

Alaska Scientific Crime Detection Laboratory

Crime Scene Procedure Manual for Forensic Technicians

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SECTION 1: INTRODUCTION

It is recognized that Federal and State statutes, case law and departmental policies will govern how a crime scene is processed.

It is also recognized that all crime scenes are unique. Because of this, it is not our intention to detail a specific list of procedures to be used at every crime scene. Instead the goal is to provide a framework of available procedures which may be utilized for the processing of a crime scene.

The objective of the Crime Scene Procedure Manual for Forensic Technicians is to provide ourselves and the users of our services the assurance that our work product meets the recognized standards of our laboratory and the international standard of the American Society of Crime Laboratory Directors/Laboratory Accreditation Board.

It is important that the Physical Evidence collected at the crime scene has integrity and is not compromised. Each technician's procedures at the crime scene should ensure that evidence is protected and recovered. Such evidence may later be examined and processed at the Anchorage laboratory or at a remote laboratory location.

The purpose of these guidelines is to ensure that all crime scenes are documented properly, that items of evidence are handled properly, that physical evidence is detected and collected with appropriate methods, and that the Forensic Technicians are fully and regularly trained.

Additional abbreviations used by the Crime Scene Response Team are found in the Latent Print Procedure Manual.

Discipline specific quality records such as preventive actions will be stored in LIMS under the CRIMESCENE case.

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SECTION 2: CALL OUT AND TRAVEL PROCEDURES

2.1 ON CALL STATUS

Remote technicians are not required to be on-call, and will respond when called during normal working hours to crime scenes if they are able to.

The Crime Scene Response Van may be driven home by the Technician. It will be his/her duty to maintain it in a clean condition, filled with gas and to report any maintenance problems that may occur.

2.2 TRAVEL TO SCENE

Most scene response occurs within driving distance of the Technician's assigned work location, however if the technician is required to fly and/or incur travel expenses such as hotel, the Technician should keep a detailed record of their travel expenses (i.e. lodging receipts, itineraries, boarding passes) and will be required to submit a State of Alaska Travel Authorization upon return.

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SECTION 3: CRIME SCENE ARRIVAL

It is the sole responsibility of the requesting agency to evaluate and secure the scene before the arrival of the Forensic Technician. The requesting agency is also solely responsible for maintaining the integrity and security of the scene, and to provide for the safety of laboratory personnel throughout the entire investigation.

An incident briefing is most often conducted with the requesting agency. At this time, the case/reporting officer and lead investigator are commonly established. The facts of the case, any photos and/or video taken by the requesting agency may be reviewed. The search warrant is the responsibility of the investigating agency and/or scene officer.

On arriving at the incident location, a secure and safe pathway into and away from the scene should be selected.

If possible, establish a safe zone away from the scene where equipment and evidence may be placed while the scene is being processed.

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SECTION 4: CRIME SCENE SAFETY

The Laboratory Health and Safety Manual is intended to be the central resource for the safe handling of evidence, and the materials and equipment associated with physical evidence collection. The following are brief reminders about the specific safety concerns associated with crime scene work.

Forensic Technicians will follow all safety rules and procedures outlined in the Laboratory Health and Safety Manual and this manual.

Forensic Technicians will know the location of the Material Safety Data Sheet (MSDS) for all the chemicals prepared and used for processing crime scenes.

4.1 SAFETY CHECKLIST

- ✓ The entering of a crime scene should be done with proper safety and protective equipment.
- ✓ It is important to protect both the technician from exposure and the evidence from contamination.
- ✓ No one should eat, drink or smoke inside the crime scene.
- ✓ All body fluids should be considered infectious and treated as biological hazards.
- ✓ Be aware of sharp objects and how to handle and package these items to prevent injury.
- ✓ Be aware of the chemical hazards associated with clandestine laboratories. These types of scenes are outside the scope of the forensic technician duties and will not be processed.”
- ✓ Proper eye protection should be worn when using the alternate light source and during the application of chemicals.
- ✓ Stay AWARE of what is going on around you and stay ALERT.
- ✓ Be familiar with the MSDS's for the chemicals which are being used for enhancement and protect yourself accordingly.
- ✓ Provide MSDS's to the investigating officer for those chemicals used at a crime scene.
- ✓ No flammable materials/chemicals are allowed on commercial flights.
- ✓ Use caution when documenting firearms; always consider a weapon as LOADED, do not pick up the weapon with an object in the trigger guard or barrel, and always point away from people. The officer in charge of the scene should be responsible for handling any firearms and rendering them safe for documentation and collection at a crime scene.
- ✓ Safety training in Blood Borne Pathogens, First Aid and Chemical Safety should be kept up to date as detailed by the Laboratory Health and Safety Manual.
- ✓ Stay current with information about immunizations as recommended by the Laboratory Health and Safety Manual.

SECTION 5: CRIME SCENE PHOTOGRAPHY

1. Take establishing photographs to show the location using street signs, addresses or other geographical information.
2. Take overall photographs of the exterior of the crime scene.
3. Take overall photographs of the interior of the crime scene.
4. Place some form of identifying marker at items of evidence and/or points of interest, and take additional photographs that include these markers.
5. Take mid-range and close-up photos of items of interest. Close up photographs for examination should include a scale and be photographed with the camera lens parallel to the plane of the evidence of interest.
6. If there is a body present, overall photos should be taken from all sides. Additional mid-range photos should be taken of a body. Take close-up photos of wounds or injuries with and without scales.
7. Once the body has been removed, photograph the area where the body had been located.
8. If possible, aerial photographs should be taken of outdoor scenes. Recent satellite photos may also be utilized for overall scene location photos.
9. If an item of evidence has been removed, do not attempt to place it back into the scene to be photographed. Photograph the item where it is now located and make a note of the move.

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SECTION 6: CRIME SCENE DIAGRAMMING

Crime scene diagrams serve to establish spatial relationships, provide an overall scene view, assist with preparation of demonstrative aides for court, and serve as an investigative aide during interviews. In addition, diagrams can clarify items of evidence in a crime scene without extraneous items such as furniture, piles of debris, etc.

It is up to the discretion of the technician if a sketch/diagram is to be created. A rough sketch may or may not include measurements. When measurements are taken a tape measure will be used.

6.1 TYPES OF SKETCHES

Perspective (3D): A perspective sketch contains a vanishing point and depicts objects of evidence, as they would appear to the eye with reference to relative distance and depth.

Projection (Bird's eye view): Usually one viewpoint and depicts objects on one plane. This is the most common type of sketching.

Exploded: Contains more than one viewpoint and can be used in modeling. It can show relationships of items in location, depth and height. The walls are folded down and on the same plane as the floor.

6.2 MAKING A ROUGH SKETCH

- The rough sketch is usually done in the field.
- Determine the best perspective and method of sketching the scene.
- The relative positions of object(s) should be incorporated into a sketch. Consider items that should be included and excluded.
- A pencil may be used to draw the sketches.
- In order to prevent clutter, notes relating to item description, location, distances and other observations may be kept in an item/evidence log or list.
- Magnetic North or a Reference North should be used and labeled on the sketch, as well as, a notation that the sketch is a rough draft.
- Related field notes will be scanned into LIMS by the Technician.

6.3 FINISHED DIAGRAM

- The finished diagram should accurately represent the information contained in the rough sketch.
- A diagram does not require the inclusion of measurements in every case.
- The finished diagram may be made manually or with a computer-aided program.
- The finished diagram should contain the following information:
 - Requesting Agency
 - Agency Number
 - Laboratory Number
 - Person(s) preparing the sketch
 - Magnetic North and/or Reference North

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Date

Notation that sketch is not to scale or scale, if drawn to scale
It may also contain the location and type of crime

- A legend or key may be used to identify items of evidence and/or points of interest in the sketch and to correlate information in the drawing.

6.4 MEASUREMENTS FOR SKETCHING

Triangulation method: Uses two fixed permanent objects within the crime scene. The measurements are taken from each fixed point to each evidence item.

Coordinate method: Measuring the distance to an object from two perpendicular objects, such as walls.

Baseline method: Useful in outdoor scenes or large scenes. Accomplished by laying a measuring tape down so that it crosses the entire room or area to be measured. Measurements are taken along the baseline paralleling the evidence items and then another measurement is taken from the baseline to the evidence item. If at an outdoor scene, the baseline may have to be fixed with a stake or some permanent marker at both ends.

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SECTION 7: BASIC EVIDENCE COLLECTION

One of the most important duties at a crime scene is the collection of physical evidence. In order to collect evidence an understanding of what evidence is and the role it will play in the investigation is imperative. Physical evidence is any object that can establish that an event or series of events has occurred and that may provide a link between persons, places and or items.

Collecting evidence should begin after proper documentation has been completed. It is recommended that the evidence most likely to be destroyed or degraded be collected first. Each item of evidence should be packaged to protect it from cross contamination and from being damaged during transport.

When possible, all evidence will be collected by OR (if collected by the Forensic Technician) in the presence of either the lead investigator or a requesting agency representative. If the crime lab technician must collect the evidence without the lead investigator or requesting agency present, then the technician will record the custody of the evidence in their crime scene notes. In most circumstances, all evidence will be left in the custody of the officer in charge of the scene.

When evidence is collected by the technician it will placed in an appropriate container and marked. Each container will contain, but is not limited to:

- Lab or agency number
- Item or placard number
- Item description
- Date
- Technician's initials

Note: the container utilized at the scene may be a temporary container.

When evidence is packaged by a technician it will be evidence tape-sealed and marked with the technician's initials and the date sealed. Whenever possible these markings should cross the barrier between the evidence tape and the container. The technician's notes will state the item was packaged.

7.1 PRELIMINARY EXAMINATION OF THE SCENE

1. Evaluate the crime scene.
2. Establish an entry and exit path into the scene that is different than the suspect(s) used.
3. Coordinate with the reporting officer and/or lead investigator on what needs to get done and how you are going to do it.
4. Have an orderly procedure for processing the scene, evaluating equipment needs and utilizing manpower.

7.2 RECORDING OF THE SCENE

Photography

1. Construct a photo sheet with Agency, Agency number, photographer, date and location.
2. Photograph overall, mid-range and close-up relevant areas and evidence items.

Video recording of the crime scene will be the responsibility of the requesting agency or the lead investigator.

Sketches are not required, but are useful.

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SECTION 8: LATENT PRINT EVIDENCE

The processing of evidence for latent prints will be conducted in accordance with the goals determined by the Forensic Technician, Lead Investigator, and the Requesting Agency.

Latent print development techniques will follow generally accepted methods and be determined by conditions at the scene. Factors to be considered may include but are not limited to: environmental conditions, surface texture and composition, matrix, availability of processing materials, and the nature of the case.

An evaluation of scene processing in lieu of transporting or shipping to a laboratory should include considerations such as possible damage or loss of latent print evidence during packaging and transportation and the value of additional processing techniques available at a laboratory. The on-scene processing with fingerprint powders of items with non-porous surfaces, that may have latent print evidence which could easily and inadvertently be damaged during packaging and transport, is encouraged. It is recognized that the determination to process items for latent print evidence at the scene versus transporting items to a laboratory for processing involves many factors and considerations. It is left to the discretion of the Forensic Technician to determine and proceed with the most appropriate methods for the preservation and documentation of the evidence in each case.

8.1 LATENT PRINT PROCESSING TECHNIQUES

Non-porous Surfaces (glass, metal, plastic, painted surfaces, etc.)

Visual Examination (may include magnification, oblique lighting, and various types of light)
Superglue (must be used under appropriate safe and controlled conditions)
Powder
Photography

Porous Surfaces (paper, cardboard, unfinished wood, etc.)

Visual Examination and Photography of Visible Ridge Detail
Whenever possible items should be collected and processed at a laboratory with capabilities for items with porous surfaces

Blood Prints

Visual Examination
Chemical Enhancement (Amido Black, Leuco Crystal Violet)
Photography

Plastic and Etched Prints

Visual Examination
Photography
Casting (Mikrosil)

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An MSDS for any chemical used should be provided to the scene officer or lead investigator at the scene or soon thereafter. The provision of the MSDS should be recorded in the Technician's notes.

8.2 PHOTOGRAPHY OF LATENT PRINTS

Any developed latent or visible ridge detail should be photographed before being lifted or packaged if possible. A scale and latent identifiers should be placed in the photograph.

8.3 LIFTING OF LATENT PRINTS

Any developed latent or visible print which is on an appropriate surface for lifting should be lifted using tape and placed on an appropriately colored finger print card. The back of the card should be marked with the source, date, case number, initials of the Technician, and should include a sketch of the item or surface to indicate from where the lift was taken. Hinge lifters, gel-lifters, and other methods of lifting may be used as the Technician deems appropriate. When possible, lifts are preserved digitally by the technician.

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SECTION 9: BIOLOGICAL EVIDENCE

9.1 BLOODSTAIN DOCUMENTATION

Photographs – should document each “pattern”, distribution of stains, orientation and size of stains (with appropriate ruler, plumb and/or level), and void patterns.

Sketches – should reflect positioning and location of pattern.

Notes – used to corroborate the sketch and photos. Notes should include measurements (if conducted), and visual description of patterns.

9.2 BLOODSTAIN COLLECTION

If the stain is wet, allow it to air dry or swab the stain and allow the swab to air dry. Each swab package should be labeled with stain/item #, initials, and date. A control swab of water used for collection will be prepared. Avoid cross contamination.

Methods of collection

- Entire item
- Cut out the material
- Swab stain
- Scraping (last resort method)

Packaging

Biological evidence items should be packaged in paper. Flakes of blood or scrapings are best packaged in paper bindles, placed in a small envelope and sealed. Swabs are best packaged in their own container and then placed into another outer envelope.

9.3 PRESUMPTIVE TESTING FOR BLOOD

Hemastix reagent is utilized by forensic technicians for presumptive testing for blood at crime scenes and remote laboratory processing. Collect the sample prior to applying enhancement chemicals. When blood is in very limited quantities do not perform a presumptive test prior to collection.

Presumptive test results and positive and negative controls are recorded in the notes.

Leuco Crystal Violet and BlueStar[®] are also presumptive tests for blood.

9.4 CHEMICAL ENHANCEMENT

Consult the lead investigator before using any chemical. If approved, the Lab is released from any liability.

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An MSDS for any chemical used should be provided to the scene officer or lead investigator at the scene or soon thereafter. Notes should record this discussion and provision of the MSDS(s).

Chemical enhancement methods are chosen based on availability, ability to transport and surface factors. The chemical enhancement methods used include, but are not limited to:

Amido Black
Leuco Crystal Violet
Blue Star[®]

Results of chemical enhancements should be photographed at the scene and/or cut out for submittal to the laboratory. Care should be noted in the case of Leuco Crystal Violet, as it will keep reacting with exposure to sunlight. Also it is recognized that Blue Star[®] reactions are limited and are only able to be photographed at the time of application.

9.5 SEMEN STAINS

Locating semen stains

Semen stains are sometimes difficult to see under room light conditions. They may appear as a slightly yellow stain on light colored fabrics or a whitish stain on dark colored fabrics. Semen stains may also appear 'crusty.' Many stains may still be missed by visual examination. It is best to collect any item on which possible semen stains have been detected and submit it to the Lab.

An alternate light source (ALS) is an illumination source in which the wavelength of light can be controlled and may cause semen stains to fluoresce when viewed through goggles or a filter. Check the ALS against a known semen standard prior to searching a crime scene to ensure the system is functioning properly and the bulb intensity is sufficient to provide adequate fluorescence (ALS+). Record the results of the control test in the notes, as well as, the combination of goggle color and wavelength of light utilized for this check.

Record the combination of goggle color and wavelength of light used to detect the stain(s) in the notes.

Long wave ultraviolet lamp – semen stains may appear on a dark background. UV eye protection is highly recommended.

Methods of Collection

- Collect the entire item (victim/suspect clothing, bedding, etc.).
- Cut out the stain.
- Moisten a sterile swab with water; swab suspected stain and air-dry prior to packaging.
- Prepare a water control swab.

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Packaging and storage

Biological evidence should be thoroughly dried and then packaged in paper.

9.6 CONTACT DNA/SALIVA COLLECTION

Methods of Collection

Swabbing

- Take two swabs of each suspected location of contact DNA or saliva. The first swab is wet and the second is dry. These should be packaged together as one stain. Swabs should be air-dried before packaging.
- Prepare a water control swab.

Collect the entire item

Documentation

Each separate area sampled should be given a unique number. For example, if there are two separate samples (cuttings or areas swabbed) taken from Item #41, they should be labeled as 41-S1 and 41-S2. These two samples (packaged separately) should then be packaged in an outer envelope as Item #41LCH (LCH being the technician's initials) or as a number provided by the agency. Label the outer envelope with a complete description of the contents and seal with evidence tape.

Packaging

Biological evidence is best packaged in paper.

Swabs are best packaged first in their original container and then placed in an outer envelope.

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SECTION 10: TRACE EVIDENCE AND FIRE SCENE EVIDENCE

10.1 METHODS OF COLLECTION

Tape Lifts

4" fingerprint tape and freezer paper is recommended.

Hand Picking

Use tweezers or similar tool to collect evidence. This technique should be used when the evidence can become dislodged or lost in transit. Small trace items should be packaged in bindles, small gel lifts or other small enclosed container (such as a film canister) to prevent loss.

10.2 HAIR AND FIBER EVIDENCE

It is recommended to use the tape lift and hand pick methods for hair and fiber evidence.

10.3 OTHER TRACE EVIDENCE

Examples may include, but are not limited to:

- Soil
- Glass
- Foliage
- Metal fragments
- Paint
- Wood fragments

These items vary, and should be packaged to preserve evidence according to applicable concerns (biological, small particles, shapes of pieces, etc.).

10.4 FIRE SCENE EVIDENCE

Generally, fire scenes are processed by the State Fire Marshall's Investigators. However, situations may arise where they cannot be present or they ask for assistance on scene processing and evidence collection.

Fire, with or without ignitable liquids, can be used during the commission of a crime or can be used as a means to cover up a crime. As a fire burns, it can create patterns on surfaces in its surrounding environment that can indicate its origin as well as sources to find remnants of ignitable liquids that were used to accelerate the combustion process. These patterns can assist in the identification of evidence.

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Documentation

Notes and photographs should document areas of interest. These areas include, but are not limited to the following:

- Fire patterns, ignitable liquid patterns, charring, transition between burned/unburned material, soot, smoke deposits, color changes, distortion (light bulbs), melting, loss of material, structural collapse, sooty/non-sooty broken glass, protected areas from fire, etc.

Potential evidence to collect includes but is not limited to:

- Heat sources: cigarette butts, matches, match books, burnt rags, damaged electrical lines, hot plates, etc.
- Fuel sources: flammable liquids, damaged gas lines, etc.
- Ignitable liquid retaining materials: porous substances, soil, floor seams, accelerant containers, etc.

Method of Collection and Packaging

Use collection containers that are air tight and appropriately sized for the evidence they will contain. Lined cans and Ampac™ plastic heat sealed bags should **only be filled up to 75% or less** to allow for air space. Avoid cross contamination.

Lined cans are preferred for objects that have sharp edges.

- Ampac™ plastic heat sealed bags can be used for soft sided objects.
- Only a representative sample of liquid should be sent to the Laboratory for analysis. Glass jars with Teflon lids may be used to collect **approximately 2 mL** of questioned liquid.

Additionally, where possible, collect an unburned control sample of the same material for comparison purposes. Typically these control samples will be found under furniture and in areas protected from fire.

SECTION 11: SHOE IMPRESSION EVIDENCE

A suspect may be associated to a crime scene by impressions left behind by the suspect's footwear. A comparison of the crime scene impressions/imprints can result in identification of a shoe. Impressions can be found in soil, snow, on counters, tile floors, doors, paper, etc. The evidentiary value of a comparison usually depends upon the quality of the impression and the manner in which it was recorded and collected.

11.1 PHOTOGRAPHY OF SHOE IMPRESSION EVIDENCE

As with all evidence, overall photographs should be taken showing the impressions/imprints in relation to other features of the scene. Photography is a valuable way of collecting impression evidence for later comparison.

It is critical that distortions are minimized by adhering to the following:

- The scale should be at the same level as the pattern for proper focus. Care should be taken not to cover any part of the impression.
- It is recommended to take multiple photos of each impression of interest with a detachable flash or flashlight at an oblique angle and from several positions.
- The photographs should contain identifiers in addition to a scale.
- The camera should be directly over the impression with the film plane parallel to the impression.
- The entire impression should be captured in one frame, BUT fill the frame with the impression and scale. Note that overlapping photos may be taken for best digital resolution.
- Use a tripod and light source when needed.

11.2 CASTING SHOE IMPRESSION EVIDENCE

After photography, casting may be performed to document the impression in 3-D form. The decision to cast is affected by the soil or snow conditions. Impressions in fine soil and even snow are candidates for casting. Coarse, rocky soil and some snow conditions are sometimes not good candidates for casting.

Casting Materials

The recommended materials for casting are Dental Stone and Sulfur Cement.

In preparation for use at crime scenes, numerous two pound zip-lock bags of dental stone can be prepared and stored. This amount will cast an average sized shoe impression. With premeasured bags, casting impressions at the crime scene only involves adding water. The required amount of dental stone and water will vary depending on the size of the impression to be cast, therefore, variations are expected.

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To make a dental stone cast, add the appropriate amount of water to the bag and close the top. The bag containing the dental stone powder can be used to mix and pour the dental stone. Mix continuously for a minimum of 3-5 minutes so that the powder can thoroughly absorb the water. The mixture should have the consistency of thin pancake batter. To accelerate hardening time potassium sulfate (K₂SO₄) may be added to the dry dental stone (about 1 tablespoon/bag). Use more at colder temperatures, less at warmer temperatures.

Pour casting material outside the impression and direct flow evenly into the impression. If the casting material does not flow completely into the impression, the top surface of the casting material may be agitated to help it flow.

The cast should be marked with case information: case number, item number, date, initials, and if needed, orientation. Do not remove any soil adhering to the cast after recovery. Package cast in a cardboard box to protect against breakage and to allow for continued drying of dental stone.

11.3 LIFTING SHOE IMPRESSION EVIDENCE

Residue and/or impressions in dust are best collected by lifting, or by collecting the entire item.

Lifting Methods

Gelatin Lifters: black gel lifters are recommended for dust impressions

Electrostatic dust lifter and / or Pathfinder - follow instructions maintained with each device for use.

Tape and/or adhesive lift: used for powdered impressions

11.4 ENHANCING SHOE IMPRESSIONS

All impressions should be photographed first before enhancement is attempted.

Shoe impressions in blood

Chemicals may be used to enhance imprints in blood. Examples are Leuco crystal violet (LCV), Amido Black and Blue Star®.

Note: see section 9.4 for enhancement chemical protocols

Wet residue or grease/oil impressions

Impressions of light grease or oily substances may be enhanced with the use of standard fingerprint powder.

SECTION 12: TIRE AND TRACK IMPRESSION EVIDENCE

A comparison of the crime scene impressions may result in the identification of a tire or track. Impressions can be found in soil, snow and other surfaces and substrates. The evidentiary value of a comparison usually depends upon the quality of the impression/imprint and the manner in which it was recorded.

12.1 PHOTOGRAPY OF TIRE IMPRESSION EVIDENCE

The procedures described in Section 11.1 for the photography of shoe impression evidence should be applied, with the following additional considerations:

- A series of overlapping photos should be taken with a measuring tape in place for re-creation of the track(s)
- The photos should be taken with the camera lens parallel to the track.
- The scale should be next to the track, not covering the track, and if possible on the same plane as the bottom surface of the track.
- A minimum of 8 feet of tire track should be photographed, if possible.
- A high birds-eye photograph may assist in reconstructing movement.

12.2 CASTING OF TIRE IMPRESSION EVIDENCE

The procedures described in Section 11.2 for the casting of shoe impression evidence should be applied, however the casts will be much larger, therefore dental stone is the recommended material.

12.3 OTHER RESIDUE TIRE IMPRESSIONS

Tire impressions may result from a deposit/transfer of material such as dirt, mud or oil. These impressions should be photographed, and a lift may be attempted with dental stone.

If possible, submit the entire item that has the impression on it.

Tire impressions in blood should follow the enhancement techniques outlined in Section 11.4 for the enhancement of shoe impression evidence.

12.4 TRACK MEASUREMENTS

The **track width** of a vehicle is the distance between the center of the tire mounted on one side to the center of the tire on the opposite side (the front and rear wheel widths may be different).

The **wheelbase** of a vehicle is the distance between the center of the front axle to the center of the rear axle.

SECTION 13: TOOL MARK EVIDENCE

A Tool mark is any impression, scratch, gouge, cut or abrasion made when a tool is brought into contact with an object leaving a mark. In some cases, tool mark identification can link a tool to a crime scene.

13.1 PHOTOGRAPHY OF TOOL MARK EVIDENCE

Overall and close-up photographs should be taken of the tool mark. Examination quality photographs should include a scale. Photographs should show case information: item number and orientation.

13.2 MEASUREMENTS OF TOOL MARK EVIDENCE

Measurements should be taken to document the tool mark in relationship to the ground and/or other fixed objects.

13.3 CASTING OF TOOL MARK EVIDENCE

If possible, submit the entire item that has the tool mark on it. If an item cannot be submitted for tool mark examination, a cast should be made using a flexible casting material such as Mikrosil. Collection of tool mark evidence should be completed without loss or destruction of biological, trace or latent print evidence. Casting should be packaged separately in a hard container.

Tool marks and tools should be packaged to prevent any additional damage from occurring.

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SECTION 14: FIREARM EVIDENCE

Firearms must be rendered safe before being handled by the Technician. Treat all firearms as loaded.

14.1 DOCUMENTATION AND COLLECTION OF FIREARMS

Inspect the weapon and only collect trace evidence that will be lost in transportation. Do not put anything down the barrel or into the trigger guard. Handle the weapon to avoid destruction of latent print evidence

Documentation

After collecting the weapon, document the make, caliber, serial number, whether it is loaded/unloaded.

Note: a qualified official, such as the scene officer or investigator, should ensure the weapon is safe before handling, and should be responsible for the unloading process.

If the weapon is a revolver, document the position of the cylinder. If bullets are removed, document the order and position in the cylinder and package in separate envelopes or boxes with identifiers which correspond to their locations.

If the weapon has a removable magazine, any ammunition still in the magazine should be left in place and the magazine and ammunition packaged separately from the firearm.

Packaging

Secure the weapon unloaded and with the action open inside a box to prevent movement and with the muzzle direction indicated on the outside of the box. If the Technician does not feel qualified to determine the aforementioned conditions they should ask the scene officer to do so. Labeling and or tags on the package should not be on the muzzle end.

14.2 BULLETS AND CASINGS

Locations of bullets and / or casings should be documented and photographed. In most cases it is best to handle each bullet or casing as a separate item for the purposes of documentation, collection and packaging.

Bullets and casings should be packaged with consideration to prevention of further damage and/or loss of trace evidence if applicable.

14.3 SHOOTING SCENE INCIDENTS

The examination of defects and holes caused by projectiles from firearms can provide information about the projectile, the firearm, intermediate objects in the path of the projectile, direction of travel (entrance or exit), order of shots and other information. This information may be useful in identifying the possible position of the source (the shooter[s]) and may reduce the sites to search for evidence.

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Shooting incidents are dynamic and varied, as is the evidence produced during such an event. No method can cover all types of evidence encounter at shooting scenes. This method is a starting point to cover basic documentation of this type of evidence and will be limited in scope to include documentation of impacts marks through photography, narrative description, sketches and/or a diagram.

The extent of this documentation does not allow for conclusions as to flight path and/or trajectory determination. As such, technicians will not be utilizing materials to establish trajectory. Technicians will notify the requesting agency that we do not perform this analysis, but can assist with basic documentation. If investigators utilize materials, such as rods, and request assistance with documentation/photography technicians will document in their field notes that investigators placed the rods.

14.4 SAFETY AT SHOOTING SCENES

Lead is typically present on or in projectiles associated with shooting incidents and can be found in association with holes and impacts produced by these projectiles. Hands should be washed as soon as practical after possible exposure, and prior to eating, drinking, smoking or other activities that could facilitate ingestion. Gloves may be used to avoid absorption through the skin or eyes by contact with a contaminated surface (hands, bullet hole, etc.).

14.5 DOCUMENTATION OF SHOOTING SCENES

- Defects (penetrating, perforating, or non-penetrating points of impact) can be documented using narrative description, photography, sketches, and/or diagrams.
- Each defect should be given a unique identifier (i.e. "A" or "1") that should be reflected in the narrative description, photographs, sketches, and/or diagrams. The size of the defect can be documented with a scale through notes, photographs, sketches, or diagrams.
- Characteristics of defects and holes vary greatly and are affected by numerous factors including intermediate objects and the type of surface impacted. Observations could include, but are limited to the size and shape of the defect and/or hole, trace material that may have been transferred by the projectile from an intervening object or from the projectile itself (bullet wipe), a description of the appearance of the defect and/or surface that was impacted.

Note: conclusions regarding the direction of travel of projectiles will not be determined by technicians, but documentation may include narrative descriptions and/or photography that differentiate corresponding holes. For example, entrance hole labeled as #A and corresponding exit hole labeled as #A1 or vice versa. Alternatively, each hole may be labeled with the same identifier, #A, and a corresponding narrative description of the location, such as "interior" or "exterior".

Photography

The following photographs should be taken:

- Overall photographs of the area(s) or object(s) with the defects.
- Overall photographs of the surface(s) with the defects.

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- Midrange photographs to show the relative locations of the defects in the surface(s) and their relative locations to each other.
- Close-up photographs with a scale at the top or bottom of each defect to document size and shape.
- The film plane must be parallel to the surface with the defects when taking the close-up photographs.

Diagrams

Diagrams may not be necessary at every shooting scene. In addition to procedures in Section 6, technicians should consider including the following:

- The overall measurement of the area or object being sketched.
- The overall measurements of the surfaces with the defects or holes.
- The height of the center of each defect or hole.
- The horizontal distances from the center of each defect or hole to the left or right corner/edge of the surface.
- The approximate length and width of each defect or hole.
- The best orientation of each defect or hole in the surface.

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SECTION 15: VEHICLES

The following guidelines vary from scene to scene and not all may apply.

15.1 PHOTOGRAPHY OF VEHICLES

Photos should include scene location and orientation and vehicle location and orientation. Close-up photos should be taken of any damage or other evidence of interest. Photograph any skid marks, impacts or tire tracks.

15.2 DOCUMENTATION OF VEHICLES

The following should be recorded in the notes for each vehicle examined:

- VIN Number
- License plate number
- Tire Information: DOT number, make, model, size if applicable
- Positions of dials, windows etc. if applicable
- Track width and wheel base if applicable

15.3 COLLECTION AND PROCESSING OF VEHICLE EVIDENCE

Vehicles may be processed for evidence using the aforementioned techniques for latent print, biological, trace, impression, tool mark and firearm evidence.

If possible, it is recommended that a vehicle be processed in a secure garage or other indoor location.

It is recommended that a vehicle be allowed to come to room temperature and to air dry before processing.

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SECTION 16: DOCUMENTATION OF VICTIMS AND COLLECTION OF EVIDENCE ON BODIES

16.1 ASSISTING WITH EVIDENCE COLLECTION DURING AN AUTOPSY

Photography taken at an autopsy will be done by ABI, personnel from the Office of the State Medical Examiner or personnel from the requesting agency. A Forensic Technician will only assist in the photography of an autopsy when requested.

Personnel from the Office of the State Medical Examiner record known inked finger and palm impressions from victims. If requested, the Forensic Technician may assist in the recovery of friction ridge detail.

16.2 COLLECTING EVIDENCE FROM A BODY

Collecting of evidence from a body during an autopsy is conducted by Medical Examiner personnel. Forensic Technicians may assist when requested.

Collection of evidence from a body at a crime scene may be necessary to prevent loss during transport, but typically requires permission from the office of the Medical Examiner to do so. No orifice should be probed, only evidence on the outer surface of the body or clothing should be collected. In particular, trace evidence or latent print evidence is best collected at the scene before the body is moved or transported. The decision to do so is at the discretion of the technician and should be communicated to the scene officer and to medical examiner personnel if any chemicals are to be applied to the body prior to application.

16.3 DOCUMENTING A BODY AT A CRIME SCENE

Location and position of a body should be documented by photography and/or diagram. Photographs and notes may be used to document appearance and other conditions of interest such as red areas, apparent wounds, etc. Overall photos should be taken from all sides. Additional mid-range photos should be taken of a body. Take close-up photos of wounds or injuries with and without scales.

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SECTION 17: CRIME SCENE FIELD NOTES AND PHOTOGRAPHS

17.1 GUIDELINES FOR NOTES

It is preferred that all field notes be done in ink, but pencil may be used. The first page of Crime Scene notes will detail the Callout Information, Case Information, Activities Performed and Wrap up information including the start and end dates for crime scenes (Appendix A-Crime Scene Information Sheet). The start date will be considered the date the technician is notified. The end date will be the date the technician submits the case for technical review. The date the case is submitted for technical review is recorded on the Crime Scene Information Sheet.

Guidelines for making corrections and content of notes are also covered in the Laboratory Quality Assurance manual (i.e. corrections should be initialed, dated and have one line as a strike through). Each page of field notes will contain, but not limited to:

Lab or agency number
Date
Technician's identifier
Page ___ of ___

Notes are scanned and entered into LIMS.

Copies of field notes are provided at the request of the court.

17.2 GUIDELINES FOR DIGITAL PHOTOGRAPHS

For crime scenes, all digital photographs must be retained.

Each CD/DVD containing a copy of the photos provided to an agency representative will contain, but not limited to:

Lab or agency number
Date
Technician's identifier

Digital documentation from crime scenes such as scanned latent lift cards and photographs are retained in the PHYSICAL SECTION IMAGES file on the Laboratory network. Access to this file is limited to personnel in the Latent and Crime Scene Disciplines and the Forensic Laboratory Manager. Access to files in the PHYSICAL SECTION IMAGES file is recorded electronically.

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SECTION 18: CRIME SCENE REPORTS

18.1 CONTENT OF REPORTS

Forensic Technicians will write a report outlining their participation in a crime scene investigation.

A report includes the following:

1. Date, agency name, agency case number and laboratory case number.
2. A discussion of the actions taken at the crime scene that pertain to the documentation, detection and collection of physical evidence at the scene. Chemicals used should be included.
3. Date(s) the crime scene was processed.
4. Location of the crime scene.
5. A list of the photographs and name of the officer and/or investigator that was provided a copy of the photos on CD/DVD.
6. Diagrams, if constructed.
7. List of evidence and identifiers used to label evidence in the photographs and diagrams.
8. Information about who the evidence was left in the custody of.

The body of the report will have numbered pages. If any diagrams, lists, photos etc. are attached to the report and are not a part of the numbered pages, then they are listed at the end of the report as attachments (Appendix B).

The evidence list and photo log attachment summarizes all evidence documented at the scene. Each evidence item is identified by a placard number with a brief description. The term "photo" in the associated evidence items column of the evidence list indicates the item was only documented and photographed by the technician, but was not collected and/or packaged. Evidence collected will be assigned an evidence item number which will be recorded under the associated evidence column.

Requirements for reports are also addressed in the Laboratory Quality Assurance manual.

18.2 REVIEW OF REPORTS

Technical Review

All crime scene and remote laboratory reports issued by the Forensic Technicians will be subjected to a technical review. During a technical review, field notes, photographs and diagrams are reviewed and cross-checked as outlined on the appropriate review checklist (Appendix F). The purpose of the technical review is to ensure completeness and accuracy of the report issued. If any changes to technical records, such as notes, are made during the process of technical review they will be tracked.

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The individual performing the technical review must agree that the report is accurate and methods sound before it is distributed. The individual conducting the technical review will be documented in LIMS.

Administrative Review

Another analyst or technician, who may be different from the technical reviewer, will conduct an administrative review of the crime scene and remote laboratory reports. During the review process, the report, the laboratory request form and all case documents will be cross-checked. The administrative review process ensures the completeness, correctness and clarity of the test reports issued. The individual conducting the administrative review will be documented in LIMS.

Guidelines for reviews are also covered in the Laboratory Quality Assurance manual.

18.3 DISPOSITION OF REPORTS

Requesting Agency

The requesting agency will receive a crime scene report which will include an original copy of the crime scene report(s) and attachments. Attachments may include, but are not limited to, lists of evidence, photo logs, diagrams, prints and/or list of the photos, and a copy of the CD/DVD of photos.

Forensic Technician Case File

It will be the responsibility of the Forensic Technician to scan all original crime scene notes into LIMS prior to technical review. The technician should verify that all pages are included in the file. Once files have been imported into the LIMS case record and verified, the hard copies of the original crime scene notes will be temporarily stored in a secure locked file location. Original crime scene notes for remote technicians will periodically be sent to the discipline supervisor for storage in the discipline records.

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SECTION 19: PROCESSING EVIDENCE AT A REMOTE LABORATORY SITE

It is recognized that the Forensic Technicians have limited equipment, facilities and materials for the processing of evidence. However, it is also recognized that there is great potential for the retrieval of fragile evidence such as latent prints, trace evidence, shoe impressions in dust, etc. if the evidence is processed without enduring the rigors of transportation to Anchorage.

Therefore, it is the goal of the placement of remote laboratory sites to provide an intermediate step between the processing of the evidence on scene and the transportation of evidence to the Anchorage Laboratory. Under direction from the Crime Scene Support Supervisor, and at the discretion of the Technician, evidence may be processed at remote laboratory sites in lieu of or in addition to submission to the laboratory. The level of processing at remote sites is dependent on training, facility space and equipment available.

The processing techniques at a remote laboratory site will be treated in some ways as an extension of crime scene processing for the purposes of choices of processing, notes, reports, quality assurance of chemical processing and presumptive testing. When technicians are conducting latent print processing, the Latent Print Procedure manual will be followed. As such, when the ALS is employed for latent print processing the results of the control tests are recorded in the notes and serves as a performance check for the ALS. Digital documentation of evidence will be retained in the physical section image records, if appropriate.

Start and end dates for remote laboratory processing will be recorded in the notes. The start date will be the day evidence is opened. The end date will be recorded next to the results in the processing notes.

Chain of custody for evidence worked at remote site locations will be recorded on the request for laboratory services form. It may also be recorded on the tag, evidence form or equivalent monitored by the agency in control of the evidence.

Remote Technicians will maintain manufacture instructions on equipment and materials used for processing evidence at their respective facilities.

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SECTION 20: CHEMICAL PREPARATION, PROCEDURES AND STORAGE

20.1 FORMULAS FOR THE PREPARATION OF CHEMICALS

Formulas followed by the crime scene discipline for the preparation of chemicals used for crime scene processing are found in Appendix E. Chemical logs will be stored periodically in the discipline records in LIMS.

The date of preparation, formula used, technician's initials and verification that a control was tested will be noted in the logbook. The date of preparation, expiration date if applicable and technician's initials must be noted on the container.

Prior to weighing chemicals each balance will be checked with a standard weight. Results and the standard weight utilized will be recorded on the equipment maintenance log at each location. To ensure optimal function for the balance, provide adequate time for it to warm up and confirm that it is level. Additionally, be sure to place the test weights and materials to weigh in the center of the balance.

Given the crime scene discipline does not have critical reagents; the acceptable accuracy limits for weighing chemicals will be plus or minus one. If the balance falls outside of this range when utilizing the test weight, the test may be repeated one time. The Discipline Supervisor will be notified if the test fails a second time and the balance requires maintenance.

20.2 VERIFICATION OF CHEMICALS

Purchased and/or prepared reagents that depend upon a chemical reaction to develop latent prints, such as Ninhydrin, will be control tested in accordance with the Latent Print Procedure Manual.

Purchased and/or prepared reagents utilized in field processing and/or crime scenes will be control tested prior to use. The Technician will document the condition of the control test in their notes. Any reaction(s) other than the expected reactions will also be recorded in the notes. If this result interferes with a Technician's ability to process a scene or evidence the Discipline Supervisor will be notified as soon as practicable to determine an appropriate course of action.

Expired reagents or processing materials will not be used for crime scenes. Expired reagents or processing materials may be retained if they are labeled as "expired for training use only" or some similar wording.

The crime scene discipline does not have critical reagents.

20.3 INVENTORY, HANDLING AND STORAGE OF CHEMICALS

Procedures for inventory, handling and storage of chemicals used by the Crime Scene Response Team are found in the Laboratory Safety Manual.

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Care should be taken when transporting crime scene chemicals on commercial air liners (e.g. no flammable items may be transported). If a question arises, contact the appropriate security personnel at the airport and research the safety of materials before transporting them.

20.4 PROVIDING MSDS INFORMATION

Material Safety Data Sheets of chemicals used at a crime scene should be provided to the lead investigator at or soon after they are used at a crime scene. If the lead investigator is not present, a copy should be left at, or with an official at the scene. This action should be recorded in the notes.

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SECTION 21: CRIME SCENE TRAINING

The purpose of crime scene training is to ensure the competency of new Forensic Field Technicians. Forensic Technicians are trained using the **Crime Scene Training Manual for Technicians**. Each Forensic Technician keeps a training notebook to document initial training.

SECTION 22: PROFICIENCY TESTING

Each year each Forensic Technician will take a proficiency test, which will cover aspects of crime scene processing. The test may be practical, oral, written and/or on-line from an approved vendor.

SECTION 23: DEFINITIONS

ABI – Alaska Bureau of Investigations is a branch of the Alaska State Troopers. They are most often responsible for the activation of the Crime Scene Response Team. Some crime scenes may not necessitate ABI personnel to respond. Some police agencies may supply their own officers to direct and support crime scene work.

Case or Scene Officer – Law enforcement officer from the requesting agency who is heading the investigation and to whom the finished crime scene report(s) will be sent.

Collection - Indicates the evidence was moved by the technician and placed in an appropriate container. The container will be marked at a minimum with the following information:

Lab or agency number, item or placard number, description, date, and technician's initials.

Documentation - Includes the written description of the item in the technician's notes referenced by the placard number. This may or may not include photographs of each item.

Lead Investigator – Law enforcement officer ultimately responsible for the crime scene investigation.

Packaging - Indicates evidence container was sealed with evidence tape and initialed/dated by the technician.

Requesting Agency – The agency that has requested the assistance of the Crime Scene Response Team.

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SECTION 24: REVISION HISTORY

Location	Revision made
Table of Contents	Added 14.3, 14.4, 14.5
Section 1	Revised sentence, "Such evidence may later be examined and processed at the Anchorage laboratory or at a remote laboratory location."
Section 4	Revised sentence, "Be aware of the chemical hazards associated with clandestine laboratories. These types of scenes are outside the scope of the forensic technician duties and will not be processed."
Section 4	Revised sentence, "Use caution when documenting firearms; always consider a weapon as LOADED, do not pick up the weapon with an object in the trigger guard or barrel, and always point away from people. The officer in charge of the scene should be responsible for handling any firearms and rendering them safe for documentation and collection at a crime scene."
Section 6	Added sentence, "When measurements are taken a tape measure will be used."
Section 6	Added sentences, "Determine the best perspective and method of sketching the scene." and "The relative positions of object(s) should be incorporated into a sketch. Consider items that should be included and excluded."
Section 6	Added sentences, "as well as, a notation that the sketch is a rough draft." And "Notation that sketch is not to scale or scale, if drawn to scale."
Section 6	Removed sentences, "Laser measuring systems may be used to collect measurements. GPS may be used to record an approximate location..."
Section 7	Added sentences, "When evidence is collected by the technician..."
Section 8	Revised sentence, "When possible, lifts are preserved digitally by the technician."
Section 9	Removed reference to reconstruction and calculations of bloodstain patterns in the documentation section.
Section 9	Revised sentence, "When blood is in very limited quantities do not perform a presumptive test prior to collection."
Section 9	Revised paragraph, "An alternate light source (ALS) is an illumination source in which the wavelength of light can be controlled and may cause semen stains to fluoresce when viewed through goggles or a filter."
Section 9	Removed sentence, "Let DNA analysts know about any chemicals or processing that was performed on the sample area. This may be written directly on the swab packaging."
Section 13	Added sentence, "Collection of tool mark evidence should be completed without loss or destruction of biological, trace or latent print evidence."
Section 14	Removed sentence, "Firearms should be kept in their same condition as found UNLESS safety issues require otherwise until they are in a controlled environment."
Section 14	Removed reference to bullet flight path evidence in title.
Section 14	Removed sentences, "Flight paths may be documented using rods and/or string methods. The results may be documented by photography and/or by diagram."
Section 14	Added procedure for documenting shooting scene incidents.
Section 17	Revised sentences, "The end date will be the date the technician submits the case for technical review. The date the case is submitted for technical review is recorded on the Crime Scene Information Sheet."

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Location	Revision made
Section 18	Removed sentence, "Documents that are attached to reports are considered administrative records."
Section 18	Added paragraph, "The evidence list and photo log attachment summarizes all evidence documented at the scene..."
Section 18	Revised administrative review paragraph.
Section 18	Added sentence, "Guidelines for reviews are also covered in the Laboratory Quality Assurance manual."
Section 19	Added sentence, "When technicians are conducting latent print processing, the Latent Print Procedure manual will be followed."
Section 20	Removed the words, "for remote locations"
Section 20	Revised sentence, "Formulas followed by the crime scene discipline for the preparation of chemicals used for crime scene processing are found in Appendix E."
Section 20	Added paragraphs, "Prior to weighing chemicals each balance will be checked with a standard weight..."
Section 20	Revised paragraph, "Purchased and/or prepared reagents that depend upon a chemical reaction to develop latent prints, such as Ninhydrin, will be control tested in accordance with the Latent Print Procedure Manual..."
Section 20	Replaced sentence, "Critical reagents such as Bluestar [®] Forensic Tablets and Hemastix [®] will be purchased from an approved vendor..." with "The crime scene discipline does not have critical reagents."
Section 23	Added definitions for documentation, collection and packaging.
Appendix C and D	Removed the words, "Matsu West"
Appendix E	Revised Alternate Light Source (ALS) procedure.
Appendix E	Revised Amido Black procedure.
Appendix E	Revised LCV procedure.
Appendix G	Added abbreviations "MTR" and "para"

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Appendix A – Crime Scene Information Sheet

Technician:
Crime Scene Notes

Lab Number:
Date:
Initials:

Page of

Callout Information

Notified by: _____ Date: _____ Time: _____

Request: _____

Case Information

Investigating Agency: _____ Agency # _____

Case Officer / Investigator: _____

Date Arrived at Scene: _____ Time Arrived at Scene: _____

Scene Location: _____

Scene Description: _____

Information provided about the scene: _____

Activities Performed:

- Photos: _____
- Diagram: _____
- DNA Swabs: _____
- Bio/Trace Collection: _____
- Latent Prints: _____
- Casts/Lifts: _____
- Other: _____

Wrap Up:

MSDS Provided (yes/no): _____ Date/Time Completed: _____

Evidence Custody Information _____

Lifts and/or Photos Custody Information _____ Date _____

Date case submitted for technical review _____ Initials _____

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Appendix E – Processing Work Instructions

Hemastix[®] Presumptive Blood Test

Description of Process

Hemastix[®] is a commercially prepared plastic strip that contains a reagent test area at one end. The reagent test area is yellow in color and contains the chemical tetramethylbenzidine. Tetramethylbenzidine is used in a chemical reaction as a presumptive test for hemoglobin, a component of red blood cells. The test is extremely sensitive. In the presence of blood, a chemical reaction produces a color change on the reagent pad ranging from green to dark blue depending on the quantity of hemoglobin present.

Procedure

- Record lot number and expiration date in notes
- Prior to application perform control tests and record results in notes
- Moisten a sterile swab with water
- Swab a portion of the stained area
- Touch swab to reagent end of Hemastix[®] test strip
- Color change should be rapid (60 seconds)
- A positive reaction will be green to blue in color
- Discard the test swab

Safety considerations

When dealing with biological samples and chemical reagents suitable protective clothing and gloves should always be worn. Tetramethylbenzidine is a component of the Hemastix[®] test strip and is known to be a possible carcinogen. Care should be taken not to touch the reagent test area or contaminate surrounding areas. The bottle should remain tightly closed when not in use.

Limitations

This test should only be administered when sufficient sample exists for testing and collection. Most animal blood will produce a positive reaction and false positive reactions can occur with some metal ions, bleach, some dyes, and other compounds.

Quality Control

A positive (with known blood) and negative (unstained) control test should be performed at every crime scene in which Hemastix[®] are used. Record the results of the controls in notes. If the positive control test results in no reaction with the known blood the test may be repeated one time. If the positive control test still results in no reaction the Hemastix[®] shall be removed from service. If this result interferes with a Technician's ability to process a scene or evidence the Discipline Supervisor will be notified as soon as practicable to determine an appropriate course of action.

Literature References

Material Safety Data Sheet
Laboratory Health and Safety Manual

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Bluestar® Forensic

Description of Process

Bluestar® is typically used as a screening tool to locate possible stains or areas of blood. Positive reactions typically occur immediately, emitting an intense bluish luminescent glow.

Procedure

Follow the manufacturer instructions for mixing.

Application

- Record lot number and expiration date in notes
- Prior to application perform control tests and record results in notes
- Minimize light sources if possible (close windows, turn off lights)
- Spray working solution lightly on suspected bloodstain area, horizontally ahead of you, NOT pointing toward the ground, in a side to side sweeping motion.
- Do not saturate walls and vertical surfaces in order to prevent the creation of drippings
- Positive reactions typically occur immediately, emitting an intense bluish luminescent glow.
- A negative reaction exhibits no luminescence.
- The reagent should be used within 3 hours of mixing tablets.

Safety considerations

When dealing with biological samples and chemical reagents suitable protective clothing and gloves should always be worn.

Limitations

Bluestar® may dilute bloodstains and does not contain a fixative element. If a patterned impression is visualized with Bluestar, immediately stop applying and consider other bloodstain development methods that would be suitable for patterned evidence. False positives may be produced by a variety of sources, including household detergents, chlorine, copper and other strong oxidizing materials.

Quality Control

A positive (with known blood) and negative (unstained) control should be performed at every crime scene in which Bluestar® is used. Record the results of the control tests in notes. If the positive control results in no reaction with the known blood the test may be repeated one time. If the positive control still results in no reaction the Bluestar® lot number shall be removed from service. If this result interferes with a Technician's ability to process a scene or evidence the Discipline Supervisor will be notified as soon as practicable to determine an appropriate course of action.

Literature References

Material Safety Data Sheet
Laboratory Health and Safety Manual
Bluestar® Forensic Latent Bloodstain reagent, Bluestar® Forensic Product Insert

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Alternate Light Source (ALS)

Description of Process

The Alternate Light Source (ALS), also referred to as a forensic light source, may be employed in a wide range of functions in a forensic capacity. The ALS can assist in locating and identifying potential evidence using different wavelengths of light not readily observable by other methods. The evidence that may be processed includes latent prints, impressions, trace material or body fluids such as semen, saliva and urine.

Procedure

- Check the ALS against a known semen standard prior to searching a crime scene to ensure the system is functioning properly and the bulb intensity is sufficient to provide adequate fluorescence (ALS+). Record the results of the control test in the notes, as well as, the combination of goggle color and wavelength of light utilized for this check. If the performance check fails, the test may be repeated one time. If the test still results in no fluorescence, the instrument may require maintenance. If this result interferes with a technician's ability to process a scene or evidence, the Discipline Supervisor will be notified as soon as practicable to determine an appropriate course of action. In the interim, if an agency has an ALS available it may be utilized at the crime scene. Follow the manufacturer's instructions for use and record the instrument make/model in the notes in addition to the combination of goggle color and wavelength of light.
- The light source will work best in a darkened environment as the contrast viewed through the filter/goggles will be more obvious. The light should be applied to the area to be searched, viewing the surface through the filter and/or goggles. If a reaction is observed, then the appropriate protocol should be followed for the type of evidence discovered (i.e. semen, blood, hairs, fibers, etc.)
- The choice of filter/goggles is left to the discretion of the technician but the following are recommendations for general selections of goggles and filters:

Type of Search	Wavelength	Goggles
Biological fluids (semen, saliva, urine)	CSS, 455	Orange, yellow
Fibers	UV, white light, 455	Orange, yellow
Blood	White light, 415	Clear or yellow
Additional information regarding which goggles to use for particular wavelengths of light can be found with the ALS.		

- Materials that naturally luminescence will appear as a different color from the surrounding area or background. Numerous wavelengths light may be necessary to achieve the greatest contrast with the background material.
- ALS photography, if necessary, may be easily accomplished by attaching a filter to the front of the camera. The filter must be the same color as the goggles being worn by the technician to replicate the viewing conditions. The flash should not be used and the camera should be set on a tripod.

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Safety considerations

Alternate Light Sources emit high-intensity ultraviolet, visible and infrared light and can be harmful with extended exposures. Never look directly into the light or the optical ports of an instrument. Goggles should be worn when using the ALS. In addition, when possible, wear gloves, long sleeves, and/or laboratory coats as protective clothing.

Limitations

The ALS search should be conducted in a darkened area to enhance the visibility of the fluorescence.

Quality Control

Check the ALS against a known semen standard prior to searching a crime scene to ensure the system is functioning properly and the bulb intensity is sufficient to provide adequate fluorescence (ALS+). Record the results of the control test in the notes, as well as, the combination of goggle color and wavelength of light utilized for this check.

Literature References

Laboratory Health and Safety Manual
Manufacture's Manual for Alternate Light Source
Forensic Light Source Applications: Wavelengths and Uses, Spex Forensics pamphlet

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Amido Black

Description of Process

Amido Black is a general protein stain used for the development or enhancement of patterns in suspected blood, such as ridge detail or footwear impressions. It will react with proteins found in blood, but is not specific for blood. Amido Black can be used as a methanol-based or water-based stain on porous and non-porous items.

Procedure

Mixing

The amido black methanol-based process consists of two solutions – a developer and a rinse – and a final rinse of distilled water.

Developer Solution

Naphthol blue black.....2 g
Glacial acetic acid.....100 mL
Methanol.....900 mL

Combine the ingredients and mix using a stirring device until the naphthol blue black is dissolved. This should take approximately 30 minutes.

Rinse Solution

Glacial acetic acid.....100 mL
Methanol.....900 mL

Combine the ingredients.

Final Rinse

Distilled water is preferred; however, if not available, tap water can be used.

For field use that requires air travel water-based Amido Black may be used. Amido black water-based formula consists of a citric acid stock, a developer, and a final rinse. The formula may be adjusted if appropriate.

- Combine 38 g of Citric acid with 2000 ml of distilled water and place on a stirring device until the citric acid is completely dissolved.
- Combine 1000 ml of the Citric acid solution, 2 g of Naphthol blue black and 2 ml of Kodak Photo-Flo™ 200 solution and place on a stirring device.
- The rinse solution is 1000 ml of the Citric acid stock solution.
- Distilled water is preferred for the final rinse; however, if not available, tap water may be used.

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Note: The water may not evaporate and consideration should be given to the surface that the solution is applied to preserve impression detail.

Application

- All visible ridge detail or impressions of potential value in blood should be photographed prior to processing.
- If applicable, collect sample of suspected blood for DNA testing prior to processing.
- Perform control tests and record results in notes.
- Apply the developer to the specimen(s) by dipping, spraying or using a squirt bottle.
- Rinse the target area with the rinse solution to remove background staining.
- A positive reaction will indicate a purple, blue, or black color change.
- A negative reaction will indicate no color change.
- These steps can be repeated to improve the development and contrast.
- Apply the final rinse and allow the specimen to air dry.
- Collect and/or photograph visible ridge detail or impressions of potential value.

Safety considerations

When dealing with biological samples and chemical reagents suitable protective clothing and gloves should always be worn. Avoid contact with skin and eyes.

Limitations

Amido black is limited to the development or enhancement of suspected blood. Caution must be exercised when applying the methanol-based formula to painted surfaces. This formula can destroy the latent prints(s) as well as the surface beneath the latent print(s). All blood must be dried prior to application. Cyanoacrylate fuming may be detrimental to the Amido black water-based formula.

Quality Control

A positive (with known blood) and negative (unstained) control should be performed at every crime scene in which Amido Black is used. Record the results of the control tests in notes. Record the lot # and expiration date (if applicable) in the notes.

Literature References

Material Safety Data Sheets
Laboratory Health and Safety Manual

Federal Bureau of Investigation Laboratory Division. Processing Guide for Developing Latent Prints. 2000.

Use of Fingerprint Powder

Fingerprint powders are used to develop latent prints on non-porous surfaces.

The procedure for Fingerprint Powder is listed in the Latent Print Discipline manual.

Use of Cyanoacrylate (Super Glue) Fuming

Super Glue is used in conjunction with a heat catalyst to produce fumes which will adhere to latent prints on evidence being processed.

The procedure for Superglue Fuming is listed in the Latent Print Discipline manual.

The Superglue Fuming method may be adapted for field use through the use of disposable heating elements, plastic fuming chambers, and pre-packaged superglue kits.

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Leucocrystal Violet (LCV)

Description of Process

Leucocrystal Violet reacts with the heme-group in blood to give a violet color. Its application can be used to enhance and develop ridge detail, footwear, and tire tracks deposited in suspected blood on porous and non-porous surfaces. Various protein stains, such as Amido Black, etc., can be used after the LCV process.

LCV reacts with heme, and therefore is a presumptive test for blood. However, it is **NOT** the presumptive test for blood used by the crime scene discipline. Presumptive testing for blood is done using Hemastix reagent.

Procedure

Mixing

- Dissolve 10 g of 5-sulfosalicylic acid in 500 ml of 3% hydrogen peroxide.
- Add approximately 30 ml of the hydrogen peroxide/5-sulfo solution to 1.1 g of leuco crystal violet. Mix thoroughly. Add this solution back to the main hydrogen peroxide/5-sulfo solution.
- Add approximately 30 ml of the hydrogen peroxide/5-sulfo/lcv solution to 4.4g sodium acetate. Mix thoroughly. Add this solution back to the main hydrogen peroxide/5-sulfo/lcv solution.
- Store in a dark bottle, or in the dark. Shelf life is 30 days, but can be extended to 3 months if solution is refrigerated.

Note: 3% hydrogen peroxide will be purchased locally rather than commercially.

To prepare for field use:

Bottle A is a 500ml bottle of 3% hydrogen peroxide.

Bottle B is a small vial with 10 g of sulfosalicylic acid.

Bottle C is a bottle (at least 40 ml capacity) with 1.1 g of leuco crystal violet

Bottle D is a bottle (at least 40 ml capacity) with 4.4 g of sodium acetate

LCV field kit directions:

Add contents of bottle B to bottle A. Shake well.

Add about 30 ml of bottle A to bottle C. Shake well. Add back to bottle A.

Add about 30 ml of bottle A to bottle D. Shake well. Add back to bottle A.

Place solution in a spray bottle for application.

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Application

- All visible ridge detail or impressions of potential value in blood should be photographed prior to processing.
- If applicable, collect sample of suspected blood for DNA testing prior to processing.
- Perform control tests and record results in notes.
- Spraying is the most effective method of application. When spraying, use the finest mist possible because excess application may cause overdevelopment or running of the blood imprint. Spray the target area. Areas containing blood will turn a bluish purple within 30 seconds (positive reaction). Areas that do not contain blood will not change color immediately (negative reaction). Blot the area with a tissue or paper towel, if necessary.
- Additional applications of LCV may be used to further enhance the pattern.
- Collect and/or photograph visible ridge detail or impressions of potential value as soon as possible to avoid overdevelopment of background.

Safety considerations

When dealing with biological samples and chemical reagents suitable protective clothing and gloves should always be worn. Avoid contact with skin and eyes.

Limitations

LCV is limited to the development or enhancement of suspected blood. This reagent contains hydrogen peroxide and should not be used on heavy bloodstains due to the resulting foaming and loss of detail. Exposure to light will cause increased background staining and possible degradation of the developed pattern.

Quality Control

A positive (with known blood) and negative (unstained) control should be performed at every crime scene in which LCV is used. Record the results of the control tests in notes. Record the lot # and expiration date (if applicable) in the notes.

Literature References

Material Safety Data Sheets
Laboratory Health and Safety Manual

Federal Bureau of Investigation Laboratory Division. Processing Guide for Developing Latent Prints. 2000.

Use of Silicone Based Casting Materials

Description of Process

Silicone based casting material can be useful in the collection and preservation of a variety of three-dimensional impressions encountered at crime scenes. The resulting casts preserve the details of the various marks and can be used for comparative examinations. Additionally, ridge detail developed on textured surfaces by powder processing can be collected by lifting with silicone based casts of a color that contrasts the powder.

Mikrosil is a common choice for casting. Brown Mikrosil is recommended for casting tool marks. For lifting powder processed prints from rough surfaces, select a color of casting material which contrasts the color of the powder. Other brands of silicone based casting material may be used. The following directions are for the use of Mikrosil. If a different brand of casting material is chosen, follow the manufacturer's instructions for preparation and use.

Procedure

Prior to application

- Given that it is nearly impossible to write on the hardened silicone rubber it is advised to prepare a label for the cast. Another option is to leave the wooden depressor "stuck" in with the cast, and then to label the depressor. It is helpful to mark the cast for orientation (e.g. arrow up).
- If any trace material is removed, scale photography should occur before and after to document location and condition.

Preparation and use for Mikrosil brand casting material

- Squeeze out **equal length** lines from the two tubes – Mikrosil and hardener catalyst. *Note - the hardener line will be thinner (less volume) than the Mikrosil line - keep the lengths the same to achieve the proper proportions. More catalyst will reduce the working time and less catalyst will increase the working time.
- Thoroughly mix the two lines of Mikrosil together using a tongue depressor or metal spatula. This should take approximately 30 to 60 seconds.
- Use the spatula, or other disposable tool, to spread the Mikrosil across the surface bearing the mark, trying to avoid trapping air bubbles in the recesses of the tool mark. Variations on the spreading technique can be used at the discretion of the technician.
- Place the prepared label in the Mikrosil, and allow the cast to set.
- Drying time varies with temperature and amount of hardener from a few minutes to 15 minutes in sub-zero temperatures. The left-over casting material can be used to monitor the drying.
- Observe the detail in the hardened cast and evaluate the quality. If the quality is lacking (hardened too fast or not enough, air bubbles present, debris from the mark imbedded in cast, etc) the procedure can be repeated as necessary until the desired results are obtained. If multiple casts are made of the same mark, all the casts should be saved in order to preserve trace material that may have been associated with the area.

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Safety considerations

Avoid contact with eyes, skin and clothing. Use in well ventilated areas and keep the container closed when not in use.

Limitations

Newly recovered silicone casts may become stuck together. As such, package casts separately and/or in such a manner that multiple casts do not come into contact with each other in an appropriately sized container.

Quality Control

The age and condition of the casting material used should be considered prior to application as old or degraded materials may prevent use and/or have a negative impact on the quality of the impression.

Observe the detail in the hardened cast and evaluate the quality. If the quality is lacking (hardened too fast or not enough, air bubbles present, debris from the mark imbedded in cast, etc.) the procedure can be repeated as necessary until the desired results are obtained.

Literature References

Material Safety Data Sheet
Laboratory Health and Safety Manual

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Casting with Sulfur Cement

Description of Process

Sulfur cement is an industrial material available in a flake form and has the ability to reliably preserve snow impression detail in a variety of snow conditions.

Procedure

- Melt sulfur cement slowly in a pan, stirring frequently. Use of a hotplate outside is recommended due to the strong smell produced by the melting sulfur.
- Once completely melted, remove the pan from the heat source and allow the sulfur cement to cool. Stir the sulfur cement constantly as it cools.
- Starting close to the snow surface to minimize the distance the sulfur cement has to fall into the impression pour the casting material outside the impression and direct flow evenly into the impression. The casting should be at least 2 cm thick. Do not pour another layer and do not use other items for strengthening. Sulfur cement hardens instantly after pouring.
- Once hardened, mark the cast with case information: case number, item number, date, initials, and if needed, orientation.
- The casts can be carefully lifted from the impression. Care must be taken to prevent the cast from breaking. Longer casts are especially susceptible.

Safety considerations

Always melt sulfur cement outside to ensure adequate ventilation. Avoid contact with eyes, skin and clothing. Overheating the sulfur cement causes the mixture to thicken at the bottom of the pot. Extreme overheating can cause the mixture to ignite (it has a flash point of 370° F). Keep container closed when not in use.

Limitations

If the sulfur cement is not allowed to cool sufficiently prior to casting the impression, detail may be damaged during the casting process.

Quality Control

Sulfur cement is prepared as needed and does not require controls.

Literature References

Material Safety Data Sheet
Laboratory Health and Safety Manual

Hammer, L. and Wolfe, JR. Shoe and Tire Impressions in Snow: Photography and Casting. *J of Forensic Identification*. Vol 56 (6), 2003 pages: 647-655.

Wolfe, JR. Sulfur Cement: A New Material for Casting Snow Impression Evidence. *J of Forensic Identification*. Vol 58 (4), 2008 pages: 485-500.

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Appendix F –Technical Review Checklists

Technical and Administrative Review of Technician Reports - Remote Lab Processing

Structure of notes

- Request for Laboratory Services (RLS)
- Lab processing notes
- Notes are numbered, initialed, dated and include the correct laboratory case number

Notes content

- Written description of processing including visual exam
- Evidence is described and includes correct item numbers
- Location of all isolated stains/samples/ridge detail are documented
- Location of all chemical testing performed is documented if applicable
- Start and end dates for processing are documented
- Corrections are tracked if applicable
- Lists swabs, lifts etc. generated
- Controls for reagents are documented if applicable
- Goggle color and wavelength of ALS is documented if applicable

Photos

- Stored on I drive if applicable
- Reviewed for focus and composition
- Evidence item descriptions in notes is consistent with image
- Individual folders on I drive contain photos of areas of ridge detail / impression evidence
- Areas of ridge detail documented and photos are consistent

Report

- Lists or describes lifts, swabs, generated
- Information in report is consistent with and documented in notes
- Includes disclaimer to send evidence to lab in Anchorage if applicable
- Includes disposition of photographs
- Check spelling, grammar and clarity of report
- RLS is scanned into LIMS
 - RLS lists evidence processed and is consistent with evidence in LIMS
 - RLS is signed by officer, shows chain of custody of items
 - RLS shows the receipt of lifts, etc. by officer
 - RLS includes victim/suspect information when possible

LIMS

- Related request for latent print examinations created if applicable
- LP images created
- The technical reviewer is in review history for bench notes and attachment

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Technical Review of Technician Reports - Crime Scene/Vehicle

Structure of notes

- Request for Laboratory Services (RLS) includes victim/suspect information when possible
- Crime Scene Information Sheet containing start and end dates
- Lab processing notes if applicable
- Thumbnails of photos
- Notes are numbered, initialed, dated and include laboratory case number

Notes content

- Written description of actions
- Evidence is described and includes placard numbers
- Location of all isolated stains/samples/ridge detail are documented
- Location of all chemical testing performed is documented if applicable
- Corrections are lined out, initialed and dated
- Controls for reagents are documented if applicable
- Goggle color and wavelength of ALS is documented if applicable

Photos

- Stored on I drive
- Reviewed for focus and composition
- Evidence item descriptions in notes is consistent with image
- Individual folders on I drive contain photos of areas of ridge detail / impression evidence
- Areas of ridge detail documented and photos are consistent

Report

- Includes type of scene, location (address) and date
- Vehicle descriptors (make, model, license number etc)
- Describes actions taken
- Describes methods of documentation used (e.g. photography, lifting, swabs, casts)
- Describes evidence and includes placard numbers
- Evidence left in custody of: name and date
- CD/DVD of photos provided: name and date
- Attachments: evidence list and photo log
- Information in report is consistent with and documented in notes
- Check spelling, grammar and clarity of report

Attachments to Report

- Located in image folder of LIMS
- Evidence list
 - Placard numbers
 - Description of evidence is consistent with notes and report
 - Collection information (cast, lift etc.)
- Photo log
 - Describes photos
 - Description consistent with photo
 - Listed by photo file numbers

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Appendix G – Abbreviations

Symbol	Meaning
+, (+), + with a circle around	Positive
=, (=), = with a circle around	Negative

Abbreviation	Meaning
ABI	Alaska Bureau of Investigation
ACN	Agency Case Number
ADA	Assistant District Attorney
AK, Ak	Alaska
ALS	Alternate Light Source
Apt	Apartment
AST	Alaska State Troopers
ATV	All Terrain Vehicle
Ave, Ave.	Avenue
B&E	Burglary or Breaking and Entering
B/R, BR	Bedroom
CSI	Crime Scene Investigation
CST	Crime Scene Technician
CSU	Crime Scene Unit
D/R, DR	Dining Room
D/S, DS	Driver's side
DOT	Department of Transportation
Dr, Dr.	Drive
E	East
e.g.	Exempli gratia (for example)
exp	expire (s)
Exp date	Expiration date
GL, GL-1, GL-2	Gel lift, Gel-lift -1, Gel-lift -2, etc.
GPS	Global Positioning Satellite
H, H1, H-1	Hair, Hair 1, etc.
Hwy	Highway
i.e.	Id est (that is)
Inv.	Investigator
Kit	Kitchen
LCN	Lab Case Number, Laboratory Case Number
L, L1, L2, L3	Latent, Latent 1, Latent 2, etc.
L/R, LR	Living Room, Left Rear
LF, L/F	Left Front
LIMS	Laboratory Information Management System
MBR	Master bedroom
MEO	Medical Examiner's Office
MK-C, MK-C1	Mikrosil cast, Mikrosil cast 1, etc.
MTR	Matanuska Towing & Recovery

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N	North
N.S.	Nothing Significant
NE	Northeast
NEG, Neg	Negative
NTS	Not to Scale
NW	Northwest
P/S, PS	Passenger side
PU, P/U, P-U	Pickup
para	Paraphernalia
pass	Passenger
PD	Police Department
POC	Point of Contact
POE	Point of Entry / Point of Exit
POS, pos	Positive
RF, R/F	Right Front
RLS	Request for Laboratory Services
RR	Right Rear
S	South
S, S0, S1, S2	Stain/swab, stain 1, stain 2, etc.
SW	Search Warrant
S&W	Smith and Wesson
SE	Southeast
St	Street
Ste	Suite
SUV	Sport Utility Vehicle
SW	Southwest
T, T1, T2	Trace, Trace 1, Trace 2, etc.
TL, TL1, TL-1	Tape-lift, Tape-lift 1, etc.
TM, TM-1, TM-2	Tool mark, tool mark 1, tool mark 2, etc
TPO	Tribal Police Officer
TRP, Trp	Trooper
TT	Tire Track
VIN	Vehicle Identification Number
VPO	Village Police Officer
VPSO	Village Public Safety Officer
W	West
w, w/	with
w/o	without
WCS	Water Control Swab

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