

Alaska Scientific Crime Detection Laboratory

Crime Scene Procedure Manual

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SECTION 1: INTRODUCTION

For the purposes of this manual, a crime scene may be defined as an area, object, or person, from which evidence is identified, documented, collected and/or processed. A crime scene may be the actual location where a crime took place or a secondary location such as a car or dwelling or any other object which may yield physical material of value to the investigation or any subsequent judicial process. Evidence encompasses any and all objects that can establish that a crime has been committed or can provide a link between a crime and its victim or a crime and its perpetrator.

It is 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 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.

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SECTION 2: CALL OUT AND TRAVEL PROCEDURES

2.1 ON CALL STATUS

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

2.2 TRAVEL TO SCENE

Most scene response occurs within driving distance of the Scientist's assigned work location, however if the Scientist is required to fly and/or incur travel expenses such as hotel, the Scientist should keep a detailed record of their travel dates, times and expenses (i.e. lodging receipts, itineraries, boarding passes).

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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 Scientist. 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 FIELD NOTES

4.1 GUIDELINES FOR NOTES

It is preferred that all field notes be done in ink, but pencil may be used if cold weather prevents the use of an ink pen. The first page of crime scene notes will include Callout Information, Case Information, Wrap up information, and start and end dates. The start date will be the date the Scientist is notified, and the end date will be the date the Scientist submits the case for technical review. The Callout Information Form has fill-in areas for this information it is recommended that this form or a similar form be used.

The level of information recorded in the notes will depend on the complexity of the scene. Relevant details of the incident should be obtained, as appropriate, from first responders and investigating officers.

This information may include the following:

- The nature of the incident
- The location, time and date of the incident
- The location of any secondary scenes
- Information regarding who has had contact or association with the scene and for what purpose (and whether anything has been moved or touched)

Original notes will be scanned and maintained in the case record in LIMS. Copies of field notes are provided at the request of the court.

4.2 CONTACT SHEETS

Contact sheets containing thumbnail files of all photographs will be created and included as a numbered page in the Scientist's notes.

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SECTION 5: CRIME SCENE PHOTOGRAPHY

1. Verify camera settings such as time/date stamps, image file format, and image size before taking scene photos.
2. Take establishing photographs to show the location using street signs, addresses or other geographical information.
3. Take overall photographs of the exterior of the crime scene.
4. Take overall photographs of the interior of the crime scene.
5. Place some form of identifying marker at items of evidence and/or points of interest, and take additional photographs that include these markers.
6. 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.
7. 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.
8. After the body is removed, photograph the area where the body had been located.
9. If an item of evidence has been moved or removed, do not place it back into the scene. Document the item with photographs if necessary, and make a note of who said they moved it. The individual that moved the item must confirm the item's original location in a court of law. It is that individual's responsibility to make detailed notes of when, how, etc. the item was moved.

5.1 GUIDELINES FOR STORAGE OF PHOTOGRAPHS

For crime scenes, all digital photographs must be retained. All digital photographs will be retained for vehicle processing and field processing cases as well.

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

- Lab or agency number
- Description (i.e. crime lab photos)
- Date
- Scientist's identifier

Digital documentation from crime scenes such as scanned latent lift cards and photographs are retained in ADAMS. Access to these files is limited to Physical Discipline personnel.

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 Scientist 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.
- Related field notes will be scanned into LIMS by the Scientist.

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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
 - 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 in a straight line so that it crosses the entire 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.

SECTION 7: BASIC EVIDENCE COLLECTION

One of the most important duties at a crime scene is the collection of physical evidence. It is neither practical nor desirable to collect everything at a crime scene and it is the responsibility of the Scientist to have an understanding of the probative value of evidence to recover physical material of potential forensic relevance. 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. An item of evidence has probative value if it establishes a fact that could be introduced at trial.

The overall approach to the collection of evidence should be systematic, objective and thorough. 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 Scientist) in the presence of either the lead investigator or a requesting agency representative. If the crime lab Scientist must collect the evidence without the lead investigator or requesting agency present, then the Scientist 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 Scientist it will be 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 and Scientist's initials

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

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

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7.1 PRELIMINARY EXAMINATION OF THE SCENE

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

7.2 RECORDING OF THE SCENE

Recording the condition, position and location of material prior to collection provides information and context.

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 Scientist, 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 Scientist 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/SDS 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/SDS should be recorded in the Scientist's notes.

8.2 LATENT PRINT PHOTOGRAPHY

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. Examination quality photographs where the photograph is of a sufficient quality to be examined in lieu of the material itself may be taken. In these instances, the photograph becomes the forensic evidence. A scale and latent identifiers shall be placed in the photograph. When examination quality photographs are taken in RAW file format the Scientist will indicate this in their notes.

8.3 LATENT PRINT LIFTING

Any developed latent or visible ridge detail on an appropriate surface for lifting that is not able to be photographed (examination quality) 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 Scientist, 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 Scientist deems appropriate. When possible, lift cards are preserved digitally by the Scientist. If lift cards are not digitally preserved, the lift card complexity will be selected on the related latent pending request in LIMS to advise the latent print discipline.

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 such as the size, shape, distribution and appearance of the bloodstains. A description of the location and absence of staining (surface texture, voids) should also be included.

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/cutting package should be labeled with stain/item #, initials, and date. Avoid cross contamination.

Methods of collection

- Entire item
- Cut out the material
- Swab stain
- Gauze (frozen blood)

9.3 PRESUPMTIVE TESTING FOR BLOOD

Hemastix reagent is utilized by Scientists 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. Presumptive test results should also be indicated on the packaging to easily identify the item has been tested.

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

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9.4 CHEMICAL ENHANCEMENT

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 and Bluestar[®] Reagent

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 Bluestar[®] Reagent reactions are limited and are only able to be photographed at the time of application.

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

An MSDS/SDS 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).

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 Laboratory for examination

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.

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Semen stain collection methods

- 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. Saturate one swab with the stain before absorbing onto the next swab.

9.6 SALIVA COLLECTION

Saliva collection methods

Swabbing

- Double-Swab Method: (non-porous objects like bottles, cans, windows) Take two swabs of each suspected location of 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.
- Single - Swab Method: (for biological fluids from non-genital areas such as finger/hand swabs, neck swabs due to possible strangulation, bite marks). Moisten a sterile swab with water; swab suspected stain and air-dry prior to packaging.
- Large Items: (porous objects like bedding, carpet, untreated wood, etc.) Moisten a sterile swab(s) with water; swab suspected stain and air-dry prior to packaging. Depending on the area to swab one or two swabs may be necessary. Saturate one swab with the stain before absorbing onto the next swab.

Collect the entire item

9.7 TOUCH/CONTACT DNA COLLECTION

Touch/contact DNA Collection Methods

Swabbing

- Single-Swab Method: Moisten a sterile swab with water; swab area of interest and air-dry prior to packaging.

Collect the entire item

9.8 PACKAGING AND STORAGE

Biological evidence should be thoroughly dried and then packaged in paper. Cuttings or gauze are best packaged in a paper bindle or glassine envelopes, placed into an outer envelope and sealed. Swabs are best packaged in their own container or a swab box and then placed into another outer envelope. Hemastix[®] and ALS positive results should be indicated on the packaging to easily identify that an item was presumptive tested or fluoresced.

SECTION 10: TRACE EVIDENCE AND FIRE SCENE EVIDENCE

10.1 TRACE EVIDENCE COLLECTION METHODS

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

Tape Lifts or **Hand Picking** as noted in 10.1 above.

10.3 OTHER TRACE EVIDENCE

Examples of other trace evidence 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

Fire scenes are a physically hazardous environment. At a burnt residence floors, ceilings, and walls are weakened. Be careful of where you step, especially when you are taking a photograph and have a limited field of vision. Also - LOOK UP - Items on a burnt second story floor can fall through to a first floor ceiling.

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.

Documentation

Notes and photographs should document areas of interest. These areas include, but are not limited to the following: Burn 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, flammable or combustible containers, etc.

Fire Debris Collection and Packaging Methods

Use Ampac™ Fire Debris plastic heat sealed bags or lined metal gallon or quart paint cans to collect fire debris evidence. Choose the appropriately sized packaging for the evidence it will contain. Cans and Ampac™ bags should **only be filled up to 50% volume or less** to allow for air space. Avoid cross contamination.

Metal paint cans are preferred for objects that have sharp edges.

Ampac™ plastic heat sealed bags can be used for soft sided objects. If an item won't fit into a gallon can, an Ampac™ plastic heat sealed bag may be used.

Only a representative sample of any flammable/combustible liquid should be collected for analysis. Glass jars with Teflon lids may be used to collect **approximately 2 mL** of a questioned liquid.

When and where possible, collect an unburnt sample of the same material for control and 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

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. When examination quality photographs are taken in RAW file format the Scientist should indicate this in their notes.

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. Overlapping photos may be taken to increase 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 three dimensional 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, Plaster (Snow Print Plaster or SnowStone™) and Sulfur Cement.

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 manufacturer instructions for each device
- 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 blood impressions.

See section 10.4 of this manual for enhancement chemical information

Wet residue or grease/oil impressions Impressions of light grease or oily substances may be enhanced with the use of standard fingerprint powder.

11.5 ELIMINATION SHOE IMPRESSION

Where shoe impressions have been recovered it may be necessary to collect elimination impressions of the footwear of those with legitimate access to the crime scene (victim, other occupants of the property, police and emergency services personnel, etc).

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Elimination impressions are used only to establish a difference of class characteristics and hence do not need to be of evidential quality. There are a number of methods by which the Scientist can take elimination prints:

Photography: take a well-lit scaled photograph of the sole of the shoes.

Inkless pad and paper kit: press the sole of the footwear onto the yellow side of the pad and then press the sole onto the treated side of the provided paper.

Lubricant and powder method: Coat the sole of the shoe with a small amount of lubricant such as WD40 or PAM (spray butter). Press the sole of the shoe onto a white piece of letter paper to create an oil shoeprint. Lightly dust the impression with black fingerprint powder.

Aluminum foil: spread square of foil onto a soft smooth surface (such as a carpet or mouse pad) push sole of footwear onto foil.

All elimination impressions should be clearly marked as to where/who they came from. The manufacturer of the footwear and size should also be recorded for use by the analyst.

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 12.1 for the photography of shoe impression evidence should be applied, with the following additional considerations:

- The photos should be taken with the camera lens parallel to the track.
- A series of overlapping photos should be taken with a measuring tape to the side of the track and running the length of the track. The tape measure will allow an analyst to recreate the track by overlaying the individual photos.
- 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 12.2 for the casting of shoe impression evidence should be applied; however the casts will be much larger.

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 12.4 for the enhancement of shoe impression evidence.

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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). On a dual axle vehicle, this is the distance from the center points between the dual tires from one vehicle side to the other.

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

12.5 ELIMINATION TIRE TREAD IMPRESSIONS

Where tire impressions have been recovered it may be necessary to collect elimination impressions of the vehicle tires of those with legitimate access to the crime scene (victim, other occupants of the property, police and emergency services personnel, etc) or vehicles that are suspected to be involved in the event.

Elimination impressions are used only to establish a difference of class characteristics and hence do not need to be of evidential quality. There are a number of methods by which the Scientist can take elimination impressions. Reference the elimination tire tread impressions work instructions.

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. When examination quality photographs are taken in RAW file format the Scientist should indicate this in their notes. 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

Where 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. Casts should be packaged separately in a hard container.

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

SECTION 14: FIREARM EVIDENCE

**Firearms must be rendered safe before being handled by the Scientist.
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, and 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 Scientist 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 DISCHARGED CARTRIDGE CASES

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

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

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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.

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, Scientists will not be utilizing materials to establish trajectory.

Scientists 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 Scientists 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.

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Defect characteristics vary greatly and are affected by numerous factors including intermediate objects and the type of surface impacted. Descriptions could include, but are limited to the size and shape of the defect, and trace material that may have been transferred by the projectile from an intervening object or from the projectile itself.

Note: Conclusions regarding the direction of travel of projectiles will not be determined by Scientists, 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.
- 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 scale above or below 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 Section 7 procedures, Scientists 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.

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. Evidence collected while processing a vehicle in the Anchorage laboratory will be considered in the Scientist's possession until turned over to an agency representative and will be stored in a secure 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: VICTIM DOCUMENTATION AND EVIDENCE COLLECTION 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 Scientist will only assist in the photography of an autopsy when requested.

Office of the State Medical Examiner personnel record known inked finger and palm impressions from victims. If requested, the Forensic Scientist 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 Scientists 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 Scientist 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 REPORTS

17.1 CONTENT OF REPORTS

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

A report includes the following:

- Date, agency name, agency case number and laboratory case number.
- A discussion of the actions taken at the crime scene that pertain to the documentation, detection and collection of physical evidence at the scene. Should include chemicals used.
- Date(s) the crime scene was processed.
- Location of the crime scene.
- A list of the photographs and name of the officer and/or investigator that was provided a copy of the photos.
- Diagrams, if constructed.
- List of evidence and identifiers used to label evidence in the photographs and diagrams.
- Information about who took custody of scene evidence.

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.

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 "Photos" in the associated evidence items column of the evidence list indicates the item was only documented and photographed by the Scientist, 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.

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17.2 CASE REPORT MATRIX

Crime Scene & Vehicle Processing
Crime scene or vehicle processing report
Attachment – evidence list and photo log, diagrams if applicable
Notes (including thumbnails of photographs)
Copy of photos provided to agency
All photos retained in digital imaging server

Field Processing (processing outside of laboratory facilities)
Field processing report
Attachment – evidence list only since photos not routinely provided
Notes
Copy of photos not routinely provided to agency
All photos retained in digital imaging server

17.3 REVIEW OF REPORTS

Technical Review

All crime scene and remote laboratory reports issued by the Scientists 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 C). 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.

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

A qualified analyst or Scientist, 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 chain of custody, 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.

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17.4 DISPOSITION OF REPORTS

Requesting Agency

The requesting agency will receive a crime scene report which will include an electronic 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 Scientist Case File

It will be the responsibility of the Forensic Scientist to scan all original crime scene notes into LIMS prior to technical review. The Scientist should verify that all pages are included in the file. Once files have been imported into the LIMS case record, verified and technically reviewed these become the original crime scene notes. Hard copies of the original crime scene notes will not be maintained.

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SECTION 18: CHEMICAL PREPARATION, PROCEDURES AND STORAGE

The crime scene discipline does not have critical reagents. Instructions for preparing chemicals made at the laboratory are found in the Chemical Inventory file on the laboratory network. There is considerable latitude in preparing chemical solutions for crime scene techniques. Exact measurements and proportions are desirable for consistent quality, but successful results are not dependent upon unequivocal accuracy.

18.1 PURCHASING

The discipline supervisor will review and approve chemicals and reagents purchased for use. Chemical vendor and catalog number information is noted on I drive/Chemical Inventory Excel spreadsheet.

Note: 3% hydrogen peroxide for Leuco Crystal Violet solutions will be purchased locally rather than commercially.

18.2 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 A. Chemicals will be logged using the I drive/Chemical Inventory Excel spreadsheet.

18.3 VERIFICATION OF CHEMICALS

Purchased and/or prepared reagents utilized in field processing and/or crime scenes will be control tested prior to use. The Scientist 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.

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.

18.4 INVENTORY, HANDLING AND STORAGE OF CHEMICALS

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

Care should be taken when transporting crime scene chemicals on commercial airliners (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.

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18.5 PROVIDING MSDS/SDS INFORMATION

Material Safety Data Sheets/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 20: EQUIPMENT

19.1 INVENTORY

Scientists will be issued individual camera kits and traveling items. Equipment may be stored in crime scene discipline areas vans. Inventories will be stored on the I drive.

19.2 INSTRUCTIONS FOR USE

Equipment instructions and materials used for processing evidence will be maintained on the internal network drive.

19.3 MAINTENANCE

Maintenance for Crime Scene Equipment will be performed as needed and documented in the equipment maintenance Excel spreadsheet located in the I Drive. If a piece of equipment fails to perform correctly, it will be removed from use immediately and documented in the equipment maintenance Excel spreadsheet located in the I Drive.

19.4 PERFORMANCE CHECKS

Performance and Validation records will be stored in the discipline records on the I drive.

SECTION 20: CRIME SCENE TRAINING

Scientists are trained using the **Crime Scene Support Training Manual**.

Each Scientist keeps a training notebook to document initial training and will complete a crime scene training checklist.

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SECTION 21: 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 Support 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.

ADAMS: - Acronym for Authenticated Digital Asset Management System

Case or Scene Officer – Law enforcement officer from the requesting agency who is heading the investigation. Receives finished crime scene report(s).

Collection - Indicates the evidence was moved by the Scientist and placed in an appropriate container.

Developed – Indicates a processing technique has been applied to evidence such as fingerprint powder, superglue, chemical enhancement, etc.

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

Examination Quality Photographs – High quality photographs taken with a scale specifically for comparison purposes (i.e. fingerprints, shoe impressions).

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

Observed – Indicates evidence is visible without further processing such as fingerprint powder or chemical enhancement.

Packaged - Indicates evidence container was sealed with tape and initialed/dated by the Scientist.

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

Appendix A – Processing Work Instructions

Hemastix[®]

Hemastix[®] are reagent strips originally designed for use in testing for blood in urine. This quick and easy test has been found to be applicable as a presumptive test for the presence of blood. The test strips contain diisopropylbenzene, dihydroperoxide and 3,3',5,5'-tetramethylbenzidine. The test is based on the peroxidase-like activity of hemoglobin which has the ability to cleave oxygen molecules from H₂O₂ and catalyzes the reaction from the reduced colorless form of 3,3',5,5'-tetramethylbenzidine to the oxidized colored form. The resulting color ranges from orange to green. Very high concentrations of blood may cause the color development to continue to blue.

Safety considerations

When dealing with biological samples and chemical reagents suitable protective clothing and gloves should always be worn. Tetramethylbenzidine is considered a possible carcinogen. Care should be taken not to touch the yellow test area or contaminate surrounding areas. The bottle should remain tightly closed when not in use.

Items needed:

- Hemastix[®] strip
- Sterile swab
- Sterile Water
- Positive control (known blood stain)

Procedure

- Record Hemastix[®] lot number and expiration date (on bottle exterior) in notes
- Moisten a sterile swab with sterile water
- Swab a portion of the suspected blood stain
- Touch swab of stain to yellow reagent end of Hemastix[®] test strip
- Color change should be rapid (within 60 seconds)
- A color change to orange through green or blue indicates a positive result.
- No color change indicates a negative result. A negative result means there is no blood present or is below the limit of detection of the test
- Record test results for stains in notes.
- Discard the test swab
- Label suspected blood stain package to easily identify it has been presumptive tested.

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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, ketchup, 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[®] strips 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.

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Bluestar[®] Forensic Reagent

Bluestar[®] is typically used as a screening tool to locate possible stains or areas of blood. Bluestar[®] reacts immediately with blood, emitting an intense bluish luminescent glow. Bluestar[®] is purchased in tablet form from a vendor.

Procedure - Follow the manufacturer instructions for mixing prior to application.

Application

- Record lot number and expiration date (on box exterior) in notes
- Prior to application perform control tests and record results in notes
- Minimize light sources if possible (close windows, turn off lights)
- Lightly spray solution horizontally ahead of you in a side to side sweeping motion. Do not point the sprayer toward the ground,
- Do not saturate walls/other vertical surfaces. This will create drips/runs and, if oversaturated, will wash away and destroy stains on these surfaces.
- A positive reaction, an intense bluish luminescent glow, typically occurs immediately
- No luminescence indicates a negative reaction
- 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.

Literature References

Material Safety Data Sheet

Bluestar[®] Forensic Latent Bloodstain reagent, Bluestar[®] Forensic Product Insert

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Alternate Light Source (ALS)

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 is typically used in conjunction with filter goggles of differing colors. The ALS emits light wavelengths above and below common, natural lighting wavelengths. These wavelengths reveal stains that are invisible under normal lighting. With an ALS an analyst can locate and possibly identify potential evidence. Evidence that may be visualized includes latent prints, fibers, other trace material and 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. Record the make/model of ALS and the goggle color and light wavelength in the notes.
- 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 Scientist 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 luminesce 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 Scientist to replicate the viewing conditions. The flash should not be used and the camera should be set on a tripod.
- ALS positive results should be indicated on the packaging to easily identify that the item fluoresced.

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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

Forensic Light Source Applications: Wavelengths and Uses, Spex Forensics pamphlet

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Amido Black

Amido Black is a general protein stain used for the development or enhancement of patterns in suspected blood, such as fingerprint 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 – Methanol based

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

Developer Solution

Amido Black.....2 g
Glacial Acetic Acid.....100 mL
Methanol.....900 mL

Combine the ingredients. Mix until amido black is dissolved (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.

Procedure – Water based

For field use requiring air travel a water-based Amido Black solution may be used. The solution consists of a citric acid stock, a developer, and a final rinse.

Citric Acid Stock

Citric acid38 g
Distilled water.....2000 mL

Combine the ingredients. Mix until citric acid is dissolved.

Developer

Citric acid stock1000 mL
Amido Black.....2 g
Kodak Photo-Flo™ 200.....2 mL

Combine the ingredients. Mix until amido black is dissolved (approximately 30 minutes).

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An alternate water based formula consisting of a fixing solution, a working solution and a rinse solution may also be used.

Aqueous Fixing Solution

- Place 20g of 5-Sulphosalicylic Acid in a clean, dry 2 liter glass beaker.
- Add 1-liter of Distilled Water to the 5-Sulphosalicylic acid while stirring with a magnetic stirrer. A clear water-based Fixing Solution will be produced. (Unused water-based Fixing Solution will keep indefinitely).

Aqueous Working Solution

- Place 2g of Amido Black and 20g of Citric Acid in a clean, dry 2 liter glass beaker.
- Add 1-liter of Distilled Water to the above beaker. Stir with a magnetic stirrer for at least 30 minutes. A blue-black solution will be produced.

Final Rinse

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

Note for water based solutions: Methanol evaporates much faster than water. The water may not evaporate and over saturation can wash away an impression. Always consider the surface type and amount of solution 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.
- If applicable, apply the fixing solution for five or six minutes. Longer times may be needed to fix heavy blood deposits.
- 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.

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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 ridge detail as well as the surface beneath. 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

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

Sirchie. Technical Information. Amido Black Catalog Nos. LV501, LV5011. 2011

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Leucocrystal Violet (LCV)

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

- 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.

LCV field kit directions:

Prepare four containers:

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

At the scene:

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

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

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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.

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.

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 Scientist.
- 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.

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- 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.

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.

Dental Stone and Plaster (Snow Print Plaster or SnowStone™) Casting

In preparation for use at crime scenes, numerous two pound zip-top bags of dental stone can be prepared and stored. Plaster casting material is contained in individual zip-top bags when purchased. 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 or Snow Print Plaster and water will vary depending on the size of the impression to be cast, therefore, variations are expected.

Procedure

A thin layer of gray primer may be applied to impressions to create photographic contrast and prepare the impression(s) for casting.

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.

To make a plaster cast, sift a thin layer of powder over the surface of the impression. Add water to the measure line on the mixing pail and stir. The mixture will start to thicken within 45-60 seconds. At low temperatures the impression may be covered with newspaper or paper to aide in setting.

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. Let the cast completely set before removal (times are variable). 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.

Safety considerations

Avoid contact with eyes, skin and clothing.

Limitations

Detail may be damaged during the casting process. All impressions should be photographed prior to casting.

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.

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Quality Control

Dental Stone and Plaster Casting material do 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.

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Casting with Sulfur Cement

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

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.

Elimination Tire Tread Impressions

The comparison of evidence tire tracks requires the production of tire tread impressions from suspect vehicles/tires. This document provides guidelines to obtain tire tread impressions from vehicles for elimination purposes.

The test prints for this technique should be made with the tires mounted on a vehicle – preferably the vehicle in question. If the tire(s) have been removed from the vehicle an elimination sample may still be collected by partially deflating the tire(s) and applying force to the tire in order to simulate the compression of the tire(s) as it would have been by the vehicle as it rolled across the surface.

Procedure

Preparation

- Select a “smooth” surface with adequate space to allow for maneuvering of the vehicle and the rotation of one tire circumference.
- Document the basic tread pattern of the tire photographically with the camera film plane parallel to the tread design. Include a scale and information card designating the position of the tire (i.e. LF, RF, LR, RR).
- Wipe the test tire tread face off with a clean cloth. Do not dislodge stones wedged in tread grooves. Note: The portion of the tire touching the ground at this point can be wiped later.

Petroleum Jelly (Vaseline) on Poster Board/white paper:

- Lay the poster board/white paper sections end to end and in a straight line with the direction of tire travel. If using poster board, tape the poster board end to end together on the backside. Additional sections may need to be added part way through the roll due to space constraints (distance between front and rear tires if trying to roll front and back at the same time).
- Coat gloved hands with a very small amount of petroleum jelly, such as Vaseline.
- Rub the tread face of the tire with jelly-covered hands so as to apply a very thin coat to all of the exposed tread face. Avoid any “globbs” of jelly that could fill in a groove, gouge, or scratch.
- Slowly drive or preferably push the vehicle very slowly over the poster board.
- Mark the starting point on the board. Also mark the same relative starting pointing with a radial line on the tire sidewall (i.e. 6 o'clock position).
- After the originally “unvaselined” portion of the tire rotates to the upper side of the tire, wipe and jelly this section.

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- When the tire completes one revolution (radial line on the tire sidewall has gone around one time) mark this as the end point. Continue moving the vehicle until it has cleared the poster board.
- Apply black magnetic powder over the jellied board to each section to enhance the print.
- Remove any excess magnetic powder.
- Package the poster board/white paper to protect the impressions.

Printer's ink with poster board/clear film:

- Lay two pieces of taped poster board end to end and in a straight line with the direction of tire travel. Each poster board should be long enough to record a full rotation of the tire.
- Apply printer's ink to one piece of poster board.
- Cut, position, and tape clear film on the second piece of poster board.
- Slowly drive or preferably push the vehicle very slowly over the poster board so the tire travels over the inked chart board and then onto the clear film. NOTE: Inked impressions may also be produced directly on the second piece of poster board.
- Mark the starting point on the board. Also mark the same relative starting pointing with a radial line on the tire sidewall (i.e. 6 o'clock position).
- Mark the film with the relevant information regarding tire, position, and direction of travel.
- Allow the inked impression to dry.
- Package the poster board/clear film to protect the impressions.

Labeling

The following information should be written along the edges of each tire print:

- Start and end location
- Tire brand (e.g. Goodyear Eagle ZR)
- Serial number (e.g. DOT MXT7 DCOL 0301)
- Tire type and size (e.g. P 215/60R 14)
- Location of tire on car (e.g. driver's front)
- Direction of travel
- Inside/Outside of tire

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Safety considerations

Follow proper safety precautions.

Limitation

Care should be taken with the application of any material to prevent over application which could lead to pooling or dripping that would adversely affect the quality of the collected prints.

Literature references

SWGTRD. Guide for the Preparation of Test Impressions from Footwear and Tires. 03/2005.
McDonald, Peter. Tire Imprint Evidence; CRC Press: Boca Raton, FL, 1993

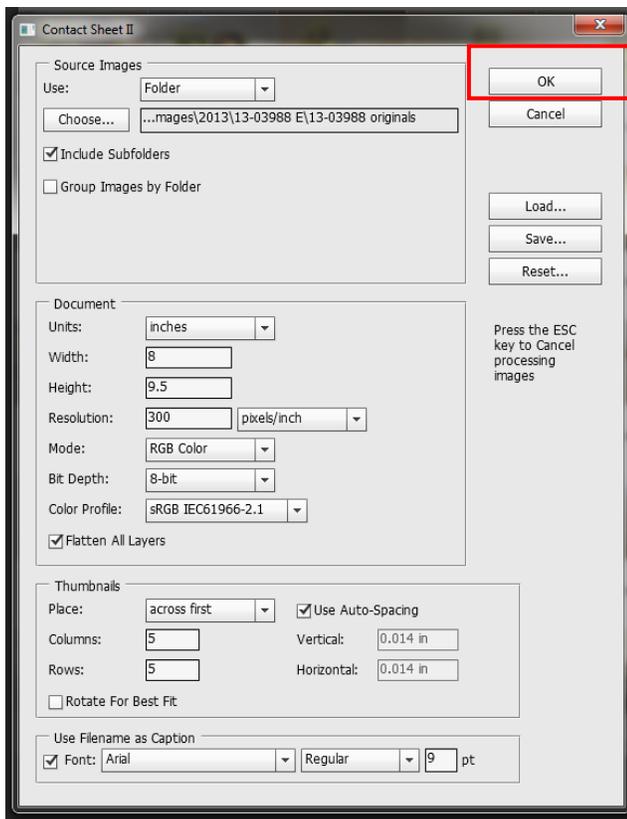
Creating a Contact Sheet

Description of Process

Contact sheets containing thumbnail files of photographs will be created for all crime scene and vehicle processing cases and will be included as a numbered page in the Scientist's field notes. The automate function in Adobe Photoshop may be used.

Procedure

- Open Photoshop
File → Automate → Contact Sheet II → Choose folder with photos



Select OK

Your contact sheet is being made. Contact sheet images may be flattened by selecting "flatten image" under the Layer

File → Save As → TIFF file

- Open Microsoft word → Insert the image

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Appendix B – Labeling Convention Guidelines

It is recognized that all crime scenes are unique and may dictate alternative methods for identifying evidence, but these should be considered. The intention of these guidelines is to create a unique identifier for evidence that permits it to be easily tracked.

	Crime scenes or vehicles	Lab processing
Latents	L1, L2, L3 in order of detection or processing	1.1, 1.2 (from item #1) 2.1, 2.2 (from item #2)
Package of lift cards	Item #L-JRH	same
Swabs	S1, S2, S3 in order of detection or processing Or if placards have been placed 5-S1, 5-S2 A-S1, A-S2 B-S1, B-S2	5-S1, 5-S2 A-S1, A-S2 B-S1, B-S2
Package of swabs	If agency can assign a number to swabs at scene Item #300 Or Item #S-JRH	Use given item number and add initials: #5-JRH

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Appendix C –Technical Review Checklists

Structure of notes

- 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
- RAW file format noted for examination quality photographs if applicable

Photographs

- 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

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 Scientist Reports - Crime Scene/Vehicle

Structure of notes

- 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
- RAW file format noted for examination quality photographs if applicable

Photographs

- 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
 - o Placard numbers
 - o Description of evidence is consistent with notes and report
 - o Collection information (cast, lift etc.)
- Photo log
 - o Describes photos
 - o Description consistent with photo
 - o Listed by photo file numbers

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Appendix D – Abbreviations

Note: Commonly used abbreviations such as Ave. for Avenue, St. for Street, approx. for approximately, misc. for miscellaneous, etc. may be used in crime scene notes.

Symbol	Meaning
+, (+), ⊕	Positive
=, (=), ⊖	Negative
λ	Wavelength

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 Scientist
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

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MEO	Medical Examiner's Office
Misc., MISC, misc	Miscellaneous
MK-C, MK-C1	Mikrosil cast, Mikrosil cast 1, etc.
MTR	Matanuska Towing & Recovery
N	North
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
Pkg, pkg	Package
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.
SN, S/N, sn, s/n	Serial number
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

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Appendix E – REVISION HISTORY

2015 R1	2016 R0 Revisions
All	Removed Technician and replaced with Forensic Scientists or Scientists
Section 1: Introduction	Cleaned up
Section 2: On Call...	Removed second paragraph "The Crime Scene Response Vans..."
Section 4: ... Safety...	Redundant. Addressed in lab wide manuals. Removed
Section 5:...	Removed "Guidelines for making.... through Page __ of __"
Section 6: ...Photography..	Removed "9. If possible, aerial.....photos" Rewrote "10: If an item of evidence....move."
6.1 Digital documentation.....	"personnel in the Latent and Crime Scene Disciplines and the Forensic Laboratory Manager" changed to "Physical Discipline personnel"
Section 10: Biological Evidence	Deleted 10.8 STAIN/SAMPLE DOCUMENTATION
Section 11: Trace Evidence...	Updated 11.4 Fire Scene Evidence for clarity. Changed "filled up to 75%" to "filled up to 50%"
Section 18: Crime Scene Rep...	18.2 Removed "Laboratory Technician Processing" table. Changed "All photos retained in PHYSICAL SECTION IMAGES" to "All photos retained in digital imaging server" 18.1 Removed "These attachments are recorded using the Laboratory Report Attachment Form – LRA2015 R0."
Section 19: Chemical Prep.....	Rewrote section
Section 20: Equipment	Removed references to Fairbanks lab 20.2 Rewrote to say equipment manuals maintained on network drive. Removed statement "will be maintained with the equipment." 20.4 Removed redundant performance check instructions.
Section 21: Crime Scene Training	Removed "Periodic crime scene training will be documented in the discipline quality records on the internal network drive."
Section 22: Proficiency Testing	Removed Section 22
Section 23: Definitions	Cleaned up
Section 24: Revision History	Moved to end of manual. Renamed as Appendix E.
Appendix A	Rewrote for clarity. Removed "If this result interferes with a Scientist's course of action."
Appendix C	Removed references to RLS
Appendix D	<u>Note:</u> Commonly used abbreviations such as Ave. for Avenue, St. for Street, approx. for approximately, misc. for miscellaneous, etc. may be used in crime scene notes.
All	Renumbered sections after removing and moving sections