larger manila envelopes, properly seal and label, and submit to the crime laboratory.
- If hair is firmly attached or embedded in an object, do not remove the hair. Send the object with the adhering hair to the crime laboratory, if feasible. Otherwise, photograph the hair in place

and then remove the hair carefully, keeping it intact. Contact the crime laboratory if there is any question on how to proceed.

- Pubic hair combings in sexual assault cases are not known reference/control samples. They are questioned samples and are collected by medical personnel. It is important that the medical personnel have a sexual assault kit that contains materials for the collection of pubic hair combings and head and pubic hair controls as well as other necessary samples.
- Check the hands of assault and homicide victims. Hairs may be found clutched in the hands or under the fingernails. Hairs may also be found on the bodies and/or on clothing.

Packaging

- Place the hairs in clean paper or small plastic bags (see page 19 for paperfolds). Seal with tape and write the date, time, item number, description of the evidence, and the location where it was found. Then place the sealed paper package into an envelope. Seal the envelope and identify the contents; note the date, time, and initials of the person handling the evidence.
- If the hairs are placed directly into an envelope, make sure that all the flaps and corners of the envelope are sealed with tape. Even a slight gap can cause hairs to be lost.

Hair References/Controls: Refer to the [Harborview](#) SEXUAL ASSAULT NURSES EXAMINATION (SANE) protocol for collection (Adult and Adolescent Sexual Assault Medical Evaluation) and packaging (Sexual Assault Evidence Packaging Handbook) guidelines.

GLASS

NOTE: Currently, glass analysis and comparisons are not performed in the Crime Lab Division. However, glass analysis will be available and offered in 2016.

Homicides, burglaries, hit-and-run cases, and assault cases may provide useful glass evidence. With larger pieces of glass, it may be possible to physically fit the questioned glass to larger pieces of the control sample of glass. These examinations require the complete collection of the control glass pieces.

The way the glass is broken and the position of the glass fragments may reveal the direction of a projectile and potentially the order in which several projectiles penetrated a glass pane or window.

Significance

The examination of glass may reveal:

- Physical fit/match.
- The direction of force that broke the glass.
- The direction of travel of a projectile that perforated the glass.
- Type of glass – tempered, laminated, bottle.

Glass fragments from the scene which can be physically fitted with fragments from the suspect vehicle or the criminal's clothing are of great value. These physical matches can prove conclusively that the fragments were once one integral part.

Collection

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- If the direction of force which broke the pane of glass is to be determined, all of the glass must be retrieved. Glass remaining in the window frame must be marked so the surfaces can be identified as "inside" or "outside," and may need to be taped to prevent loss or further breakage. The amount of glass on the ground or floor on each side of the frame should be noted and collected separately. Photographs of the window frame should be taken prior to collection of the complete frame. Carefully package and submit all of the glass recovered. Submission may require hand delivery to the crime lab.
- If projectile holes, such as bullet holes, are to be examined, the entire pane of glass should be submitted intact. Care must be taken not to disturb any possible gunshot residue on the surface of the glass. The glass may have to be taped on the exit surface to hold it together. If the exit side cannot be determined, consult with the crime laboratory.
- At traffic scenes, it is important to search a wide area. Glass fragments can travel appreciable distances in many directions; pieces of glass may drop off a fleeing auto some distance from the scene. All glass fragments must be recovered, with each different location identified and packaged separately, especially glass from headlights, tail lights, and signal indicators.
- If glass fragments are suspected to be on clothing, do not attempt to remove the glass at the scene. Handle the clothing carefully so that the fragments are not lost or transferred to other items. Wrap each article of clothing in clean paper and package them in separate paper bags.
- Glass fragments are often embedded in the soles and heels of shoes as one walks over broken glass. Do not remove the glass from the shoes. Wrap the shoes in clean paper and place them into separate, clean paper bags. Control samples collected at the scene should be submitted separately. Avoid contamination.
- All of the glass must be collected if a physical match is to be considered.
- Care should be taken to preserve any other trace evidence such as hairs, fibers, paint, shoe prints, or stains that may be adhering to the glass.

Packaging

- Glass found in different areas must be packaged separately.
- Small pieces of glass should be placed in a paperfold, sealed, labeled, and packaged in a small rigid container (e.g., a pill box, metal vial). The container must also be sealed and properly labeled.
- Large pieces of glass should be packaged in rigid containers. Use packing material such as cardboard or part of a corrugated carton to avoid breakage and to protect the edges. Hand delivery is the preferred way to submit large pieces of glass, as it avoids the task of extensive packaging and reduces the risk of breakage.
- Package so that if a container opens or tears during shipping, the glass is not lost and does not leak out and contaminate other glass evidence or pose a safety hazard.
- Vehicle lamp filaments can break when they are sent by mail; therefore, they should be hand-carried to the laboratory for examination. See the section on vehicle lamp examination for more information.

Control/Reference Samples

- It is important to collect and send all of the known broken glass (controls) to the crime laboratory for comparison with questioned fragments from the suspect, suspect vehicle, victim, etc. If the control glass source is large, a number of representative samples may suffice. Consult the crime laboratory as to the extent and size of the samples needed.
- Submit control samples from each source of broken glass. Samples from both panes of a double pane window must be submitted.

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- Glass such as that found in the frame of a window or remaining in a headlight rim are the best control samples, preferred over glass samples from a floor or roadway. If the glass is collected from outside the frame or headlight rim, please describe the location of collection.
- If it is important to know whether the glass was broken from the inside or the outside, the submitted control fragments must be carefully marked as to the collection location or facing position in the window frame. The crime laboratory must be consulted for details.

CLOTHING AND FIBERS

The transfer of fibers and fragments of cloth can be the result of such actions as violence to a person with a weapon or with a vehicle, clothing being snagged and/or torn, or the contact of clothing with another article of clothing. Microscopic examinations of fibers, yarns, cordage, and clothing can reveal many characteristics which can be further supported by chemical and physical analyses. The type of fiber, color, dye characteristics, thread count, twist, and cross-section can be determined. The piece of cloth may be physically fitted into a garment, showing a common origin.

Significance

The examination of fibers and fabric may reveal:

- Usage or origin of the fiber or fabric.
- Contact between two or more persons.
- Contact with objects such as blankets, upholstery, carpets, and drapes.
- Contact between a vehicle and victim.
- Contact between the suspect and the crime scene.
- A physical match between two pieces of fabric.
- Nature of damage to fabric (e.g. tearing, ripping, cutting, puncture, type of knife, etc).

Fibers may assist in locating the positions of persons riding in a vehicle, if the fibers are embedded or are firmly adhering to a surface.

Comparison of questioned and control fibers and threads cannot conclusively establish that they are of common origin. However, the forensic scientist can determine the color, type, and generally the product use of the fibers. The types of fibers are animal, vegetable, mineral, synthetic, or a mixture. Various product uses are garments, carpets, bedding, clothing, etc.

Collection

- Pieces of fabric, threads, or fibers may be found adhering to the front or underside of a vehicle which hit a pedestrian. They may be part of a fabric impression. Photograph the impacted fibers and the entire fabric impression prior to collection.
- Fibers are readily caught in hair. An assault victim's head should be combed with a cotton filled comb to recover any fibers. Sexual assault victims should have the pubic area combed in the same manner. A suspect's head should be combed in the case of an assault if a head covering was used as a disguise. The head covering should also be collected.
- Recover the clothing to be examined, taking care to avoid contamination and loss of fiber and other trace evidence. Dry carefully, if damp or wet, on a clean piece of paper in a protected area. Collect the debris that falls onto the clean paper. Package each clothing item in paper containers

separately to avoid transfer of fibers from one item to another. Submit the paper over which the item dried together with the item itself.

- Any observed threads and long fibers should be carefully collected using tweezers. Place the recovered material on a clean piece of paper and fold, seal, and label.
- Small fibers should be left on the item and the entire item, or at least the part holding the fibers, submitted to the crime laboratory.
- Transparent tape can be used to pick up fibers from surfaces. The adhesive surface of "Post-it" notes is also useful for collecting fibers. Since fibers can be difficult to see, surfaces likely to have come into contact with fibers of interest should be tape lifted routinely. The adhesive surface of the tape or Post-it should be placed on a clean glass slide or clear plastic sheet, i.e. sheet protectors. Do not fold the tape over upon itself; it is very difficult to separate the tape during examination.
- Vacuum cleaning is not a desirable collection procedure, since it picks up so much dirt and other extraneous material. It should be used as a last resort to collect trace evidence. At times, fibers can be swept onto a clean piece of paper. A surface may have to be carefully scraped to remove fibers if the fibers are impressed into a surface, and the surface cannot be removed for submission.

Packaging

- It is best to collect the loose fibers or threads on a clean piece of paper and then fold, seal, and label. Place the folded paper into an envelope or paper bag, seal, and label. Do not put loose fibers in the outer evidence envelope.
- Since fibers, threads, and fabrics can be easily lost, care must be taken to seal each container. The corners and flaps of an envelope must be sealed with tape.
- Air dry clothing items at room temperature in a protected area and place a clean piece of paper over the item to protect against contamination while drying. Do not use fans to dry the items. Wrap them in clean paper, and package each in a separate paper bag along with the paper over which the item dried.

Control/Reference Samples

- All clothing that may be involved in the case must be collected for comparison with the collected questioned fibers.
- Representative samples of possible sources of the collected questioned fibers-such as rugs, blankets, and upholstery-or the entire item itself must be submitted as control samples. Take control samples that represent the entire source, such as color, fabric, worn areas, etc. The crime laboratory should be contacted for assistance and information on the collection of the control samples.
- If carpet fibers are involved or suspected, a representative sample of carpet must be submitted. The sample should be a piece of the carpet or good representative samples pulled from the carpet, including areas of worn and non-worn carpet. Carpets can consist of several types of fibers, so it is imperative to collect samples from various areas of the carpet.

PAINT AND OTHER PROTECTIVE COATINGS

Chips and fragments of protective coatings-such as paint, varnish, lacquer, enamels, and plastics may be found at the scenes of hit-and-run cases and burglaries involving forced entries. A transfer of paint can occur when two vehicles collide. Chips of paint at the accident scene or on the victim's clothing may

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produce information regarding the year, make, and model of the vehicle which fled the scene. Traces of paint on burglary tools may connect these tools to the burglary scene.

Significance

The examination and comparison of paint or other protective coating chips and fragments may reveal:

- That the paint chip from the scene came from a particular object or vehicle by a physical match (i.e., the questioned paint chip edges fit like a piece of a jigsaw puzzle with edges of the damaged area).
- A possibility of common origin if the questioned chips and control samples show similarities in physical and chemical characteristics. Multilayered chips which also show similarities and correspondence in the number of layers, order of colors, and thickness of the layers can increase the probability of a common origin to a very high degree.
- The type of paint or coating and its applications. This information may lead to a possible source. Chips left by an automobile at a hit-and-run scene may produce information regarding the make, model, and year of manufacture.

Collection

- Paperfolds and plastic or paper envelopes can be used to collect the paint samples. Paper is preferred over plastic because of the static electricity buildup problems of plastic.
- Small samples of material should be collected on a clean piece of paper. The paper fold is then labeled, sealed, and placed in an envelope, which in turn is labeled and sealed.
- A convenient method of collecting paint scrapings is to tape an envelope or clean sheet of paper just below the sampling area. Hold the envelope or paper open and scrape the paint samples loose, allowing them to fall into the paper. Be sure the paint samples contain all the layers of paint down to the underlying surface. Use a new, clean blade for sampling each particular area. Tape the corners and seams of the envelope or use folded paper.
- If the item containing the paint or paint smear is small enough, the entire item should be submitted to the laboratory. Do not attempt to remove the paint.
- If an item is too large to submit to the laboratory, control paint chips or the questioned paint chips representing all of the layers must be submitted. Do not scrape off the sample in such a manner that the paint chip sample contains only a partial number of layers. The forensic scientist will examine a cross-section of the chip to determine the number, depth, and the color of each layer.

Packaging

- Each of the recovered items must be packaged separately, properly labeled, and sealed. If a vehicle is involved, labeling should include the location on the vehicle, make, model, year, VIN, and license plate number. Envelopes must be sealed on the corners with tape to ensure that no leakage occurs. Put the paint chips into a folded paper packet and label, and then place the packet into a second envelope, also labeled properly.
- Tools with paint smears must be protected to avoid loss or contamination of the questioned paint. The area containing the paint smear should be protected with soft tissue paper, and the tool packaged securely into an appropriate container (e.g., box).
- If paint chips are to be submitted for a possible physical match, they must be packaged so that the chips do not break. The chips must be protected with tissue paper or cotton and placed in a small, rigid container.

Control/Reference Samples

- In all cases, the control samples must be taken from an undamaged area immediately adjacent to the area of damage or of interest. The collected chips must contain all of the layers down to the underlying surface. If a physical match is possible, all paint from the damaged area must be collected or the item submitted.
- When investigating a hit-and-run collision, control samples should be taken from each vehicle. The samples should be taken from the undamaged area on the same panel immediately adjacent to the damage. Similar control samples must be taken from the suspect vehicle when it is apprehended. Different body panels or parts may have different paint or layer structure. Samples from each damaged panel must be taken (i.e., fender and door).
- At burglary scenes, control samples should be taken from an area immediately adjacent to the tool mark. Do not touch the tool mark itself; it may be altered and rendered useless for later tool mark comparison examinations. The paint on a door or window jamb may not be the same as on the door or window itself. If it appears that paint may have transferred from both surfaces, control samples must be taken from each surface.

VEHICLE LAMP EVIDENCE

Introduction

Vehicle lamps are submitted when the question of whether a vehicle's lamps were on (incandescent) or off at the time of an impact may be critical to the investigation of a case. Examinations are conducted by obtaining lamp(s) from the area of impact on the vehicle and examining the filaments and other portions of the lamp affected by the filaments. Exams of other lamps at a distance from impacts can only yield information as to whether the lamp is functional based on continuity of the filaments. These types of exams should be limited to lamps from motor vehicles (i.e. cars, trucks, motorcycles), since the empirical data upon which these lamp exams are based come from motor vehicles. If lamps from other types of vehicles are examined, caution must be used in interpreting motor vehicle data.

Precautions

- Never turn on a vehicle's headlamps after an accident. If the glass envelope of a bulb has fractured, the filament can burn out when energized and show indications of being incandescent at impact.
- The evidentiary value of vehicle lamps can be lost if the lamps are not collected, packaged, and transported using the correct procedures. Lamp filaments are often fragile after an impact. Lamps should always be hand carried to the crime laboratory rather than mailed or shipped.

Significance

Vehicle lamp conclusions range from "on" (incandescent) at the time of impact to "off" at the time of the impact in question. The condition of vehicle lamps after an impact can often be explained by more than one set of circumstances. For this reason, vehicle lamp cases are often inconclusive.

Collection and Preservation

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- Photograph the lamps in place prior to removal. Record the dash lamp switch position and if the vehicle is equipped with daylight running lamps.
- Prior to removing a lamp, mark the 12 o'clock or "up" position.
- If possible, measure continuity of the filaments using a circuit tester prior to collecting the lamps. Do not test continuity by turning on the lamps.
- Avoid breaking any filaments during handling or transporting lamps. If a filament is accidentally broken, make note of the fact and submit the information with the lamp.
- Whenever possible, submit all of the lamps from the vehicle in question.
- If a lamp is intact and easily removed from its socket, it can be removed as normal for replacing the lamp.
- Broken lamps should be removed with the lamp base and packaged to protect the filaments. One method of accomplishing this is to push the lamp base through a hole in the bottom of a drink cup, cut the bottom from a second cup to put over the lamp as a spacer, and use a third cup as a cover. Tape the cups together.
- Check the lamp housings and surrounding areas for loose filament fragments. Use tweezers or "Post-it" notes to collect any fragments of loose filaments present. These can then be packaged in plastic bags or envelopes.
- Do not place packaging materials around the filaments of broken lamps.
- Provide a diagram of the accident, speeds and directions involved, vehicle information, and photographs of the damage. Include any additional relevant information, such as number of impacts, any prior impacts the lamps may have been subjected to, time of day, and weather conditions.

Packaging and Transporting

- When the lamp is removed from the vehicle, label with the exact location, usage, and vehicle information (year, make, model, license number).
- Ensure that the lamps are protected from shock and that all packaging materials are well sealed.
- Hand carry to deliver all vehicle lamps. Failure to hand carry vehicle lamps can result in a loss of information. There are circumstances when the damage to a lamp can be used to determine if it was incandescent at the time of an impact only if it can be demonstrated that the damage did not occur subsequent to the impact.

IMPRESSION EVIDENCE

In the process of entering and leaving a crime scene, shoeprints, footprints, and tire tracks can be left behind. This evidence should be aggressively searched for at crime scenes and precautions taken to preserve it, for later documentation and collection.

Impression evidence also includes fabric impressions and latent prints. Latent fingerprints and palm prints are examined by the Olympia or the Spokane Crime Laboratory. Please refer to the [Latent Prints Section](#) of this manual for more information.

Forensic odontology is not performed in the Washington State Patrol Crime Laboratory System.

Tool mark impressions are examined in the Firearms section and are discussed in the [Tool Mark](#) section of this document.

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Significance

Examination of impression evidence may reveal:

- Possible number of footwear and/or objects present
- If an impression was created by a specific object.
- The approximate size of the object creating the impression.
- Manufacturing information about the object creating the impression.
- Possible sources of what caused the impression.
- Order of deposition and possible movements/direction of travel at the time the impressions were made.

Impression evidence can show class characteristics, wear characteristics, and individualizing characteristics. Class characteristics include such things as the overall pattern of a shoe outsole, the weave of a fabric, or the number of ribs and grooves in a tire track. Wear characteristics are those due to the erosion of the surface of the item being examined and are reflected in the impression. Individualizing characteristics are a product of random events which occur to that one item, such as cuts in a shoe outsole, a flaw in the weave of a fabric, or a stone in a tire's tread. When present in sufficient quantity and detail, the individualizing characteristics in an impression may allow it to be identified to a specific source.

Shoe prints can be examined to obtain information as to possible manufacturer, type of footwear (boot, athletic, dress), and approximate size. Tire tracks can be examined to obtain information as to possible tire manufacturer, design name and type of tire (automobile, truck, off-road vehicle). Fabric impressions can be examined to determine the type of weave and possible sources.

Shoeprint Image Capture and Retrieval (SICAR) Database

SICAR is a footwear database which contains manufacturer information including outsole patterns to aid in identifying potential make and/or model of footwear impressions recovered from scenes of a crime. With the use of SICAR, images of footwear impressions, even if taken at an angle, with a point-and-shoot camera, or those with low resolution, can be used to provide investigative information. Even limited design elements, shapes, or logo portions can offer enough information to provide a possible shoe make and model.

There are no crime type restrictions for a SICAR search to be performed - images will be accepted for any crime. To better assist our agencies the WSP Crime Laboratory will allow agencies to submit images electronically. Only images with impression information should be submitted. The file size for an image, or the total of multiple images, must not exceed 25 MBs. Submit a completed RFLE and images as attachments to: shoearch@wsp.wa.gov. Any questions about this database can be sent to Jeff.Jagmin@wsp.wa.gov.

Collection

- The impression needs to be photographed 1) both with and without a scale/ruler, 2) using digital or a low speed film, and 3) using lighting which highlights the impression (usually several oblique or side lighting shots). The camera must be placed directly over or straight onto an impression, not at an angle to the side, so that the entire impression is clearly in focus and no size or focus distortions result. Use of a tripod to hold the camera steady is recommended. The scale must be in the same plane as the impression so that both are in focus simultaneously. The camera should be positioned as close as possible to the impression (fill the frame with the impression). Digital

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cameras may be used in the photography of impressions, ONLY if they have high pixel resolution. Please consult the crime lab prior to photography.

- Whenever possible, the entire object which has the impression should be submitted to the laboratory. Positive identification of the source of the evidence is more likely when the original impression can be examined. The evidence has to be packaged in a manner which protects the impression from contact with any other surface.
- When the impression cannot be submitted to the laboratory, the impression should be documented using photography. It should then either be cast or lifted. Dust impressions are best lifted using an electrostatic dust print lifter. An impression can sometimes be lifted with fingerprint tape, a trace evidence lifter, or a gel lifter. Where appropriate, an impression can be lightly dusted with fingerprint powder prior to being lifted with fingerprint tape or a gel lifter. Impressions in soil should be cast with dental stone (plaster should be avoided as it gives less detail and forms a softer cast). Impressions in snow and under water require special handling, and the crime laboratory should be contacted for instructions when these types of impressions are encountered.
- Be aware of clothing impressions on car finishes, bumpers, undercarriages, etc. The opportunity may exist to compare the impressions to the clothing items.
- Care should be taken to preserve any trace evidence such as hairs, fibers, or paint in the impression.
- Some impressions may be latent in part or whole and need to be chemically enhanced before correct documentation and collection is possible. Contact the crime laboratory for instructions in these instances.

It is important to photograph the impression prior to collection and/or making any alterations to it. For this reason, all impressions should be photographed at the scene with and without a scale. Although impression evidence examinations can be done using only photographs (correctly taken), lifts or casts should also be taken. The important individualizing characteristics required to identify the source of an impression may not be visualized in a photograph. Also, for impressions in soil and snow, there is three-dimensional information that is lost in photographs.

Packaging

- Impressions and dust print lifts of impressions should be secured in boxes in a manner which prevents anything from coming into contact with the impression or lift. Plastic should never be used to package impressions or dust print lifts of impressions since the plastic can actually develop an electrostatic charge which can then remove portions of the impression or lift.
- Casts should be thoroughly air dried prior to packaging. The cast should be cushioned and packaged in a cardboard box which allows the cast to continue drying. Never use plastic.
- All items should be clearly marked as to location, orientation to the scene, date, and agency information.

Control/Reference Samples

- Most impression examinations involve comparison of the questioned evidence impression with a known source (shoe, tire, etc.). The amount of information which can be determined from an impression without a direct comparison is limited. Submission of the possible sources of an impression is required, as well as submission of any test impressions or scaled photographs taken of these possible sources. All evidence submitted should be clearly labeled as to source.
- The test impressions (exemplar prints) of tires should be made while the tires are on the vehicle. These can be made by preparing pieces of white poster board the length of one full rotation

of the tire's circumference. A clean board is evenly rolled with black ink and the tire is rolled across this inked board. The tire is then rolled across a clean length of second poster board (also the length of the tire's circumference). The starting and ending position and the direction of the tire roll must be marked with chalk or crayon on the tire and the poster board. The tire information (position on vehicle, inside and/or outside edge, manufacturer, design name, size, and DOT serial number) should be written on the poster board. Be careful to prevent the rear tires from running over the front tire impressions. The vehicle may need to be turned slightly to prevent such an overlap. The tires may be submitted with the test impressions.

- For all impression evidence, care should be taken to preserve trace evidence before any attempt is made to collect the impression.

Call the laboratory if you have any questions or specific concerns.

PHYSICAL MATCH

Physical match examinations consist of the examination and comparison of broken, cut, or torn items to determine if two or more pieces were at one time one item. Materials submitted for a physical match examination can include broken glass (from burglaries, vehicle accidents, shootings, etc.), automobile parts from accidents, broken wood or metal (bats, sticks, architectural structures, etc.), paint chips, tape, wires, plastic bags, household items, and any other type of material/object that may be physical evidence in a criminal investigation. Prematurely “fitting” pieces together can alter and/or destroy fine tips, shards, detail, etc. on the side edges of the pieces. These features are an important part of the examination and can add significant weight to conclusions when they are present. Documentation of such features is needed before the final “fitting together” is conducted and documented. Each item of evidence is examined visually to determine the correct orientation of the pieces. After the pieces are marked for identification and “sided”, the contours, edges, colors, surface markings, etc. are used to help align pieces correctly. Scratches, stains and/or defects that traverse the broken, cut or torn edge serve to reinforce the physical fit conclusion. Matching hackle marks and defects may be seen and serve to reinforce the physical fit conclusion. Matching fabric pieces involves examination of general size and shape, weave, fiber type, twist, colors, long versus short threads, and thread counting, etc.

Significance

A physical match examination may reveal:

- That one or more questioned items originated from the same source.
- The possibility of common origin if the questioned item and control item show similarities in physical characteristics and chemistry.

Collection

- Many times analyses for fracture matches may involve items that are broken into numerous pieces. It is imperative to collect as many of these pieces as possible.
- If at all possible collect the entire item which may be used in a fracture match. If this is not possible, it may be required to deconstruct all or part of a larger item such as a car or a wall. If this is not practical, or cannot be done without damaging the evidence, it may be necessary to contact the crime lab and seek guidance or request that the Crime Scene Response Team respond to assist in collection.

- Many times there may be questioned items related to a scene and more than one possible source (i.e. rolls of duct tape, torn clothes/rags, etc.) are also present at the scene or found at a later time. It is extremely important to collect all possible sources for further examination and comparison.

Packaging

- Materials found in different areas must be packaged separately.
- Each of the recovered items must be packaged separately, properly labeled, and sealed. If a vehicle is involved, labeling should include the location on the vehicle, make, model, year, VIN, and license plate number. Containers must be sealed to ensure that no leakage occurs. Put the material into a folded paper packet, or paper container and label, and then place the packet into a second container, also labeled properly.
- Package so that if a container opens or tears during shipping, the material is not lost and does not leak out and contaminate other evidence or pose a safety hazard.

Control/Reference Samples

There are generally no controls or reference samples for fracture match examinations.

SOIL AND GEOLOGICAL MATERIALS

Soil consists of loose aggregates of rock, mineral, botanical and biological material. Due to its widespread occurrence and tendency to adhere to most materials, soil is commonly present on physical evidence. Examinations are performed to characterize, identify and compare soil evidence, which may help to establish an association between individuals, objects and/or locations. Soil is a non-manufactured product with great compositional variation which can lead to very strong associations. A detailed examination of soil recovered from bodies, clothing, vehicles, etc. may be used as an investigative tool in identifying a soil's geographic source. There are a variety of methods and procedures in the examination of soil ranging from color analysis, the identification and characterization of minerals, diatoms, pollen, vegetative materials, and artificial constituents such as fly ash, tire rubber, and industrial materials. Examinations are based primarily on soil color and identification and comparison of minerals and non-mineral soil components using stereobinocular microscopy and polarized light microscopy (PLM). Weight percent distributions of the sand, silt and clay components are performed by weighing and sieving a known portion of the soil sample.

Significance

The examination and comparison of soil or other geological materials may reveal:

- Identification of the type of substance (e.g. rock, glass, sand, peat)
- A possibility of common origin if the questioned soil and control samples show similarities in physical and chemical characteristics.
- A possible source of the questioned soil by an analysis of physical and chemical properties.

Collection

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- Examine clothing or other materials for stains, smears or lumps of soil. Soil may fall from clothing as it dries; therefore collect clothing as soon as possible. Do not remove soil from clothing; preserve it with the evidence item.
- Lumps of soil with distinctive layers may be found in or on vehicles and at the scene of hit and run or other accidents. Collect soil clumps in separate small cushioned containers to prevent breakage. Do not vacuum samples; this will result in a mixing of different soils.
- Examine the undercarriage of vehicles for areas of missing soils. The shape of such gaps can be compared to soil found at the scene for a physical match.
- Tools and weapons may have lodged soil particles. Do not attempt to remove the soil, submit the entire tool.

Packaging

- Each of the recovered items must be packaged separately, properly labeled, and sealed. If a vehicle is involved, labeling should include the location on the vehicle, make, model, year, VIN, and license plate number. Containers must be sealed to ensure that no leakage occurs. Put the soil into plastic or cardboard containers. Do not package soil evidence in paper envelopes. Label and then place the packet into a second envelope, also labeled properly. Do not place moist soil in plastic or glass containers. If the soil is moist or wet upon collection, air dry completely and then package.
- Tools with soil must be protected to avoid loss or contamination of the questioned soil. The area containing the soil should be protected with soft tissue paper, and the tool packaged securely into an appropriate container (e.g., box).
- Soil lumps can be gently wrapped in tissue paper and placed into small cardboard boxes of a size that the lump will not freely move within the box.

Control/Reference Samples

- To collect a soil sample, use any suitable tool to scrape about 2-4 tablespoons of soil from a surface area of about 6 by 6 inches into a container. Wipe the tool clean between each sample collection. Do not scrape below a depth of ½ inch except when there is an indication that the questioned sample may have come from a deeper layer of soil.
- When there is a footprint impression at the scene, collect a sample directly from it after any photographs are taken. If the impression is to be cast, collect soil adjacent to the cast. Where there are several footwear impressions, provide a sample from each different soil in which there are imprints using color as a guide to change from one type of soil to another.
- Do not conclude from the absence of footwear impressions or other obvious marks that soil was not picked up. If the ground was wet, soil was probably transferred. Collect comparison samples from each different soil color observed at the scene.
- Additional samples should be collected from any location where the suspect may have been, or claims to have been during the time of the crime.
- Control soil samples from a grave should be collected from the surface and along the grave wall. Collect soil that looks different in color or texture. Also collect soil on top of and under the body. Place soil samples into separate containers. After removal of the body, use a straight edged spade and dig into the side wall, noting any differences in layers and collect.
- At the surface of the grave, note location with Global Positioning Satellite (GPS) technology, if possible. Collect approximately eight surface soil samples from around the grave at distances of 50 and 100 yards in four convenient directions at right angles to one another. Remember to label the locations and distances of each sample.

BUILDING MATERIALS

Building materials comprise a very large variety of particles that cross a diversity of microanalysis sub-disciplines including paint, fibers, soil/geological, botanicals and glass. Primary and secondary transfer of building materials between individuals, tools, and weapons may occur during practically any crime. The examination of discharged bullets may help define bullet path including impact with intervening materials. Fibrous insulation, gypsum wallboard dust, paint, glass, wood dust, etc. may transfer to a suspects clothing and hair during a burglary. Tools found in a suspect's possession may have building materials smeared or adhering to them which may offer important clues in an investigation. Motor vehicles involved in an accident may be an excellent repository of building materials from contact with an immovable object such as a concrete barrier or wooden utility pole.

Significance

The examination and comparison of building materials may reveal:

- Identification of the type of substance
- Origin of the material (e.g. roofing vs. insulation)
- Possible age of material or period of installation (e.g. asbestos products)
- A possibility of common origin if the questioned building material and control samples show similarities in physical and chemical characteristics.
- Assist in bullet path reconstruction by an examination of material on bullets

Collection

- For rigid objects, cut or saw a representative portion of the material (e.g. lumber, roofing, wallboard, floor tile, etc.).
- For friable materials, sample by simply tearing, breaking, pulling, or picking (e.g. wall insulation).

Packaging

- Materials found in different areas must be packaged separately.
- Each of the recovered items must be packaged separately, properly labeled, and sealed. If a vehicle is involved, labeling should include the location on the vehicle, make, model, year, VIN, and license plate number. Containers must be sealed to ensure that no leakage occurs. Put the material into a folded paper packet, or paper container and label, and then place the packet into a second container, also labeled properly. Do not place moist building materials in plastic or glass containers. If the material is moist or wet upon collection, air dry completely and then package.
- Small pieces of material should be placed in a paperfold, sealed, labeled, and packaged in a small rigid container (e.g., a pill box, metal vial). The container must also be sealed and properly labeled.
- Large pieces of material should be packaged in rigid containers. Use packing material such as cardboard or part of a corrugated carton to avoid breakage and to protect the edges. Hand delivery is the preferred way to submit large pieces, as it avoids the task of extensive packaging and reduces the risk of breakage.
- Footwear and tire impressions are often preserved in fine powdery building materials such as wallboard dust. Package so overlying packaging material is not rubbing or smearing the impression.

- Tools with building materials must be protected to avoid loss or contamination. The area containing the material should be protected with soft tissue paper, and the tool packaged securely into an appropriate container (e.g., box).
- Package so that if a container opens or tears during shipping, the material is not lost and does not leak out and contaminate other evidence or pose a safety hazard.

Control/Reference Samples

- Submit control samples from each source of broken building material.
- If it is important to know whether the building material was broken from the inside or the outside, the submitted control fragments must be carefully marked as to the collection location or facing position. The crime laboratory must be consulted for details.

BOTANICALS

Botanical examination typically involves small, often incomplete fragments of leaves, woody and non-woody fibers, needles, grass, stems, thorns, weeds, flowers, tobacco, seeds, diatoms, pollen and spores which are found as associative evidence on or in clothing, vehicles and soil.

Significance

The examination and comparison of botanicals may reveal:

- Identification of the type of substance
- Origin of the material (e.g. hardwood forest vs. mangrove swamp)
- Possible age of material (e.g. tree rings)
- A possibility of common origin if the questioned botanical specimen and control samples show similarities. The rarity and diversity of the materials found would have probative significance.

Collection

- If botanicals are suspected to be on clothing, do not attempt to remove them at the scene. Handle the clothing carefully so that the fragments are not lost or transferred to other items. Wrap each article of clothing in clean paper and package them in separate paper bags. Do not vacuum botanicals, many are very brittle.
- Botanicals are often embedded in the soles and heels of shoes as one walks. Do not remove the particles from the shoes. Wrap the shoes in clean paper and place them into separate, clean paper bags. Control samples collected at the scene should be submitted separately. Avoid contamination.
- Large pieces of plant material caught under vehicles should be carefully removed and packaged into cardboard boxes to prevent damage.

Packaging

- Materials found in different areas must be packaged separately.
- Each of the recovered items must be packaged separately, properly labeled, and sealed. If a vehicle is involved, labeling should include the location on the vehicle, make, model, year, VIN, and license plate number. Containers must be sealed to ensure that no leakage occurs. Put the material into a folded paper packet, or paper container and label, and then place the packet into a

second container, also labeled properly. Do not place moist botanicals in plastic or glass containers. If the material is moist or wet upon collection, air dry completely and then package.

- Tools containing botanicals must be protected to avoid loss or contamination. The area containing the material should be protected with soft tissue paper, and the tool packaged securely into an appropriate container (e.g., box).
- Package so that if a container opens or tears during shipping, the material is not lost and does not leak out and contaminate other evidence or pose a safety hazard.

Control/Reference Samples

- Submit control samples from botanical sources observed along suspected paths leading to and from the crime scene, below windows at burglary scenes and at any area the suspect may have traveled through. Sample whole specimens if possible including the roots, leaves, seeds, etc. You may decide to cut off small branches having specific vegetation. To collect easily transferred vegetation along a path, obtain a clean piece of white fabric about one foot square and drag it through the pathway above the ground. Small thorns, seeds, etc. will stick to it. Package the fabric in a paper envelope.
- Living specimens (e.g. leaves) that are collected need to be either submitted as soon as possible to the crime lab, or placed on clean paper between the pages of a heavy book to dry prior to submission to the lab. Please contact the lab if you have any questions.

FOOD AND VOMIT

Foodstuffs often originate in the kitchen or the restaurant environment during the food preparation process. Foodstuff particles may be transferred to countertops, flooring, shoes and clothing. Food particles can find their way to almost any location from bedding, furniture and vehicles. Common food traces include spices, herbs, salt, sugar, starches, pastry and bread crumbs, meat, vegetables, and fruits. Food particles are examined in the laboratory microscopically and identified to a food type (e.g. cereal grains, spice, meat). An examination of food particles and stains may be used as associative evidence linking people, places and objects. Vomit samples submitted to the laboratory are of two types; gastric samples collected during autopsy or dried stains on materials such as clothing.

Significance

The examination of food and vomit may reveal:

- Identification of the type of substance
- Origin of the vomit (e.g. Asian restaurant vs. breakfast cereal)
- Establishing a time line. Food products are retained in the stomach for up to approximately 4-6 hours.
- A possibility of common origin if the questioned food specimen and control samples show similarities. The rarity and diversity of the materials found would have probative significance.

Collection

- If food particles are suspected to be on clothing, do not attempt to remove them at the scene. Handle the clothing carefully so that the fragments are not lost or transferred to other items. Wrap each article of clothing in clean paper and package them in separate paper bags.
- Vomit stains on materials must be air dried prior to submission to the laboratory.

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- Gastric contents collected at autopsy need to be well secured in an air tight container. The vomit sample should be refrigerated prior to sending it to the laboratory.
- If the item containing the vomit stain cannot be sent to the laboratory, scrape off the dried stain into a small paper fold or envelope. If the vomit is in a fluid state, place it in a plastic container and properly label.
- Dried food particles can be picked up with a forceps or Post-it note. Liquid foods and vomit can be spooned or pipetted.

Packaging

- Each of the recovered items must be packaged separately, properly labeled, and sealed. If a vehicle is involved, labeling should include the location on the vehicle, make, model, year, VIN, and license plate number. Containers must be sealed to ensure that no leakage occurs. Put the material into a folded paper packet, or paper container and label, and then place the packet into a second container, also labeled properly. Place liquid items in plastic containers.
- Package so that if a container opens or tears during shipping, the material is not lost and does not leak out and contaminate other evidence or pose a safety hazard.

Control/Reference Samples

- Submit control samples from food ingredients or food products such as spices, cookies, and beef jerky.

TAPE

Significance

Tape examination:

- May provide evidence types including latent prints, DNA, hairs/fibers, explosive residue, miscellaneous trace evidence. Please consult the laboratory to determine the highest priority before examination.
- The tape itself can be examined for a physical match with known tapes.
- Determine if it was used as a restraint.
- Identify possible product information, manufacturing, and retailing sources.

Collection

- When possible, submit tape still adhering to the substrate to minimize loss of trace evidence, latent fingerprints, or contact impressions.
- If unable to submit substrate, do not distort or tear the tape during removal.
- If the tape is cut during removal, mark cut ends accordingly.

Packaging

Tape rolls can be placed in a cardboard box or paper bag. Loose piece of tape can be placed in a sealed metal can or adhering to a plastic sheet. Do not place the tape on paper.

MISCELLANEOUS MATERIALS

An abundance of materials and particles that do not neatly fall into the above categories are submitted to the Materials Analysis Unit of the crime laboratory for analysis. Miscellaneous materials have included cigarettes, glitter, plastics, caulks, rubber bands, owl pellets, bird nests, paper match books, paperclips, filler ingredients in drugs, glassy material from burnt grass, soot, dust, debris from fingernails, etc. Each crime scene offers the investigating officer an opportunity to critically observe the surrounding and determine which materials may have evidentiary significance. Please call the Materials Analysis Unit if you have any questions regarding what to collect.

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MATERIALS ANALYSIS

CHEMICAL ANALYSIS

The Washington State Patrol Materials Analysis Unit is responsible for the analysis of chemical compounds and mixtures, including, but not limited to, controlled substances, clandestine laboratory evidence, explosives evidence analysis, fire debris samples, select poisons and toxins, and a variety of other types of physical evidence in which chemical and instrumental examinations may be required. Because of the wide variability in the complexity and types of evidence submitted in these cases, a single approach or set of methods and procedures may not adequately address all types of chemical analysis casework. However, for most cases submitted, the procedures listed below are routinely employed by Crime Lab personnel. Non-routine cases may require the modification of listed procedures or research into the establishment of new procedures. Should this happen for a particular case, it will be described in the resulting Crime Lab report.

CONTROLLED SUBSTANCES

Controlled substance analysis typically involves the qualitative examination of suspected drug evidence to determine if the material does in fact contain a controlled substance, and if so to identify that substance to the exclusion of all others.

With the exception of certain marijuana items, the Crime Lab does not perform quantitative analyses, which is often referred to as the measurement of the purity of a substance or the measurement of the amounts of components in a mixture.

The conclusive identification of a controlled substance is accomplished by the use of at least two uncorrelated analytical techniques. At least one of these techniques must provide molecular structural data about the substance. This analysis must be accompanied by additional testing using another analytical technique or techniques, that together lead to the same conclusion and preclude a false positive identification. These techniques include but are not limited to:

- Fourier Transform Infrared spectrophotometry (FTIR)
- Gas chromatography-mass spectrometry (GC-MS)
- Gas chromatography-Flame Ionization Detection (GC-FID)
- Raman spectroscopy
- High Pressure Liquid Chromatography (HPLC)
- Capillary electrophoresis (CE)
- Thin layer chromatography (TLC)
- Microcrystalline tests
- Pharmaceutical identifiers
- Color Tests
- Microscopy and quantitative analysis via GC (for leaf marijuana): Leaf marijuana exhibits tend to have characteristics that are visually recognizable. A microscopic examination coupled with quantitative analysis by gas chromatography provides a basis for the identification of leaf marijuana.

Controlled substances are a major part of the crime laboratory caseload. They are physical evidence not only in illegal possession and sale cases, but also in such varied cases as burglaries, traffic fatalities, and

assaults. For efficiency and accuracy, it is imperative that the evidence be selected, packaged, and forwarded in a careful manner.

Precautions

- Do **not** submit any hypodermic needles, razor blades, or other sharps. Syringes will not be accepted except with management approval. The crime laboratory will not accept any case that includes a needle alone or a syringe with the needle attached.

NOTE: The cutting or shearing of a needle from a syringe is prohibited by federal and state regulations. [WAC 296-823-14010 and WAC 296-823-18030]

- Many drugs are very potent, and even minute amounts present a health hazard. Do not taste or hold the suspect material close to the nose in order to smell it. Do not eat, drink, or smoke while handling the material.
- Be sure to exercise good personal hygiene when handling suspected substances by washing the hands thoroughly using soap and water after handling, even if direct contact was not made. Hand sanitizer is not effective in these situations. Use appropriate protective equipment (gloves).
- Small amounts of material must be handled with care to avoid contamination and loss.
- If green or wet plant material is stored in plastic or vapor tight packaging, biological degradation may result in decomposition which would preclude analysis of the sample. Dry thoroughly, if possible, and package in paper containers.

Field Tests

Drug field test kits are **presumptive** tests (i.e., a positive result indicates a possibility that the substance being tested for is present). They are **not** conclusive tests which prove the presence or absence of a particular drug. These kits are useful in establishing probable cause and enabling the investigating officer to obtain a search warrant or an arrest warrant. Some field tests have been shown to give false positive results, indicating the presence of one type of controlled substance when another type is actually present.

If the amount of suspected material is very small, a field test may consume too much of the sample and prevent further testing by the crime laboratory. In such cases, it is best not to perform a field test, but to send the material to the crime laboratory for analysis.

Do not send the used drug field test kit to the crime laboratory—the reagents are corrosive and likely to spill during shipping; the resultant colors fade and are not recognizable. The crime laboratory will carry out a full analysis and report on their findings for your evidence.

Plant Material

Marijuana (Genus Cannabis)

The definition of marijuana changed with the implementation of I-502 to state “marijuana” or “marihuana” means all parts of the plant Cannabis, whether growing or not, with a THC concentration greater than 0.3 percent on a dry weight basis. The law further states “THC concentration” means percent of delta-9-tetrahydrocannabinol content per dry weight of a part of the plant Cannabis, or per volume or weight of marijuana product. However, the State of Washington’s definition of marijuana is not aligned

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with that of federal law, international legislative bodies or the scientific community. International methodologies for determining THC concentration determine the total THC content and WSP CLD will also be reporting total THC (see below).

Plants of the genus cannabis can be thought of as two distinct varieties – those grown for their fiber content and those grown for their physiological properties. Plants grown for their fiber content are generally referred to as hemp while those grown for their physiological properties are referred to as marijuana in North America or herbal cannabis in Europe. Morphologically these plants are virtually indistinguishable from one another though the chemical composition of the plants allow for their distinction.

While eighty-five different cannabinoids have been identified in cannabis plants, it is primarily one compound, delta-9-tetrahydrocannabinol (THC), which has psychoactive properties. Tetrahydrocannabinolic acid (THCA) is the biosynthetic precursor to THC. THC levels in fresh plant material, regardless of variety, are quite low and the conversion of THCA to THC occurs during drying and with exposure to light and/or heat. Marijuana use by smoking or addition to baked products will also convert THCA to THC. Hemp plants contain a low concentration of THCA and therefore THC. To account for this conversion, the hemp industry has established legal acceptable levels for total THC that reflect the combination of THCA and THC (0.2 percent in Europe; 0.3 percent in Canada). Hemp industry standards require frequent testing to ensure compliance with these limits. The United Nations Office of Drugs and Crime (UNODC) and Health Canada have oversight of the testing methodologies to ensure compliance with the total THC limits in the European Union and Canada respectively. These methods call for the quantitative analysis of total THC using gas chromatography.

Gas chromatography (GC) is an analytical technique used for quantitative analysis which exposes the sample to high temperatures resulting in the conversion of THCA to THC. High pressure liquid chromatography (HPLC) is another analytical technique which can be used to quantify THC and does not utilize high temperatures thereby reducing the likelihood of THCA conversion to THC.

The legal limit for recreational possession for any person twenty-one years of age or older without a medical marijuana authorization is:

- One ounce of useable (leaf) marijuana;
- Sixteen ounces of marijuana-infused product in solid form; or
- Seventy-two ounces of marijuana-infused product in liquid form.

The table below lists the types of marijuana cases the Crime Lab will accept for analysis:

	Under the age of 21	21 and older
Leaf Marijuana	All	Exceeding maximum amount allowed*
Marijuana Concentrates (hash oil, wax, shatter)	All	Exceeding maximum amount allowed*
Marijuana Infused Products in Solid form	Offenses on or after July 24, 2015	NONE
Marijuana residues (smoking devices)	All	NONE
All manufacturing and delivery cases, except marijuana infused products in solid form cases		

*Requires THC quantitation. Leaf marijuana and marijuana concentrate items for those under 21 with offense dates before July 24, 2015 also require THC quantitation.

Because of technical complexity and costs, the Crime Laboratory Division will not provide THC quantitation analysis for marijuana-infused products in solid form. (The Toxicology Division provides analysis for evidence submitted in liquid form.) Effective July 24, 2015, infused product cases related to minors don't require THC quantitation. We will accept cases of marijuana-infused products in solid form involving those under the age of 21 and perform a **qualitative** analysis for offense dates on and after July 24, 2015. Please contact the Toxicology laboratory for marijuana-infused products in liquid form.

For all other suspected marijuana-infused product in solid form cases, please refer to outside laboratories approved by the Liquor and Cannabis Board (LCB). A list of these labs is located at the LCB website:

<http://www.liq.wa.gov/publications/Marijuana/Labs/Lab%20List%20for%20Web.xlsx>

(Note that shipping across state lines is prohibited, and no analytical labs can accept cases from out of state because marijuana is still a Schedule 1 controlled substance according to Federal statutes.)

A three week minimum lead time is required for all marijuana cases requiring THC quantitation. Please keep your local crime laboratory informed of all rush dates to facilitate the timely analysis of marijuana cases. Marijuana cases requiring THC quantitation may be forwarded from your local laboratory to another laboratory in the Crime Laboratory Division for analysis.

Other Plant Materials — Other plant materials include psilocybin mushrooms, opium poppies, khat, peyote and Spice.

Suspected khat (which contains cathinone and/or cathine) should be frozen immediately and delivered to the laboratory in a manner that minimizes thawing. Call the laboratory if you have any questions.

For marijuana and other plant material, completely dry the plant material at room temperature. Fans should be considered if air circulation is poor. When dried thoroughly, place in a paper sack, box, or paper envelope. Avoid loose mesh bags as contents (plant particles and fragments, dirt, etc.) may sift through the mesh holes. Do not place the dried plant material in a plastic container or a plastic-coated container. If not dried and packaged properly, the material may degrade and interfere with or prevent any analysis. Please do not submit wet plant material.

If a large amount of plant material is confiscated, it is not necessary to send all of it to the crime laboratory. A representative sample of the plant material should be selected and dried, if necessary, and sent to the crime laboratory. Careful notes should be taken as to the total amount (weight) of material confiscated and the amount and locations of the sampling. If there is a question as to how to take a representative sample or the amount of the sample to be collected, contact the crime laboratory for assistance.

Solid Dosage Forms and Powders

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Solid dosage forms of evidence include pills, powders, tablets, chunky material, tar-like substances and blotter paper. Drug paraphernalia includes pipes, measuring scales, balances, sifters, bowls, spoons, and a variety of other objects used, or intended to be used, with controlled substances.

- Make sure each item is contained within appropriate packaging before sealing in the final evidence envelope or container. Do not put loose powder, tablets, or any other small or breakable objects directly into the final evidence envelope. This packaging should include the case number, item number, officer's initials, and date.
- Make sure the outer envelope or package containing the item(s) is sealed and labeled properly.
- Use the [Request for Laboratory Examination](#) form (3000-210-005).
 - Make sure to list the items in order of priority (i.e., the order in which you want the items to be examined). Specifying the probable cause item is recommended.
 - Write the item numbers clearly.
 - Do not list substances as a particular drug. Instead, list substances as "suspected cocaine" or "suspected of containing heroin."
 - Describe any special precautions to be taken, such as biohazards or future latent print examination.

Liquid Samples

Liquid samples include contents transferred from syringes, injectable solutions and steroids, some precursor materials, and other controlled substances.

Liquids should be stored in vials or bottles with secure, non-leaking lids. Teflon sealed vials are particularly recommended. Plastic flip-top vials are good for small quantities. Vials and bottles should be packaged to prevent breaking. As with all other types of evidence, the items should be sealed and labeled properly.

Procedures for Drug Evidence Retrieved from Body Cavities

Drug evidence recovered from anal, vaginal, and oral cavities presents a serious health hazard to both law enforcement and crime laboratory personnel. To keep these personnel from being placed in jeopardy, the Crime Laboratory Division has instituted procedures affecting law enforcement personnel for dealing with this type of evidence.

Controlled substance evidence removed from a body cavity is usually packaged in some type of protective material, such as a balloon, condom, or plastic bag. Certain steps need to be taken to decontaminate the outside of this container, both to protect personnel from biohazards and to eliminate malodorous decomposing bodily substances.

The following procedures must be used for decontaminating evidence which is packaged as described above:

- Place the evidence (in its protective material) in a container of fresh bleach solution (1 part household bleach and 10 parts water) and soak for at least 15 minutes. Rinse thoroughly with running water. Dry carefully with a paper towel. Place in a clean container and label the container "From Body Cavity" and "Soaked in Bleach Solution." It may be submitted to the crime laboratory for examination of the contents. The clean container will not require a biohazard label.

- If you have reason to believe that the wrapped evidence may leak and be attacked by the bleach solution, do not use the above method. If possible, transfer the suspected controlled substance to an appropriate container or call the crime laboratory for an alternate procedure.
- Be sure to note on the laboratory request form AND on the evidence packaging that (1) the item of evidence was removed from, or suspected of being from, a body cavity, and (2) that it was soaked in bleach solution to render it in proper condition for submission.

The clean container will be safe for handling by law enforcement personnel who must come into contact with, transport, and store the evidence. Disposable gloves and other personal protective equipment should be used while handling the contaminated container. Do not contaminate the outside of the clean container.

Controlled substance cases involving evidence found to be removed from a body cavity and not properly processed before being submitted will be returned to the law enforcement agency without further examination.

If there is any difficulty or question regarding the above procedure, contact the crime laboratory before processing with the bleach solution.

Disposal of Controlled Substances

The crime laboratory does not destroy or dispose of any controlled substances or any other submitted evidence, even if it is determined not to contain a controlled substance. All submitted evidence—except that which was consumed in the analysis—will be returned to the submitting agency.

POISONS/TOXINS

The Crime Laboratory Division is not properly equipped to analyze the majority of poison/toxin type cases. The Division lacks validated procedures and methods of analysis, personnel expertise, safe facilities and sufficient training for the wide variety of potential toxins, poisons, biotoxins, neurotoxins, and other possible contaminants. Furthermore, these substances may endanger Crime Laboratory staff when accepted into the laboratory.

When cases are received with specific suspected contaminants suggested by the agency, Supervisors or Laboratory Managers will have the authority and flexibility to accept such cases if Crime Lab personnel have demonstrated experience and accepted methods for conducting such analyses. Agencies should contact their local Crime Laboratory with any questions prior to submitting such items. It may be necessary to refer the agency to another laboratory more fully capable of handling these analyses.

SOLVENTS, INHALANTS, AND GENERAL UNKNOWNNS

Other types of physical evidence including solvents, inhalants and general unknownns may require chemical and instrumental analysis. Examination of these types of evidence could include any of the methods or procedures listed above.

Many of the collection and packaging techniques listed for fire debris evidence can also be utilized for solvents, inhalants and general unknownns. It is especially important that any evidence suspected to be volatile in nature be packaged in vapor resistant packaging such as paint cans, polyester bags or nylon

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bags that are properly sealed. Contact your local crime laboratory if there are any questions concerning the packaging of this type of evidence.

EXPLOSIVES

[Explosives Safety Checklist](#)

The Crime Laboratories in Seattle, Tacoma, Spokane, and Marysville can conduct analyses of explosives evidence including post-blast debris, bulk explosives, components of explosive devices, and deactivated explosive devices. Each of these types of evidence can provide information about how a device was made (or could have been made) and can also provide links to individuals of interest to an investigation. The manner in which this evidence is collected, packaged, and submitted to the laboratory is one of the most important factors that will determine how much information the laboratory can provide about the evidence.

Laboratory personnel should never accept unexploded (intact) explosive devices, or large quantities (greater than 1 teaspoon) of explosives. If evidence is suspected of containing an intact explosive device, the submitting agency **must** contact the crime lab for instructions on submitting the evidence

Bulk Explosives

Bulk explosives may be single chemical compounds or they may be mixtures of substances that together are explosive. Explosives can be commercial or military products, or they may be homemade mixtures. Crime laboratory analysis of bulk explosives can identify the components of an explosive, and in some cases, provide information about the possible source of the explosive. In some cases, distinguishing characteristics of an explosive sample can be linked to explosives or individual chemicals in a suspect's possession.

Post-Blast Debris

Debris from an explosion may be burned, buried in rubble, and/or scattered over a wide area. Pieces of an explosive device may be thrown farther from the site of an explosion than one might think. An extensive search of the surroundings and painstaking sifting through rubble may be required to obtain important evidence. This evidence may include fragments of the explosive device itself (e.g., pipe fragments, blasting caps, electrical components) or chemical residues deposited on objects near the explosion. Crime laboratory analysis can often determine what explosive material was used in the device, and may sometimes provide information about the general construction of the device, and how the device was initiated. In some cases, unusual or distinguishing characteristics of the explosive or the device can be linked to materials in a suspect's possession.

Components of Explosive Devices and Deactivated Devices

Components of explosive devices may include tape, glue, containers, pipes, fuses, wires, blasting caps, clothespins, clocks, remote controls, etc. Many everyday items can be used in the construction of an explosive device, and nothing about these items may be suspicious or sinister in itself. When found together with bulk explosives, or when found partly assembled, the particular combination of materials found may suggest how these materials might be combined in an explosive device.

Unexploded devices, and the individual components of a device, will often provide the best evidence to link an individual to a bombing attempt. Fingerprints will often be intact, tape and glue will not have burned away, wiring and fusing will be undisturbed. In such cases, chemical analysis along with trace examination and fingerprinting or DNA analysis can provide a more complete picture of the device, and there is a much greater chance of connecting the device to an individual.

Collection and Packaging of Explosives Evidence

- **Do not submit active devices to the laboratory.** Active devices, including blasting caps, should be dismantled, deactivated, or discharged in some way before submission to the laboratory. Call your local bomb squad or the Washington State Patrol Bomb Unit to deactivate the device. Make note of what method was used to deactivate the device (e.g., water cannon, blown up with dynamite, etc.), and provide this information when submitting the evidence.
- Items with sharp or jagged edges should not be packaged in paper envelopes. Use sturdier containers such as clean metal paint cans.
- Many explosives, particularly "high" explosives, contain components that are volatile and will evaporate over time. If it is suspected that high explosives (e.g. dynamite, nitroglycerin, C4, etc.) may be present, evidence should be packaged in a vapor-tight container. Clean metal paint cans or vapor-tight plastic bags (such as Kapak bags) are suitable to preserve volatile evidence.
- Submit only small amounts of bulk explosives. Be sure to include representative samples of the bulk material, especially if there are indications of mixtures. Typically a teaspoon of material is sufficient for laboratory analysis of bulk explosives.
- Flash powder can be very sensitive and may ignite with a spark. If possible, package flash powder in anti-static plastic bags, made for use with static-sensitive computer components; or use paper packages, making sure to completely seal all openings and seams – flash powder is a very fine powder and will seep out of very small openings. Do not package bulk flash powder in metal containers or plastic bags not designed to be static-resistant. Submit only small amounts of flash powder. Typically a teaspoon of material is sufficient for laboratory analysis.
- Whenever possible, submit control samples in a separate package along with the evidence. For example, if soil from a blast site is submitted, also collect a sample of similar soil from an area away from the seat of the blast. If a portion of rubber molding with blast residues is submitted, also submit a clean area of the molding. Package controls in the same manner as samples with residues – the manner in which a piece of material is packaged can affect the analysis (e.g., bacterial action in soil over time – See the trace materials packaging procedures referenced earlier.).
- Porous materials or objects with cracks and ridges tend to collect a large amount of useful residues. Materials from near the blast site such as foam, rubber, pipe threads, cardboard, or any rough-surfaced items will often be useful items to collect.
- If fingerprint analysis is desired, submit the items to the crime laboratory first. Indicate clearly that a fingerprint examination is needed. The crime laboratory can usually forward evidence to the latent prints laboratory after the explosives analysis is finished.
- Give the laboratory as much information as possible about the circumstances of the case. If evidence is from a blast scene, send pictures, diagrams, witness statements, officer's reports, etc. If a suspect has been interviewed or a premise searched, send information about what the suspect may have been involved with, including internet recipes, jars of chemicals recovered, statements from the suspect about what kind of device he was making, etc. The more information the laboratory has about the circumstances of a case or the source of a particular item of evidence, the better able we will be to help investigate an incident.

- The person who collects explosives evidence must be free of contamination. If the individual collecting evidence has been involved with explosives recently, they should wear clean clothing including footwear. Hands should be washed and gloves should be worn. If very small amounts of explosives residues are involved, alcohol swabs and water swabs (with controls) should be taken of the evidence collector's hands and shoes, before any evidence is collected. Submit these swabs along with the evidence.
- For larger scale incidents, assistance may be required from an agency with more resources at its disposal than any local agency or the state crime laboratories. For scenes beyond the capabilities of local responders or the laboratory, it may be necessary to contact your local BATF or FBI office. The BATF and FBI can provide scene response, investigative assistance, and laboratory services in cooperation with local agencies and the state crime laboratories. When in doubt, call the state crime laboratory, and a BATF or FBI field office.

Submission of Explosive Evidence to the Laboratory

In order to assure the safety of WSP CLD personnel and to be in compliance with applicable Federal Regulations, all potential unexploded explosives evidence must be delivered in person to one of the four CLD laboratories that perform explosives analysis. The Spokane, Marysville, Seattle, and Tacoma laboratories are the only labs currently performing explosives examinations. Also, with any submission of explosives type evidence, please complete and submit the CLD Explosive Safety and Evidence Checklist ([Explosives Safety Checklist](#)) along with the evidence and the Request for Laboratory Examination.

If any questions arise about evidence collection, packaging, submission, or about what services the laboratory can provide, call the state crime lab for assistance and advice.

CLANDESTINE LABORATORY ANALYSIS

Clandestine lab case samples may contain a variety of liquids, solids, pure reagents, reaction mixtures, extracts and waste chemicals. Samples will normally be collected at the scene in duplicate to ensure that sufficient samples are available for reanalysis if required; therefore, only one sample vial set needs to be submitted to the Crime Lab for examination.

Generally, the first step in the analytical process is the identification of relevant chemicals in a sample. In general, a successful chemical identification strategy will utilize two or more techniques which lead to the same conclusion and preclude a false positive identification. The analysis of clandestine laboratory evidence utilizes a variety of instrumentation, including but not limited to, GC, GC-MS, FTIR, Raman, CE, X-Ray Fluorescence (XRF), and Scanning Electron Microcopy/Electron Dispersive X-ray Detection (SEM/EDX). Additionally, non-instrumental tests such as flame tests, color and precipitation tests, and microcrystal tests will also aid a forensic scientist in the identification and characterization of clandestine lab evidence.

As soon as there are good reasons to believe a clandestine laboratory exists, the investigator must not enter the premises. If you have already entered, vacate the area immediately. Do not smoke. Do not turn any electrical switches on or off; leave them as they are. Do not shut off any running water. Do not pour any water on any equipment or material—some chemicals will burst into flame or explode when in contact with water. If equipment is operating or "cooking," leave it as is. Many of the chemicals involved are toxic, flammable, and even explosive. Because a suspected clandestine laboratory potentially contains many chemical and physical hazards, these sites are treated as hazardous material incidents and the safety rules governing their processing will apply. These rules are dictated by OSHA, WISHA and Washington State Department of Labor and Industries. Only those personnel who are trained and qualified to use personal safety equipment (hazardous material protective clothing, SCBAs and respirators) are permitted to work in this kind of environment.

There are several well-trained teams throughout the state that have the expertise, equipment and necessary certifications to handle and process clandestine laboratories.

CONTACT THE CLANDESTINE LAB TEAM

The WSP Crime Lab has a team of chemists that are available to provide on-scene advice related to the clandestine manufacture of illicit substances. The chemists are available to provide advice related to safety, what samples to collect, type of process occurring, etc. The chemists are *not* available to collect and package evidence or to conduct a hazmat response within a scene.

If advice of a chemist is all that is needed, call the Crime Scene Response Team (CSRT) coordinator at (253) 255-3064 and request the assistance of a chemist.

If a full clan lab response by a qualified team is needed, contact WSP-SWAT.

WSP-SWAT consists of specially trained investigators who have the proper safety gear and equipment to enter and investigate a clandestine drug laboratory. While waiting for SWAT to arrive:

- Secure the surrounding area. Do not allow anyone to enter.
- Follow any instructions that the Team may provide.

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- Treat the clandestine laboratory and surroundings as a crime scene. Any physical evidence—such as tire or foot impressions, fingerprints, records, and vehicles—must be protected for later evaluation and collection.

COLLECTION OF EVIDENCE AT A CLANDESTINE LABORATORY

The collection of evidence at a clandestine laboratory focuses on documenting the chemical reagents and chemical hardware present. Samples need to be collected from reagents, reaction mixtures, and possibly wastes and residues for later analysis. An inventory of all laboratory related materials should be submitted to the crime laboratory along with the samples. This will enable the chemist to evaluate the method of manufacture used and potential production capacities.

In conducting an analysis of clandestine laboratory samples, very little material is actually needed. The only substances that should be collected in their entirety are suspected finished product or other controlled substances. Actual weights or volumes of the materials being sampled should be recorded. Estimates based on container size (such as “a one quart jar, half full”) are acceptable. Residues in filter papers may be collected by taking the entire filter paper or a representative number if there are several. All samples should be clearly labeled with item numbers.

Factory sealed reagents do not need sampling but should be photo documented and included in the inventory. All samples should be collected in duplicate and over-packed in separate metal cans with an absorbent material (such as kitty litter) for storage and preservation. One of the sample cans is submitted to the WSP Crime Laboratory and the other is stored by the submitting agency. Identification of what needs to be sampled is often difficult and best left to an experienced chemist if available.

Training in clandestine lab sampling may be provided to detectives who have taken an appropriate safety course. If you are unsure of how to handle any materials encountered in a clandestine lab, it is important to contact the crime laboratory and speak to a chemist.

SPECIAL NOTE ON HANDLING ANHYDROUS AMMONIA

RCW 69.50.440 relates to the possession of anhydrous ammonia for the intent of manufacturing methamphetamine. It is common practice for illicit drug manufacturers to take propane tanks and fill them with anhydrous ammonia. This compound is then used in the production of methamphetamine. Common propane tanks were never intended to store anhydrous ammonia. The fittings around the nozzle of the tanks are readily corroded by this compound, causing potential leakage of ammonia gas.

Proper training and safety equipment are needed to handle and test these tanks. **TANKS IN THIS CONDITION ARE A SERIOUS POTENTIAL HEALTH HAZARD – DO NOT SUBMIT THEM TO THE CRIME LABORATORY FOR ANALYSIS.** Contact your local Crime Laboratory or WSP-SWAT for information on preliminary testing and documentation. Disposal information can be obtained from the Department of Ecology (1-800-258-5990).

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FIRE DEBRIS ANALYSIS

INTRODUCTION

The primary role of the crime laboratory is to identify ignitable liquids or residues remaining in the aftermath of the fire.

ANALYTICAL PROCESS

The analytical process involves recovery of the material to be examined, data collection, and interpretation of results, based on the current versions of ASTM E1386, E1388, E1412, E1618, E2451 and E2881.

A. Recovery

The purpose of the recovery procedure is to isolate volatile organic materials from the sample matrix in a form suitable for testing and data collection.

Separation (Recovery) Techniques:

- 1) Headspace – Direct sampling of vapors from a closed container.
- 2) Adsorption-Elution (AE) – Concentration of gas phase volatile organics on an adsorptive medium (typically activated charcoal strips) followed by desorption (elution) with a solvent such as carbon disulfide.
- 3) Liquid-liquid Partition (Solvent Extraction) – Extraction and concentration of organic materials from a sample matrix by suitable solvents.
- 4) Solid-liquid Partition (Solid Phase Extraction) – Extraction and concentration of adsorptive materials by solid media followed by desorption.

B. Data Collection

Most ignitable liquids and ignitable liquid residues will be identified using an adsorption-elution (AE) procedure followed by Gas Chromatography-Mass Spectrometry (GC-MS).

Other techniques that may be employed include:

- 1) Infrared Spectrometry
- 2) Additional instrumental and non-instrumental chemical and physical tests may be employed.

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PRECAUTIONS

- It is important that the crime laboratory be called if there are any questions concerning the procedures for collecting and packaging fire debris evidence.
- Any liquid found may be ignitable; remember to handle with care.
- The search for ignitable liquids must not be delayed, since they may be lost through evaporation, weathering, or bacteriological degradation.
- Evidence suspected of containing traces of ignitable liquids must be packaged in vapor tight containers.
- Each container must be properly labeled and sealed. The containers must be sealed with tape extending across the top of the container and down the sides. The tape must be initialed so that the initials are across the tape onto the container.
- Do not place gloves used for collecting and packaging evidence in the evidence container.
- If possible, evidence containers should be stored in the freezer, or refrigerator if freezing is not possible, prior to submission to the Crime Lab.

SIGNIFICANCE

Laboratory examination of the evidence may reveal:

- The presence and nature of an ignitable liquid which may have been used to accelerate the fire.
- The manner and area where the fire was set.
- The connection of a suspect with the arson scene through comparison of ignitable fluids, trace evidence, and latent prints.
- The presence of another crime which the fire was planned to conceal, such as a homicide or fraud.

COLLECTION

- Ignitable liquid residues (fire debris):
 - Locations: protected areas (under furniture, floor moldings and joists, in cracks); lower surfaces, since liquids flow downhill; porous materials (carpet and padding, wood); soil, unsealed concrete, flooring and sub-flooring.

Use of a vapor detector ("sniffer") or ignitable liquid trained K-9 may be helpful. Many ignitable liquids do not have a noticeable odor. Other solvents may be masked by the odor of burnt materials. The human nose loses its sensitivity to certain odors when exposed to large quantities of scents for an extended period of time.
 - Methods: cut cross-section through and below suspect area or pour pattern, if possible. **Do not** use a gas-powered saw tools or generator near the sample area because contamination of the sample may occur. Sampling substrates which cannot be cut or removed may be accomplished with the use of unscented non-clumping kitty litter. Contact your local crime laboratory for guidance with this process.
 - Comparison Sample: a sample of the same substrate as the samples collected from the origin of the fire, without the suspected accelerant.
 - Sample collection amount: Do not fill sample container more than 2/3 full.

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- Ignitable liquids:
 - Locations: cans, bottles, porous materials, surface of puddles.
 - Methods: pipette, pour, or siphon into proper container; blot or skim surfaces with paper towel or gauze.
 - Labeling: Label the secured container properly and label as “fragile”.

- Molotov cocktails:
 - Package ignitable liquid and wick separately from the bottle, jar, or glass fragments. If there is no visible liquid, the wick remains are more likely to contain residue than the glass.
 - If fingerprint examination is desired, the glass should be stored so it can dry out rapidly. Fingerprints are dissolved by ignitable liquids. Preservation of this evidence for fingerprints may prevent ignitable liquid analysis.
 - If there is insufficient liquid, seal the glass in a vapor-tight container. Separate the larger pieces, which are most likely to contain latent prints, for drying and fingerprint processing. If there is not enough glass to process for both prints and for liquid analysis, a decision must be made as to which of the processes to sacrifice.
 - Label containers as fragile or as containing fragile material.

- Burned, charred paper (for document examination):
 - Before proceeding, call the Forensic Questioned Documents Section at the Spokane Lab at (509) 625-5401 for instructions.
 - Handle as little as possible. Leave charred paper where found if in a box, drawer, or wastebasket.
 - If repackaging of charred paper is necessary, place them loosely in a rigid container lined with cotton. Use gloves so as not to leave your own fingerprints.
 - Hand-carry. Do not mail.
 - If an analysis for volatiles is desired, seal papers in a new, unused paint can. If other examinations are desired, call the crime laboratory immediately for instructions.
 - Label all containers as fragile.

- Soil samples:
 - Freeze all soil samples after collection. Refrigerate if unable to freeze. Bacteria in the soil can destroy petroleum-based products; low temperatures will retard bacterial action.

- Clothing and cloth:
 - Gloves, shoes, and pants are the most likely to have ignitable liquid stains and spills. If possible, retain all of the suspect's outer clothing.
 - Package in the same manner as ignitable liquid evidence. **Do not fill the entire can with the garment;** cut the garment into pieces, if necessary. Leave at least 1/3 of the can empty.
 - Clothing removed from a body needs to be frozen after packaging in a vapor-tight container.
 - Shoes are often too long to fit easily into a gallon-size can without significantly bending and/or distorting the sole. It is not known whether or not this will alter the individualizing characteristics of the shoe outsole. To avoid this possibility, seal shoes in a polyester or nylon fire debris bag.

- Solid accelerants:
 - Package in plastic or paper bags, metal cans, or if sharp or jagged edges are present, package in a rigid container that will not be punctured or torn. If the solid accelerants are found with petroleum products, call the crime laboratory for handling and packaging instructions.

PACKAGING

It is important that the correct container is used to package the evidence. It is best to keep a variety of containers in several sizes on hand. Ignitable liquid residue evidence should not be stored in plastic containers or containers with plastic lids. Nylon and some polyester bags are an exception when properly sealed and have been shown to be free of contamination.

- Screw-top vials with Teflon-lined caps should be used to hold liquids of larger quantities (more than a milliliter) and should be packaged so they remain upright. Kitty litter or other absorbent medium may be used to hold vials upright and absorb leaks.
- Clean, paint-type, unused, metal cans are preferable for storing liquid residues. Paint cans should be filled between 1/3 and 2/3 full. Never fill the can completely.
 - **Advantages:** Cans are easily obtained, inexpensive, unbreakable, available in various sizes, and almost always maintain an airtight seal. Lined cans may delay or reduce the development of rust on the can.
 - **Disadvantages:** Cans may rust through, rather rapidly on occasion, and must be checked frequently. They are bulky and do not nest. Once sealed, the evidence cannot be readily inspected.
 - Use a hammer or rubber mallet to tap around the circumference of the lid for a proper seal. Keep debris out of the sealing groove. Inspect the seal to make sure the lid is completely seated.
 - Several local manufacturers sell these cans. When a batch of cans is ordered, it is a good idea to send the crime laboratory an empty control can for examination, especially if epoxy lined cans are used.
- Polyester bags and nylon bags designed specifically for fire debris evidence (and other kinds of volatile evidence) are acceptable. Polyester bags must be heat-sealed. Nylon bags can either be heat-sealed or rolled three times and taped. When rolling and taping nylon bags, the tape must extend the length of the roll and wrap around to the other side of the package on both sides.
 - **Advantages:** Bags are relatively inexpensive, easy to store, available in a variety of sizes, and are particularly useful for large bulky items. Evidence is readily visible.
 - **Disadvantages:** Bags can be punctured by sharp objects from the interior and/or exterior during handling. Polyester bags require a heat-sealer (and source of electricity), and can be awkward at a scene.
 - Polyester and nylon bags require special care to seal properly. The seal should be inspected closely to make sure it is complete and vapor tight.
 - Properly sealed cans may be placed inside these bags if can rusting is a concern. Alternately, properly sealed polyester or nylon bags can be placed in metal cans to protect the bags.

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- When a batch of polyester or nylon bags is ordered, it is a good idea to send the crime laboratory an empty control bag for examination.
- Glass jars are not recommended.
 - Jars are breakable, difficult to store, and may not provide a good seal.

CONTROLS/COMPARISON

A sample of material from the fire scene which is identical to the evidence submitted but does **not** contain any ignitable liquid is necessary. This sample, called a **comparison sample**, is collected from an area adjacent to the area where the evidence is collected and must be uncontaminated by the suspect ignitable liquid.

- Locations: From a protected area in the same room as the fire origin; from the room next to fire origin; or from outside of a clearly defined pour pattern.
- Precautions: A comparison sample is easily contaminated by walking through a pour pattern and then through the control area; by water run-off; by condensation of a volatile which evaporated from another area of the scene; by using contaminated gloves, tools, or utensils to collect the comparison sample. It is difficult, if not impossible, for the investigator to always collect an uncontaminated comparison sample. To help avoid contamination, collect the comparison sample first, then the suspect sample.

FIRE DEBRIS PACKAGING PRODUCTS

Products designed for packaging volatile evidence may be purchased from many evidence packaging supply companies. For additional information on packaging materials for volatile evidence, contact your local Crime Laboratory.

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FIREARMS EVIDENCE

INTRODUCTION

The number of incidents involving firearms evidence has increased significantly in recent years. The requests for examinations involving firearms, ammunition, and components of cartridges have grown immensely. It is important that the evidence be properly collected and handled in order to expedite and maximize the examination results.

PRECAUTIONS

- Do not pick up the firearm by placing a pencil or some other object in the barrel. Pick up by checkered portion of the grip. Always handle the evidence with gloves.
- Handle the firearm carefully, even if the safety is on or the firearm is not cocked. The safety may be faulty or the trigger pull may be very light ("hair trigger"). Place the firearm into a box (preferred), paper bag, or envelope for transport back to the workstation.
- Knives/Firearms/sharp items: should be placed in a new cardboard box and secured with plastic zip-ties.
- If the firearm is loaded, it must be unloaded before shipping to the crime laboratory. If, for some reason, the firearm cannot be unloaded, the submitting agency must call the crime laboratory and determine when and how to hand deliver the firearm to the laboratory.
- If the firearm is to be processed for latent fingerprints or DNA, caution should be exercised in order to prevent the destruction of prints or the contamination of potential DNA on the firearm. The submitting agency should call the crime laboratory for instructions prior to packaging and submitted evidence to the laboratory if there are questions regarding latent fingerprints or DNA.
- If a firearm or other metal object is recovered from fresh or salt water, it should be placed in a container of fresh water immediately. Immersion in fresh water will slow the oxidation process and remove the corrosive action of the salt water.
- Do not clean the firearm before submitting.
- Do not fire the firearm before submitting.

Proper labeling of evidence includes the contents, source, date, time, item number (alpha-numeric as necessary), agency name and case number, and the name or initials of the collector.

- Secure weapons in new cardboard boxes with zip-ties or other method to prevent movement.
- Document and label the package appropriately (see [pages 15-17](#) of this manual).

SIGNIFICANCE

The laboratory examination may reveal data about the firearm, ammunition, or components, information regarding the target object, and may contribute information regarding the circumstances of the firearm incident. The examination may determine:

- The caliber of the fired ammunition.
- The type of firearm by examining the recovered bullets and expended cartridge cases.
- If the recovered bullets and expended cartridges cases were fired from a particular firearm.
- Any malfunctioning of a submitted firearm.

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- The entrance and exit bullet holes in clothing.
- The approximate distance from muzzle to target.
- Any obliterated serial numbers.
- Bullet trajectories.
- Reconstruction of events.

METHODS USED

- Detailed examination of firearms including test firing and collection of fired bullets and cartridge cases.
- Microscopic comparisons between test fired bullets and cartridge cases, to each other, and then with submitted fired bullet and cartridge case evidence for specific firearm association.
- Microscopic examination of fired bullets for caliber determination, number of firearms used and the generation of a list of possible responsible firearms.
- Microscopic examination of fired cartridge cases to determine the number of firearms used.
- Polishing, acid etching and other methods applied to items with obliterated identifying markings or serial numbers.
- Visual and microscopic examination and chemical processing of items for the presence of gunshot residues, normally lead and gunpowder. These examinations will normally result in the determination of an approximate muzzle to target distance, in a range bracket, at the time of discharge.
- Review and examination of reports, images or other information to assist in the analysis of trajectories or in the reconstruction of events.

CONCLUSIONS

Microscopic conclusions will normally be reported as:

- The identification of a specific firearm to fired bullets or cartridge cases.
- The elimination of a specific firearm as having fired a bullet or cartridge case evidence.
- The identification or elimination of a specific firearm to fired bullet or cartridge case evidence cannot be made (inconclusive).
- The submitted evidence is unsuitable for microscopic comparison.

OPERABILITY AND TEST FIRES

The Crime Laboratory Firearms Section has developed a video for agencies to do their own test fires/operability testing. This video demonstrates how to test firearms, which will then allow the firearms scientists to focus on the critical forensic analysis in the laboratory. There are certain circumstances that might require submission of an operability case. Those circumstances include but are not limited to full auto conversions, damaged firearms, and other non-functional firearms. The laboratory will also continue the operability testing on cases that require microscopic comparison. Turning this service back to our customer/user agencies allows us to focus on cases requiring our work in the laboratory. The video can be found on the FLSB website of the WSP [Firearms Operability Video](#).

OTHER EXAMINATIONS

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- Elemental analyses of gunshot residue for the presence of lead, barium and antimony are not conducted.
- The attempted association of a specific fired bullet to a specific discharged cartridge case is not normally conducted.
- Elemental analysis of lead bullets or bullet cores for identification to a lot or box of ammunition is not conducted.

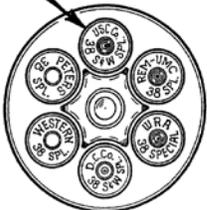
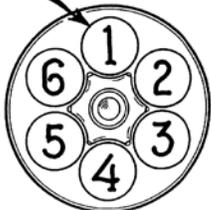
COLLECTION AND PRESERVATION

- All items should be inventoried. Record the source, date, time, agency case number, item number, and description of the item. Descriptions of firearms should include the serial number (do not confuse with part numbers), make, model, caliber, and the condition when found (i.e., loaded or unloaded, cocked or uncocked, safety on or off, etc.).
- The area of recovery should be measured, sketched, and photographed, showing the positions of the item.
- Unload the firearm, if possible.
- Handle carefully in order to preserve trace evidence. Do not remove the trace evidence unless the entire object cannot be submitted. Before removing, describe the location of the trace evidence and photograph or sketch the evidence in place.

UNLOADING A REVOLVER

- Place a line on the cylinder on each side of the top strap with a pencil or felt pen prior to opening or moving the cylinder. This will inform the examiner which chamber was at the top.
- While pointing the barrel downward, open the cylinder; before moving the cylinder or removing the cartridges, make a diagram of the cylinder. Number the chambers, starting at the top and going clockwise; note any cartridge in each chamber, whether the cartridge has been fired, and the headstamp information, indicating the manufacturer. See example:

Headstamp

FACING REAR OF CYLINDER		Chamber #	Condition	Information
<p>APPEARANCE OF CYLINDER AS RECOVERED</p> 	<p>DIAGRAM TO BE MADE BY OFFICER RECOVERING WEAPON</p> 	1	Fired	S&W
		2	Fired	REM
		3	Fired	WRA
		4	Loaded	S&W
		5	Loaded	WES
		6	Loaded	PET

- Each cartridge or cartridge case that is removed must be placed in an individual container. The number of the chamber from which it was removed must be noted on the container.
- The firearm and cartridges must be marked prior to packaging and shipping. A tag is a good method of marking the firearm.
- Unfired cartridges should be marked with an indelible felt tip pen along the case.
- Fired cartridge cases should be handled in a similar fashion as cartridge cases collected at a scene. Note - a mark made with a permanent marker may be removed during examination.
- **Never** mark the base of a fired or unfired cartridge.

UNLOADING A SEMI-AUTOMATIC PISTOL

- Remove the magazine. Handle the magazine with care if it is to be processed for latent prints or DNA. Do not remove any cartridges. Mark the magazine. Package the magazine in a paper envelope, small box, etc. Seal and label the container. Submit with the firearm.
- Remove the live cartridges, if any, from the chamber. Mark the cartridge, indicating that it was removed from the chamber, place in a container, and seal and label the container. Submit with the firearm.
- Note the serial number of the firearm for proper identification.

UNLOADING BLACK POWDER FIREARMS

Percussion cap revolvers –

- Remove the percussion caps from the cylinder and then remove the cylinder from the frame.
- Do not attempt to unload the individual cylinder cavities.

Percussion cap rifles –

- Remove the percussion cap. Do not attempt to unload the firearm.

Flint Lock pistols and rifles –

- Remove the flint and any powder in the flash pan. Do not attempt to unload the firearm.

Call the Crime Laboratory for shipping instructions.

RECOVERED BULLETS, PROJECTILES, AND FRAGMENTS

- Each bullet or fragment recovered from the crime scene should be wrapped separately in tissue paper and then placed in a small box (e.g., a pill box) or envelope. Seal and label the container. The fine striations on the bullet must be protected. Do not use any cotton material for wrapping—it may be confused with fibers from clothing involved in the case.
- If a bullet is buried in a wall or other object, cut around the bullet. Remove the material containing the bullet. Do not probe the hole or try to dig out the bullet—it may damage the bullet. Wrap, place in a carton, and seal and label the carton.
- Do not touch recovered bullets with bare fingers. Possible traces of blood on the bullet could be contaminated by handling. Use a clean, unused pair of plastic gloves or pick up with clean tissue.
- Shot pellets should be collected and submitted in the same manner as bullets.
- Search for shot shell wads and shot cups whenever a shotgun is involved.
- Shot patterns should be measured, sketched, and photographed. If possible, the surface containing the shot pattern should be recovered.
- Bullets and fragments recovered at an autopsy should be carefully rinsed and dried. Wrap in tissue paper and place in a small carton or envelope. Seal and label the container.

FIRED CARTRIDGE CASES AT SCENE

- Consider whether the items will be submitted for processing for fingerprints and/or DNA. Wear gloves to collect the evidence and prevent potential contamination.

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- Each cartridge case should be placed in a small carton or envelope. Make sure the packing is appropriately labeled. Do not mark the cartridge case on the base or on the side.

GUNSHOT RESIDUE FOR DISTANCE DETERMINATION

If fired at close range, a firearm will discharge partially burned and unburned gunpowder particles onto the target surface. The appearance (i.e., the pattern and density of the particles) may assist in establishing the distance between the firearm and the target surface.

In addition to gunpowder particles, soot, vaporous lead, and small lead particles are also produced during the discharge of a firearm and these substances can be found on a target surface around a suspected bullet hole. These various products of the discharge of a firearm can be identified using chemical testing and the results of the various chemical tests can also be used to determine an approximate muzzle to target distance.

CAUTION:

Chemical testing of clothing may have a detrimental effect on retesting and subsequent testing may not produce results similar to the original.

- If clothing is submitted, each article must be air-dried and packaged separately. Package the clothing in paper bags or wrap in brown paper. Do not package in plastic bags. Seal and label the containers, noting the contents.
- If the pattern is on skin, 1:1 color photographs of the wound and entire pattern should be submitted, before and after the wound area is cleaned. A scale or ruler must be included in the photographs. Close-up photos of the entry and exit wounds should be submitted as well as close-up photos of typical gunpowder particles in the pattern. Some of the particles should be picked off and folded in a piece of clean paper. The paper should be sealed, labeled, and placed in an envelope. Seal and label the envelope.
- The laboratory should be informed of the locations of the entry and exit wounds found on the body. Copies of autopsy or medical reports may be helpful in the course of the analysis and should be submitted to the laboratory.
- The suspect firearm and the same type of ammunition must be submitted. The gunpowder pattern on the proximity test target material is then compared to the patterns visible on or chemically developed on the submitted clothing.
- In the case of black powder firearms, the unknown factors of powder type and amount will be limiting factors in trying to establish distances between the firearm and target.

FIREARMS PARTS

- It is important to collect any and all firearm parts found at the crime scene.
- It may be possible to reassemble the firearm for testing; a firearm type and manufacture may be identified.
- All of the collected parts may not be from the same firearm.
- The parts may be packaged in a box (preferred), a paper bag, an envelope, etc. Parts packaged in a box may be strapped down to prevent shifting during transport. The packaging should be marked with the appropriate identifying marks, such as agency case number, item number, and description of the item.

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SERIAL NUMBER RESTORATION

- The serial number on a firearm (as well as office equipment, bicycles, machinery, skis, etc.) may be obliterated to conceal ownership. Chemical processing can often restore the number. Do not wipe or abrade the surface.
- Package the firearm in a suitable box (preferred), paper bag, envelope, etc. Firearms packaged in a box may be strapped down to prevent shifting during transport. The packaging should be marked with the appropriate identifying marks, such as agency case number, item number, and description of the item.

SHIPPING FIREARMS AND RELATED EVIDENCE

- Live ammunition cannot be sent through the U.S. Postal Service. Ship by United Parcel Service (UPS), Fed-Ex, or other common carrier. Federal Law requires that ammunition must be shipped separately from firearms; check with your preferred carrier for more information.
- All firearms must be unloaded before being shipped or hand-carried to the laboratory. If the firearm is difficult to unload, contact the crime laboratory for assistance. Secure the weapon in a new cardboard box with plastic ties to prevent movement.
- Handguns shipped via UPS must be shipped via Next Day Air. Please refer to the requirements of your normal carrier for more information.
- Long guns may be shipped via UPS ground.
- Other carriers may have rules regarding the shipping of firearms and ammunition. Please contact the carrier with specific questions regarding the shipping of this type of evidence.

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TOOL MARK EVIDENCE

INTRODUCTION

A tool mark is a mark made by one object on the surface of another, softer object. Although these marks are generally made at the entry point of a burglary, various kinds of tool marks can be found elsewhere, such as fractured knife blades, cut marks on wire, abrasions left on a vehicle, cut marks on a padlock, and machine marks on a metallic surface.

TYPES OF TOOL MARKS

- Some tool marks only show the basic shape of the tool. This type of tool mark lacks specific detail that can single out a particular tool; only the general shape and size of the tool can be determined—wood impressions are often of this type. Since wood will fracture or partially "spring" back, often only the general form and size of the tool can be determined.
- The tool mark that is of more value is the type that consists of striations (a series of narrow, fine grooves, some of which are microscopic) and indentations which show the individual characteristics of the tool. These marks can often lead to the identification of a particular tool.

***NOTE:** To examine the tool mark closely, a magnifying lens is helpful. If the tool mark does not have sufficient detail, a decision must be made whether the tool mark is of value and worth expending time and effort to collect and to be examined by the crime laboratory.*

METHODS USED

The submission of a tool with a questioned/unknown tool mark will normally result in the making of test tool marks in an appropriate medium using the submitted tool. These test tool marks will be microscopically compared to each other and then compared with the questioned/unknown tool mark. Casting of the test tool marks may be required depending on the type of questioned/ unknown tool mark submitted.

CONCLUSIONS

Microscopic comparisons will normally be reported as:

- The identification of the submitted tool to the questioned tool mark.
- The elimination of the submitted tool from the questioned tool mark.
- The identification or elimination of the submitted tool to the questioned tool mark cannot be determined (inconclusive).
- The submitted tool mark is unsuitable for microscopic comparison

OTHER EXAMINATIONS

Impression tool marks (i.e., footwear and tire tracks) and fracture matches are assigned to the Materials Analysis Unit.

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PRECAUTIONS

- Do not attempt to fit a suspected tool into the questioned mark. The tool mark may be damaged, the tool may be altered, and trace evidence may be lost or contaminated.
- In the case of cut wire type materials, mark the end of the wire type material cut by an agency representative during the retrieval of the evidence with paint, permanent marker, or wrap with tape, indicating this is a cut produced by a known tool. This provides information to the laboratory as to which end of the wire type material is to be compared with the suspected tool.
- Care must be taken to protect the suspected tool so that the face of the tool is not damaged, thus changing the tool mark it will produce. Protect the face of the tool with soft tissue paper.
- Handle the tool with gloves, as DNA might be recovered from a tool left at the scene.
- Protect any trace material on the face of the tool. Paint, metal particles, and other materials from a surface frequently adhere to the tool. The trace material can be compared with samples of the surface containing the tool mark.
- Samples of the surface adjacent to the tool mark must be taken. Later, when the suspect tool is recovered, trace materials on the tool can be compared to the samples taken at the scene. This information can be very valuable, particularly if the tool mark comparison is not definitive.

PRESERVATION OF TOOL MARKS

- When possible, submit the object containing the tool mark. This may entail submitting a drawer, a metal screen door, or cutting out a portion of the object containing the tool mark.
- Close-up photos that include a scale must be made if the object containing the tool mark cannot be submitted. The film plane should be parallel to the tool mark. Oblique lighting will increase details visible in the photo.
- It is important that the tool mark be kept clean and dry. An exception is when a tool mark on a metal surface is subject to rusting. To retard rusting, coat the tool mark with a light film of oil.
- Casting of the tool mark may be done as a last resort. A cast will never completely replicate the details of the original tool mark. Suitable silicone rubber casting materials, such as Mikrosil, can replicate a significant amount of the details in a tool mark. A formulation with a lesser degree of replication will cause a loss of the finer details in the tool mark and reduce the chances for a definite conclusion.
- Casting should be done by an experienced person. Improper casting may produce a worthless cast and damage the tool mark. **DO NOT PRACTICE ON THE EVIDENCE.**

TOOL FRAGMENTS

- At crime scenes, burglary tools may break during the commission of the crime. Fragments of the broken tool may be found near the scene or even in the tool mark itself.
- Since these fragments may be very small, a flashlight held obliquely to the floor surface is helpful. A magnet may also be used to locate the fragments that contain iron.
- The recovered fragment may be fitted to the suspect's broken tool and constitute what is called a physical match. The physical match may identify the tool as the one used at the crime scene.

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NATIONAL INTEGRATED BALLISTIC INFORMATION NETWORK (NIBIN) EVIDENCE

The National Integrated Ballistic Information Network (NIBIN) has greatly increased the ability of the Firearms Sections to identify incidents in which the same firearm was used. Often, NIBIN can offer new leads in “dead end” cases and reduce the number of unsolved firearm cases.

NIBIN is located in the Tacoma and Seattle Crime Laboratories. If there are any questions regarding submissions for NIBIN entry, please contact the Firearms Section at one of the three labs that handle firearms evidence.

METHODS USED

- Images of evidence fired cartridge cases will be entered into the NIBIN database for correlation with existing stored images.
- Images of test fired cartridge cases from submitted firearms will be entered into the NIBIN database for correlation with existing stored images.
- The submitting agency representative will be contacted regarding a potential association between submitted evidence items or test fired cartridge cases and existing database images.
- Potential associations between submitted evidence items or test fired cartridge cases and existing database images will be physically examined by a Firearms Examiner. Positive associations will be communicated to the representatives of the agencies involved.

SUBMISSIONS FOR NIBIN ENTRY

The following items may be submitted for NIBIN entry:

- Firearms, except revolvers and derringers
- Cartridge cases – from all firearms types except revolvers and derringers – can be entered in the NIBIN database.

The Crime Laboratory Division Firearms Section has developed a video for agencies to do their own firearms test fires/operability testing for NIBIN/IBIS entry. The video is entitled WSP Firearms Operability Testing Process and is located on the WSP website. ([Firearms Operability Video](#))

Test fires are now considered as evidence items and must be submitted as evidence. After the test fires are entered into the NIBIN database, the evidence will be returned to the submitting agency.

Please submit your test fires in a manila envelope in a sealed condition. In order to process your test fires, all boxes need to be completed on the envelope except the “laboratory number” and “date entered”. Manila envelopes are available from your local firearms section.

FIREARMS

Firearms should be submitted as instructed in the Firearms Evidence portion of this manual.

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Please send all firearms to the lab to which you normally submit firearms.

CARTRIDGE CASES

Cartridge cases should be submitted as instructed in the Firearms Evidence portion of this manual.

Cartridge cases for NIBIN entry only may be shipped directly to the Tacoma or Seattle Crime Laboratories.

Cartridge cases that require an examination of any type in addition to NIBIN entry must go to the lab to which they would normally be submitted.

OTHER EXAMINATIONS

No evidence bullets or bullets produced during the test firing of firearms are currently being entered into the NIBIN database.

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FORENSIC DOCUMENT EVIDENCE

The Washington State Patrol Questioned Document Section provides a wide variety of services related to documents involved in criminal investigations to our customer agencies. Those services include:

- **Handwriting and signature examinations** to identify writers and signers of documents that are related to criminal investigations.
- **Indented writing examination** to detect and decipher indented writing and determine the sources of anonymous or questioned documents.
- **Identification of the processes used to create documents**, including machine-generated documents, typewriting, photocopies, graphic arts processes, ink and paper examinations that are important in counterfeiting investigations.
- **Physical matches** to associate torn or cut documents with their sources.
- **Alterations** to genuine documents.
- In-house examination or referral to outside experts regarding **ink examination and dating, and differentiation of paper**.
- In-house examination or referral to outside experts regarding **document restoration**. This includes charred, soaked, torn, shredded, or otherwise damaged documents.

A document is defined as anything printed, written, typed, or reproduced that is relied upon to record or prove facts in an investigation. The role of documents is important in a society of contracts, wills, checks, and promissory notes, as well as threat and harassment notes, ransom notes, professional records and counterfeiting. The authenticity of these documents is often a critical issue to the resolution of a dispute or crime.

STRUCTURE OF EXAMINATIONS

The typical **handwriting or signature examination** case has three parts:

- 1) The questioned items which are submitted by the investigator. It is always preferable to receive the original of all documents. Examinations can be made from copies; however, the clarity of the copy can affect the interpretation results of the evidence and reported conclusions.
- 2) Standards (known samples) of the suspect's writing.
- 3) Standards (known samples) of the victim's writing.

Handwriting and signature examinations might identify the writer of a check, letter, or questioned signature. Handwriting examinations might also determine that an individual is not the writer.

Writing of similar kind is needed for comparison (i.e. known handwriting to questioned handwriting, known hand printing to questioned hand printing, and known signatures to questioned signatures). Additionally, the same letter and word combinations are very important components for meaningful examinations and conclusions. *Handwriting examination must be performed prior to latent fingerprint analysis.*

Indented writing examinations can yield information regarding writing that appears on several sheets of paper below the source page. Indented writing is created by the transfer of the writing instrument's pressure track from the page upon which the writing occurs to the pages beneath. This is helpful in such

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cases as the investigation of anonymous notes. Such notes can be processed for indented writing, and they often yield writing that occurred in a tablet several pages above the questioned note. Evidence recovered for indented writing examinations should be well-protected to prevent damage or additional indentation created during evidence processing.

Identification of the processes used to create documents can yield valuable information regarding the sources of documents and the determination of authenticity in counterfeiting cases. Examination of machine-generated documents can determine the type and, in certain cases, the specific machine used to create them. This includes typewriters, photocopiers, printers, facsimile machines, commercial graphic devices and systems. Especially important to counterfeiting cases is the submission of an authentic model of the document in question to which the suspected counterfeit can be compared. Examples include title certificates, checks, passports, and identification cards.

Among the most common cases involving **physical matches** is the microscopic association of pages to a source, such as a writing tablet or notebook. Careful attention to the preservation of the evidence will insure that the critical areas of the evidence do not sustain damage that might interfere with physical match determination.

Alterations to genuine documents are detectable using a variety of laboratory examination methods. These methods can determine data regarding alteration techniques and restoration of the original information that was altered.

Ink examination and dating, and the differentiation of paper are highly-specialized sub-disciplines of document examination. The Questioned Documents Section can provide services related to these examinations, and can also refer cases to experts outside our system who are imminently qualified to examine such evidence.

The Questioned Documents Section provides services in the highly specialized sub-discipline of **document restoration**. Some in-house services are available for such cases, and we can refer evidence to outside experts who specialize in various types of restoration work.

HANDLING AND SHIPPING OF EVIDENCE

Questioned documents generally do not require special handling or procedures. However, document evidence should be protected from excessive handling. There are two notable exceptions that require special handling:

Indented writings

Indented writing is the impression from the writing instrument that transfers to the sheets under the sheet containing the writing. These sheets should be protected from fingerprints, excessive handling, and additional impressions (e.g., do not write on the envelope after placing indented writing evidence inside).

Indented writing evidence must be examined before being processed for fingerprints. Fingerprint processing will destroy indented writing.

Charred documents

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Charred documents require hand delivery. They should be placed in a box lined with cotton. Do not attempt to separate the pages. The Spokane Crime Lab should be consulted before collecting and submitting.

SUBMISSION

Separate documents into at least two groups and submit in separate envelopes, Questioned and Known. If you have numerous writers, known documents should additionally be separated into groups by writers (K1, K2...). Each item of evidence must have a unique identifier. Evidence should be sealed with tape, with initials and date across the taped seal. If you have questions at any time, please contact the QD Section.

Questioned Documents: Documents that are suspected of being forged, altered, and counterfeit, etc...

- Place the questioned items together in a labeled envelope and seal. If you suspect multiple writers among the questioned documents, group accordingly and submit in separate envelopes.
- Do not write on the documents as impression writing may be recovered. If indented writing examinations are requested, sandwich between cardboard/cardstock and place in envelope.
- Do not fold or alter the documents. Keep them in the original state.
- Wear gloves and take appropriate measures to preserve fingerprint evidence. Please submit all questioned documents to the Questioned Document Section before processing for latent prints.

Known Documents: Documents containing handwriting from a known source, which will be used for comparison to the questioned writing.

- Place the known documents from each writer in separate labeled envelopes and seal.
- Obtain known writing samples from victim(s).
- Submit collected writings, those writings that are not requested. This type of known writing is most valuable in determining authorship.

The known documents must be of the same style of writing as the questioned items (i.e., hand printing to hand printing, handwriting to handwriting).

Requested standards are obtained through use of Crime Lab Division *Handwriting Exemplar Forms*. The exemplar will provide sufficient writing for examination. All four pages of the exemplar are necessary to obtain a representative sample of the subject's writing. Fully one-half of the exemplar is designed for the investigator to dictate to the subject the various signatures, amounts, numerals, phrases, and other writings specific to the case. Additional paper may also be used along with the exemplar packet.

You must be familiar with the questioned writing in order to dictate to the subject the correct questioned names, amounts, dates, payees, phrases, or signatures.

- Each questioned signature, name, word, etc., should be dictated to the subject 15 to 20 times.
- The various names, dates, questioned entries, etc., should be dictated in a random manner (e.g., "John Smith, four hundred, John, Smithsonian, Smith and Johnson," rather than "John Smith" 20 consecutive times).
- The exemplar should be filled out by the subject with a black ink ballpoint pen. Do not use a fiber tip or rolling marker pen.
- The Questioned Documents Section Handwriting Exemplar Form can be obtained by contacting the Spokane Crime Laboratory at 509-625-5401.

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- Handwriting exemplars should be packaged, labeled, and treated as evidence when submitted to the crime laboratory.

Collected standards are any writings that will be accepted in court as the genuine writing of the subject. Cancelled checks, business records, court documents, payroll checks, letters, and diaries are examples of collected standards. Contact the QD Section for ideas of collected standards.

There are some cases where the standard exemplar is not the best sample. The questioned item may not be typical of the normal writing situation. The investigator should obtain writing standards under circumstances similar to those of the questioned writings. For example,

- Graffiti on a wall: Have the subject write on a piece of paper taped to the wall at a similar height/position.
- Anonymous writing on unlined paper: Have the subject write dictated, verbatim samples on unlined paper.

If taking photographs of threats or graffiti, please take high quality, properly exposed, correctly-focused photos made with the camera perpendicular to the writing surface. If possible use a tripod and NO flash. More than one photo is recommended. If it is a digital photo, then please record original files on a CD or prints on photo-quality paper.

For questions regarding this information or to discuss the specific aspects of your case please contact the Questioned Documents Section at the Spokane Crime Laboratory.

Washington State Patrol
Spokane Crime Laboratory
Questioned Documents Section
580 W 7th St
Cheney, WA 99004
(509) 625-5401

Frequently Asked Questions

Do the forensic document examiners (FDE) administer the exemplars? No, we do not. We are available if you have questions, but we do not administer the exemplars. We leave that to the investigator.

Can we send the documents to you by fax or email? No, we cannot accept documents this way for examination requests. Keep in mind that this is potentially evidence and needs to be treated as such. All evidence for examination must be submitted as outlined in this Guide.

Can a FDE determine gender, age, ethnicity, personality, or mental state from writing? No.

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LATENT PRINTS EVIDENCE

INTRODUCTION

Latent prints are a widely recognized means of personal identification. Most crime scene evidence has the potential to contain latent prints. One should assume that latent prints are present on all objects handled and process or collect these pieces of evidence accordingly. Latent prints are some of the most fragile evidence which may be collected at a crime scene. Latent prints are susceptible to destruction and may be destroyed simply by coming into contact with other items of evidence or a package container. Proper collection, handling, and packaging of the evidence are critical.

SAFETY CONSIDERATIONS

Knives and broken glass may be encountered as objects that have latent prints on them. Personal protective equipment should be used in the collection of these types of objects and they must be packaged appropriately in puncture resistant containers

Do not submit hypodermic needles (or syringes with the needles attached), razor blades, or other sharps without management approval. The Crime Laboratory will not accept any evidence that includes a needle, regardless of packaging, without prior approval.

NOTE: *The cutting or shearing of a needle from a syringe is prohibited by federal and state regulations.[WAC 296-823-14010 and WAC 296-823-18030]*

All bloodstained objects should be treated as potential sources of bloodborne pathogens and appropriate protective measures (such as personal protective equipment) should be used when collecting contaminated or potentially contaminated evidence. Any known or suspected biohazard contamination should be noted on the Request for Laboratory Examination form.

All firearms must be unloaded before being shipped or hand-carried to the laboratory. If the firearm is difficult to unload, contact the crime laboratory for assistance. Federal Law requires that ammunition must be shipped separately (in a separate shipping container) from firearms; check with your preferred carrier for more information.

DEFINITIONS

Latent Print is a transferred impression of friction ridge detail that may not be readily visible.

Known Prints (Known prints can also be referred to as exemplars or elimination prints) are the prints of an individual, associated with a known or claimed identity, and deliberately recorded electronically, by ink, or by another medium. Recording comprehensive prints (pictured below) can help ensure the entirety of the friction ridge surfaces of fingers and palms are recorded. Submission of comprehensive known prints provides the laboratory with the greatest opportunity to conduct complete latent print comparisons.

Alternate Light Source is any light source, other than a laser, used to excite luminescence of latent prints,

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body fluids, or other items. These systems usually use various filters in conjunction with certain powders or chemicals to cause latent prints to fluoresce.

Automated Biometric Identification System (ABIS) is a computer system (previously known as the Automated Fingerprint Identification System) that stores, analyzes, and searches finger or palm print images against a database.

Next Generation Identification (NGI) is the FBI's national AFIS (previously known as IAFIS or the Integrated Automated Fingerprint Identification System).

CAPABILITIES AND SERVICES

The primary functions of the Latent Prints sections are to examine and process items of evidence for latent prints, determine if prints are suitable for comparison, compare unknown prints to known prints, and search unknown prints in the ABIS system. The results of all examinations will be compiled in a case report which is returned to the requestor or other interested parties.

The Washington State Patrol (WSP) contracts with the Western Identification Network (WIN), to operate and maintain the Automated Biometric Identification System software and database. WIN is a consortium of several western states, referred to as central sites, sharing a common ABIS database. When searching a print in the ABIS database, the WSP can search Washington records alone, each central site member, some combination of central site members, or all central site members. In addition, access may be provided to other national, state, or local state databases through the WIN network (e.g. California DOJ and the FBI's NGI).

COLLECTION

Evidence should be examined thoroughly for latent prints prior to collection. All visible impressions should be photographed.

Latent prints developed by powder processing methods should be lifted and submitted to the laboratory. If the lift process may pose a challenge, the latent prints should be photographed prior to lifting. Lift tape may be placed over the impression, left in place without lifting, and the item submitted to the laboratory for examination.

Latent lift cards should be documented with the location and orientation of the latent print. Please provide written information and a simple sketch of the object to describe the location from where the lift was made. Small directional arrows are helpful in orienting the placement of a latent print. Written information should include the date, case number, crime scene location, the object from which the lift is made, and name of person making the lift. If any of the officer's prints appear on the lift tape after lifting then those impressions should be crossed out and initialed (figures 1 and 2).

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Figure 1

Date	Crime	Case No.	— Sketch and/or Remarks —
6/30/15	Burg.	15Z1234	
Victim Chip Chuck			
Address of Incident 18A Big Tree Ln			
Location of Latent Prints Lifted Door window			
Prints Lifted by: Diego Garcia			
ID No. XXX			
Lightning Powder • (800) 347-1200 www.lightningpowder.com			
Re-Order #1-2501			

Figure 2

If any evidence is to be submitted for processing with chemicals the officer should refrain from the use of powder processing as powders could interfere with chemical processing.

Latent prints should be photographed using a high resolution digital SLR camera. The largest file format available should be used and images should be captured in a loss-less file format such as .tiff or RAW. The camera should be perpendicular (at a right angle) to the latent print so that the camera sensor is parallel with the latent print. Every attempt should be made to fill the frame with the latent print to ensure

that the maximum amount of detail is recorded and that the image is captured at a minimum of 1000ppi. The latent print should first be photographed without a scale to show the latent print in-situ on the object. A scale should then be placed next to the print and on the same plane. The latent print should then be re-photographed. The scale is important to allow the image to be sized 1:1 for comparison and possible search of the ABIS system.

Digital images should be burned to a CD or DVD for submission to the laboratory.

Known Exemplars

The requestor should take inked prints from all persons known to have legitimate access to the evidence (elimination prints) to allow for comparison against any latent prints recovered. These exemplars should be treated like items of evidence and should be packaged accordingly. Alternatively if individuals already have known prints on file, list their name, date of birth, and SID number on the laboratory request. Latent prints recovered from items of evidence often include palms or prints made from the second or third joint areas of the fingers. For this reason it is always best to obtain comprehensive known prints for comparison.

Comprehensive known prints are also known as major case prints.

A properly inked and rolled 10-print card should have all ten fingers and thumbs rolled nail to nail with minimal smears, along with plain (or flat) impressions at the bottom of the card.

In addition, each finger and thumb should have the center, both sides, and extreme tips inked and recorded (figure 3).



Figure 3

The palms should be inked from the tips of the fingers to the base of the wrist or the wrist crease. The outside of the palm should also be inked and recorded separately which is known as the 'writer's palm' (figure 4).



Figure 4

Post Mortem Prints

In homicide and death investigation cases, the agency should make every effort to obtain a complete comprehensive record of all friction ridge detail. The laboratory should be contacted if assistance is needed.

If it becomes necessary to remove the hands or fingers from the body, notify the laboratory in advance of its intent to deliver the body parts in person. **Do not send body parts through the mail or other carrier services.**

HANDLING AND PACKAGING

REMINDER: Prohibited items include: Explosives, flammable liquids, razor blades, and syringes with needles.

- Non-porous items (glass, aluminum cans, plastic bottles) should be packaged in containers to limit movement while in transit. Items should be submitted in separate containers if possible. If multiple items are submitted in the same container ensure the separate items will not contaminate others (leaking or cross contamination of biological substances). Items should be handled as little as possible and in a manner to avoid those areas that would be handled normally. Unnecessary layers of packaging and handling can easily damage latent impressions.
- **Do not pack the sealed evidence container with “filler” material (shredded paper, foam peanuts); these materials risk rubbing away any latent impressions.**
- It is strongly recommended that knives, firearms, or other sharp items be packaged in cardboard boxes and secured with plastic zip-ties. Make note on the Request for Laboratory Examination of any potential hazards present.
- Porous items (paper, cardboard) may be packaged in an envelope. Multiple porous items may be packaged in the same container. Handling of these items should be kept to a minimum even with gloves as glove marks can interfere with the development of latent impressions.
- Any wet items should be completely air-dried prior to submission.
- Adhesive tape, if possible, should be placed onto a sheet protector or a sheet of heavy plastic. Avoid "wadding" the tape. Do not package tape in paper containers.
- Latent lift cards collected at clandestine laboratories must be properly packaged to protect the health and safety of Crime Laboratory personnel. If latent print lift cards from clandestine laboratories are not packaged properly the evidence cannot be accepted. To package the lift cards properly, seal each latent lift card individually in plastic bags that have not been exposed to any potential contamination.
 - Note: When latent print processing is requested on items recovered from a suspected clandestine laboratory such as glassware, plastic baggies, and chemical containers, please call the WSP-SWAT team for assistance. Crime Laboratory personnel will not process evidence from clandestine laboratory “hot zones” for latent prints due to safety considerations for laboratory personnel.

Section Two

HIGH TECH CRIMES UNIT

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DIGITAL EVIDENCE

INTRODUCTION

The Washington State Patrol’s High Tech Crime Unit (HTCU) provides city, county, state, and federal law enforcement agencies with digital forensic technical support and training; and in accordance with established practices and standards of digital forensics processing, recover evidence that may exist on computer hard drives, cell phones and other digital media for use in related criminal and internal investigations.

ABOUT THE HIGH TECH CRIME UNIT

HTCU is a full service digital evidence retrieval and analysis unit. HTCU detectives are experienced professional investigators that can retrieve evidence without damaging or altering the original data. The data can be recovered from deleted or damaged file structures.

HTCU can provide an independent, impartial, and secure investigation while revealing and preserving important evidence, which agencies use to ensure an appropriate outcome to important digital criminal investigations.

HTCU SERVICES

Recovery of Cell Phone contents including (varies based on phone model and carrier):

Decoded Data	GPS	Applications	Internet Browser
Call Logs	Home Location	WhatsApp – Chat	History
Voicemails	Favorites	Viber	Cookies
Contact Lists	Recently found locations	Fring	Bookmarks
Locations (Wi-Fi, cell towers, and GPS fixes)	Last Journey	AIM	
Images	Last Fix	TextNow	
Video Files		TextFree	
Text messages (SMS)		Google+	
Multimedia messages (MMS)		Skype	
Emails		Tiger text	
Notes		Facebook	
Installed Applications		Motion X	
User Dictionary			
Calendar			
Bluetooth Device Pairing History			
Chats			
GeoTag Information			
Deleted Data			

Recovery of data from computer hard drives and other digital media (cameras, SD cards, thumb drives, CDs/DVDs, etc.) including:

- Recovery of e-mail files
- Recovery of deleted files
- Recovery of Internet History files
- Recovery of financial records
- Recovery of photo/video files
- Recovery of text documents

TYPICAL INVESTIGATIONS

Internet Crimes against Children, Homicide, Rape, Child Abuse, Financial Crimes, and Narcotics.

HANDLING AND SHIPPING OF EVIDENCE

HANDLING

No attempt should be made to power up a computer taken as evidence, as this may alter/destroy information stored on the hard drive.

Hard Drives should be submitted as found when seized, i.e. if in a desktop tower the entire tower should be submitted.

External hard drives, GPS units, digital cameras and other external devices should be submitted with power and connection cables.

Batteries should be removed from laptops and submitted with the computer and the power supply.

Batteries should be removed from cell phones prior to being packaged and should be submitted with power and connection cables.

If any known biohazard is present the outside of the package will require a "BIOHAZARD" label or markings.

SHIPPING

Evidence should be shipped via UPS, Fed Ex, Certified Mail or delivered in person. When shipping digital media all items should be packaged properly with plenty of packing material. All items should include a Lab Request Form and a copy of the signed search warrant and affidavit or a signed consent to search form.

The address for shipping is:

Washington State Patrol/High Tech Crime Unit
210 11th Ave SW, Suite 402
Olympia, WA 98501

For questions or if delivering in person please call: 360-704-4242.

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Section Three

TOXICOLOGY LABORATORY DIVISION

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TOXICOLOGY LABORATORY

2203 Airport Way S., Ste 360
Seattle WA 98134
Telephone: (206) 262-6100
FAX: (206) 262-6145

Email: toxlab@wsp.wa.gov

Website: <http://www.wsp.wa.gov/forensics/toxicology.htm>

STATE TOXICOLOGIST AND TOXICOLOGY LABORATORY DIVISION COMMANDER

– Dr. Fiona Couper

TOXICOLOGY LABORATORY MANAGER

– Dr. Brianna Peterson

QUALITY ASSURANCE MANAGER

– Ms. Amanda Black

TOXICOLOGY SUPERVISORS

– Mr. Brian Capron

– Ms. Lisa Noble

OFFICE MANAGER

– Ms. Kim Miller

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PREFACE

In July 1999, the Washington State Toxicology Laboratory became a division within the newly formed Forensic Laboratory Services Bureau of the Washington State Patrol. The Washington State Patrol Crime Laboratory formed another division within the same bureau. It is important the user recognize that each Laboratory Division performs distinct services for the State of Washington and that the appropriate guidelines and requests forms be used for each.

The Toxicology Laboratory Division handbook is organized to provide the following:

- A description of services provided by the Toxicology Laboratory
- General guidelines for the collection, preservation, and packaging of physical evidence
- The procedure for submitting physical evidence

It is not possible for any handbook to be comprehensive for every type of case. The Toxicology Laboratory staff are always available to advise you on any specific or unusual case. You can reach a toxicologist to answer any questions you have at (206) 262-6100.

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INTRODUCTION

The State Toxicology Laboratory, located in Seattle, provides toxicological services to all medical examiners, coroners and law enforcement agencies within the state. Forensic toxicology answers the question: “Did drug or alcohol use contribute to or cause an individual’s death or intoxication?” In support of that effort, the State Toxicology Laboratory provides the following services:

- Performs toxicological examinations of blood, urine and/or other tissues collected during a death investigation; or from living individuals who were either the victim of a crime or were suspected of committing a crime in which drugs and/or alcohol may have played a role. This includes driving under the influence (DUI) of intoxicating liquors and/or drugs, victims of suspected drug facilitated sexual assault (DFSAs), and miscellaneous drug related incidents or crimes. The Toxicology Laboratory reserves the right to decide which method(s) to use in the detection of alcohol and drugs in submitted casework.
- Prepares and certifies External Standard Solutions and Quality Assurance Procedure Solutions for use with the DataMaster breath alcohol measuring instruments.
- Provides consultation and interpretation for medical examiners and coroners on the results of toxicology analyses in death investigation cases.
- Provides consultation and interpretation for law enforcement agencies and attorneys on the results of toxicology analyses in driving-related cases.
- Provides expert testimony in court trials, hearings, and depositions.

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SAMPLE SUBMISSION

The Toxicology Laboratory in Seattle provides forensic toxicology services for all law enforcement agencies, coroners and medical examiners within the State of Washington, in addition to law enforcement agencies in Alaska. The laboratory analyzes blood, urine, and other biological tissues or fluids for the presence of alcohol and/or drugs.

Sample Collection Kits

The Toxicology Laboratory provides user agencies with kits for sample collection. To order any materials, please call or email the laboratory. The standard kit contains the following:

- Two (2) 10 ml gray-top glass vacutainer tubes for blood collection
- Evidence tape
- Cotton absorbent pad
- Plastic bag
- Polyfoam box
- Mailing sleeve pre-addressed to the Toxicology Laboratory

In addition, death investigation kits also contain two (2) 10 mL glass red-top vacutainer tubes. Sexual assault kits for toxicological analysis contain a urine cup.

If you have expired kits, please return those to our office as we recycle all materials, including the tubes.

NEVER submit the vacutainer collection needle or any other needle with the samples. Asking the nurse or phlebotomist to resheath the needle is subjecting him/her person to unnecessary risks and is against OSHA regulations. The Toxicology Laboratory will not accept any case that includes a needle or a syringe with the needle attached. Similarly, do not submit the betadine wipes or gauze – these are discarded upon receipt.

NOTE: The cutting or shearing of a needle from a syringe is prohibited by federal and state regulations. [WAC 296-823-14010]

Collection and Submission to the Laboratory

Tubes should be completely filled, wherever possible. Submitting partially filled tubes, or using smaller tubes, may result in partial or incomplete testing. Each assay performed requires a minimum volume of blood and the laboratory may not be able to confirm the presence of drugs if insufficient sample is submitted. In driving-related cases, the laboratory tries to reserve the second tube for the defense if independent analysis is requested.

All samples must be labeled with the subject's name and agency case number. It is important that, when labeling the blood tubes, the printing on the manufacturer's label not be covered. The Toxicology Laboratory maintains quality assurance certificates from the manufacturer for specific lot numbers and, if tubes from another source are used, the laboratory may not be able to provide a certificate.

Not only must the proper collection tube be used but it should always be **inverted 3 to 4 times** after collection to dissolve the container additives in the sample. This activity serves to preserve the sample and to prevent its coagulation; both being requirements under Washington Administrative Code 448-14-020: (<http://apps.leg.wa.gov/wac/default.aspx?cite=448-14-020>).

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Once the sample has been collected, place the evidence tape over the top of the tubes/containers. The initials or other identification of the person creating the seal shall be placed on the seal or across the seal onto the container. The tubes should be wrapped in the absorbent pad and placed in the plastic bag provided. The absorbent pad is used to cushion tubes during transportation as well as absorb fluid in the event of leakage. It is important that the absorbent pad is around the tubes, **INSIDE** the plastic bag. For law enforcement cases, it is recommended that you seal the top of the bag with tamper evident tape. If shipping, the sealed bag should then be placed into the polyfoam box provided.

If urine is collected, please ensure the urine cup cap is sealed correctly to prevent leaking in shipment. This is a commonly encountered problem and the entire sample may be lost. **Do not forget to label the cup with the subject's name.**

Complete the appropriate Toxicology Laboratory Request for Analysis form (refer to the appendix) and submit along with the samples. **Do not submit the Crime Lab RFLE forms.** The more information you provide in your request, the more thorough analysis the laboratory can perform. A telephone number should be provided should any question arise during analysis. If the sample is a DRE, a copy of the DRE "Face" Sheet should also be sent with the completed request form. Please note the column on the far right-hand side of the form is for *laboratory use only*. Current forms are available online at: <http://www.wsp.wa.gov/forensics/toxicology.htm>.

Verify that the subject's name on the request form and the samples are the same. It is the laboratory's policy to use the name on the specimen when there is a discrepancy.

The request form should be packaged on the outside of the polyfoam box inside of the mailing sleeve provided. This allows the Property and Evidence Custodian to access the request form without handling the specimen itself. All specimens should be refrigerated until sent. Specimens may be shipped to the laboratory by US Postal Service, UPS, Federal Express or another carrier of your choice. Specimens may also be hand delivered Monday through Friday between 7:30 am and 1 pm.

CASE TYPES

There are four types of cases typically submitted to the Toxicology Laboratory: Driving Under The Influence (DUI)/Drug Recognition Expert (DRE) cases; Death Investigation cases; Drug Facilitated Sexual Assault (DFSA) cases; and Drug Investigation cases. See the appendix for the appropriate form to use. If you have questions about which form to use, do not hesitate to contact our office.

Driving Under the Influence (DUI)/Drug Recognition Expert (DRE)

Only blood or breath alcohol test results are admissible in court as per se evidence of intoxication, so when alcohol is suspected and a legal breath test is not conducted, obtain a blood sample and not urine. A blood sample is collected following a complete DRE evaluation.

Death Investigation

For deceased subjects, blood is typically the most valuable sample for postmortem toxicological testing. Peripheral blood is the specimen of choice as it is generally the most reliable for interpretation of toxicological testing, since it is less susceptible to postmortem changes.

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Urine is also a useful specimen for drug testing in a postmortem setting and should, if available, be collected and sent to the laboratory using the red-top vacutainer tubes provided. Urine is resistant to postmortem changes and can indicate prior drug ingestion after drugs are no longer detectable in the blood. Urine is often analyzed first to screen for common illicit drugs and prescription medications.

Where available, vitreous humor fluid should be routinely collected (all available fluid should be collected, typically 3-5 mL in each eyeball). It is more than 98% water, and any drugs present in the blood will eventually equilibrate in the vitreous. Vitreous is a particularly useful sample for testing for alcohol to distinguish between postmortem production of alcohol and alcohol ingestion, since the eye as an enclosed organ is generally more resilient to microorganism infestation than other tissues.

Liver, cerebrospinal fluid, gastric contents, other tissues and maggots may also be useful specimens for analysis depending upon the circumstances of the case.

Whenever a death may involve unusual circumstances or unusual drug(s), it is advisable to contact the Toxicology Laboratory staff for guidance in sample collection.

Drug Facilitated Sexual Assault (DFSA)

Urine is typically the specimen of choice for drug facilitated sexual assaults because it provides the longest window of detection. The sooner a urine specimen is collected and refrigerated after the alleged event, the greater the chances of detecting drugs which may have been used as many of the drugs used are quickly eliminated from the body. A 50 mL urine specimen should be obtained as soon after the incident as possible, or at least within 96 hours.

Blood should additionally be collected if the patient presents within 24 hours of the alleged incident or if the patient appears sedated and/or intoxicated.

Proper labeling and documentation of all specimen containers should be ensured including details of the victim's name, date and time of collection, and approximate time after the alleged assault.

Drug Investigation

Non-driving related cases on living subjects where drugs are suspected (i.e. homicide suspect) are considered Drug Investigations. It is important to collect two full gray-top vacutainer tubes of blood as drug testing consumes more blood than alcohol testing.

If there is a significant delay between the incident and the blood collection (> 2 hours), a urine specimen may also be useful in Drug Investigation cases. In general, blood provides better evidence of drug influence than urine, but drugs will be detected for a longer time in urine than blood.

TOXICOLOGY LABORATORY APPENDIX

The following pages are copies of the Toxicology Laboratory Request for Analysis forms. Current forms can be obtained electronically at <http://www.wsp.wa.gov/forensics/toxicology.htm> or by emailing your request to toxlab@wsp.wa.gov. DO NOT SUBMIT CRIME LAB FORMS. Please note that the column on the right hand side of the form is for “Laboratory Use Only”.

Appendix A – Driving Under the Influence/DRE – Request for Analysis

Appendix B – Death Investigation – Request for Analysis

Appendix C – Drug Facilitated Sexual Assault – Request for Analysis

Appendix D – L.C.B/Drug Investigation – Request for Analysis

The following appendix is a list of drugs the laboratory screens for and their drug class. This list may change as screening methods develop.

Appendix E – Summary List of Drugs

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Washington State Toxicology Laboratory - Washington State Patrol

Death Investigation – Request for Analysis

2203 Airport Way S., Ste 360
Seattle, WA 98134-2027
Phone: (206) 262-6100
Fax: (206) 262-6145
e-mail: toxlab@wsp.wa.gov

Subject's Information: (Please print clearly) Name: _____ <small style="margin-left: 100px;">Last</small> <small style="margin-left: 200px;">First</small> <small style="margin-left: 100px;">MI</small> Age: _____ Sex: M <input type="checkbox"/> F <input type="checkbox"/>		Laboratory Use Only Laboratory # _____ Date: _____ Analyst: _____ Specimens Received: <input type="checkbox"/> Blood _____ ml <input type="checkbox"/> Blood Peripheral _____ ml <input type="checkbox"/> Urine _____ ml <input type="checkbox"/> Vitreous _____ ml <input type="checkbox"/> Liquid _____ ml <input type="checkbox"/> Serum _____ ml <input type="checkbox"/> Other: Please list <div style="border: 1px solid black; height: 40px; width: 100%;"></div>																													
Date Sent: ____/____/____ Date of Death: ____/____/____ Agency Case # _____ County _____ Sent By: Name: _____ Phone: (____) _____ Send Results To: Name: _____ Agency: _____ Address: _____ City: _____ State: _____ Zip: _____																															
Suspected Manner of Death: <input type="checkbox"/> Natural <input type="checkbox"/> Accident (non traffic) <input type="checkbox"/> Undetermined <input type="checkbox"/> <input type="checkbox"/> Homicide <input type="checkbox"/> Traffic Accident <input type="checkbox"/> Suicide: <input type="checkbox"/> Drug Related <input type="checkbox"/> Other Pending Tox: Y <input type="checkbox"/> N <input type="checkbox"/>																															
Medical History: brief description of the incident and attach copy of the investigation report. _____ _____																															
Drugs Suspected: list observations, drug history, prescriptions, etc. _____ _____																															
Sample Information: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Specimen</th> <th style="text-align: left; border-bottom: 1px solid black;">Collected</th> <th style="text-align: left; border-bottom: 1px solid black;">Sent</th> </tr> </thead> <tbody> <tr><td>Central Blood</td><td>_____</td><td>_____</td></tr> <tr><td>Peripheral Blood</td><td>_____</td><td>_____</td></tr> <tr><td>Urine</td><td>_____</td><td>_____</td></tr> <tr><td>Gastric</td><td>_____</td><td>_____</td></tr> <tr><td>Vitreous</td><td>_____</td><td>_____</td></tr> <tr><td>Bile</td><td>_____</td><td>_____</td></tr> <tr><td>Liver</td><td>_____</td><td>_____</td></tr> <tr><td>Spleen Squeeze</td><td>_____</td><td>_____</td></tr> <tr><td>Other:</td><td>_____</td><td>_____</td></tr> </tbody> </table>	Specimen	Collected	Sent	Central Blood	_____	_____	Peripheral Blood	_____	_____	Urine	_____	_____	Gastric	_____	_____	Vitreous	_____	_____	Bile	_____	_____	Liver	_____	_____	Spleen Squeeze	_____	_____	Other:	_____	_____	Analysis Requested: Blood Alcohol: <input type="checkbox"/> Vitreous Alcohol: <input type="checkbox"/> performed if blood is pos Carbon Monoxide: <input type="checkbox"/> Drug Screen: Urine <input type="checkbox"/> Drug Screen: Blood <input type="checkbox"/> performed if urine is pos Other: (Specify) _____ _____ _____
Specimen	Collected	Sent																													
Central Blood	_____	_____																													
Peripheral Blood	_____	_____																													
Urine	_____	_____																													
Gastric	_____	_____																													
Vitreous	_____	_____																													
Bile	_____	_____																													
Liver	_____	_____																													
Spleen Squeeze	_____	_____																													
Other:	_____	_____																													
Was the subject embalmed before the samples were taken? Y <input type="checkbox"/> N <input type="checkbox"/> State of decomposition: None <input type="checkbox"/> Early <input type="checkbox"/> Moderate <input type="checkbox"/> Advanced <input type="checkbox"/>																															
Chain of Custody: (signature required) From: _____ To: _____ Date: _____ From: _____ To: _____ Date: _____ From: _____ To: _____ Date: _____ Comments: _____		Evidence sealed Y <input type="checkbox"/> N <input type="checkbox"/> <input type="checkbox"/> Box sealed <input type="checkbox"/> Bag sealed <input type="checkbox"/> Tubes sealed Samples leaked Y <input type="checkbox"/> N <input type="checkbox"/> <input type="checkbox"/> 1 st Class <input type="checkbox"/> UPS <input type="checkbox"/> Certified <input type="checkbox"/> Registered <input type="checkbox"/> Fed Ex <input type="checkbox"/> Campus Mail <input type="checkbox"/> Hand Delivered																													

3000-215-002 (R 11/07)

Washington State Toxicology Laboratory - Washington State Patrol															
Drug Facilitated Sexual Assault – Request for Analysis	2203 Airport Way S., Ste 360 Seattle, WA 98134-2027 Phone: (206) 262-6100 Fax: (206) 262-6145 e-mail: toxlab@wsp.wa.gov														
Victim's Information: (Please print clearly) Name: _____ <small style="margin-left: 100px;">Last</small> <small style="margin-left: 150px;">First</small> <small style="margin-left: 100px;">Mi</small> Age: _____ Sex M: <input type="checkbox"/> F: <input type="checkbox"/>	Laboratory Use Only Laboratory # Date: Analyst: _____ Specimens Received: <input type="checkbox"/> Blood _____ ml <input type="checkbox"/> Blood Peripheral _____ ml <input type="checkbox"/> Urine _____ ml <input type="checkbox"/> Serum _____ ml <input type="checkbox"/> Liquid _____ ml <input type="checkbox"/> Other: Please List <div style="border: 1px solid black; height: 40px; width: 100%;"></div>														
Agency Case # _____ County _____ Sent By: Name: _____ Phone: () _____ Send Results To: Name: _____ Agency: _____ Address: _____ City: _____ State: _____ Zip: _____															
Alleged Incident Date: _____ Time: _____ am / pm Specimen Collection Date: _____ Time: _____ am / pm															
Case History: Detailed description of the incident <u>and</u> attach copy of the investigation report.															
Drugs Suspected: list symptoms, observations, drug history, prescriptions, etc.	<input type="checkbox"/> Box sealed <input type="checkbox"/> Bag sealed <input type="checkbox"/> Tubes sealed <input type="checkbox"/> Samples leaked Y <input type="checkbox"/> N <input type="checkbox"/> <input type="checkbox"/> 1 st Class <input type="checkbox"/> UPS <input type="checkbox"/> Certified <input type="checkbox"/> Registered <input type="checkbox"/> Fed Ex <input type="checkbox"/> Campus Mail <input type="checkbox"/> Hand Delivered														
Sample Information: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Specimen</th> <th style="text-align: center; border-bottom: 1px solid black;">Collected</th> <th style="text-align: center; border-bottom: 1px solid black;">Sent</th> </tr> </thead> <tbody> <tr> <td>Urine</td> <td style="text-align: center;">Y <input type="checkbox"/> N <input type="checkbox"/></td> <td style="text-align: center;">Y <input type="checkbox"/> N <input type="checkbox"/></td> </tr> <tr> <td>Blood</td> <td style="text-align: center;">Y <input type="checkbox"/> N <input type="checkbox"/></td> <td style="text-align: center;">Y <input type="checkbox"/> N <input type="checkbox"/></td> </tr> <tr> <td>Serum</td> <td style="text-align: center;">Y <input type="checkbox"/> N <input type="checkbox"/></td> <td style="text-align: center;">Y <input type="checkbox"/> N <input type="checkbox"/></td> </tr> <tr> <td>_____</td> <td style="text-align: center;">Y <input type="checkbox"/> N <input type="checkbox"/></td> <td style="text-align: center;">Y <input type="checkbox"/> N <input type="checkbox"/></td> </tr> </tbody> </table>		Specimen	Collected	Sent	Urine	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>	Blood	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>	Serum	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>	_____	Y <input type="checkbox"/> N <input type="checkbox"/>
Specimen	Collected	Sent													
Urine	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>													
Blood	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>													
Serum	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>													
_____	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>													
Chain of Custody: (signature required) Also: Please Print Name From: _____ To: _____ Date: _____ From: _____ To: _____ Date: _____ From: _____ To: _____ Date: _____ Comments: _____															

3000-215-003 (R 11/07)

Washington State Toxicology Laboratory - Washington State Patrol			2203 Airport Way S., Ste 360 Seattle, WA 98134-2027 Phone: (206) 262-6100 Fax: (206) 262-6145 e-mail: toxlab@wsp.wa.gov
L.C.B/Drug Investigation – Request for Analysis			
Subject's Information: (Please print clearly)		Laboratory Use Only Laboratory #	
Name: _____ Last First Mi		Date: _____	
Date of Birth: ____/____/____ Sex: M <input type="checkbox"/> F <input type="checkbox"/>			
Date Sent: ____/____/____ Date of Incident / Arrest: ____/____/____		Analyst: _____	
Agency Case # _____ County _____			
Sent By: Name: _____ Phone: (____) _____		Specimens Received: Blood _____ ml Blood Peripheral _____ ml Urine _____ ml Serum _____ ml Liquid _____ ml Other: Please List <div style="border: 1px solid black; height: 40px; width: 100%;"></div>	
Send Results To: Name: _____			
Agency: _____			
Address: _____			
City: _____ State: _____ Zip: _____			
Liquor Control Board: brief description of the incident: (Samples Analyzed for Ethanol content only)			
Drug Investigation Case History: brief description of the incident and attach copy of the investigation report:			
Drugs Suspected: list symptoms, observations, drug history, prescriptions, etc.			
Medications and illegal drugs of abuse suspect admits having taken:			
Sample Information:		Analysis Requested:	
Specimen	Collected	Sent	Blood Alcohol: <input type="checkbox"/>
Blood	_____	_____	Drug Screen:
Urine	_____	_____	Blood <input type="checkbox"/> Urine <input type="checkbox"/>
Serum	_____	_____	Other: (Specify)
Chain of Custody: (signature required)		Also: Please Print Name	
From: _____	To: _____	Date: _____	<input type="checkbox"/> 1st Class
From: _____	To: _____	Date: _____	<input type="checkbox"/> UPS
From: _____	To: _____	Date: _____	<input type="checkbox"/> Certified
Comments:			<input type="checkbox"/> Registered
			<input type="checkbox"/> Fed Ex
			<input type="checkbox"/> Campus Mail
			<input type="checkbox"/> Hand Delivered

3000-215-004 (R 11/07)

Appendix E from Toxicology – Summary List of Drugs

<p>The list provides a general overview of analytes that may be tested for by the Toxicology Laboratory, with corresponding method information. Case circumstances may require the testing of other compounds, either in-house or by an external laboratory. The Toxicology Laboratory reserves the right to decide which method(s) to use. Please contact the lab at 206-262-6100 with any questions.</p>		
REPORT DATE: 7/31/15		
Analyte Name	Confirmation Method Name	Typical Reporting Limit
Volatiles		
acetone	Headspace Gas Chromatography	10 mg/dL
butane	Headspace Gas Chromatography/Mass Spectrometry	POS
desflurane	Headspace Gas Chromatography/Mass Spectrometry	POS
difluoroethane	Headspace Gas Chromatography/Mass Spectrometry	POS
ethanol	Headspace Gas Chromatography	0.01-0.02 g/100 mL
ethyl chloride	Headspace Gas Chromatography/Mass Spectrometry	POS
isopropanol	Headspace Gas Chromatography	10 mg/dL
methanol	Headspace Gas Chromatography	10 mg/dL
sevoflurane	Headspace Gas Chromatography/Mass Spectrometry	POS
toluene	Headspace Gas Chromatography/Mass Spectrometry	POS
Basic Drugs		
bupropion	Gas Chromatography/Mass Spectrometry for basic drugs and metabolites	0.05-0.10 mg/L
citalopram	Gas Chromatography/Mass Spectrometry for basic drugs and metabolites	0.05-0.10 mg/L
cyclobenzaprine	Gas Chromatography/Mass Spectrometry for basic drugs and metabolites	0.05-0.10 mg/L
dextromethorphan	Gas Chromatography/Mass Spectrometry for basic drugs and metabolites	0.05-0.10 mg/L
diphenhydramine	Gas Chromatography/Mass Spectrometry for basic drugs and metabolites	0.05-0.10 mg/L
gabapentin	Liquid Chromatography/Mass Spectrometry for gabapentin	1.0 mg/L
ketamine	Gas Chromatography/Mass Spectrometry for basic drugs and metabolites	0.05-0.10 mg/L
methadone	Liquid Chromatography/Mass Spectrometry for methadone	0.01 mg/L
phencyclidine (PCP)	Gas Chromatography/Mass Spectrometry for phencyclidine	0.01 mg/L
tramadol	Gas Chromatography/Mass Spectrometry for basic drugs and metabolites	0.05-0.10 mg/L
trazodone	Liquid Chromatography/Mass Spectrometry for trazodone	0.05 mg/L
venlafaxine	Gas Chromatography/Mass Spectrometry for basic drugs and metabolites	0.05-0.10 mg/L
zolpidem	Liquid Chromatography/Mass Spectrometry for zolpidem	0.01 mg/L

Acidic/Neutral Drugs		
acetaminophen	High Performance Liquid Chromatography	5.0 mg/L
carbamazepine	Gas Chromatography for acidic and neutral drugs	5.0 mg/L
carisoprodol	Gas Chromatography/Mass Spectrometry for carisprodol and meprobamate	1.0 mg/L
ibuprofen	Gas Chromatography for acidic and neutral drugs	5.0 mg/L
lamotrigine	Gas Chromatography for acidic and neutral drugs	5.0 mg/L
meprobamate	Gas Chromatography/Mass Spectrometry for carisprodol and meprobamate	1.0 mg/L
phenytoin	Gas Chromatography for acidic and neutral drugs	5.0 mg/L
topiramate	Gas Chromatography for acidic and neutral drugs	5.0 mg/L
valproic acid	Gas Chromatography for valproic acid	10 mg/L
CNS stimulants		
amphetamine	Gas Chromatography/Mass Spectrometry for amphetamines	0.05 mg/L
ephedrine	Gas Chromatography/Mass Spectrometry for amphetamines	0.05 mg/L
MDA	Gas Chromatography/Mass Spectrometry for amphetamines	0.05 mg/L
MDMA	Gas Chromatography/Mass Spectrometry for amphetamines	0.05 mg/L
methamphetamine	Gas Chromatography/Mass Spectrometry for amphetamines	0.05 mg/L
pseudoephedrine	Gas Chromatography/Mass Spectrometry for amphetamines	0.05 mg/L
Barbiturates		
amobarbital	Gas Chromatography/Mass Spectrometry for barbiturates	0.50 mg/L
butalbital	Gas Chromatography/Mass Spectrometry for barbiturates	0.50 mg/L
pentobarbital	Gas Chromatography/Mass Spectrometry for barbiturates	0.50 mg/L
phenobarbital	Gas Chromatography/Mass Spectrometry for barbiturates	0.50 mg/L
secobarbital	Gas Chromatography/Mass Spectrometry for barbiturates	0.50 mg/L
Cocaine and metabolites		
benzoylecgonine	Gas Chromatography/Mass Spectrometry for cocaine and metabolites	0.01 mg/L
cocaethylene	Gas Chromatography/Mass Spectrometry for cocaine and metabolites	0.01 mg/L
cocaine	Gas Chromatography/Mass Spectrometry for cocaine and metabolites	0.01 mg/L

Antidepressants		
amitriptyline	High Performance Liquid Chromatography for antidepressants	0.05-0.10 mg/L
desmethyldoxepin	High Performance Liquid Chromatography for antidepressants	0.05-0.10 mg/L
desmethylsertraline	Gas Chromatography/Mass Spectrometry for the presence of antidepressants (SSRI's)	0.05-0.10 mg/L
doxepin	High Performance Liquid Chromatography for antidepressants	0.05-0.10 mg/L
fluoxetine	Gas Chromatography/Mass Spectrometry for the presence of antidepressants (SSRI's)	0.05-0.10 mg/L
norfluoxetine	Gas Chromatography/Mass Spectrometry for the presence of antidepressants (SSRI's)	0.05-0.10 mg/L
nortriptyline	High Performance Liquid Chromatography for antidepressants	0.05-0.10 mg/L
paroxetine	High Performance Liquid Chromatography for antidepressants	0.05-0.10 mg/L
sertraline	Gas Chromatography/Mass Spectrometry for the presence of antidepressants (SSRI's)	0.05-0.10 mg/L
Benzodiazepines		
7-aminoclonazepam	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
7-aminoflunitrazepam	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
alpha hydroxy alprazolam	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
alprazolam	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
chlordiazepoxide	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
clonazepam	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
desalkylflurazepam	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
diazepam	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
flunitrazepam	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
flurazepam	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
lorazepam	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
midazolam	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
nordiazepam	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
oxazepam	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
quetiapine	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.02 mg/L
temazepam	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
triazolam	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
zopiclone	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L

N-desalkyl flurazepam	Liquid Chromatography/Mass Spectrometry for benzodiazepines, quetiapine, and zopiclone	0.01 mg/L
Cannabinoids		
carboxy-THC	Liquid Chromatography/Mass Spectrometry for cannabinoids	5.0 ng/mL
THC	Liquid Chromatography/Mass Spectrometry for cannabinoids	1.0 ng/mL
Opiates		
6-acetylmorphine	Liquid Chromatography/Mass Spectrometry for opiates	2 ng/mL
codeine	Liquid Chromatography/Mass Spectrometry for opiates	0.01 mg/L
hydrocodone	Liquid Chromatography/Mass Spectrometry for opiates	0.01 mg/L
hydromorphone	Liquid Chromatography/Mass Spectrometry for opiates	2 ng/mL
morphine	Liquid Chromatography/Mass Spectrometry for opiates	0.01 mg/L
oxycodone	Liquid Chromatography/Mass Spectrometry for opiates	0.01 mg/L
oxymorphone	Liquid Chromatography/Mass Spectrometry for opiates	0.01 mg/L
Miscellaneous Compounds		
amantadine	By request: Gas Chromatography/Mass Spectrometry	
brompheniramine	By request: Gas Chromatography/Mass Spectrometry	
bupivacaine	By request: Gas Chromatography/Mass Spectrometry	
buprenorphine	By request: Liquid Chromatography/Mass Spectrometry	
chlorpheniramine	By request: Gas Chromatography/Mass Spectrometry	POS only
cyanide	Screen by Cyantesmo Test Strips	0.25 mg/L
diltiazem	By request: Gas Chromatography/Mass Spectrometry	
doxylamine	By request: Gas Chromatography/Mass Spectrometry	
ethylene glycol	By request: Gas Chromatography/Mass Spectrometry	POS
etizolam	By request: Gas Chromatography/Mass Spectrometry	
fentanyl	By request: Gas Chromatography/Mass Spectrometry	2.5 ng/mL
flubromazepam	By request: Gas Chromatography/Mass Spectrometry	
gabapentin	By request: Liquid Chromatography/Mass Spectrometry	1.0 mg/L
GHB	By request: Gas Chromatography/Mass Spectrometry	
glucose (urine)	Semi-qualitative screen by Keto-Diastix [®] Test Strips	
guaifenesin	By request: Gas Chromatography/Mass Spectrometry	
ketones (urine)	Semi-qualitative screen by Keto-Diastix [®] Test Strips	
levetiracetam	By request: Gas Chromatography/Mass Spectrometry	
lidocaine	By request: Gas Chromatography/Mass Spectrometry	
meperidine	By request: Gas Chromatography/Mass Spectrometry	
mesoridazine	By request: Gas Chromatography/Mass Spectrometry	
metaxalone	By request: Gas Chromatography/Mass Spectrometry	
methocarbamol	By request: Gas Chromatography/Mass Spectrometry	
methylphenidate	By request: Gas Chromatography/Mass Spectrometry	

Washington State Patrol Forensic Laboratory Services Bureau
Forensic Services Guide

metoclopramide	By request: Gas Chromatography/Mass Spectrometry	
mirtazapine	By request: Gas Chromatography/Mass Spectrometry	POS only
naoloxone	By request: Liquid Chromatography/Mass Spectrometry	
nefazodone	By request: Gas Chromatography/Mass Spectrometry	
norbuprenorphine	By request: Liquid Chromatography/Mass Spectrometry	
oxcarbazepine	By request: Gas Chromatography/Mass Spectrometry	
pentazocine	By request: Gas Chromatography/Mass Spectrometry	
pheniramine	By request: Gas Chromatography/Mass Spectrometry	
phentermine	By request: Gas Chromatography/Mass Spectrometry	
phenylpropanolamine	By request: Gas Chromatography/Mass Spectrometry	
primidone	By request: Gas Chromatography/Mass Spectrometry	
procaine	By request: Gas Chromatography/Mass Spectrometry	
promethazine	By request: Gas Chromatography/Mass Spectrometry	
propoxyphene	By request: Gas Chromatography/Mass Spectrometry	
strychnine	By request: Gas Chromatography/Mass Spectrometry	
thioridazine	By request: Gas Chromatography/Mass Spectrometry	
verapamil	By request: Gas Chromatography/Mass Spectrometry	
zonisamide	By request: Gas Chromatography/Mass Spectrometry	
Synthetic cannabinoids ("Spice")	External Lab	
Synthetic cathinones ("Bath salts")	External Lab	
lithium	External Lab	
LSD	External Lab	
mitragynine (Kratom)	External Lab	
pregabalin	External Lab	
propofol	External Lab	
psilocin	External Lab	
risperidone	External Lab	