

# **PHYSICAL EVIDENCE MANUAL**



**OREGON STATE POLICE  
FORENSIC SERVICES DIVISION**

## *Preference*

*The purpose of this handbook is to educate our customer in the Criminal Justice System regarding the services provided by the Oregon State Police Forensic Services Division, and the recommended methods of documenting, collecting and preserving physical to ensure the best analysis results.*

*The value of properly collected physical evidence followed by examination and interpretation by the forensic laboratory cannot be over-emphasized.*

*Every attempt has been made to make this handbook as current and up-to-date as possible; however, it should be noted that the field of forensic science is expanding at a rapid rate. New techniques and procedures are constantly being developed, providing new capabilities or refinements to existing capabilities.*

*Consequently, techniques, procedures and capabilities contained herein may change in the future. All agencies are encouraged to keep in regular contact with their local laboratory to keep abreast of any such changes. This handbook will be stored on the State Police Internet site:*

*<http://egov.oregon.gov/OSP/FORENSICS/index.shtml>*

*Updates will also be available from the same location.*

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*Oregon State Police*

*Forensic Services Division*

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## **1.0 FORENSIC SERVICES DIVISION MISSION STATEMENT**

The purpose of the Forensic Services Division (FSD) is to provide timely and accurate scientific, technical, and investigative support to the criminal justice system through forensic analysis.

### **INTRODUCTION**

Oregon's first forensic laboratory was established on June 14, 1939 under ORS 181.080 and located at the University of Oregon Medical School in Portland.

The OSP Forensic Services Division laboratories have been nationally accredited since 1985, and are accredited to ISO 17025 and American Society of Crime Laboratory Directors Laboratory accreditation (ASCLD- LAB) supplemental standards.

The services of the forensic laboratories are available to all local, state, and federal law enforcement agencies in Oregon for the purpose of rendering assistance in criminal investigations and judicial proceedings. Casework will also be conducted for the defense upon court order. Normally, all laboratory examinations, court appearances, and travel expenses are available without charge.

The FSD maintains five laboratories across the state of Oregon located in Bend, Central Point, Clackamas Pendleton and Springfield. The FSD will provide services in the scientific examination of physical and digital evidence, collection and preservation of evidence, reconstruction of major crime scenes and expert testimony regarding the scientific examinations according to the legal directions listed above. In addition, the FSD manages and administers the CODIS database and the State of Oregon's breath-testing instruments and officer certification.

The following is a list of the FSD disciplines and a brief description of the type of forensic services provided.

#### **Biology Processing**

The screening and preliminary processing of physical evidence for biological material (e.g., blood, semen, saliva).

#### **Breath Alcohol Program (Implied Consent Unit)**

The Implied Consent Unit services Oregon's Breath Alcohol Program. The Unit approves breath alcohol instruments, certifies the instruments, provides instrumentation, training and certification for the users and offers expert testimony.

#### **Controlled Substances**

The analysis of solid dose physical evidence to determine if a controlled substance is present. The analysis of evidence collected from suspected clandestine laboratory scenes to determine the identification of chemicals and processes used to manufacture controlled substances. Qualitative analysis is standard with quantitative analysis performed on an as needed basis for methamphetamine cases only.

#### **Crime Scene/Field Investigations**

The analysis of physical locations or objects suspected to be involved in a crime. Analysis will include recognition, documentation, collection and preservation of evidence and/or performing scientific analysis

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and interpretation, the identity of the involved individuals and/or the reconstruction of the events related to the crime.

**Digital and Multimedia Evidence**

Digital and multimedia analysis includes the use of analytical and investigative techniques to identify, collect, examine and preserve evidence/information which is magnetically [or optically] stored or encoded and can consist of computer forensics, video analysis, image analysis and audio analysis. Computer forensic analysis involves the examination, analysis and/or evaluation of digital evidence. Image analysis involves the application of image science and domain expertise to examine and interpret the content of an image and/or the image itself. Video analysis involves the examination, comparison and/or evaluation of video. The FSD does not perform audio analysis.

**DNA Analysis**

The analysis of biological evidence for the presence of nuclear DNA. If a DNA profile is developed it will be compared to relevant standards and/or searched in the CODIS database. Current DNA analysis is accomplished using the polymerase chain reaction and capillary electrophoresis to examine short tandem repeats. The FSD DNA unit also manages and administers the State's CODIS database.

**Firearms/Toolmarks**

Screening and comparisons of bullets and cartridge cases, firearm functionality, caliber determination of cartridge cases and projectiles, proximity determination tests and restoration of obliterated markings. Toolmark analysis compares marks left during the commission of a crime to test marks from a tool possibly used in the crime. The IBIS database is used for the correlation of unknown bullets and cartridges to known samples.

**Latent Prints**

Latent print processing is the physical and chemical processing of evidentiary items to develop and preserve friction ridge detail. Latent print comparison is the subsequent comparison of friction ridge detail to a person or persons. AFIS and IAFIS databases, databases composed of known fingerprint standards, are used for searching unknown latent prints.

**Questioned Documents**

Examination of printed, typed or written material for the purpose of identifying the source, determining alterations or other means of gaining information about the item or the circumstances surrounding its production.

**Toxicology**

The qualitative analysis of biological fluids (e.g., blood and urine) for alcohol, controlled and non-controlled substances and poisons. Quantitative analysis is performed on blood alcohol and post-mortem toxicology cases.

**Trace Evidence**

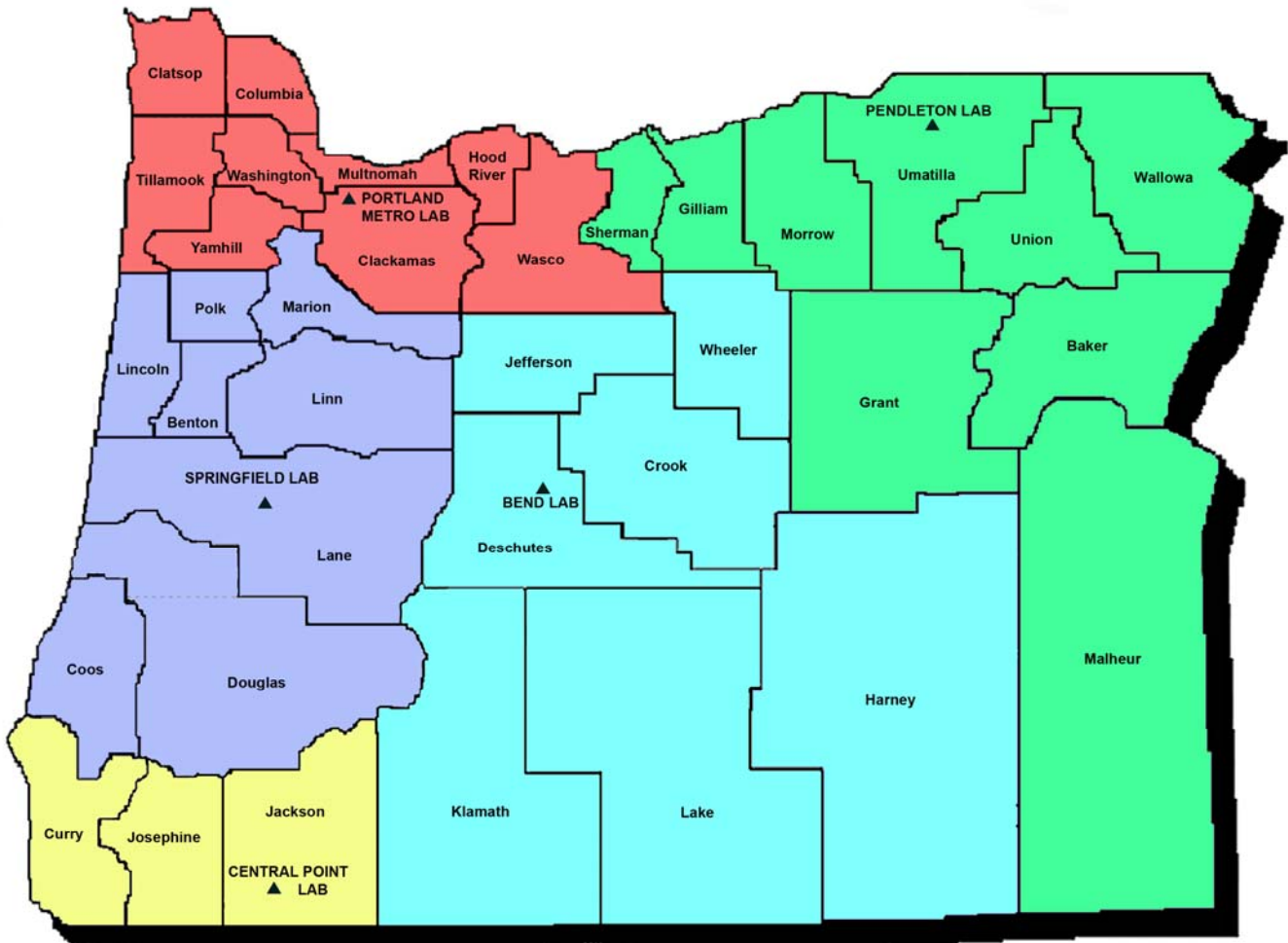
The screening for and the analysis of ignitable liquids, fibers, soil, glass, paint, hair, explosives, footwear and tire impressions and miscellaneous evidence (e.g., the identification of unknown chemicals and materials).

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**2.0 LABORATORY LOCATIONS AND SERVICES**

Forensic Services Division Oregon State Police General Headquarters Public Services Building 255 Capitol St. N.E., 4 <sup>th</sup> Floor Salem, OR 97310 503-378-3720	Pendleton Forensic Laboratory 700 SE Emigrant Street Pendleton, OR 97801 541-276-1816
Bend Forensic Laboratory 20355 Poe Sholes Drive, Suite 200 Bend, OR 97701 541-388-6150	Portland Metro Forensic Laboratory 13309 SE 84th Avenue, Suite 200 Clackamas, OR 97015 971-673-8230
Central Point Forensic Laboratory 4500 Rogue Valley Highway, Suite B Central Point, OR 97502 541-776-6118	Springfield Forensic Laboratory 3620 Gateway Street Springfield, OR 97477 541-726-2590

**Figure 1: Service Areas for the Oregon State Police, Forensic Services Division Laboratories**



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**SERVICES PROVIDED**

**Bend Lab**

Biology Processing  
Crime Scenes  
Drug analysis  
Latent Print analysis  
Trace Processing

**Central Point Lab**

Biology Processing  
Crime Scenes  
Clandestine Lab analysis  
Drug analysis  
Firearms Processing  
Latent Print analysis  
Trace Processing  
Serial Number Restoration

**Pendleton Lab**

Biology Processing  
Crime Scenes  
Drug analysis  
Firearms Processing  
Serial Number Restoration  
Trace Processing

**Portland Metro Lab**

Arson analysis  
Biology Processing  
Blood Alcohol analysis  
Clandestine Lab analysis  
(Including Meth Quant)  
Crime Scenes  
DNA analysis  
Drug analysis  
Explosives  
Firearms/Toolmark analysis  
Latent Print analysis  
Questioned Documents  
Toxicology analysis  
(Post Mortem and Ante  
Mortem)  
Trace Evidence analysis  
Video Image capture

**Springfield Lab**

Biology Processing  
Blood Alcohol analysis  
Clandestine Lab analysis  
Crime Scenes  
Drug analysis (Including Meth Quant)  
Firearms/Toolmark analysis  
Latent Print analysis  
Toxicology analysis (Ante Mortem)  
Trace Evidence analysis

The Forensic Services Division may move evidence from one lab to another in order to complete the work more efficiently.

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### **3.0 LABORATORY ONLINE INFORMATION SYSTEM (LOIS)**

The LIMS Online Information System (LOIS) provides web-based customer-access to laboratory analytical reports, case status, laboratory bulletins and the Implied Consent Program (ICP) certifications.

LOIS allows users to check the status of lab requests, verify the lab has received their evidence, and retrieve signed copies of final lab reports. In addition, you can check a notification box on a case and the system will send an email when a lab report is ready or when new requests for lab work are added. LOIS also allows printing of Intoxilyzer 8000 certifications and searching of the convicted offender database.

Each agency can control what agencies have access to their information in LOIS. To assist our customers with maintaining confidentiality of their cases, agencies are given the control to allow or deny access via LOIS to other LOIS user agencies. This duty will be performed by the agency LOIS administrator(s). District Attorney Offices are only given access to agencies in their jurisdiction.

Questions regarding LOIS can be emailed to [LOIS.Info@state.or.us](mailto:LOIS.Info@state.or.us).

## 4.0 GENERAL EVIDENCE HANDLING

It is important that items of evidence be collected, handled, and stored in a way that will ensure their integrity

### GENERAL EVIDENCE GUIDELINES

- Protect yourself and others
- Protect the evidence
- Consider all types of forensic evidence
- Chain of custody starts at the crime scene – keep it short
- Document location with notes, sketches, and/or photographs
- Mark evidence and/or packaging with your case identifier, initials, date, and description of evidence or as required by your agency
- Package all evidence separately
- Allow wet biological stains to air-dry
- Obtain standards if needed for a comparison of evidence
- Use packaging that is appropriate for the specific type of evidence such as paper bags, envelopes, plastic bags, cardboard boxes, tamper-proof sealing, etc.

### EVIDENCE COLLECTION

#### Packaging

The type you choose depends on the type of evidence, the condition of the evidence, and the examination(s) you want the laboratory to perform. Use the information in Table 1 below or consult the section specific to the type of evidence you have to select the proper way to package it. All packaging types need to be clean and unused (e.g. no recycled grocery bags).

**Table 1: Evidence Packaging**

Packaging Type	Uses
Paper bags or envelopes	Any biological material, (marijuana, psilocybin mushrooms, blood or semen stained items, condoms, etc.) <i>If unable to air-dry prior to packaging, submit to the laboratory as soon as possible and notify them that it is a wet sample.</i>
Plastic bags or Ziplocs	A non-biological material such as powder drug samples
Metal cans	Arson evidence
Plastic buckets	Samples from clandestine laboratories that are individually packaged in glass vials and set in an absorbent material (e.g. vermiculite, kitty litter, etc.) in the plastic bucket.
Glass vials	Liquid drug samples, syringe contents, samples from clandestine laboratory, etc.

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Paper folds <sup>1</sup> and Post-It notes, then placed into a clean envelope	Small pieces of trace evidence, hairs, fibers, minute glass particles, paint chips, residue amounts of powder drugs, etc. Place inside a larger paper envelope. Use a Post-It note by placing the trace evidence on the adhesive and folding the Post-It in half to cover the adhesive.
Cardboard boxes	Firearms, knives, large pieces of plate glass, a piece of flooring with a shoeprint, etc. Offers protection from sharp edges and the depth protects one surface of the evidence from rubbing.

**Sealing**

A proper seal ensures that evidence has not been accessed, altered, compromised, or lost during storage. A good seal is tamper-proof and is detectable if tampered with. The person packaging the evidence should initial and date across the seal (See Figure 2).

***The laboratory cannot accept evidence that is not sealed.*** This is a policy of the Forensic Services Division as stated in its Operations Manual.

**Table 2: Evidence Sealing**

Do Use	Don't Use
Evidence tape (tamper-proof)	Staples
Heat seals	Masking tape or Scotch tape
	Paper clips, binder clips, etc.

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<sup>1</sup> See "Appendix A" for instructions on making paperfolds.

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**Figure 2: The bag shown at left is properly sealed with evidence tape. The bag at right is not; evidence could be lost or accessed through the portions that are not secured.**



### **CHAIN OF CUSTODY**

OSP Forensic Services Division maintains a chain of custody for all evidence from time of receipt at the lab to when it is returned to the agency. Each laboratory utilizes a secure electronic chain of custody record through the JusticeTrax Laboratory Information Management System (LIMS) for all evidence submitted to the laboratory regardless of method of submission. For evidence that is personally delivered, the initial COC (when evidence is received in the laboratory) is documented on the Form 49 with a date, time and signature of person receiving the evidence submission. For evidence that is delivered via USPS, UPS or the State of Oregon Shuttle, the initial chain of custody (when evidence is received in the laboratory) will be documented by the person who signed for/received the shipment either on the Receipt of Shipment Log or on the Form 49.

### **SUBMISSION OF EVIDENCE TO YOUR FORENSIC LABORATORY**

All sealed evidence should be submitted to your local laboratory. An exception to this is a case with blood alcohol, toxicology evidence, arson, which can be submitted directly to the appropriate laboratory (Portland Metro or Clackamas). For example, although DNA analysis is only performed at the forensic

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laboratory in Portland, you should still submit all evidence needing DNA analysis, including standards, to your local laboratory.

Prior to submitting a large quantity of evidence in a single case, it is recommended that a meeting be arranged with an analyst in your local laboratory to triage the evidence. OSP Forensic Scientists are trained to manage the evidence in your case by ensuring that the evidence gets to the appropriate person for examination. That person may be in another laboratory and the evidence will be transferred to them without any additional request by you. The analyst(s) that is managing your case evidence in your local laboratory will be your contact person for status updates.

Sealed evidence may be submitted to the forensic laboratory by one of the following methods:

- Personal/Individual delivery (please call for an appointment before delivering to the lab)
- first class U.S. Mail
- Federal Express
- United Parcel Service (UPS)
- OSP Shuttle.
- Electronic transfer of digital images or data

For all methods, care must be taken to ensure that evidence is not lost, damaged, or contaminated and that the chain of custody on all exhibits can be established and maintained.

The Department of Transportation has Federal Regulations on packing and shipping items.

Upon receipt, the evidence packaging will be checked for an acceptable seal. If evidence is received improperly sealed, the submitting officer or a laboratory staff member must seal and initial the evidence. Evidence items received will be inventoried against the Forensic Services Request Form (Form 49) to ensure that the items indicated on the Form 49 are the items received. If a discrepancy is noted it will be documented on the Form 49 and the customer notified.

## **FORENSIC SERVICES REQUEST FORM**

All submissions should be accompanied by a Forensic Services Request (Form 49)<sup>2</sup>. These forms are available at [http://www.oregon.gov/OSP/FORENSICS/docs/OSP\\_Form\\_49-Sept-2011.pdf](http://www.oregon.gov/OSP/FORENSICS/docs/OSP_Form_49-Sept-2011.pdf), through the local Forensic Laboratory or the local State Police Office. Much of the form is self-explanatory; however, an explanation of what each field in the form means is described below.

- **Additional Suspect Information Only and Previous Evidence Submitted to this/any Laboratory** – check if either applies.
- **Page Numbers** – fill in number of form pages you are submitting so lost paperwork can be detected.
- **Agency** – fill in your agency. List all involved agencies.
- **Agency Case #** – if more than one case number applies to the evidence being submitted, list all.
- **Offense** – fill in all offenses associated with the case.
- **Offense Date** – this is the date the crime occurred, *not* the date the evidence was collected or turned

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<sup>2</sup> See “Appendix A” for a copy of the Forensic Services Request Form 49.

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into an agency's property room.

- **County of Venue** – this is the District Attorney's Office that will receive a copy of the laboratory report. Fill in the county that the case will be prosecuted in which may not necessarily be the county your agency is in.
- **NCIC** – fill in your NCIC number.
- **Names of Involved Individuals** – list all victims, suspects, and other involved individuals. Including the date of birth and SID/FBI numbers is important for fingerprint examinations, and race can become important for hair examinations.
- **Investigating Officer and phone number** – this is the name of the individual the laboratory report will be mailed to in your agency. If a Deputy collected the evidence submitted, but a Detective is handling the case, put the Detective's name, telephone number and email in the appropriate spaces. Please make phone numbers direct lines, when possible.
- **Submitting Officer** – this is the individual that delivered, mailed, or shipped the evidence to the laboratory.
- **Agency Exhibit** – fill in your exhibit numbers for the evidence that is being submitted.
- **Description of Evidence** – describe the evidence that is being submitted. The list of evidence should be exactly the same as the evidence submitted. Do not list additional evidence that was not submitted, or submit evidence that is not listed. When possible, associate drugs, clothing items, or other evidence to the individual it came from or belonged to.
- **Exam Requested** – this is what you want the laboratory to do with the evidence. Be as complete as you can with your request. If you do not know what request is appropriate, or want help phrasing your request, please call your local laboratory for assistance.

The Laboratory Case #, Submission #, Laboratory Exhibit and the bottom portion of the form should be left blank. If the form is not available, a letter containing the following information should be submitted with the evidence:

1. The date of the letter
2. The originating agency name
3. The agency case number
4. The county of venue
5. The nature of the offense and the offense date
6. The victim or complainant (an establishment or individual) and the date of birth of individuals
7. The names of suspects and their dates of birth
8. The evidence submitted (described in detail)
9. The type of examination requested
10. The name of the officer submitting the report or investigating the case, the officer's commission, telephone numbers and email address.

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11. Notations concerning accidental or intentional changes which the submitting officer has made in the exhibits

**Rushes**

If your request is a "Rush", indicate so in the appropriate location on the Forensic Services Request (Form 49), along with the date the request needs to be completed by, if known. Common reasons for "Rushes" are upcoming grand jury and trial dates, and an immediate need for investigative leads.

**Laboratory Reports**

A final report is released electronically to the agency/customer that made the request for service through the Laboratory On-line Information System (LOIS). An automatic notification of the report availability is also sent to a designee at the District Attorney's office that serves that agency/customer.

**FORENSIC LABORATORY EVALUATION FORM AND SURVEYS**

Periodically, the Forensic Services Division will send evaluation forms or surveys to its service agencies. The following are the different categories of evaluation forms or surveys that maybe sent:

- Intoxilyzer (sent via LOIS)
- Crime Scene Investigation
- Court Room Testimony
- Laboratory Analysis (sent via LOIS)

These evaluations and surveys provide valuable feedback on our goal of providing quality and timely scientific, technical, and investigative support. Should you receive an evaluation form or survey, please take the time to provide your feedback.

## 5.0 ARSON AND FIRE DEBRIS EVIDENCE

Many times it is difficult to ascertain whether a fire was accidental or arson. Flammable liquids readily evaporate and thus arson evidence should be collected and packaged in an air tight container to prevent loss by evaporation and possible contamination. *Moisture is not a problem; do not dry arson evidence.*

### ARSON SCENE INDICATORS

- Multiple fires in unrelated areas of the fire scene
- Odor of petroleum products, paint solvents, alcohol, etc.
- Stains on floor or other material
- Evidence of explosions not due to heat (shattered glass)
- Rapid spread of fire not explainable by structure, weather, or other conditions
- Smoke not explainable by building materials
- Fire trails such as cloth or paper trails, burn trails on carpeting, or deep charring in hardwood
- Removal of household property and valuable items
- Evidence of another crime which the fire might conceal (items stolen, evidence of violence)
- Recent similar fires in the vicinity

### EVIDENCE TO COLLECT

- Charred debris and related material from the origin where the accelerant was placed
- Igniting devices (fuses, rags, candles, etc.) including mechanical and electrical devices
- Samples of upholstery, drywall, plaster, wood, or other material that may have been penetrated by flammable liquids
- Samples of soil that may have been penetrated by flammable liquids
- Trace evidence possibly left by the arsonist such as hairs, clothing fibers, matches, etc.
- Suspect clothing worn at time of crime, including shoes
- Liquids containing possible accelerants
- A sample of uncontaminated carpeting and/or padding, drywall, wood, etc. must be collected and packaged separately
- Material used as a wick (shirt, sock, towel, etc.) from an incendiary device. This material may be analyzed for DNA comparisons.

### PACKAGING OF EVIDENCE

- Use airtight containers. Unused, clean metal paint cans are preferred. Lined or unlined cans work equally as well, but the lined cans will not rust through over time. Heat sealed bags manufactured for flammable evidence collection may also be used. When these bags are used you need to submit an unused bag as a control. Contact the laboratory for information on where

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to purchase these packaging supplies.

- Seal each collected item separately and securely.
- Mark all containers with appropriate identifiers.
- Document locations from which evidence samples were collected by notes, sketches, and/or photographs.

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## **6.0 BIOLOGICAL EVIDENCE**

Biological fluids such as blood, semen, and saliva are frequently encountered as physical evidence in many types of criminal investigations such as homicides, sexual assaults, assaults, and robberies.

Since blood, semen, and saliva originate as liquids, they quickly coat or penetrate surfaces they are deposited on, and can be difficult to remove when dried. Because no two humans are genetically the same (except for identical twins) these body fluids are unique to the person they originated from. By performing DNA analysis of these fluids or stains, a genetic marker profile can be obtained which can then be compared to DNA profiles obtained from reference standards or from other items of evidence.

Because DNA analysis lends itself to a computerized identification system, DNA profiles from items of evidence can be compared to the Combined DNA Index System (CODIS), a database that maintains qualifying DNA profiles from convicted offenders, items of evidence, and missing persons. In Oregon, this information is maintained at the state level. Searches of the database also occur at a national level.

The type of DNA analysis currently performed at the Oregon State Police forensic laboratories on biological material can yield much information. The table below lists those things that DNA analysis can determine and those it cannot.

**Table 3: DNA Examinations**

<b>DNA analysis <u>can</u>:</b>	<b>DNA analysis <u>cannot</u>:</b>
Associate evidence DNA to a person and give the frequency of occurrence in a random population	Determine the age or race of the person who donated the sample
Positively exclude a person from being the donor of evidence DNA	Determine how old the sample is
Determine the gender of an evidence DNA Donor	Determine how the sample was deposited (see "Crime Scene Investigations – Bloodstain Pattern Analysis")
Determine that the biological material is from a human	Determine whether or not force was used in a suspected rape from the analysis of semen evidence

### **SAFETY AND CONTAMINATION PREVENTION**

Current DNA technology allows for very small amounts of sample to be analyzed. For example, a bloodstain the size of a sharpened pencil point may be enough to perform DNA analysis on, as would the residue amount of sweat and skin cells on the inside rim of a ball cap. Because of this, inadvertent contamination of the evidence is possible if you do not take precautions. Individuals who routinely collect biological evidence may want to work with their local laboratory to submit a DNA elimination standard for profiling, so they may be ruled out as possibly having contaminated a particular item of evidence.

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- Wear gloves and, if desired, a mask and eye protection while collecting biological samples.
- Change gloves frequently or anytime your gloves are contaminated with biological material.
- Do not touch the tips of cotton swabs with your fingers.
- Avoid contaminating your swabs by getting them dirty, talking over them, blowing on them to make samples dry faster, etc. Consider purchasing individually wrapped sterile swabs.
- Do not touch your water dropper bottle tip to any surface or evidence.
- Clean tools (such as scissors or tweezers) that you might use to collect evidence with a 10% bleach solution and dry thoroughly.
- Do not lick envelope seals.

**GENERAL COLLECTION GUIDELINES**

In general, wet or moist biological evidence should be dried and packaged into clean and previously unused paper containers (e.g., envelopes, bags, cardboard boxes). Do not wrap the evidence first in plastic and then inside paper (or vice versa) as these conditions could cause the evidence to degrade. Package each item separately and properly label and seal the container. Mark the packaging with a "BIOHAZARD" label.

Rules of thumb for long-term storage of biological evidence are to refrigerate liquid evidence and freeze wet evidence. Dry biological evidence can be maintained at temperature controlled room temperature.

**Table 4: Long-Term Storage Conditions Matrix**

Type of Evidence	Frozen	Refrigerated	Temperature Controlled	Room Temperature
Liquid Blood	Never	Best		
Urine		Best		
Dry Biological Stained Items			Best	
Wet Bloody Items (not acceptable)				
Bones			Best	
Hair			Best	Acceptable
Swabs with Biological Material		Best (wet)	Best (dry)	
SAFE kits			Best	
Feces	Best			
Buccal Swabs			Best	

**UV Light Searches**

Many officers chose to use an ultraviolet (UV) light, Woods lamp, or other alternate light source to assist in the search for biological stains. Such devices can be helpful in a search, given that many biological

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stains such as semen and saliva may fluoresce, or appear bright, when viewed with UV light in a darkened room.

However, there are three important points to remember when using a UV light to assist with your search for biological stains:

1. A number of other materials may also fluoresce, such as urine, stains from food or drink, laundry detergent, and many other substances.
2. Not all semen or saliva stains will necessarily fluoresce with a UV light.
3. Blood will *not* fluoresce when viewed with a UV light; rather, it will appear dark.

## **BLOOD EVIDENCE**

Blood evidence is common in violent crimes and property crimes. Bloodstains may appear red, reddish-brown, tan, or yellowish. Bloodstains may be undetectable to the unaided eye depending upon evidence and stain characteristics. In addition to DNA, blood contains cells and proteins that allow the laboratory to perform the following examinations:

- Testing can indicate if blood is present.
- Testing can determine if blood is non-human in origin, or indicate if blood is human in origin.

### **Collecting Liquid or Moist Blood – Large Quantity**

1. Saturate 4-6 sterile cotton swabs with the blood.
2. Blood will coagulate so it is important to collect a good mix of clotted cells and serum.
3. Allow the swabs to thoroughly air dry.
4. Place the dried swabs in a paper container (e.g., paper envelope or bag).
5. Properly label and seal the container.

### **Collecting Liquid or Moist Blood – Small Quantity**

1. Limit the number of swabs. One-by-one, use swabs to collect the blood, concentrating the blood onto each swab. Use as many swabs (up to 4) as needed until the entire stain is completely collected.
2. Allow the swabs to thoroughly air dry.
3. Place the dried swabs in a paper container (e.g., paper envelope or bag).
4. Properly label and seal the container.

### **Collecting Dried Blood**

If the stained object is transportable, collect the entire item and submit it intact. Be careful to seal all openings of a package since dried blood may flake off of an object. If the stained object is not transportable, collect the blood by one of the following methods.

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### **Swabbing**

1. Moisten a sterile cotton swab using 1-2 drops of distilled water or tap water.
2. Gently swab the stain with the moistened swab tip until the swab thoroughly absorbs the blood. Continue collecting the stain until it is either completely collected or a sufficient number of swabs (up to 4) have been saturated.
3. Allow the swabs to thoroughly air dry.
4. Place the dried swabs in a paper container (e.g., paper envelope or bag).
5. Properly label and seal the container.
6. When the amount of blood is small, it is advised to select an unstained area adjacent to the suspected bloodstain and collect a substrate control in the same manner as described above. Package the substrate control separately.

### **Cutting out the stain**

This may be desirable when the dried bloodstain is on an object such as the upholstery of a car seat or on carpeting. Use a clean, sharp knife or scissors to excise the stained area, taking care to include unstained margins surrounding the stained area in your cutting for use as a substrate control and to avoid contaminating the stain. Package into a paper container and properly label and seal the container.

It is recommended that you consult with the District Attorney's Office before destroying property since the item may need to be repaired or replaced.

### **SALIVA EVIDENCE**

Saliva stains are not usually evident from a visual examination. However, certain types of evidence frequently contain traces of saliva (e.g., cigarette butts, drinking containers, gummed surfaces of envelopes, chewing gum, bite marks, ski and/or nylon masks, etc.).

#### **Collecting Saliva Evidence**

If the stained object is transportable, collect the entire item and submit it intact. If it is not transportable, such as bite marks on a body, collect the saliva stain in the following manner:

1. Moisten a sterile cotton swab with 1-2 drops of distilled or tap water.
2. Gently swab the suspected saliva stain.
3. Follow with a dry swab to collect any remaining moisture.
4. Label the swabs as "wet" and "dry".
5. Allow the swabs to thoroughly air dry.
6. Place the dried swabs in a paper container (e.g., paper envelope or bag).
7. Properly label and seal the container.
8. When there is a reasonable expectation that background DNA will be present on the substrate, select an unstained area and collect a substrate control in the same manner as described above. Package the substrate control separately.

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## **SEMEN EVIDENCE**

When the perpetrator of a sexual offense is a male, semen stains may be found on the victim as well as on clothing, bedding, rags, upholstery and other objects. Semen stains may appear off-white, yellow, or colorless and may have a crusted appearance. Semen stains may be undetectable to the unaided eye depending upon evidence and stain characteristics.

### **Collecting Semen Evidence**

Carefully recover all suspected stained material (e.g., bedding, underwear or other clothing, etc.). Each item of evidence should be packaged separately and carefully to prevent loss of any trace evidence (e.g., hairs) that may be present.

Air dry all evidence with damp stains. Consider marking the location of a damp stain by circling it with permanent marker, as it may not be visible when dry.

Clean paper should be spread under the item to catch any debris, which may be dislodged during the drying process, and between items hanging next to each other to prevent cross-contamination. Package each item separately in paper bags or envelopes, along with any paper used.

If the semen stain is on an object that cannot be easily submitted to the laboratory, contact your local laboratory for instructions on how to recover the stain.

## **TOUCH EVIDENCE**

Touch evidence is a category of DNA evidence defined as limited casual contact by an individual with a surface or material. This would primarily include objects touched by an individual's hand for a short period of time, such as cigarette lighters, keys, door handles, gun grips and triggers, light switches, drawer handles, countertops, gear shift knobs, steering wheels, etc.

Touch evidence will only be analyzed with prior approval from the DNA Unit Supervisor. The case should meet all of the following criteria:

1. The case is a rape, attempted rape, homicide, or attempted homicide.
2. All other forensic avenues to identify a suspect or link a known suspect to the crime have been exhausted.
3. A DNA result, possibly in conjunction with the CODIS database, is necessary to identify a suspect or link a known suspect to the crime. Evidence items will not be processed to determine, establish, or corroborate path of travel or location.
4. There should be a reasonable expectation that the suspect handled the item.
5. Every reasonable effort has been made to collect elimination standards from individuals who have routine or recent contact with these items.

If a case does not meet the above criteria, a private DNA laboratory may be of assistance if a suspect standard is also available. If there is no suspect, analysis by a private laboratory may be of limited value unless the OSP DNA laboratory is involved in the submission process. Generally, the OSP DNA Unit is unable to accept profiles generated by private laboratories for entry into CODIS.

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Touch evidence should be collected prior to using any latent print processing techniques on an item. The definition does **not** generally apply to items of “aggressive manipulation”, which may include ligatures or a weapon that was used in a repeated, aggressive manner to cause homicide (e.g., knife). While not considered Touch Evidence, the DNA on the item(s) is considered *fragile* and an abundance of caution should be used when swabbing the item or packaging the entire item for submission. If there is some ambiguity, the DNA Unit of the OSP Portland lab should be contacted for more guidance.

**Collecting Touch Evidence**

1. Moisten a sterile cotton swab with 1-2 drops of distilled or tap water.
2. Gently swab the area suspected of having been touched.
3. Allow the swab to thoroughly air dry.
4. Place the dried swab in a paper container (e.g., paper envelope or bag).
5. Properly label and seal the container.
6. Select an unstained area and collect a substrate control in the same manner as described above. Package the substrate control separately.

**ADULT AND CHILD SEXUAL ASSAULT FORENSIC EXAMINATION (A-SAFE AND C-SAFE) KITS**

Biological evidence associated with the body of a sexual assault victim needs special attention. The victim needs to be transported to a medical facility for a sexual assault examination. This should be done as expeditiously as possible in order to preserve what remains of the biological evidence and to document any physical trauma. Consider having photographs taken of any physical trauma as well. Attending medical personnel should collect the evidence by using the appropriate Sexual Assault Forensic Examination Kit provided to them by the Forensic Services Division.

In general, if more than 84 hours has elapsed from the time of the sexual assault to the time of the medical examination, the chances of finding semen evidence in the body of a living victim are greatly diminished. However, it may be prudent to collect a SAFE Kit if you have any doubts or concerns. This time range does *not* apply to deceased victims; it is recommended that you collect a SAFE Kit from deceased victims regardless of the elapse time.

Bathing, showering, and douching by the victim does not necessarily eliminate the possibility of finding semen evidence in body cavities, so collect a SAFE Kit even under these circumstances. Showering or bathing may, however, eliminate saliva, semen, and trace evidence deposited on the exterior of the body.

Undergarments, worn by the victim during and/or immediately after the assault, are also good sources for collecting semen and hair evidence. Package each clothing item separately.

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## **PENILE SWABBING EVIDENCE (PSE) KITS**

If a male suspect is taken into custody within 24 hours of the incident and he has not showered or bathed, a Penile Swabbing Evidence (PSE) Kit provided by the Forensic Services Division should be collected. If a PSE Kit is not available, contact your local laboratory for instructions on collection.

The suspect's underwear should also be collected as such evidence may provide an excellent source of the victim's DNA.

## **DNA STANDARDS**

DNA standards should be obtained from all listed individuals in a case who may have contributed DNA to evidentiary items, if those items will be referred for DNA analysis. This includes the victim(s), suspect(s), and in sexual assault cases, any recent (within 3 days) consensual sexual partner(s). These standards are compared to the DNA profiles obtained from the evidence to determine inclusions and exclusions.

*Oral swabs are recommended for routine use as a DNA standard for living individuals; however, blood samples are also acceptable. It is not recommended to swab the bleeding wounds of a living individual for submission as a DNA standard in lieu of collecting oral swabs.*

*Blood is preferred as a DNA standard for deceased individuals that are not severely decomposed or have not recently received a blood transfusion. For recently transfused decedents, an oral swab standard is an appropriate DNA standard.*

### **Oral Swab Standards**

1. Vigorously swab the inside of the mouth, one swab at a time, until 2-4 swabs are collected. The individual may do this him/herself under your direct supervision.
2. Allow the swabs to air dry thoroughly.
3. Seal in a paper envelope labeled with the individual's name, date, and "Oral Swab Standard." The swabs collected from one individual should be packaged together.

### **Blood Standards**

1. Collect at least one vial of blood into a lavender top tube, which contains the preservative EDTA. If the blood is being collected from a decedent,
2. 4-6 swabs of blood may be collected instead of a vial of blood.
3. Label the vial with the individual's name and date collected, then seal it in a box or padded envelope to prevent breakage. Label the outer packaging with the individual's name, date, and "Blood Standard."
4. Never store liquid blood tubes in the freezer. Refrigerate them instead.

### **Decomposed Remains**

If the human remains are too badly decomposed, it may be impossible to obtain an adequate oral or blood standard and thus necessary to collect an alternate type of DNA standard. Contact your local laboratory for instructions on other collection and preservation options.

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**Secondary Standards**

When a person from whom a standard is desirable based upon case scenario is unable to be located (e.g., missing person, fled area, etc.), secondary standards may be used. Occasionally, secondary standards may also be used if oral swab standards cannot be obtained from a person of interest for other reasons, such as lack of probable cause. Suitable secondary standards include personal care items known to have been used only by the person in question (e.g., toothbrush, razor, etc.), or cigarette butts and drinking containers which the person in question is known to have used. An agency must keep in mind that DNA standards in this form are not always successful as they are used in lieu of the best evidence, which is a DNA sample documented as being directly from an individual.

**No Available Standards**

Evidentiary items may still be referred for DNA analysis even if no standards are available, as the DNA profiles from the evidence may be suitable for comparison to the CODIS database. It is important to note that in the event of a probative association to a CODIS profile, a known standard (e.g., oral swabs) will likely be required for confirmation.

## 7.0 CONTROLLED SUBSTANCES

Controlled substance analysis is the identification of specific chemicals that are designated as controlled by the Oregon Administrative Rules.

There are three categories of analysis related to control substances.

- Control substance analysis- evidence can be found in both in liquid and solid samples (e.g. tablets, powders, plant material, etc.), varying in size from a few milligrams to multi-kilogram submissions, while the concentration can vary from a few parts per million to almost 100% purity.
- Clandestine laboratory analysis - samples are also analyzed to determine the method being used to manufacture the illegal drug and the possible drug yield given the quantity of chemicals and precursors seized.
- Methamphetamine Quantification – large quantities of methamphetamine may need to be analyzed to determine the purity of the evidence.

### ANALYSIS OF CONTROLLED SUBSTANCES

- Identification of controlled substances only. In general, non-controlled substances are not identified.
- Analysis is qualitative only. Oregon law requires only the presence of a controlled substance, not its purity.
- Quantitative testing is performed for federal sentencing in methamphetamine cases only.

### SUBMISSION POLICIES

Each laboratory limits analysis to two items per defendant, so the investigating officer should use discretion and submit only those two items that are essential to the case. Exceptions can be made by District Attorney's Office request to the laboratory. In cases with multiple suspects, an indication should be made as to what evidence belongs to which suspect.

Large seizures of over a kilogram of powder or large amounts of marijuana should not be submitted directly to the laboratory. A small sample of the material should be removed, packaged, and submitted for analysis. Laboratory personnel can assist with the weighing of large submissions, however, the officer must maintain possession of the evidence. A small sample will be retained by the laboratory for analysis.

Syringes, razors, and other sharp objects ("sharps") will not be accepted unless the District Attorney's Office has given notice of their intent to prosecute the case. All sharp objects should be separated from other evidence that requires analysis.

Approved sharp objects that are submitted for analysis must be packaged in such a manner as to protect personnel during handling. The packaging must be protective enough to ensure *no* possibility of being injured or punctured. Commercially manufactured puncture-proof ("sharps") containers are available for purchase. Contact your local laboratory for information.

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**COLLECTION AND PACKAGING**

Items removed from a body orifice as well as syringe contents should be labeled with a "BIOHAZARD" label.

Live plant material and other damp/wet evidence should be dried prior to submission. This includes marijuana (Figure 3), mushrooms, peyote, or opium poppies. Fresh plant material, when packaged in airtight containers such as plastic bags, decays rapidly and can inhibit or possibly eliminate the chance for detecting a controlled substance. Suspected fresh khat should be frozen and submitted as soon as possible.

Suspected LSD should be kept away from direct light. Potentially spiked liquids should be submitted in a timely manner.

Drug packaging that needs processing for latent fingerprints should be separated from the drugs when possible. The evidence for latent fingerprint processing is then submitted separately from the drugs.

Care should be exercised when packaging more than one exhibit in the same package. Cross contamination of evidence can occur, especially with bags that are open, leaking, or have cut corners. All submitted items must be written on the Form 49.

**Figure 3: Marijuana leaves on a growing plant. If you encounter such evidence, uproot the plant and shake the soil from the roots, allow it to air-dry and package.**



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## **FIELD TEST KITS**

When using commercially purchased field test kits, remember a positive result with the kit only indicates the possible presence of a drug. There can be other substances that give the same reaction. Generally, the colors of a positive reaction indicated on the test kit are very apparent and interpretation of the result is usually not necessary.

The field test kits should be discarded after use. Many of the kits contain concentrated acids that can leak, creating a chemical hazard. In addition, drugs tested in these kits cannot be further analyzed and therefore should not be submitted to the laboratory.

Officers should not use field test kits on a residue amount of drug. In cases where quantities are limited, omit the field test and submit the evidence directly to the laboratory for analysis.

## **CLANDESTINE DRUG LABORATORIES**

Clandestine drug laboratories range from crude makeshift operations to sophisticated and technologically complex facilities. They can be set up anywhere and are often found in private residences, hotel and motel rooms, trailers, barns and outbuildings, and commercial buildings. At these locations sophisticated surveillance equipment and booby-traps may be set up to deter intruders and law enforcement personnel from entering.

There are usually two situations when a clandestine laboratory is encountered. The first is when police or fire agency personnel encounter a previously unknown lab. When this occurs the personnel should secure the scene, allow no unauthorized or unnecessary entry, and contact the local specialized unit or trained personnel to process clandestine laboratories.

When clandestine drug laboratory chemicals are detected during a vehicle stop, treat the site as a crime scene. Contact the local law enforcement unit trained to handle this situation for assistance.

The second situation would involve prior knowledge by the local law enforcement agency of the illegal activity. A raid is planned and personnel needed for the proper shut down and dismantling of the laboratory have been contacted

### **Types of Clandestine Drug Labs**

Although methamphetamine is by far the most commonly encountered clandestinely manufactured drug in Oregon, the OSP clan lab analysts are prepared to analyze samples from other types of manufacture. These include but are not limited to amphetamine, methcathinone, MDMA & related compounds, PCP, LSD and other compounds in the phenethylamine, tryptamine and piperidine classes.

### **Collection of Clandestine Drug Lab Samples**

Extreme care and caution should be exercised whenever investigating or processing a clandestine drug lab site. The chemicals and substances used in the manufacturing process can be caustic, explosive, carcinogenic, poisonous, irritating, and flammable. Personnel participating in clandestine drug laboratory investigations should have specialized training in the use of protective equipment and the appropriate health and safety procedures.

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Clandestine Laboratory samples and reagents include highly corrosive acids, caustic bases, volatile respiratory irritants, flammable liquids and many other dangerous substances. The appropriate use of personal protection equipment is strongly recommended. In addition, samples must be packaged in a safe manner for long term storage and transport.

Everyone should be aware that the majority of the chemicals used in the chemistry section have one or more hazardous properties.

The processing of clandestine drug laboratories also involves the sampling, removal, and proper disposal of hazardous toxic chemicals. For forensic purposes, representative samples of all substances that could be used for the synthesis of a controlled substance should be submitted to the lab. In addition, photographs of the scene depicting any glassware along with any officer's report should also be submitted. If at anytime the investigating personnel have questions about what should be sampled on scene, it is encouraged that they contact their local forensic laboratory for assistance. The transportation and disposal of all chemicals at the scene is regulated by state and federal environmental protection agencies and as such, any questions regarding disposal procedure should be directed to them.

### **METHAMPHETAMINE QUANTIFICATION**

The Oregon State Police Forensic Services Division performs quantitative analysis on solid dose methamphetamine only. This type of analysis requires a separate request, usually by a federal attorney, and is conducted when cases are being prosecuted at the federal level.

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## **8.0 CRIME SCENE INVESTIGATIONS**

OSP FSD is available to assist with crime scene investigations at the request of any law enforcement agency, District Attorney's Office or the State Medical Examiner's Office. A request can be made during normal business hours (8am to 5pm Monday to Friday) by calling your local laboratory. After hours, call OSP Regional Dispatch Center at 541-776-6111 (Southern Regional Dispatch Center) or 503-375-3555 (Northern Regional Dispatch Center) and they will contact the on-call forensic laboratory supervisor for you.

Laboratory management will assess each request based upon the crime type, the complexity of the forensic services needed, available resources within the laboratory and the investigating agency, and the anticipated response time. Crime scene response is primarily limited to homicides/attempted homicides, buried body recovery and officer involved shootings. If special circumstances exist which require the skills of trained forensic personnel, crime scene assistance may be provided for person crime cases such as assault, rape and robbery. The FSD does not respond to property crimes cases but FSD resources are available to consult via telephone for any crime scene

If a search warrant is deemed necessary, it should be procured prior to the arrival of laboratory staff and available for them to review. It is the responsibility of the investigating agency to provide crime scene security for the duration of the crime scene processing.

### **CRIME SCENE SERVICES OFFERED**

- Evidence identification, documentation, preservation, and collection
- Buried body excavation
- Crime scene photography
- Bullet trajectory determinations
- Advanced bloodstain pattern analysis and reconstruction
- Shooting scene reconstruction
- Locating occult blood
- Alternate light source processing
- Impression enhancement, casting or lifting, e.g., shoe or tire
- Metal detection
- Latent Print processing

### **PRIMARY CRIME SCENE SERVICES**

- Evidence recognition, documentation, collection and preservation.
- Buried body excavation
- Photography
- Bullet trajectory determination
- Bloodstain pattern analysis and reconstruction
- Locating occult blood
- Impression enhancement, casting or lifting e.g., shoe or tire
- Shooting scene reconstruction
- Latent Print processing

## PROCESSING A CRIME SCENE

Refer to the specific chapters in this manual (Biological Evidence, Fingerprints, Firearms Evidence, etc.) for evidence collection techniques and safety considerations.

Crime scene documentation consists of notes, photographs and diagrams/sketches. Using a combination of these techniques will create a detailed record and will provide a basis for the investigator's future recollection of the scene.

### Notes

Crime scene notes should be clear, legible, detailed, and should be taken in chronological order throughout the processing of the crime scene. Observations (e.g., description of the body, weapons, bloodstains) and processing techniques/results (e.g., dusted with black fingerprint powder and lifted one print) should be documented.

### Photography

Photographing a crime scene should be performed in a systematic manner to ensure that all necessary photos are taken. Photographs should be taken before any evidence is moved. The best approach to crime scene photography is to sequentially take overall, midrange and close-up photographs.

- **Overall Photographs**

These photographs show the relationship of evidence in an area (e.g., photographs of a living room showing a body and numerous other items of evidence), or document the location of a crime scene (e.g., a photograph of the outside of a house showing the street number). Overlapping photos are recommended to ensure that the entire area is documented. If placards are utilized to identify the location of evidence at the scene, photos should be taken before and after their placement.

- **Midrange Photographs**

These photographs document the relationship of evidence items to other items within an area.

- **Close-up Photographs**

These pictures show the detail of an individual item of evidence. Close up photographs should be done with and without a scale.

### Diagrams/Sketches

Scene diagrams/sketches can provide an overall view of a scene and the location of evidence items. They can also be used to document detail of specific items or areas.

OSP Reconstructionists should be utilized to diagram the scene whenever possible. A sketch that will be used to create a scaled diagram must include all relevant measurements (e.g., dimensions of the room, measurements to all evidence from two independent points, heights of objects/evidence for a 3-D computerized rendition of the scene, etc.)

A key/legend is necessary if you are using item numbers or evidence markers to show the locations of items on the sketch.

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### **Conduct a Detailed Search**

Conduct the search of the crime scene using a systematic search approach. Room to room searches and logical association searches (e.g., following a blood trail from one point to another) are commonly used indoors. For outdoor scenes, areas are typically searched in overlapping sections.

### **Vehicle Examinations**

Note the following information about the vehicle:

- Year
- Make
- Model
- License plate
- VIN
- Color
- Damage

Below is a list (not all-inclusive) of things to consider, based on the case circumstances, when examining a vehicle. It may help to divide the interior into quadrants and search each quadrant from ceiling to floor.

- Examine the exterior of the vehicle. Look for transfer evidence relevant to the case (e.g. paint from a hit and run vehicle, clothing impressions on the plastic of a front bumper, hair caught on the broken edge of windshield glass, etc.).
- Document tire information for all tires including manufacturer, type, size, and tire pressure. If the tires need to be compared to tire track evidence the forensic laboratory should be contact to assist in collecting to an exemplar from each tire.
- Note the position of seat(s), tilt wheel, accelerator and brake pedals, and rear view mirror.
- Vacuum or tape lifts of specific areas for trace evidence.<sup>3</sup>
- Examine the interior of the vehicle and the trunk for potential evidence.
- Examine the engine compartment and undercarriage of the vehicle for potential evidence.
- Take known standards from the upholstery, carpet, or other vehicle for possible later comparisons.

### **Postmortem Examinations**

Photograph the following:

- Full body photographs of victim as delivered to the postmortem examination.
- Full body photographs of victim unclothed, before and after clean up.
- Mid-range and close-up photographs of exterior wounds and/or identifying marks (e.g. tattoos) with and without a scale.
- Photograph any body parts or evidence requested by the Medical Examiner (e.g. bullets, bullet tracks, etc.).

It is recommended that the following evidence be collected during a postmortem examination. Remember that the postmortem examination may be the only (or last) chance to collect this evidence, so it is prudent to collect more than you think you need, rather than less, in these situations.

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<sup>3</sup> See "Fiber Evidence – Collection of Fiber Evidence."

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- Blood standard. Collect at least one lavender/purple stoppered tube for a DNA standard. For recently transfused decedents, an oral swab standard is an appropriate DNA standard.
- Blood sample for blood alcohol determination. Collect at least one gray stoppered tube.
- Urine sample
- Head hair standard. This should be pulled, not cut.
- Pubic hair standard. This should be pulled, not cut.
- Sexual assault evidence kit<sup>4</sup>
- Penile swabbing evidence kit<sup>8</sup>
- Fingernail scrapings
- Clothing, one item per bag
- Evidence items located in or on the body
- Finger and palm prints (for elimination print purposes and identification)

**Decomposed Remains**

If the human remains are too badly decomposed, it may be impossible to obtain an adequate oral or blood standard and thus necessary to collect an alternate type of DNA standard. Contact your local laboratory for instructions on other collection and preservation options.

**Bloodstain Pattern Analysis**

Analysis of bloodstain patterns can reveal significant information in some cases. In such cases, the relevant issue may be how the blood was deposited rather than whom the blood came from. When this is the situation, contact your local laboratory for a qualified expert to assist in the bloodstain pattern interpretation.

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<sup>4</sup> Consider collecting this evidence even when sexual assault is not immediately suspected. If it is not collected and becomes relevant later in the investigation, the samples may be difficult or impossible to recover. See "Biological Evidence – Sexual Assault Evidence Kits and Penile Swabbing Evidence Kits" for further information.

## **9.0 FIBER EVIDENCE**

- Textile fibers can be exchanged between individuals, between individuals and objects and between objects. When fibers are associated with a specific source, such as fabric from the victim, suspect or scene, a value is placed on that association.

A fiber is transferred and detected is also dependent on the nature and duration of the contact between the suspect and the victim and/or scene and the persistence of the fibers after they have been transferred.

Research has shown that with few exceptions the largest quantity of fibers on an object is from the last object to be in contact with it. Therefore, it is advantageous to consider collecting fiber evidence prior to processing for other types of evidence. Caution should be used to prevent cross contamination of evidence collected for fiber examinations, particularly when crime scene personnel will also be responsible for collecting suspect or victim clothing items or for the processing of related scenes or vehicles.

Fiber examinations involve a comparison of samples from known and questioned sources to determine whether they are consistent with having originated from the same source (e.g., carpet from a suspect's car compared with foreign fibers removed from the victim's clothing). Laboratory analysts examine various physical, chemical, and microscopic properties of fibers when performing a comparison between evidence fibers and a potential source. Common conclusions include statements regarding the similarity or dissimilarity of the evidence fiber(s) to the possible source or standard. This comparison involves the recognition and evaluation of class characteristics, which associate materials to a group, but never to a single source. Conversely, individual characteristics allow the association between two or more items with each other to the exclusion of all other items. For fiber examiners, this most often occurs when pieces of fabric or cordage are physically matched.

### **FIBER EXAMINATIONS**

The following may be determined from fiber examinations:

- The type of fiber (e.g. natural or synthetic, animal fiber, glass fiber, etc.)
- The possible product uses for the fiber (e.g. carpet fiber, clothing fiber, etc.)
- The degree of similarity between evidence fiber(s) and a fiber source

### **COLLECTION OF FIBER EVIDENCE**

Fiber evidence can be collected in a number of ways. Table 5 lists various methods and when they are appropriate.

### **COLLECTION OF FIBER STANDARDS**

A fiber standard (or a possible source) is required when the laboratory is requested to perform a fiber comparison. If the possible source can be packaged and transported to the laboratory with ease, submit the entire object (e.g., clothing items, throw rugs, etc.)

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**Table 5: Fiber Collection Methods**

<b>Method</b>	<b>Description</b>	<b>Packaging</b>	<b>When to Use</b>
Adhesive lifts*	Use fingerprint tape, cellophane tape, or other clear adhesive substrate and pat over the item. Take care not to miss any areas or allow the tape to become "overloaded." Post-It notes may also be used for small areas.	Stick adhesive tapes onto a clear, colorless plastic sheet (e.g. transparency film). Place into a paper envelope or bag. Fold Post-It notes in half and place into a paper envelope.	For fibers you cannot see, or to be sure you have not missed any. Good on car seats, surfaces of clothing, and other medium to large surfaces.
"Pick" method	Using your fingers or tweezers, carefully retrieve the fiber taking care not to pinch, crush, or stretch it.	Place the fiber into a paperfold, in a folded Post-It note, or paper envelope.	For fibers you can see.
Vacuum sweepings	Use a portable vacuum cleaner equipped with special traps holding a piece of filter paper. <i>Lightly</i> vacuum the surface of interest. The goal is to collect fiber evidence that is on the surface of the object, not to clean it.	Carefully remove the filter trap, cover with the lid or cap, and package in a paper or plastic bag.	For fibers you cannot see, or to be sure you have not missed any. Good on car seats, sections of carpeting, and other large surfaces.

\* Care should be taken to store adhesive lifting materials in such a way that they will not become contaminated prior to use.

If the fiber source is believed to be from a large object or one not easily transported, such as car upholstery or carpeting from a dwelling or vehicle, cut representative samples from various areas of the carpeting. Be sure to collect samples from areas that are visually different (e.g. different colored areas, faded areas due to sunlight, worn sections, etc.). Samples should be about 1x1 inch unless you see variations in the item that would warrant a larger sample cutting.

Package the garment, object, or sample cuttings in paper envelopes or bags and clearly label with a description of where the standard came from.

Do not package standards with evidence fibers, or allow them to be near or in contact with each other. This could allow cross contamination to occur.

Adhesive lifts are NOT acceptable for collection of standards.

## 10.0 FINGERPRINT (FRICTION RIDGE SKIN) AND LATENT PRINT EVIDENCE

Fingerprints (friction ridge skin) are a widely recognized means of personal identification. Most crime scene evidence has the potential to reveal comparable latent print impressions. Thus, one should assume that latent prints are present on all objects handled by the perpetrator and process or collect these pieces of evidence accordingly.

By examining the evidence submitted, the laboratory will be able to:

- Determine the presence of latent, patent or plastic print impressions.
- Determine if these print impressions are of comparison quality.
- Compare these print impressions with the known friction ridge print impressions of suspects and those of others for elimination purposes.
- Search for a possible latent donor by utilizing the Automated Fingerprint Identification System (AFIS).

**Figure 4: Chemical processing of latent fingerprints on a coffee mug using a protein stain.**



The Forensic Services Division Laboratories that provide latent print processing and comparison services include the Bend, Central Point, Portland Metro and Springfield labs.

### LATENT PRINT ASSESSMENT & PHOTOGRAPHY

Assess evidence for the presence of visible friction ridge detail. When friction ridge detail is visible marked with a scale if possible (units of measurement must be visible). Areas of friction ridge detail should be photographed. An overall photograph should be taken such that the print can be re-located within the scene.

### LATENT PRINT LIFTS

Lifts should be attempted on all photographed prints. Multiple prints in close proximity may be collected on the same lift. In some instances, one may need to perform multiple lifts of the same print to capture the best quality latent lift. Once lifted, affix the tape to either a lift card of appropriate color (i.e., white cards for black and bi-chromatic powder; black cards for white powder) or a transparency cover. Lift cards will be marked with appropriate identifying information such that the card can be matched back to the image(s) and the scene location. If it is unlikely that the impression can be lifted, then attempt to collect and package the evidence with the area of ridge detail.

### COLLECTION, PACKAGING, AND SUBMISSION OF EVIDENCE

Evidence collected from the crime scene should be submitted to the laboratory for latent print processing and comparison examination using the Forensic Services Request (Form 49) and should be submitted

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for examination as soon as possible after its discovery. The item should be packaged so that no rubbing action occurs as this may destroy latent fingerprints present on the object.

Evidence Exposure to water or dampness should be avoided. However, this exposure does not necessarily destroy all latent prints. Any wet or damp object must be air-dried before it is packed for shipment. Unless absolutely necessary, do not process items of evidence that are to be submitted for latent prints analysis. If items have been processed prior to submission to a laboratory, package those items to prevent smudging of the latent prints. Information regarding what type of processing has been performed on the evidence should be documented and submitted to the laboratory as well. Chemical processing of items should only be done by staff in a laboratory setting. Digital images of the latent, with a scale in the image, may be submitted.

Any number of paper items may be placed in a single envelope for submission.

Latent prints of comparison quality will be imaged and the original lifts or evidence will be returned to the submitting agency.

Additional DO's and DON'Ts for Latent Print Evidence can be found in Table 6.

After comparisons are conducted with any known suspect's prints or submitted inked standards, the remaining unidentified latent fingerprints may be evaluated for AFIS quality and may be searched against the AFIS database. Unidentified latent prints of AFIS quality will be stored in the Unidentified Latent Database (ULD) for future searches against new standards added to the database. If identification is effected as a result of this search the submitting agency will be notified in an official laboratory report. In the event the submitting agency should identify any latent prints that should be cleared for any reason, the agency should notify the laboratory so these latent prints can be purged from the ULD.

### **SUBMISSION OF INKED PRINTS FOR COMPARISON PURPOSES**

The investigator should take inked prints from all persons known to have legitimately handled the evidence (elimination prints) to permit comparison with any latent prints, or if the individual already has inked prints on file, list their SID number on the Form 49 when submitting the evidence.

Often latent prints found at the scene of a crime involve areas of the palms, second and third joints of the fingers, and the finger sides and tips. For this reason the analyst may request that the investigator take complete inked prints (major case prints) of all ridges on the hands of suspects or persons known to have legitimately handled the evidence (elimination prints) to permit comparisons. Palm prints should always include prints of the lower finger joints, as well as an extra print of the outer edge of the palm.

Inked prints for comparison with latent prints should be submitted with the evidence itself.

### **IDENTIFYING THE DECEASED**

The responsibility for identifying deceased persons rests with the State Medical Examiners (ME) Office. Forensic Services Division may on occasion be requested to assist the Medical Examiner's Office, or another agency, with these identifications. Requests of this type should be made through the State ME's Office. Friction ridge impressions obtained from unknown deceased persons may be compared with known standards and/or searched through AFIS for the purpose of individualization or exclusion

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Routine identifications for the purpose of clearing a Complete Criminal History (CCH) record should be made through the Identification Services Section in Salem.

**Table 6: Latent Fingerprint Evidence DO'S and DON'T'S**

<b>DO</b> use cotton or latex gloves to pick up items of evidence being careful not to wipe possible latent prints off the surface.
<b>DO</b> minimize handling of evidence.
<b>DO</b> fasten down large articles containing latent prints with string or wire to a rigid surface to prevent shifting and contact with other items. Mark containers with the words "latent print evidence."
<b>DO</b> put developed latent lifts in envelopes and mark and seal.
<b>DO</b> place papers and documents containing latent prints in manila envelopes, seal and mail.
<b>DO</b> take complete and legible, inked prints of all of subjects without SID numbers.
<b>DO</b> include inked fingerprints and palm prints of all individuals who may have handled the items before or after the crime.
<b>DO</b> treat all inked print cards as evidence, seal and package with a completed Forensic Services Request (Form 49).
<b>DO</b> list all descriptive information of subjects being named for latent print comparison. These include appropriate State Identification numbers (SID), FBI numbers, dates of birth and complete names.
<b>DO</b> mark packaging with "Biohazard" symbol if item contains skin, blood or other biological stained evidence.
<b>DON'T</b> apply powder to obviously greasy, wet or bloody surfaces, or to prints left in dust or soft putty. Please photograph these prints.
<b>DON'T</b> wrap nonporous items in cotton or cloth as they may damage or destroy the latent impressions.
<b>DON'T</b> use "packing peanuts" directly in contact with the evidence.
<b>DON'T</b> directly cover exhibits to be examined for latent prints with evidence tape.

## **11.0 FIREARMS EVIDENCE**

Firearm examinations compare marks or impressions result when two objects make contact with each other. These resulting impressions are characteristic of the “tool”, which is usually the harder of the two objects. When a bullet, which is composed of relatively soft metals, travels through the harder barrel of a firearm the barrel leaves markings on the bullet. These markings are unique and can often be associated with a specific firearm. The same is true for markings left on cartridges and cartridge cases from the firearm or its components.

Firearm examiners conduct the following types of examinations:

- Determining firearm function and safety.
- Determining if a firearm discharged in a manner other than designed (e.g. accidental discharge, full automatic conversion, etc.).
- Generating a list of possible firearm(s) based on the rifling characteristics on fired bullets and cartridge cases.
- Comparison of bullets, cartridge cases, or fired shot shells to a firearm to determine if they were fired in a particular firearm.
- Cartridge comparisons to determine if they had been worked through the action of a suspect firearm.
- Determination of proximity, which is the distance from muzzle to target determined by powder or shot patterns.
- Crime scene reconstruction and trajectory analysis.
- Manufacturer and type of ammunition.
- Examinations and conclusions regarding the identification of gunpowder.
- Examination of wounds for the presence of firearms related evidence.

### **INTEGRATED BALLISTICS IDENTIFICATION SYSTEM (IBIS)**

IBIS is a system that captures and compares images of firing pin impression and ejector marks on the fired cartridge cases. These images are searched against a database. When similarities are observed, the cartridge cases are referred to a firearms examiner for a comparison to determine whether they could have been shot by the same weapon or not...

To request a search of NIBIN using IBIS, contact your local Forensic Laboratory for information on how to submit.

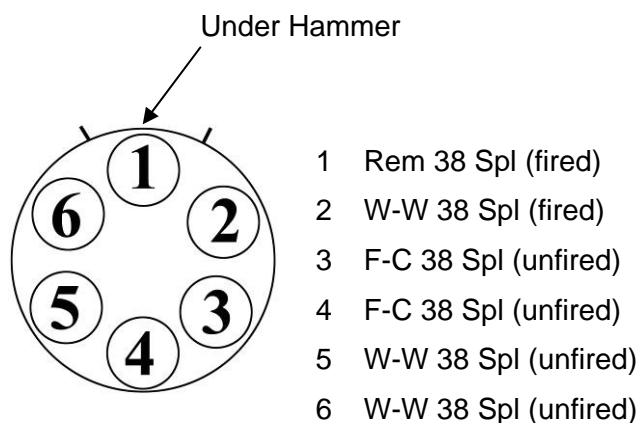
### **COLLECTION AND PACKAGING OF FIREARMS EVIDENCE**

The primary concerns when packaging firearms are safety and the preservation of the evidence including blood, trace evidence, and latent prints that may be present.

- Never insert anything into the barrel of a firearm.
- Minimize handling because it is possible to recover latent prints from firearms and ammunition.
- Do not remove cartridges from magazines, however, do remove the magazine.

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- Absent special circumstances, recovered firearms and ammunition components should not be physically marked in any manner (see exception listed below). Label the packaging instead.
- Mark the position of the cylinder on both sides of the top strap before opening the cylinder of a revolver and make note of the position of fired and unfired cartridges in the cylinder. This is so the position of the cylinder, as recovered, can be determined after the cylinder is opened.
- Store and transport firearms unloaded and rendered safe. If unable to do so, hand-deliver the firearm to the laboratory and inform lab personnel immediately of the firearm's condition.
- Any evidence with possible blood or body fluids should be air-dried, then packaged in paper bags, envelopes, or cardboard boxes labeled with a "BIOHAZARD" label.
- Recover any unused ammunition of the same brand and type for laboratory examinations.



**Figure 5: Example of how to note the positions of cartridges and cartridge cases in the cylinder of a revolver.**

## 12.0 IMPRESSION EVIDENCE

Shoe, tire and fabric impressions are routinely present at crime scenes and are frequently overlooked by law enforcement personnel. Examination of these impressions may provide the investigator with valuable leads such as the type, make/model, and approximate size of the footwear or tire. If properly documented and collected, almost every impression left by a shoe or tire has value for forensic comparison to a suspected source. Even when suspect footwear is not available, images of impressions from scenes may be submitted to the laboratory for search in the SICAR (Shoeprint Image Capture and Retrieval) database for make/model determination and comparison to impressions from other scenes.

Impressions made by other objects (e.g., weapons) may also be encountered and may be collected/documentated using the methods described below.

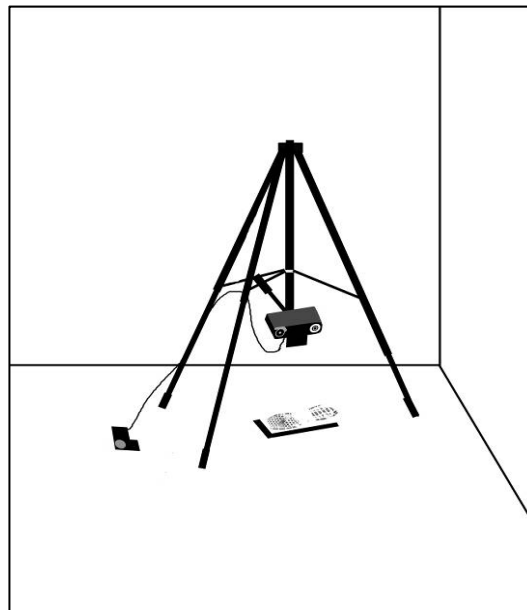
### IMPRESSION EVIDENCE GENERAL GUIDELINES

- Always include a scale when taking photographs of impressions to be used for examination. The scale should be a two dimensional ruler.
- Whenever possible, retrieve the original item containing the impression (e.g., paper, glass, flooring, door) for submission to the laboratory.
- Lift or cast the impression when it is in soil, sand, or snow, or when it cannot be sent to the laboratory.

### PHOTOGRAPHIC METHODS

- Photographs of the evidence should always be taken first before any attempt to collect it.
- Photograph the general scene that contains the impression evidence.
- Digital photography is acceptable; however, low resolution images may be of limited use in comparisons. If using a film camera, select a camera with a large negative format such as 35mm or 4 x 5 inch.
- Place the camera on a tripod with the camera directly over and perpendicular to the impression. It is important to avoid taking the photos at an angle to the impression. This can result in the inability to accurately enlarge the images as needed for comparison.
- Adjust the camera height so the impression and scale fill the frame.
- Use overlapping exposures to record elongated impressions.
- Use side lighting at various angles and from various directions to illuminate tread design more clearly. This may require shading the camera setup from high, bright sunlight with a makeshift tent and access to a detachable flash unit.

**Figure 6: Representation of the camera and tripod setup for shoeprint photography**



## THREE-DIMENSIONAL IMPRESSIONS

Three-dimensional impressions are those that have a significant depth, in addition to the length and width of the impression. Commonly, they may be found in soil, sand, snow or other materials and the detail within the impression may vary according to the substrate. Casting is an effective method of collecting these types of impressions. Impressions should always be photographed prior to casting. Photographs, however, are not considered substitute for a cast. If a lengthy tire track is encountered, an attempt should be made to cast a section at least three feet in length.

### Casting Methods

**Note:** The methods described below are not applicable to casting of impressions in snow. Specialized techniques are required for casting of snow impressions. Should the need arise to cast impressions in snow, please contact the laboratory for assistance or advice regarding the casting of snow impressions.

Dental stone or die stone should be used to cast three-dimensional footwear and tire tread impressions. Plaster of Paris is no longer recommended as an acceptable casting material. Dental stone can be obtained from local dental supply houses or in pre-made ready to use kits at minimal cost.

If using bulk dental stone, two (2) pounds of dental stone may be placed into an 8x12 inch Ziploc plastic bag; this amount will cast an average sized shoe impression. In preparation for use at crime scenes, numerous two-pound bags can be prepared and stored.

When using a commercially prepared kit, follow manufacturer instructions for mixing. The following is the procedure for making a cast from a self-made dental stone kit:

1. Retrieve a two-pound bag, add about 8 ounces of water, and thoroughly mix in the closed bag. The mixture should have the consistency of thin pancake batter. If needed, add more water or dental stone to create the correct consistency.
2. Open the bag and with the bag at ground level, carefully pour the mixture into or next to the impressions, allowing it to gently flow into it. Fill the impression completely so that the mixture overflows out of the impression.
3. When the cast is firm but still soft, scratch identifying marks on the exposed surface or write identifying marks with a permanent marker when the cast is dry.
4. Allow the cast to dry for a minimum of twenty minutes in warm weather, longer in cold, wet conditions.
5. Carefully lift the cast. Do not try to clean it; cleaning will occur in the laboratory.
6. Package the cast in a large brown paper bag or cardboard box (not plastic) and allow to dry for an additional 48 hours.

## TWO-DIMENSIONAL IMPRESSIONS/PRINTS

A two-dimensional impression is one where there is no significant depth to the impression. A thin deposit of dust, mud, blood, or other material from a shoe onto a hard surface may create these impressions.

- Floors, glass, desktops, doors, paper items, etc. can retain a dust or residue impression at a scene. Some impressions may be clearly visible while others may be partially or totally latent.

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- Latent dust shoeprints can often be located by turning out all lights and shining a flashlight across the surface of interest at a low angle. For example, to search for latent shoeprints on a vinyl floor, place the flashlight on the floor (or near it) and allow the long beam of light to shine across the floor.
- Photograph the impressions, as described above, before collecting.
- Attempt to enhance or lift the impression only if the entire item cannot be retrieved from the scene and submitted to the laboratory.
- Dry dust and residue impressions may be lifted with an electrostatic lifting device or gelatin lifter or adhesive lift. Contact the laboratory for information on where to purchase an Electrostatic Dust Print Lifter or lifts.
- Impressions made by wet or damp footwear can sometimes be enhanced by carefully dusting with fingerprint powder. A small portion of the impression should be dusted first to test the success of the powdering technique. The impression is then photographed and can be lifted with a contrasting gelatin or adhesive-lifting material. Contact the laboratory for information on where to purchase lifts.

## **EXEMPLARS AND STANDARDS**

### **Footwear Exemplars**

There may be several people who have legitimately walked into a crime scene. These include first responders, medical personnel, members of the crime scene team, funeral home or Medical Examiner's Office personnel, individuals from the District Attorney's Office, etc. These people may leave shoeprints at the scene and it can become difficult to distinguish evidentiary shoeprints from those that are artifacts of the crime scene processing.

Exemplars may be collected from people entering the crime scene in a number of ways. A good time to do this is have the person keeping the crime scene log require everybody entering the scene to give a shoeprint exemplar before proceeding into it. This may be accomplished by:

- Taking a photograph of the shoe sole.
- Greasing the soles with a thin film of petroleum jelly and having the individual step onto a clean piece of paper. Dust the grease print with fingerprint powder for visualization.
- Using a commercially available kit consisting of an ink pad with non-visible ink and foot-sized pieces of paper for collection.
- Having the person step onto a piece of aluminum foil which is on a flat piece of cardboard (leaving a rough impression of the shoe sole)

### **Footwear Standards**

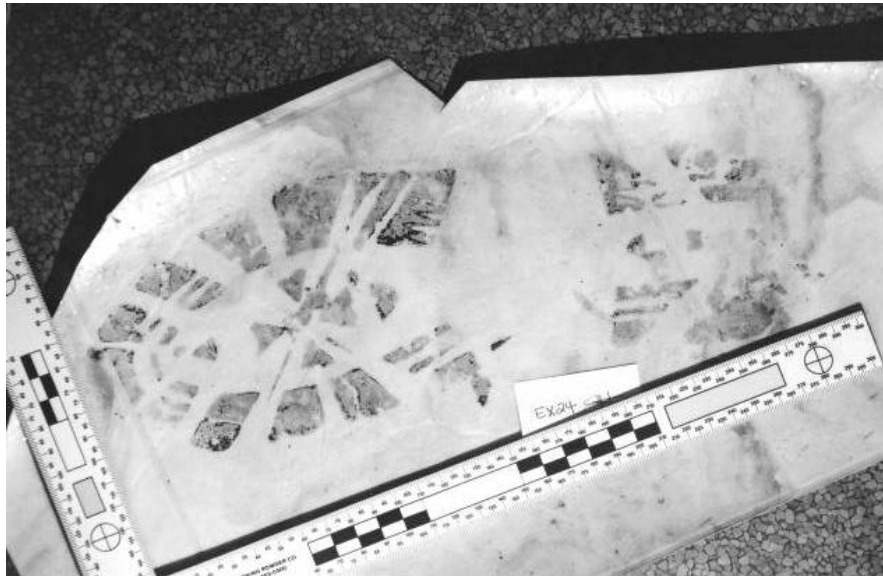
If a comparison is to be performed, footwear should be submitted to the laboratory as standards from all individuals thought to have left evidence impressions.

### **Tire Exemplars and Standards**

It is highly recommended that tires be submitted to the laboratory for the making of tire exemplars and comparison to unknown tire tracks. Whenever possible, tire exemplars should be made with the tire still in place on the vehicle. If it is not possible to transport the vehicle or to collect the tire, please contact your local laboratory for recommendations on how to proceed.

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**Figure 7: Photograph of a shoeprint impression. Notice the shoeprint fills the frame, a scale is present, and the camera is directly over the shoeprint, not at an angle.**



### COLLECTION AND PACKAGING

- Whenever possible, collect the impressed item and submit it to the laboratory.
- Protect the impressed item so that the impression does not rub off.
- Package in a cardboard box or paper bag. Carefully securing the item to the bottom of a thin cardboard box is a good way to protect flat impressed items.
- Submit the photographs of the impression to the laboratory. These should be properly packaged as evidence and submitted along with any casts or lifts.

## 13.0 GLASS EVIDENCE

Glass is one of the more important types of physical evidence that is commonly overlooked. Glass is frequently encountered in burglaries and hit and run cases, and glass fragments may be found adhering to garments, hair, embedded in shoe soles, or may be transferred to other property belonging to the victims and suspects.

Glass evidence cannot be individualized to a single source, however, there are some instances where two fragments can be physically matched together and a common origin can be conclusively established.

Glass examinations may demonstrate the following:

- The presence and number of glass particles recovered from clothing or other surfaces.
- Whether or not fragments of recovered evidence glass are similar to glass from a known source of broken glass
- The type of glass found (e.g., tempered glass, container glass, etc.)
- The direction of force (from inside or outside) used to break a window
- The order of shots fired into a window or windshield

Consider that large glass pieces may have latent fingerprints present and the broken edges of glass may have other trace evidence present such as blood, hair or snagged fibers.

### COLLECTION AND PACKAGING OF GLASS STANDARDS

A comparison of evidence glass to a possible source requires the submission of glass standards. A separate glass standard should be submitted for each broken glass item at the scene. **For each glass standard, submit at least ten fragments of broken glass from that item.** These fragments should represent the entire broken area of the item (i.e. taken from different areas of the broken item, if possible) since physical properties may vary even within a single glass object.

For window glass standards, collect the glass that is still adhering to the window frame when possible. Collecting glass standards from the ground increases the likelihood of introducing contaminant glass into the standard. A second comparison standard may be collected from the ground and submitted separately.

Vehicle windshields and some structural glass may be double paned, meaning that two different panes of glass are present. Standards must be collected from multiple areas on *both* glass panes. Package the standards from each pane separately, if possible.

Submit glass evidence in packaging that reduces the chance for further breakage.

### COLLECTION AND PACKAGING OF RECOVERED GLASS EVIDENCE

- Package glass pieces from different locations into different containers, clearly marking the outside packaging as to the location and description of the evidence.

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- Collect and submit *all* glass pieces if you believe numerous glass pieces were from the same object (e.g. a window, a bottle, vehicle headlights, etc.) and request the laboratory to attempt a physical match.
- Package glass pieces from different locations into different containers, clearly marking the outside packaging as to the location and description of the evidence.
- Label large glass pieces with orienting marks (e.g. up/down, inside/outside) when applicable.
- Collect and package a large glass piece in a rigid container such as a cardboard box. Protect the broken or fractured edges of the glass from any additional damage or breakage.
- Depending on the size, small glass pieces can be packaged in envelopes, bags, paperfolds, or on Post-It notes. For very small glass particles, place the particle onto the adhesive of a Post-It note and use a pen to circle around it. Fold the note in half, covering the glass particles, and then put the folded Post-It note in a paper envelope.
- Tape over any holes in the packaging through which small glass particles could be lost.
- Glass pieces that are slightly bigger can be packaged in envelopes or bags, then secured in a padded envelope to protect from further breakage or injury to those handling the evidence.

**Clothing Items and Hair Combing**

An individual who breaks a window with force or who is in contact with or nearby a breaking glass object may have very small particles of glass on his/her clothing and hair..

Collect clothing items, taking care not to shake or handle the clothing more than necessary. Doing so may dislodge these small glass particles. If the clothing is not stained with biological material (e.g. blood), package in a paper bag carefully sealing all possible openings. If the clothing is stained with biological material, allow the clothing to air-dry on a clean, dry surface and package in a paper bag. If this is not possible, collect *and submit to the lab ASAP*.

To collect glass particles from hair, have the person stand or lean over a large clean sheet of examination or butcher paper. Comb the hair to dislodge any particles so that they will fall onto the paper. Fold the paper to enclose any debris from the hair and tape closed.

**Vacuum Sweepings / Large Objects**

In some cases, it is useful to screen large objects such as carpets, car mats/vehicle flooring, or backpacks for glass particles. The entire object may be submitted, or a vacuum sweeping may be made of these objects. Adhesive lifts are not recommended for collection of glass evidence from these surfaces, as the lifts too quickly become saturated and lose the ability to pick up any glass present.

## 14.0 GUNPOWDER AND SHOT/PELLET PATTERNS

When fired, a mixture of partially burned and unburned gunpowder, vaporized primer compound is expelled out of the firearm's muzzle along with the bullet or shot pellets and wad(s).

Examination of the evidence may reveal the following:

- Proximity, which is the distance from muzzle to target determined by gunshot residue and/or shot pellet patterns
- Ammunition type
- Ammunition manufacturer
- Firearm condition
- Bullet or pellet entry angle
- Stippling or sooting around the entrance

### COLLECTION OF GUNPOWDER EVIDENCE

Submit the clothing or other object(s) that may have gunshot residue or bullet/pellet holes. Carefully handle and package the evidence to avoid losing deposited gunpowder and/or other residue(s).

If possible, collect and submit ammunition of the same type used in the crime (e.g., ammunition from the firearm's magazine, unused ammunition from a box at the scene, etc.)

## **15.0 HAIR EVIDENCE**

Hair evidence can be obtained from the victim, the suspect, a crime scene, or from other evidence such as clothing. Hair is valuable evidence, particularly in cases where the perpetrator is a stranger to the victim or an environment.

### **HAIR EXAMINATIONS**

The following may be determined with hair examinations:

- Similarity or dissimilarity between evidence hairs and a hair standards
- Determination of human or non-human origin
- Determination of animal species
- Determination of human body origin (e.g. head hair, pubic hair, etc.)
- Determination of classic racial characteristics
- Whether there are indications that a human hair was forcibly removed
- Alterations exhibited in a human head hair (e.g. bleached, dyed, etc.)
- Whether the root of a hair appears appropriate to attempt nuclear DNA analysis

Whole human head hairs and pubic hairs (where the root is present) generally have enough microscopic features to allow for a meaningful comparison to a standard. Hairs from other parts of the body, or hair fragments (where the root isn't present), are typically *not* well suited for a comparison.

A hair examiner will examine and compare evidence hair to standards, basing his/her conclusion(s) on the microscopic features of the hair samples. Common conclusions include statements regarding the similarity or dissimilarity of the evidence hair to the standard; however, hair comparisons are not a means of identification.

### **DNA ANALYSIS OF HAIRS**

Because nuclear DNA analysis of hairs is destructive and does not always end in a useable DNA result, it is the policy of the Forensic Services Division to perform microscopic hair comparisons prior to DNA analysis when possible.

The hair examiner will evaluate the hair for nuclear or mitochondrial DNA. The nuclear DNA analysis targets the root section of the hair. Mitochondrial DNA analysis of hairs can be performed on the root or the shaft portion of the hair. The Forensic Services Division does not perform mitochondrial DNA analysis, but can assist with the transfer of evidence to the FBI or a private laboratory when necessary. The amount of DNA in a hair is very small and therefore contamination may occur if precautions are not taken. Do not touch hair evidence with your bare hands or contaminated gloves.

### **COLLECTION OF HAIR EVIDENCE**

Hair evidence can be collected in a number of ways. The table below lists the various methods and when they are appropriate.

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**Table 7: Hair Collection Methods**

<b>Method</b>	<b>Description</b>	<b>Packaging</b>	<b>When to Use</b>
"Pick" method	Using your fingers or tweezers, carefully retrieve the hair taking care not to pinch, crush, or stretch it.	Place hair into a paperfold, in a folded Post-It note, or paper envelope.	For hairs you can see.
Vacuum sweepings	Use a portable vacuum cleaner equipped with special traps holding a piece of filter paper. <i>Lightly</i> vacuum the surface of interest. The goal is to collect trace evidence that is on the surface of the object, not to clean the object.	Carefully remove filter trap, cover with the lid or cap, and package in a paper or plastic bag.	For hairs you cannot see, or to be sure you have not missed any. Good on car seats, sections of carpeting, and other large surfaces.
Adhesive lifts*	Use fingerprint tape, cellophane tape, or other clear adhesive substrate and pat over the item. Take care not to miss any areas or allow the tape to become "overloaded." Post-It notes may also be used for small areas.	Stick adhesive tapes onto a clear, colorless plastic sheet (e.g. transparency film). Place into a paper envelope or bag.	For hairs you cannot see, or to be sure you have not missed any. Good on car seats, surfaces of clothing, and other medium to large surfaces.
Scraping	Use a clean spatula or long, flat tool to scrape the surfaces of an object onto a large, clean piece of paper. For this to work well, the object should be hanging or held up vertically over the paper, scraping downwards.	Carefully shake any trace evidence on the paper to the center and fold the paper. Seal the paperfold and place into a paper envelope or bag.	For hairs you cannot see. Works well on clothing or other pliable objects.

\* Care should be used to avoid contamination prior to use.

### **COLLECTION OF HAIR STANDARDS**

Because of the variation in microscopic characteristics among different hairs from the same body region of one person, it is important to obtain a sufficient number of hairs in order to adequately represent the ranges of all characteristics (e.g., color, length, etc) present. If the ranges of characteristics are large, it becomes necessary to obtain a large number of hairs.

Hairs should be collected from the head and pubic area if appropriate. Hairs from different regions have different characteristics. Head hair standard cannot be used for comparison to pubic hair evidence.

Collect hair standards in the following manner:

- Obtain standards from all persons who might reasonably be considered a source of an unknown hair. (e.g., suspect, victim, and other individuals common to an environment).

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- Obtain standards as soon as possible after the crime occurred. Hair naturally changes in its characteristics over time because it is constantly growing. The standards should reflect the individual's hair as close to the date of the crime as possible.
- It is recommended that a known head hair sample consists of at least 24 hairs collected from 5 different areas of the scalp (center, front, back, and both sides). These hairs should be obtained by both pulling and combing. The recommended procedure for obtaining combed hairs is to use a clean, unused comb and repeatedly comb the hair over a large sheet of clean paper.
- If appropriate to the case pubic hair standard should consist of at least 24 hairs obtained by both pulling and combing from different areas of the pubic region
- Gather all the hairs collected from a single body region and place into a paperfold or paper envelope
- Seal and label the envelope with the individual's name and the body region it was collected from.
- Do not package paperfolds containing different individual's hair in the same envelope, or package hair standards with hair evidence. This could allow cross contamination to occur.

**Secondary Standards for Missing person**

A secondary standard is not obtained from an individual directly, but from an object or location where the individual is believed or known to have deposited hair (e.g., a hairbrush). Necessity should be the only reason to obtain secondary hair standards vs. pulled/combed hair standards (e.g., missing person).

Secondary hair standards may be acceptable if it can be demonstrated or documented that the hair collected from the object/location is unlikely to include hair(s) from other individuals. The acceptance of a secondary standard for comparisons will be evaluated by the hair examiner on a case-by-case basis.

## **16.0 PAINT EVIDENCE**

Paints are used as surface coatings for a variety of surfaces such as vehicles, structures, and appliances. Many crimes, such as burglaries, hit and run vehicle investigations, and others involve forceful activities that can result in the transfer of paint from the original source to another place, person, or thing. Paint transfer may also occur if wet paint is applied in the commission of a crime.

Paint evidence may be transferred from one object to another from contact or loose paint chips may be collected at the crime scene for later comparison with a suspected source. Paint chips may also fracture in such a way that a conclusive physical match can be made between the loose chips and the object they came from.

Paints contain a multitude of components, many of which may be detected in very small samples such as those encountered as evidence. Analysis and comparison of paint samples can be successful even when they are extremely small in size

Paint examinations can determine:

- Whether evidence paint sample(s) are similar to a paint standard
- The type of paint (vehicle, architectural, etc.)
- Lists of possible make and model of a vehicle by using Paint Data Query (PDQ), a computerized database
- If a physical matches exists between paint coatings on two pieces of an object that was at one time joined

### **COLLECTING AND PACKAGING PAINT EVIDENCE**

Paint comparison standards from a known object are required when the laboratory is required to perform a paint comparison. Paint comparisons are performed on a variety of paint types including vehicle paints, architectural paints, spray paints, cosmetic lacquers, etc.

A potential paint source may have one or more different kinds and colors of paint that are present (e.g. vehicles), and the differences may only be apparent using microscopic or instrumental techniques. Because of this, it is important to obtain paint standards that adequately represent all of the paint types present on a potential source. If multiple body panels of a vehicle show damage, a paint standard should be collected from each.

If paint transfer is loosely adhering to a surface, place a loose paper cover over the area to protect it during packaging and transport. Do not place tape directly onto an area of paint transfer.

Procedures:

#### **Small Items (Easily Transported)**

If an item that is a potential source or recipient of paint transfer is small enough to be easily packaged and transported, then it should be submitted in its entirety (e.g. tools, keys, knives, spray paint cans, etc.).

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**Large Items (Not Easily Transported)**

If the potential paint source or paint transfer is on a large object or one not easily transported, such as a vehicle part or a door from a residence, use the following method for sample collection:

1. Locate the area of damage. If paint transfer from one object to another is suspected, collect both the area of suspected paint transfer and a nearby area of a paint standard that shows no paint transfer. Collect a standard from an area as close to the point of damage as possible; on vehicles, they should be from the same body part (i.e. hood, right front quarter panel, driver's door, etc.).
2. When contact between two painted surfaces is suspected, the possibility of cross-transfers must be considered. Collect both objects, or collect areas showing paint transfer and standards from both surfaces.
3. If broken paint edges are present, care should be taken to collect as much of the damaged edge material as possible. The potential for a physical match may exist.
4. Use a clean razor blade, scalpel, or sharp knife to gently pry, carve, or chip the paint from the surface down to the foundation or substrate.
5. Always clean collection tools between each use to avoid cross-contamination of one sample with another.
6. Collect a total of about a nickel-sized amount of paint from each damaged area, when possible.
7. Place each paint sample into a paperfold or small paper envelope. Securely seal all possible openings in the packaging, including seams and corners if necessary.
8. Securely seal and label the package(s) with a description of where the sample came from.
9. Continue to collect paint from each damaged area in the same manner, even if the object appears uniformly painted. Also collect any samples that are visually different. Package and label each area separately.
10. Paperwork should clearly document the locations of collection of any paint evidence to be submitted to the laboratory.

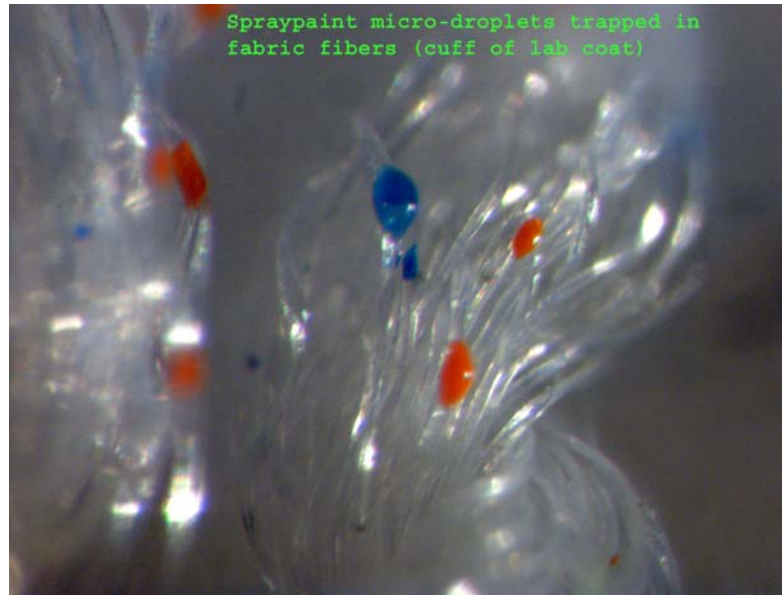
**CAUTIONS**

- Do not package paint standards in the same envelope as recovered paint evidence. This could allow cross contamination to occur.
- Do not collect paint evidence on tape. The adhesive from the tape may interfere with instrumental analysis of the paint. Post-it-type adhesive notes are acceptable.
- Substantial variations in thickness and layer sequences over short distances can exist across a painted surface. This is particularly true in architectural paint and for vehicle paint where curves, corners, and edges are often impact points and may have been subjected to previous damage, sanding, or over-painting. Known paint samples should be collected from these areas, when recognized.

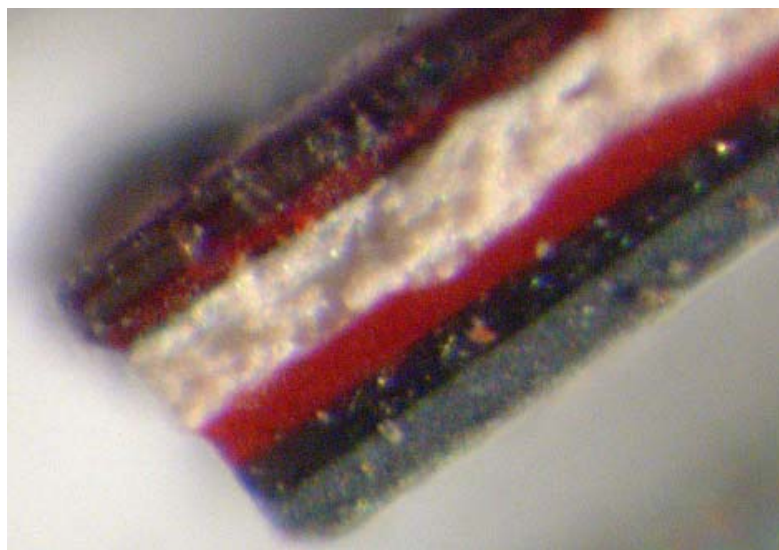
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- Do not use plastic bags (including evidence bags) that have small holes in them. Such bags are manufactured to allow excess air out; however, they are not appropriate for trace evidence collection as small particles may be lost.
- Be aware that when a vehicle's clear topcoat of paint is abraded, it may appear white to the naked eye.
- When observing road debris, be on the lookout for paint chips and plastic parts that may form a physical match with a damaged vehicle. Collect these items now for later comparison to a suspect vehicle.

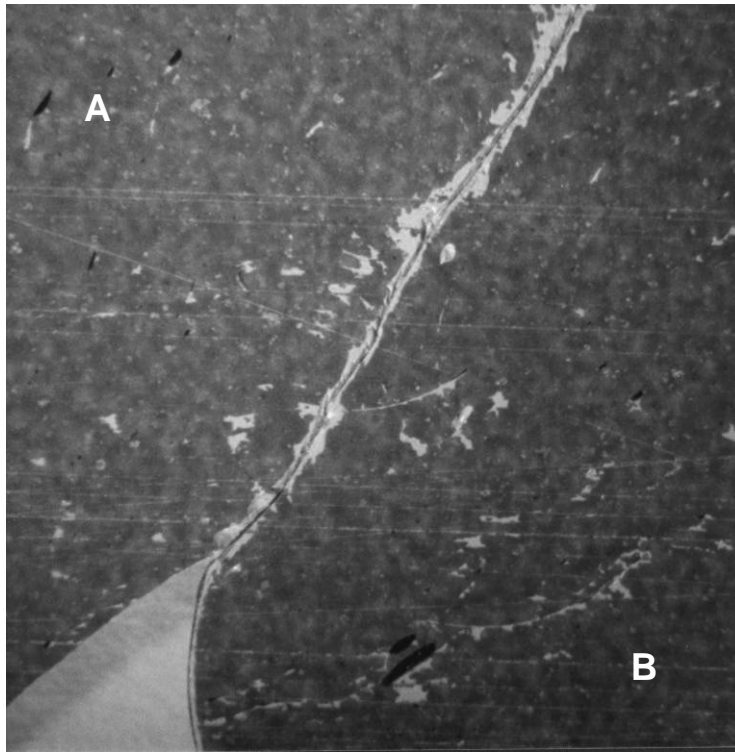
**Figure 8: Micro-droplets of spray-paint on fibers of a sleeve cuff**



**Figure 9: Layers of original and aftermarket paint from a vehicle**



**Figure 10: A physical match of two paint chips. Paint chip “A” was recovered from the scene of a hit-and-run; paint chip “B” was collected from the damaged area of a suspect vehicle. Note the microscopic scratches in the paint extending across the break.**



## PLASTIC AND TAPE EVIDENCE

Plastics are composed of polymers that are manufactured into a variety of different objects. Plastic evidence that may be encountered includes broken vehicle reflectors, smears on clothing, and small pieces of plastic from tapes and garbage bags.

Laboratory examination may be able to determine the type of plastic and whether or not it is similar to a suspected source. For large, rigid plastic pieces (e.g. broken reflectors), the laboratory can attempt a physical match.

Plastic fusion marks might be present on an individual's clothing as a result of a high-energy impact with a plastic component of a vehicle interior. Because a variety of different plastics may be present on the interior of the same vehicle, it may be possible to establish the position of the individual within the vehicle by comparing the plastic fusion mark to standards from the vehicle interior. Remember that a high-energy impact can cause a plastic component in a vehicle interior to have fibers or a fabric impression from the clothing, as well.

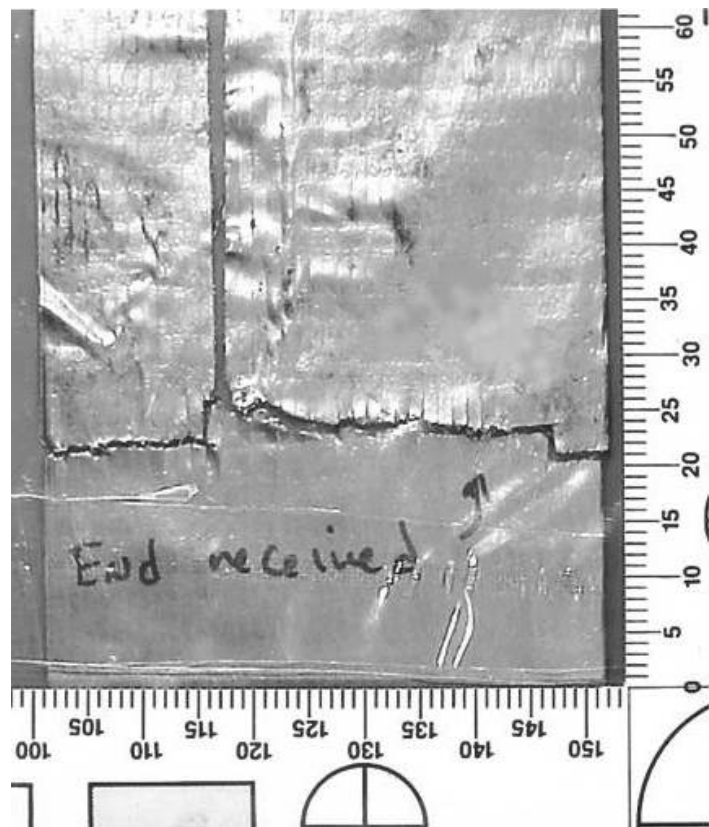
## COLLECTION OF PLASTIC EVIDENCE

Large, rigid plastic pieces may be collected and packaged into paper envelopes or bags, plastic bags, or cardboard boxes.

Small pieces of pliable plastic evidence (e.g. tape pieces, piece of garbage bag, etc.) should be placed into a paper envelope. Tape pieces that are adhesive should be affixed to a clear plastic sheet, *not* to a piece of paper, prior to packaging.

Clothing with possible plastic fusion marks should be packaged separately into paper bags.

**Figure 11: Physical match of duct tape pieces. The piece on the right was recovered from the suspect's possession; the pieces on the left were recovered from the crime scene.**



## **17.0 QUESTIONED DOCUMENTS**

A document is defined as anything upon which a mark is made for the purpose of conveying a message. Many seemingly insignificant documents involved in criminal investigations may offer conclusive proof of certain facts.

The following information can be determined from documents:

- Identification of handwriting or hand printing as the product from a certain individual.
- Determination of whether a specific typewriter was used in preparing a specific document.
- Determination of whether a particular document was prepared continuously or if certain portions were added later.
- Determination of whether two pieces of paper were at one time a single piece.
- Decipherment of erased, obliterated, altered, charred, or water soaked documents.
- Decipherment of indented writing.
- Determination of whether different inks were used to complete different parts of a document.

### **SUBMISSION OF QUESTIONED DOCUMENT EVIDENCE**

The following are general guidelines when submitting questioned document evidence to the laboratory:

- Whenever possible, submit the original document(s). Send copies if the original(s) are not available.
- Document examinations should be performed prior to processing the evidence for latent fingerprints.
- Clearly identify on the Forensic Services Request (Form 49) which items are exemplars and which items are questioned.
- Call the Forensic Document Unit at 971-673-8230 for instructions regarding typewriter or other problems.

### **COLLECTION OF EXEMPLARS**

Never show the questioned document to the person while obtaining an exemplar. If you are unable to obtain exemplars, or the exemplars are incomplete, submit what you have because conclusions may still be possible. Always identify, sign, and date the exemplars legibly to maintain a proper chain of custody. The writer should use black ink; use different color ink for your notations.

When possible, obtain collected writing of the writer from other sources. This is writing that is already in existence and was not produced for the purpose of an investigation. One source can often be found in the writer's wallet or purse that may be copied if you have the proper permission and/or authority. These writings can help determine whether or not the writer has given you a naturally written exemplar.

Also obtain exemplars and/or collected writings from the victim for elimination purposes, especially in anonymous writing cases. Cancelled checks written by the victim are excellent in check cases and signature verifications.

Use the following procedure to obtain proper exemplars:

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1. Use the Oregon State Police generic exemplar form (Form 76)<sup>5</sup>. Instruct the subject to fill out two forms, one in cursive and one hand printed. Both should be filled out completely.
2. Next obtain specific exemplars by dictating the questioned material to the subject several times. If the questioned material is lengthy, dictate portions of it. When obtaining requested signatures, having the subject write the signature several times on different pieces of paper.
3. Specific writings must be comparable. Cursive writing can only be compared to cursive and hand printing can only be compared to hand printing.
4. When obtaining specific writings, duplicate the questioned document as closely as possible by using the same type of writing instrument and the same format (e.g., personal check, prescription form, lined or unlined paper, etc.) used to produce the questioned document.

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<sup>5</sup> See "Appendix A" for a copy of the generic exemplar form (Form 76).

## **18.0 SERIAL NUMBER RESTORATION**

The obliteration of serial numbers and manufacturer's marks is often done to prevent tracing ownership of articles. The laboratory uses mechanical and chemical processes that may restore the original marking in whole or part. Firearms, bicycles, motorcycles, chainsaws, boats, and cameras are all evidence items where serial numbers have been restored.

### **COLLECTION AND PACKAGING OF EVIDENCE**

Package the evidence in a manner that will protect the area where the serial number has been obliterated. Contact the laboratory prior to delivering large items.

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## **19.0 TOOLMARK EVIDENCE**

Toolmarks are impressions or marks produced when a tool comes into contact with an object; the tool is generally the harder of the two objects. Physical contact between a tool and the surface of an object produces marks not only characteristic of the type of tool used, but marks that may be unique to a single tool.

In the absence of a suspect tool, toolmark impressions can be examined in an attempt to determine the type of tool(s) that may have produced them. The following are types of tools that may be encountered are: hammers, screwdrivers, pry bars, knives, bolt cutters, pliers, tin snips, pipe wrenches, axes, and hatchets.

*Do not attempt to determine if a found tool fits in the toolmark.* This may alter or obliterate the toolmark and trace evidence may be lost or added.

### **COLLECTION AND PACKAGING OF TOOLMARK EVIDENCE**

The recovered tool should be carefully packaged to prevent the prying blade or cutting edges from having contact with any other objects that may cause an alteration of the tool.

Send the whole object containing the toolmarks to the laboratory. If this is not possible, photograph the toolmark, then cut out the area with the toolmark or make a cast of the mark. Information about casting material that is appropriate for toolmarks may be obtained by contacting the laboratory.

Mark the cast or cut object with appropriate information indicating its orientation such as up/down, inside/outside, and left/right directions. Package the object containing the toolmark in such a manner as to prevent alteration or damage during shipment and storage.

## 20.0 TOXICOLOGY

During investigations when there is cause to believe that an individual may have been under the influence of alcohol and/or drugs, efforts should be made to obtain blood and/or urine for toxicological analysis.

### Type of Sample

**Alcohol** - In cases where it is necessary to determine the level and effect of alcohol on the individual, blood is the specimen of choice. Urine may be tested for the *presence* of alcohol, however it is not a legally recognized testing medium for blood alcohol determinations and therefore a percentage of alcohol will not be reported.

**Drugs** - In cases where the use of controlled substances or other drugs is in question, urine is the specimen of choice.

The laboratory is also able to determine the alcohol concentration of unknown liquid samples.

Many drugs leave the blood very rapidly and may be difficult or impossible to detect unless the blood is collected expeditiously. Generally, drugs are present in the urine in greater abundance than in blood, and are therefore more readily detected. When there is a question as to which medium is best, collect both blood and urine.

The Forensic Services Division is not able to test blood for the presence of drugs other than alcohol at this time. If blood-drug analysis is required, the laboratory may be able to assist you in locating an outside laboratory that is able to perform the work.

### Triaging

If both urine and blood are submitted, the laboratory will test the blood for alcohol and the urine for drugs.

The laboratory may not test blood for alcohol concentration if a valid breath test has already been administered, and may not test urine for drugs if the subject's blood alcohol concentration is greater than 0.08% (w/v).

Cases that have pending criminal charges are prioritized higher than those that do not have pending charges.

## BLOOD ALCOHOL

### Collection, Packaging, and Storage

At least 4 milliliters of blood should be collected in a commercially available gray-top tube that contains sodium fluoride and potassium oxalate or EDTA. Ideally, two 10 milliliter tubes will be collected at the same time. The Forensic Services Division will test one and leave the other unopened so it is available for additional testing if desired.

When gray-stoppered tubes are not available, other types of blood samples may be submitted (serum or plasma samples or tubes with other-colored stoppers).

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The Forensic Services Division does not recommend the collection of multiple sequential blood draws. Testimony given at the time of trial will be the same whether there is one blood draw or several.

Blood Alcohol Specimen Kits can be purchased for packaging and securing the blood tube. Contact the laboratory for information on where to purchase these kits.

A specimen labeling system must be employed which assures unequivocal matching of the specimen with the person from whom it was collected. The tube(s) should be labeled with the individual's name, date, and time of the blood draw. If two or more vacutainer tubes are collected consecutively during the same blood draw, they should be labeled with the same time.

Do not place evidence tape or other seals over the stopper of the vial, as the tape can obstruct the information on the vial label, and can interfere with resealing of the tube. Instead, the packaging containing the blood tube(s) should be securely sealed with evidence tape.

Care must be taken to maintain proper chain of custody. Blood should be submitted to the laboratory as soon as reasonably possible, and should be refrigerated during any delay in submission. Blood evidence returned to the submitting agency should be stored under refrigeration.

## **URINE**

Only qualitative analysis (identification of drugs) is performed. Quantitation of drug in a urine sample is not performed because urine drug concentrations cannot be correlated to a level of impairment. It should be noted that the mere presence of a drug in the urine cannot, by itself, support a determination that the subject was under the influence of the drug at a particular time. Likewise, the laboratory may be unable to detect drugs that are actively impairing a person due to limitations of the analytical methods or because the drug has not yet been metabolized to reach a sufficient concentration in the urine.

It is recommended that you include suspected drug information that is known and consider a Drug Recognition Evaluation (DRE) in conjunction with obtaining a urine sample. If a DRE evaluation has been completed, please include a copy of the DRE face sheet when submitting the evidence to the Laboratory.

## **Drugs Tested in Routine Toxicological Analysis**

Samples generally undergo screening by EMIT (Enzyme Multiplied Immunoassay Technique) and confirmation by Gas Chromatograph/Mass Spectrometer (GC/MS). The analyst looks for the following types of drugs in a routine toxicology analysis:

- Opiates/Narcotic analgesics (e.g. morphine, vicodin, codeine, etc.)
- Amphetamines/Stimulants (e.g. amphetamine, methamphetamine, MDMA, etc.)
- Barbiturates (e.g. butalbital, phenobarbital, etc.),
- Benzodiazepines (e.g. Valium, Klonopin, Ativan, etc.)
- Marijuana metabolite
- Cocaine and its metabolites

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- Methadone
- Other prescription drugs (e.g. Prozac, Soma, Ambien, etc.)
- Other potentially impairing over the counter drugs (antihistamines, dextromethorphan, etc.)

The laboratory currently is unable to test for inhalants (e.g. paint thinner, “Dust Off,” etc.), synthetic cannabinoids (e.g. “K2” or “Spice”) and LSD. If any of these types of drugs is suspected, collect a blood sample, store it in a cool, dark place, and contact the laboratory for help in locating a lab to analyze the sample,

If you suspect that lorazepam (Ativan), psilocin (mushrooms), or a date rape drug (e.g. GHB, etc.), was used, this must be specifically noted on the Forensic Services Request (Form 49). These drugs may not be detected in a routine toxicology analysis, and notice ensures that specialized detection methods can be utilized if necessary.

### **Collection, Packaging, and Storage**

Urine Collection Kits are provided by the Oregon State Police and should be available at all Intoxilyzer locations. These kits can also be obtained through the OSP stockroom by calling 503-378-4348.

Urine samples should be collected in the plastic screw-top container provided in the kit. Be sure the lid is *tightly* secured, and seal and label the container with the following information:

- The individual’s name (not just initials)
- The date of collection
- The time of collection

Make note of the temperature of the urine specimen. If the temperature of the specimen is less than 90 degrees, or if there is any other reason to suspect tampering, try to obtain another sample from the subject, and send both samples to the laboratory.

Do not place evidence tape over the lid of the container, as this can obstruct the information on the label and interfere with reclosing. Instead, the packaging containing the urine specimen should be securely sealed.

Secure the urine cup in the plastic bag provided to contain any possible leaks. It should be noted that urine that leaks into the plastic bag will not be analyzed.

Care must be taken to maintain proper chain of custody. Urine should be submitted to the laboratory as soon as reasonably possible, and should be refrigerated during any delay in submission. Urine evidence returned to the submitting agency should be stored in a secure freezer or in a refrigerator if freezer space is limited.

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## **21.0 DIGITAL IMAGES (VIDEO)**

The Oregon State Police Forensic Services Division current limits examination to retrieving still images from a video. Once the still image has been captured, it will be released to the submitting agency in either print or digital format. Please contact your local laboratory for assistance in submitting this type of evidence.

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## **22.0 COMPUTER EVIDENCE**

The Forensic Services Division does not examine this type of evidence. The Federal Bureau of Investigation (FBI) accepts this type of evidence at its regional laboratory in Portland, Oregon. Please refer to the FBI's NWRCFL website: <http://www.nwrcfl.org/>.

## 23.0 MISSING PERSONS

If a person who has been reported as missing has not been located within 30 days after the missing person report is made, the law enforcement agency that accepted the missing persons report shall attempt to obtain a DNA sample from the missing person or from family members of the missing person in addition to any documentation necessary to enable the agency to use the sample in conducting searches of DNA databases.

To identify the remains of a victim through DNA analysis, DNA from remains must be matched to DNA known to be from the victim or the victim's relatives. Thus is necessary to collect DNA samples from family members and from personal items or prior medical specimens from the victim.

### **Secondary Victim Standards or Direct Reference Sample (DRS)**

Agencies should attempt to obtain DNA samples known to be from the victim. Sources of DNA known to be from the victim may include:

- Previously collected medical specimens- Medical specimens may have been stored at a hospital or clinic. Please have the investigator check with the medical facility to see if the medically obtained samples have been stored in a fixative like formaldehyde or formalin. If it has, this would be the very last choice of samples that UNT would like to receive. The fixative places the chances of obtaining a usable DNA profile in question.

Personal items such as a toothbrush, lipstick, or other item containing saliva or blood are often good sources. It is very important that the personal items were used only by the victim or rarely used by anyone else. Note: Family reference sample will also need to be submitted to confirm the person item is from the missing person.

- Hairs-University of North Texas does not like to receive hair as a direct reference sample because of various concerns and contamination. They discourage hair submission if at all possible and ask agencies to work to get a better sample. Before they would accept the hair, a qualified hair examiner would have to examine the hair to determine if the hair was human and that roots were intact. The report and the examiners credentials would need to be accompanying the submission from the agency.
- NO Clothing- The University of North Texas will not accept cloth as a direct reference sample because of contamination with other mitochondrial DNA. They need to get both a mitochondrial DNA profile and nuclear DNA profiles in order to have a match to any unidentified remains.
- Baby teeth are not very good because of mix ups with other children's teeth and the possible lack of mitochondrial DNA.

These items should be submitted directly to the University of North Texas. You local laboratory is available for questions.

### **DNA from the Victim's Relatives (Family Reference Standards)**

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When medical specimens and personal items (mentioned in paragraph above) are not available, DNA testing can be done on DNA samples from biological (blood) relatives. DO NOT collect the DNA from adoptive parents, adopted children, stepparents and other non-biological relatives. DNA from these relatives cannot be used to identify the victim. The closer the family relationship to the victim the more likely a match can be made. It is more difficult to make a match between victim remains and distance relatives. In some cases, it is useful to have DNA samples from specific relatives. If DNA from the victim's children is used, it is helpful to have DNA from the children's other biological parents.

Preferred Family Reference Samples in order of preference

1. Both Parents or Known identical twin
2. One parent, spouse and children
3. Children and spouse
4. One parent and sibling
5. Siblings (two or more)

**Family Reference Standard kit (FRS)**

This is the kit produced and disseminated by UNT to be used to collect oral swab DNA from family members of missing persons. Collection kits are available with instructions and supplies for retaining the DNA samples from family members. Each kit is for one family member. Several kits may need to be collected. The oral cells on swabs will be collected by the law enforcement agency involved using the Presidents DNA Initiative Collection kit or the FBI collection instructions. A signature of the person giving consent to the collection and testing of the DNA sample is required. A signature of the officer witnessing the collection is also required. Do not submit these collection kits to the OSP Forensic Laboratories. The kits will be sent directly to the FBI or UNT for Nuclear and Mitochondrial DNA analysis. The FBI and University of North Texas have the capability to enter the profiles into the appropriate CODIS databases. For more information on the CODIS database go to the following website:  
[http://www.fbi.gov/hq/lab/codis/codis\\_brochures.htm](http://www.fbi.gov/hq/lab/codis/codis_brochures.htm)

Contact information:

DNA Collection kits  
University of North Texas  
(1-800-763-3147)

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## 24.0 UNIDENTIFIED REMAINS

Refer to ORS Chapter 146 - Investigations of Deaths, Injuries and Missing Persons.

### Unidentified Remains

- “Unidentified human remains” do not include human remains that are part of an archaeological site or suspect of being Native American. Archaeological remains are covered under ORS chapters 97 and 390 and OSR 358.905 to 358.961.
- All unidentified human remains will be initially processed by the Medical Examiner’s Office. The Forensic Laboratory will not accept human remains in any form from any agency other than the Medical Examiner’s office.
- Skeletal remains may be mailed to the Oregon State Medical Examiner’s Office for anthropological exam. All agencies must contact the OSP-ME Anthropology Section for instructions prior to sending the remains. Call 917-673-8200.
- All investigative processes (e.g. dental record comparison, pt. history/healed fracture comparisons, personal effects) will be utilized in order to identify remains before DNA analysis will be attempted. If the remains are not identified after these processes, they will be sent to either the FBI or UNT for Nuclear and Mitochondrial DNA analysis. The decision for DNA analysis will be made by the Oregon State Medical Examiner’s Office.

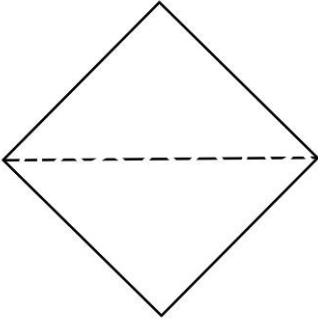
Contact information:

DNA Collection kits, University of North Texas, (1-800-763-3147)  
Oregon State Medical Examiners Office.  
13309 SE 84<sup>th</sup> Avenue, Suite 100  
Clackamas, Oregon 97015  
Phone 971-673-8200

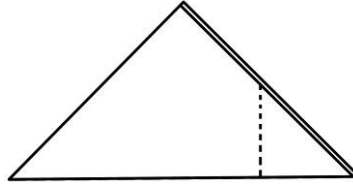
Additional online resources:

(<http://www.namus.gov/>) : This is a line to the National Missing and Unidentified Persons System, NamUs, is the first national online repository for missing persons records and unidentified decedent cases. It was [launched in July 2007](#) by the Office of Justice Program’s [National Institute of Justice](#).

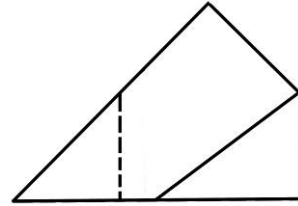
25.0 APPENDIX A: HOW TO MAKE A PAPERFOLD



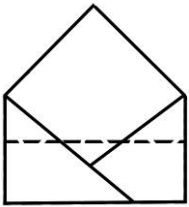
1. Fold a square piece of paper into a triangle. If using a rectangular piece of paper, make the same fold as above and then cut off the excess.



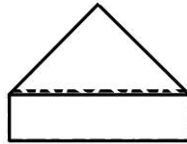
2. Take one corner at the folded edge and bring the corner just past the center point, keeping the two folded edges together.



3. Take the second corner at the folded edge and bring the corner just past the center point on the opposite side, keeping the two folded edges together.



4. Bring all folded edges up together to the point where the top of the paper starts to angle.



5. Take the top center point and tuck into the opening created by the folded edges.



6. Fold and tape seal along this opening.



**OREGON STATE POLICE FORENSIC SERVICES DIVISION  
PHYSICAL EVIDENCE MANUAL**

**27.0 APPENDIX C: GENERIC QD EXEMPLAR FORM (FORM 76)**

FORM 76 (REVISED 06/03)

<b>OREGON STATE POLICE GENERIC WRITING SAMPLE</b>				Case No.										
NAME		DATE OF BIRTH		Arthur Bob Charles Don Edwards Frank George Henry Imig John Kenneth Lamb Mary Nan Olson Paul Quentin Robert Samuel Tom Umphrey Vernon Will Xavier Yolanda Ziffman Jan                      Feb                      Mar Apr                      May                      Jun Jul                      Aug                      Sept Oct                      Nov                      Dec Dollars and Cents Hundred & Thousand Numbers: 1 2 3 4 5 6 7 8 9 0										
STREET ADDRESS														
CITY	STATE	ZIP												
BIRTHPLACE		SOCIAL SECURITY NUMBER												
NAME OF MOTHER		NAME OF SPOUSE												
HEIGHT	WEIGHT	SEX												
HAIR COLOR		EYE COLOR												
RIGHT OR LEFT HANDED		OCCUPATION OR TRADE												
<b>NORMAL WRITING                      IF QUESTIONED WRITING IS CURSIVE - GET CURSIVE,                      IF HAND PRINTED - GET HAND PRINTED - IF BOTH GET ONE OF EACH                      NOTE SPECIAL INSTRUCTIONS BELOW*</b>														
Pay to the order of														
For Deposit Only														
CAPITAL, SMALL LETTERS AND SYMBOLS														
A	B	C	D		E	F	G	H	I	J	K	L	M	N
O	P	Q	R		S	T	U	V	W	X	Y	Z	&	%
a	b	c	d	e	f	g	h	i	j	k	l	m	n	
o	p	q	r	s	t	u	v	w	x	y	z	\$	@	
Numbers:	1	2	3	4	5	6	7	8	9	10				
One	Two	Three	Four	Five	Six									
Seven	Eight	Nine	Ten	Eleven	no/100									
Twelve	Fifteen	&	Twenty											

Name - Print (Last, First, Middle Initial)		Witness Signature		Date
Signature		Date	*COMMENTS	

OREGON STATE POLICE FORENSIC SERVICES DIVISION  
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GENERIC EXEMPLAR FORM (FORM 76)

SPECIFIC WRITING SAMPLES

IF INVESTIGATING A CHECK CASE THE QUESTIONED WRITING ON THE CHECK(S) MUST BE DICTATED VERBATIM (NEVER SHOW THE WRITERS THE CHECK AND HAVE THEM COPY IT). FOR A COMPREHENSIVE EXAM ADDITIONAL BLANK CHECK FORMS SHOULD BE USED AND THE QUESTIONED WRITINGS REPEATED SEVERAL TIMES TO ESTABLISH A BETTER RANGE OF VARIATION.

QUESTIONED CHECK

Check No. \_\_\_\_\_

City \_\_\_\_\_ Date \_\_\_\_\_ ,

Pay to Order of \_\_\_\_\_ \$ \_\_\_\_\_

\_\_\_\_\_ Dollars

For \_\_\_\_\_ Signature \_\_\_\_\_

QUESTIONED SIGNATURES

ENDORSE HERE:

X \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

DO NOT SIGN / WRITE / STAMP BELOW THIS LINE  
FOR FINANCIAL INSTITUTION USAGE ONLY

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

4 \_\_\_\_\_

ENDORSE HERE:

X \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

DO NOT SIGN / WRITE / STAMP BELOW THIS LINE  
FOR FINANCIAL INSTITUTION USAGE ONLY

EXTENDED WRITINGS

THE FOLLOWING LETTER ONLY HAS TO BE WRITTEN ONCE IN CHECK CASES. IN OTHER CASES THIS LETTER IS MANDATORY AND CAN BE WRITTEN SEVERAL TIMES. IT IS TO BE WRITTEN ON A SEPARATE SHEET OF PAPER. VERBATIM WRITINGS FROM THE QUESTIONED MATERIAL SHOULD ALSO BE OBTAINED.

NORTHWEST LETTER

Dear Mr. & Mrs. V. Buck,

I'm in Portland, Oregon. You can reach me at Box 2458, Zip #97631. Don't blow me off! From here I will be traveling up thru Washington & Alaska. Then will shoot to California via Idaho on the X.Y.Z. Railroad Express. Dr. Underwood "Huck" LaGrande, from Salem & Albany will be traveling with Copper and me. No small bills. Cash, drugs and guns only. Just joking. Truman McQuin @ the Kilo Sucker Store, 807 Main St., had only a large bill (\$100.00) and change when he was killed by a bomb near the school. Robbery was suspected. Yours truly & Good-bye.  
(Signed)

OREGON STATE POLICE FORENSIC SERVICES DIVISION  
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**28.0 APPENDIX D: MANUAL REVISION HISTORY**

**Revisions Table to Physical Evidence Manual**

<b>Date</b>	<b>Revision #</b>	<b>Revision</b>	<b>Author</b>
May 2002	0	Creation and Adoption of Physical Evidence Manual	
February 2004	1	Removed references to Coos Bay Lab, added "gum seal" as ok for use as evidence sealer,	
January 2006	2	Re-write to comply with ISO requirements; changes in programs	
October 20, 2006	3	Removed gum seal w/ dye indicator as an acceptable method of sealing evidence.	
December 11, 2006	4	Updated lab area service map to show all Douglas Co. to Springfield.	
October 26, 2007	5	Added information regarding touch evidence to 6.0; added 25.0 Missing Persons and 26.0 Unidentified Remains. Deleted lab survey card from appendix. Slight changes/corrections/clarifications made to Fingerprints, Firearms	
January 31, 2008	6	Updated/added information to Missing Persons 25.0. Also changed contact info in 25.0 & 26.0 to UNT.	
December 13, 2011	7	Complete revision of entire manual – Susan Hormann Operations Manager	S. Hormann