



**Crime Scene Unit**  
**Standard Operating Procedures**  
Crime Scene and Multimedia Division



1. Introduction .....5
2. Calls for Service .....6
2.1. Scope .....6
2.2. Safety/Personal Protective Equipment.....7
2.3. Preventing Contamination .....7
2.4. Assignments and Duties .....8
2.5. Arrival on Scene.....8
2.6. Crime Zone Perimeter.....10
2.7. Clearing the Scene.....10
3. Scene Documentation .....11
3.1. Scene and Examination Notes.....11
3.2. Photography.....13
3.3. Long Exposure Photography .....15
3.4. Ultraviolet (UV)/Infrared (IR) Photography.....15
3.5. Videography.....17
3.6. Crime Scene Searches.....17
3.7. Sketching.....18
3.8. Measuring Techniques .....19
3.9. FARO .....20
4. Evidence Documentation.....21
4.1. Evidence Collection and Transport.....22
4.2. Chain of Custody .....22
4.3. Evidence Packaging.....23
5. Biological Evidence.....23
5.1. Biological Safety and Contamination Precautions .....23
5.2. Contact DNA Samples .....24
5.3. Alternate Light Source.....24
5.4. Presumptive Testing.....26
5.5. Collection of Biological Material .....28
5.6. Bloodstain Swabbing.....28
5.7. Packaging and Storage of Biological Evidence.....29
5.8. Blood Enhancement .....29



6. Firearms .....32
6.1. Firearms Documentation and Swabbing .....32
6.2. Cartridges and Cartridge Cases .....34
6.3. Possible Bullet Defects and Projectiles .....35
6.4. Officer Involved Shootings.....36
7. Trace Evidence .....37
7.1. General Trace Evidence Collection .....37
7.2. Hair and Fiber Reference (Known) Samples .....38
7.3. Paint Standards and Samples.....39
7.4. Soil Collection .....40
7.5. Gunshot Residue.....40
7.6. Ignitable Liquids and Ignitable Liquid Residues.....41
8. Latent Print Processing .....42
8.1. General Latent Print Information .....42
8.2. Latent Print Powder Processing .....42
8.3. Small Particle Reagent (SPR).....43
8.4. Latent Lifting Techniques .....44
8.5. Plastic and Patent Prints .....44
8.6. Latent Print Cards.....44
8.7. Latent Print Photography.....45
9. Impression Evidence.....46
9.1. General Impression Information .....46
9.2. Impression Evidence Photography .....46
9.3. Gel Lifts .....49
9.4. Electrostatic Dust Print Lifter (EDPL).....50
9.5. Casting Materials .....51
9.6. Impression Evidence Standards (Eliminations).....53
10. Sharps .....53
11. Liquids .....54
12. Currency .....54
13. Mobile Cellular Devices .....55
14. Video Evidence.....55



<b>15.</b>	<b>Narcotics Evidence .....</b>	<b>56</b>
<b>16.</b>	<b>Entomological Evidence .....</b>	<b>56</b>
<b>17.</b>	<b>Non-Routine Evidence .....</b>	<b>57</b>
<b>18.</b>	<b>Processing Persons .....</b>	<b>57</b>
18.1.	<i>Personal Protective Equipment .....</i>	<i>57</i>
18.2.	<i>Documentation .....</i>	<i>57</i>
18.3.	<i>Photographing Persons .....</i>	<i>58</i>
18.4.	<i>Evidentiary Items on Persons .....</i>	<i>58</i>
<b>19.</b>	<b>Deceased Persons Located Out of Harris County .....</b>	<b>59</b>
<b>20.</b>	<b>Bodies Found in Water .....</b>	<b>60</b>
20.1.	<i>General Information .....</i>	<i>60</i>
20.2.	<i>Other Documentation for Bodies Found in Water .....</i>	<i>61</i>
<b>21.</b>	<b>Processing Vehicles .....</b>	<b>61</b>
21.1.	<i>Vehicles at the Scene .....</i>	<i>61</i>
21.2.	<i>Vehicle Examination Building (VEB) .....</i>	<i>61</i>
21.3.	<i>Photography .....</i>	<i>63</i>
21.4.	<i>Fragile Evidence in or on a Vehicle .....</i>	<i>63</i>
21.5.	<i>Evidence Collection from Vehicles .....</i>	<i>63</i>
21.6.	<i>Bullet Defects in a Vehicle .....</i>	<i>64</i>
21.7.	<i>DNA Collection from Vehicles .....</i>	<i>64</i>
21.8.	<i>Vehicle Latent Print Processing .....</i>	<i>64</i>
<b>22.</b>	<b>Securing and Packaging Evidence .....</b>	<b>64</b>
22.1.	<i>Authorized Temporary Storage .....</i>	<i>66</i>
22.2.	<i>Drying Cabinets .....</i>	<i>66</i>
22.3.	<i>Other Evidence Drying Equipment .....</i>	<i>67</i>
22.4.	<i>Non-HPD Evidence .....</i>	<i>67</i>
<b>23.</b>	<b>Post-Scene Documentation .....</b>	<b>67</b>
23.1.	<i>Uploading Images .....</i>	<i>67</i>
23.2.	<i>Report Writing .....</i>	<i>68</i>
23.3.	<i>Final Scene Diagram .....</i>	<i>68</i>
23.4.	<i>Case Records .....</i>	<i>69</i>



---

<b>Appendix A: Technical Details.....</b>	<b>71</b>
<b>Appendix B: CSU Case Record Review Checklist .....</b>	<b>77</b>
<b>Appendix C: FARO Checklist.....</b>	<b>78</b>

ARCHIVED



## 1. Introduction

This manual outlines the general standard operating procedures (SOPs) for Crime Scene Unit (CSU) employees tasked with processing and investigating crime scenes. The SOP is not intended to define every step that must be completed in every crime scene investigation. Crime scene investigators (CSIs) are expected to think critically and apply the appropriate procedure to the situation at hand. **Houston Forensic Science Center (HFSC) management** recognizes that each crime scene presents a variety of unique circumstances. Therefore, methods and procedures in this manual are described in a general sense and do not reflect all variations and combinations of services provided by the CSU.

For the purposes of this manual, the term CSI also includes the position of Crime Scene Supervisor when the supervisor is conducting crime scene investigations. Any reference to "supervisor" also encompasses the positions of CSU Director and Deputy Director.

CSIs shall keep all information obtained or created during scene processing and investigation confidential, except as required by law. Information shall be released only on a need-to-know/right-to-know basis.

**During crime scene investigations, CSIs are expected to develop a strategy for scene processing based on the case circumstances, professional judgement and information at hand. Documentation in each case record shall serve as demonstration of the selected strategy. In formulating the appropriate strategy, consideration shall be given to:**

- maintaining communications with the police investigator(s) on scene
  - **CSIs are allowed to communicate with investigators by phone if none are present on scene.**
- obtaining a synopsis of the scene
- **ensuring appropriate PPE is used to prevent contamination of the evidence and protect CSIs from exposure**
- walking through the scene with or without police investigators
- **ensuring appropriate resources, equipment and supplies are present on scene**
- **searching the scene using the search method determined to be most appropriate to that scene**
- **determining the sequence in which the scene will be processed**
- capturing scene photographs and/or video
- sketching and completing other documentation as required by CSU policies
- **determining what evidence is probative and what evidence will be collected**
- performing a final walk-through
- releasing the scene

**The plan shall be reassessed, and changes made if warranted. Warranty could be based on receipt of additional information, changes in environmental conditions, etc. Upon completion of a processing and before leaving the scene, CSIs should give final consideration as to whether the scene was processed adequately and thoroughly.**

Only those evidence items with probative value or those specifically requested by stakeholders (i.e. assigned law enforcement investigators) should be collected. **As used in this SOP manual, the word probative indicates evidence that has potential forensic value to the case being investigated.** The CSI is expected to use training, experience and communications with law enforcement to determine



probative value. A member of CSU management is available to guide the CSI in this process.

This SOP complies with the HFSC quality manual. CSIs are considered forensic practitioners as defined by the quality manual and will follow all applicable forensic practitioner requirements stated in the quality manual. By following this CSU SOP, the work performed by CSIs will conform to applicable ISO/IEC 17025 and accrediting body supplemental requirements as well as applicable documents listed on the OSAC registry.

- When words such as should, can, may, shall, must or will are used in this SOP, they are used in accordance with definitions in the HFSC Quality Manual.
- Receiving authorization to process and investigate scenes means the CSI has the training, experience and knowledge needed to select the appropriate processing approach and to process each scene in accordance with this SOP.
  - In addition to authorization, knowledge and experience, CSIs also adhere to the continuing educational requirements stated in the HFSC Quality Manual.
- The CSI is expected to be flexible and use professional judgment to apply procedures appropriately. Exigent circumstances may require CSIs to deviate from the SOP. An exigent circumstance is one that requires an immediate action. Examples include but are not limited to:
  - inclement weather that may compromise evidence
  - situations where there is a threat to the CSI's personal safety

CSIs shall notify their supervisor or other member of CSU management prior to deviating from this SOP, unless exigent circumstances are present.

- If it is not possible to notify management in advance, the CSI shall notify them as soon as practical.
- The exigent circumstance and resulting deviation, along with management's acknowledgement, shall be documented in the case record as soon as practical.
- Refer to the HFSC Quality Manual for more information on deviations.

The information contained within this SOP applies to CSIs while they are on-scene, while they are processing evidence at the Vehicle Examination Building (VEB), while they are working in laboratory spaces at 500 Jefferson and while they are working or training at the HFSC Crime Scene House. Although the Crime Scene House is typically used only for training purposes, CSIs must still follow applicable policies including those related to health, safety and personal protective equipment.

## 2. Calls for Service

CSU maintains operations 24 hours a day, 7 days a week and 365 days a year. CSU squad staffing levels may be determined by the circumstances and/or overall staffing level of the unit. CSU management may deny CSI time off requests if approving the request could result in less than minimum staffing.

### 2.1. Scope

CSU supports law enforcement by processing crime scenes that include, but are not limited to: homicides, juvenile deaths, suspicious death investigations, officer-involved shootings, in-custody deaths and sexual assaults. The HFSC CSU may be asked to process scenes outside the city of Houston and for agencies other than the Houston Police Department. Approval to



process these scenes must come from CSU management. The CSI knows approval is granted if the CSI is dispatched to the scene by a member of management. Scenes should be worked with a requesting agency investigator or officer present. If no requesting agency investigator or officer is present, the CSI shall notify a supervisor.

## 2.2. Safety/Personal Protective Equipment

CSIs shall exercise caution when performing their duties to prevent injury, illness or exposure to potentially hazardous materials/conditions. Applicable safety protocols outlined in the HFSC Health and Safety Manual shall be followed. CSI exposure to potential biohazards such as blood and other body fluids is a known hazard. If exposure to other relevant risks (e.g. known carcinogens, explosives, confirmed cases of HIV, Hepatitis B and novel coronavirus) is encountered, document the risk in the case record and notify your supervisor as soon as possible.

Upon completion of opioid awareness and safety training, CSIs are assigned a Narcan kit for emergency situations. They are responsible for taking the Narcan with them to each scene. An HFSC Health and Safety representative ensures the Narcan is replaced prior to its expiration.

CSIs must be alert for sharps such as needles, scalpels or other items that could cause wounds or punctures. These items must be handled cautiously as if they are contaminated with infectious material such as HIV, hepatitis B or other blood borne pathogens. Used sharps, that are not considered evidence, shall be disposed of in puncture-resistant sharps disposal containers. Sharps evidence items shall be packaged in accordance with Section 10.

CSIs shall use appropriate personal protective equipment (PPE) to prevent/limit exposure to potentially hazardous materials (chemicals and/or biologicals). PPE shall be changed as necessary to prevent evidence contamination.

- Masks and gloves shall be worn by all personnel at scenes, including the VEB and all lab spaces.
  - Masks and gloves are not required at the VEB or in lab space if all evidence is packaged and sealed or contained in a closed locker or dryer.
- Shoe covers shall be worn if scene processing cannot be completed without coming into contact with biological fluids on the ground.
- Personnel are encouraged to use maximum protection which may include eye-shields, hairnets, and/or full barrier suits.
- CSIs should wear an appropriate traffic vest when exposed to traffic hazards.

CSIs shall remove biohazardous or contaminated personal protective equipment prior to leaving the scene. The used PPE must be placed into a biohazard bag for disposal.

Refer to Section 5.1 for additional information regarding personal protective equipment.

## 2.3. Preventing Contamination

CSIs must exercise due care and caution when performing their duties to prevent the possible contamination of evidence.



CSIs can minimize scene contamination using the following practices:

- **Gloves should be worn when stocking consumable materials in the lab or vehicles (swab boxes, envelopes, bags, etc.).**
- Limit access to the crime scene, including removing any citizens or non-essential police personnel.
- Use designated entrance/exit points.
- Use appropriate PPE when near potential evidence.
- Do not use gloved hands to touch your face or other unprotected areas of your body before handling potential evidence.
- Do not sneeze, cough or talk excessively when near potential evidence. A face mask **shall** be worn while around evidence.
- Do not smoke, eat or drink when near potential evidence.
- Avoid excessive handling of potential evidence; when collecting physical evidence, handle it in a way that minimizes the chance of interfering with potential DNA, latent prints and/or other forensic analyses.
- Change gloves after handling equipment, evidence markers, etc., and before collecting evidence.
- Place evidence collected at the crime scene into a secure package or container upon collection.

#### **2.4. Assignments and Duties**

Section management assigns cases to CSIs on an informal rotating basis. Prior to leaving HFSC to process a scene, the CSI should record the scene information, including the vehicle they are taking to the scene, the agency case number, the scene location and the names of the responding CSIs on the white board near the main door.

HFSC provides equipment for use at scenes. Personnel shall use only HFSC-issued or authorized equipment for casework. Authorized equipment is marked with a unique identifier such as a serial number or internally generated and tracked number. CSU management issues equipment and authorizes CSIs to use specific equipment. CSIs will not use any equipment on scene unless they have received authorization in the form of an authorization memo signed by CSU management.

CSIs shall take reasonable measures to prevent excessive wear, tear, and/or damage to all equipment and are responsible for the care and custody of all items assigned to them. Any lost, stolen, or damaged equipment shall be reported to a supervisor as soon as practical.

CSIs shall take care to protect their camera and video equipment, **the alternate light source (ALS) and 3D imaging scanner (FARO)**, during inclement weather. Damage to equipment caused by a CSI's failure to protect equipment may result in disciplinary action. CSIs can use an umbrella or plastic bag with a hole cut out for the lens to protect the equipment. **Do not use the FARO in the rain.**

#### **2.5. Arrival on Scene**

**The initial stakeholder requests shall be recorded and considered. However,** CSIs have a responsibility to perform all forensic work required **to reasonably** and sufficiently investigate



and process the crime scene. This responsibility may go above and beyond and include processes not included in the initial request of the stakeholder. The stakeholder will be informed and/or consulted on significant changes to the requested examination.

CSIs are also responsible for ensuring case records are sufficiently documented to show professional judgment was used while on scene.

CSU management may assign CSIs to function in lead, assisting CSI or administrative assisting CSI capacities. When CSIs are dispatched to a call, lead and assist CSI designations may be given. The designations are given based upon the scene to which the CSIs are responding.

Lead CSI refers to the CSI who is responsible for communication with the requesting agency, HFSC supervisors and other CSIs on scene. The lead delegates tasks to the other CSIs on scene. Assist CSI refers to any additional CSIs who respond for scene processing. Assisting CSIs work in conjunction with the lead CSI and are responsible for openly communicating with them throughout scene processing.

Both lead and assisting CSIs are responsible for ensuring the scene is processed thoroughly and according to this SOP manual. All CSIs should work together to ensure the scene is processed efficiently and effectively. The CSIs should contact the on-call supervisor if a conflict occurs on scene that cannot be resolved.

An administrative assist (AA) designation may be given for in-office functions such as transporting and submitting evidence to non-HFSC entities or to the 3-HFSC designation for the lead or assisting CSIs (see Section 22.1 for more information on 3-HFSC). The AA designation is not used for on scene work.

Upon arrival at the scene, all responding CSIs should brief with the officer and/or investigator on scene to gather preliminary information on what occurred and actions by individuals that may have affected the scene. These details are for informational purposes only and CSIs must consider alternate hypotheses while processing the scene. CSIs should be objective, not allowing themselves to be biased by the information while processing the scene. The information shared shall be documented in the case record. CSIs shall also confirm the agency case number and should exchange contact information.

All CSIs are trained to assess:

- Adequacy of scene security and scene perimeter
  - If needed, CSIs shall request additional resources to secure and/or extend the scene and perimeter. This could include asking officers to stop traffic, turn on or off lights to facilitate photography, or halting civilians from cleaning or otherwise altering the scene.
- Scene entry/exit points
  - If possible, avoid locations that may have been used by the suspect(s).
- The need for additional CSI personnel.
  - If needed, the lead CSI will request additional personnel.
- If proper search authority has been established.



- CSIs shall document the name of the detective from whom **proper** consent or search warrant is obtained.

CSIs enter a scene under the assumption the scene has been made safe by law enforcement officers. The CSI should not enter a scene if he/she believes it is not safe to do so.

The **lead** CSI and any necessary personnel will conduct an initial walkthrough, ensuring:

- Appropriate PPE is worn.
- There is an overall plan for processing the scene.
  - If applicable, the plan should consider environmental or situational conditions that may require **prioritizing the processing of certain areas or items and/or to** deviation from protocol.
- A trash disposal location, a safe equipment staging area, and/or a temporary evidence storage location **are designated**.

While processing the scene, all CSIs should consider and attempt to answer the following:

- What happened?
- Where did it happen?
- When did it happen?
- How did it happen?
- Who was involved?

## 2.6. Crime Zone Perimeter

The CSI sets up the "Crime Zone" with red barrier tape or, if one has already been established, ensures it is adequate. This zone denotes areas that may contain DNA evidence.

A PPE staging area shall be established just outside the red barrier tape. A kit with PPE is in each CSU vehicle. The kit includes laminated signs advising that PPE is required for all personnel entering this zone. All CSU personnel entering the red zone shall properly wear **the following** PPE:

- masks
- gloves
- shoe covers (If biological fluids are present on the ground, see Section 2 for more information).

The CSI should offer PPE to any individual prior to that person entering the crime scene. **The CSI should document** the name(s) of any individual(s) inside the red tape perimeter who are not wearing the appropriate PPE. **If the names are known, they shall** be included in the CSI's case **notes and** report.

## 2.7. Clearing the Scene

**Upon completion of scene processing**, the **lead** CSI and **officer/investigator** will complete a final walk-through to ensure that all necessary processing and collection have been completed. **If the officer/investigator is not present, this shall be documented in the lead CSI's case notes.** **During the final walk-through, the lead CSI should:**

- **Ensure** photographs are taken of any damage caused by CSIs during the recovery of



evidence. This may include, but is not limited to, cutting into drywall or removing portions of the flooring.

- Consider if additional processing will be needed based upon changes in circumstances of the investigation or if additional information comes to light.
  - Maintaining the security and integrity for additional processing is the responsibility of the requesting agency.
- Ensure all trash, disposable items and evidence markers have been removed from the scene.
- All equipment and collected items have been secured in CSI vehicles.
- Consideration should be given to the potential for additional processing being required if circumstances change or further information comes to light. Security and integrity of the scene should be maintained if this is likely to occur.

Upon return to HFSC from the call out, complete 'end of shift duties' as described in Appendix A.

### 3. Scene Documentation

Scene documentation shall include a thorough and comprehensive account of observations, actions and analyses performed at the scene to later assist the CSI in report writing and testimony. This documentation shall provide enough detail that another trained CSI could review the documentation and understand:

- What was done at the scene by whom and when.
- The correct scene location and relevant environmental factors in effect at the time of processing.
- The results, both positive and negative, of scene processing.
- The description and unique identifiers of the evidence collected at the scene.

Documentation may include scene and examination notes, photography, videography, scene searches, sketches and measurements.

#### 3.1. Scene and Examination Notes

CSIs shall keep written notes throughout the scene investigation. These notes shall be written in pen.

- CSIs responding to a scene for the sole purpose of scribing notes for another CSI shall include their name and a statement describing their role as a scribe on the scene notes form. The scribing CSI is not required to complete any additional scene notes.
- CSIs responding to a scene for observation purposes only are not required to complete scene notes.

Notes shall contain the relevant scene information stated below, processing requests and evidence collection requirements provided by the investigator in charge of the scene. Any non-standard or technical abbreviations shall be defined when first used in the case notes. CSIs shall not rely solely on their photographs and/or memory to later write their case notes or report.

CSU provides forms to assist the CSI in the note-taking process. Only current controlled and



approved forms will be used for:

- Recording case information
- Recording crime scene observations
- Documenting on-scene activity
- Documenting processing techniques used
- Documenting the evidence collected
- Graph paper may be used for rough sketches in lieu of the controlled sketch form. Rough sketches may be recorded using pen or pencil

CSIs will document at least the following information in the scene notes:

- Case number
- Name of lead investigator
- Names of other relevant personnel such as first responding officer or Medical Examiner's Office investigator
- Type of case
- Victim's name as provided to the CSI
- Date/time of arrival on scene
- Exact location of the scene(s)
- Scene information obtained from the investigator
- Date/time of evidence collection (CSIs shall also record in their notes if no evidence was collected)
- Description and location of all evidence collected
- Items/locations processed for latent prints and/or DNA
- Date/time crime scene investigation was completed
- **The name of each CSI who entered the crime zone perimeter**
  - **HFSC CSU does not maintain a record of every person (e.g. law enforcement, medical examiner, district attorney, witness) inside the scene.**
  - **The name(s) of any individual(s) (if known) inside the red tape perimeter who are not wearing the appropriate PPE.**

Examination and crime scene notes may not be rewritten without documented supervisor approval. **Even if approval is received**, the original page(s) shall be preserved. Observations should not be made on scrap or other unapproved papers (e.g., **napkins, paper bags**). If this occurs, the **scrap or other unapproved** papers shall be retained as part of the case record.

Case notes shall be written in a clear and legible fashion. Any information that is added to the notes **or corrections made** after the original date of service shall be dated and initialed.

The following are examples of information to record in the crime scene case record. However, this list is not all inclusive and does not cover all crime scene investigations.

- Appearance of suspect(s) and/or victim(s)
  - Clothing (including stains or defects)
  - Injuries
  - Visible marks, scars, or tattoos
- Circumstances that require departure from normal scene processing procedure
  - Scene safety, environmental factors, traffic



- Environmental conditions
  - Weather, high winds, temperature, etc.
- Lighting
  - Indoor/outdoor, on/off, day/night
- Potential entrance/exit points
- Furnishings and appliances
  - Moved, on/off, missing, etc.
- Personal items
  - Moved, missing, damaged
- Unusual odors
- Wall surfaces, carpet areas, furniture or flooring exhibiting recent cleaning
- Signs of passive activities
  - Dishes in sink, meal preparation, etc.
- Signs of aggressive activities
  - Items broken, damaged, knocked over, out of place
- Indication of time
  - Mail, caller ID, phone messages, relative temperature of items
- Firearms
  - Loaded, unloaded, hammer position
- Transient evidence
  - Melting ice, drying liquids

See Section 23: Post-Scene Documentation for additional documentation requirements.

### 3.2. Photography

Photographing crime scenes is one of the most important duties of a CSI. No matter how well a CSI can verbally describe a crime scene, visual communications are substantiated and verified by concise and accurate photographs of both the scene and the evidence as it was found. Photographs supplement, but do not replace, handwritten notes and observations made on scene and in the laboratory.

#### 3.2.1. General Photography Information

Photograph all aspects of the crime scene prior to collection and preservation of the physical evidence. This shall be done using photography equipment issued to the CSI by CSU management.

CSIs shall ensure their assigned camera equipment is:

- Maintained in proper working order
- Readily available while on duty
- Checked for correct date and time settings upon initial receipt of a camera and at least at the beginning and end of daylight savings time

Notify a CSU supervisor of malfunctioning or damaged equipment as soon as is practical. If the malfunction or damage occurred while on a scene, the CSI shall document this in the case notes.



Digital cameras provided to CSIs are equipped with a viewing screen. Use this screen to ensure the image taken is properly exposed, is in focus and depicts what was intended. Images not meeting these criteria shall be retaken until the desired image is achieved. Digital images taken during scene or evidence documentation shall not be deleted.

### 3.2.2. General Crime Scene Photographs

All general crime scene photographs **should** be taken in .jpg format with resolution settings at:

- For Nikon cameras
  - Image quality: Fine
  - Image size: Medium
- For Canon cameras
  - Image quality: Largest .jpg setting
  - Image size: Large

### 3.2.3. Comparative Quality Photographs

Comparative quality photographs are typically used to capture photographs of impression evidence for comparison purposes. **Comparative quality photographs, also called examination quality photographs,** are high quality, close-up images and shall be taken in an uncompressed image format such as RAW. RAW + JPG format should be used since JPG does not require a file conversion to view the images. **Impression evidence may be present at a scene in the form of footwear and tire marks, bite marks, tool marks and patent or plastic fingerprints. When photographing this kind of evidence:**

- Fill the frame
  - May require use of a macro lens; macro photography is a unique photography form that involves capturing small details (i.e. fingerprints) to make them look larger
- Maximize the depth of field
- Keep the film plane parallel

See **Sections 8 and 9** for more information on comparative quality photographs.

CSIs shall spot check scene photographs prior to departing from the scene to ensure photographs saved properly to the memory card. The CSI shall document this check in the case record. **Memory cards shall also be spot checked and will be replaced as needed.**

### 3.2.4. Photography Case Identification

CSIs must complete a photography cover sheet **at each scene**. The cover sheet should be the first photograph captured in the case. **Each time a significant scene change occurs, a new photography cover page shall be completed with the updated address and a new photograph taken.** When photographing a live person, a cover sheet or any other document (such as a driver's license) depicting the person's name, should be photographed prior to capturing images of the individual.

### 3.2.5. Progression and Composition of Crime Scene Photographs



Crime scene photographs should depict a true and accurate representation of the scene as it is when CSIs arrive. Photography is an ongoing process which will include taking additional photographs as new evidence is discovered.

When documenting a crime scene through photography, the CSI should consider the following:

- Progression
  - A logical sequence of images that depicts the layout of the area and relationship of the area to the evidence within the crime scene.
- Composition
  - The images are properly framed ensuring the object fills the frame, depth of field is correct, the film plane is parallel and extraneous equipment and/or personnel are not captured.
- Exposure
  - The photographs must contain enough light to ensure the clarity and detail in the images are visible.

The CSI must take overall, mid-range and close-up photos at every scene in which evidence is present. This process often occurs twice; once without evidence markers and once with evidence markers.

- **Overall photographs** shall establish the location of the crime scene through street signs, address numbers or geographical location. These photographs are taken in an overlapping fashion, covering all areas of the scene. Items of evidence and their relationship to the scene are visible but are not the main subject.
- **Mid-range photographs** show the spatial relationship between items of evidence and the scene. This is often done by photographing an item of evidence along with a fixed object in the scene.
- **Close-up photographs** depict individual items of evidence or areas of interest.

CSIs must document in the case record if they believe probative evidence was compromised, perhaps by being moved in to or out of the scene. If the case record does not say otherwise, it is assumed the CSI did not believe evidence was compromised. If an item is moved from its original position, it shall not be placed back into the scene by the CSI. The CSI shall photograph the item in its current location and document what happened with the item in the crime scene notes.

### 3.3. Long Exposure Photography

Long exposure photography uses available light to photograph nighttime or very low light situations such as when using an alternate light source (ALS) and/or to photograph the reaction of Blue Star. This method can also be used to photograph scenes during rain to help reduce the appearance of raindrops.

#### 3.3.1. Taking long exposure photographs

Long exposure photography requires the use of a tripod or copy stand and remote control or timer to avoid camera shake.

- The camera should be set to Manual or Aperture Priority mode.
  - In Manual mode, the CSI selects the F-stop and the shutter speed.



- In Aperture Priority mode, the CSI selects the desired F-stop.
- The F-stop should be set to F-8 or F-11 for an acceptable depth of field.
- For exposures that require a time longer than the pre-programmed settings (usually 30 seconds), use the Bulb setting.
- A pop of the flash or soft sweeping strokes with a flashlight (avoid creating hotspots) may be used to help illuminate the scene or highlight extremely shadowed areas, such as under a car.
- The photographer should stay behind the camera to avoid being captured in the image.
- A shadow of the photographer and/or the tripod may be minimized by adding a small amount of extra light to the shadow.

**3.4. Ultraviolet (UV)/Infrared (IR) Photography**

An HFSC Fujifilm X-T1 (UV/IR) camera has been converted to allow the camera to detect ultraviolet and infrared light that is not visible to the “naked” human eye. Any UV/IR photography will be performed only after visible light photography has been captured. The captured images will only be used for supplemental documentation purposes and will not be interpreted as positive or negative results by crime scene personnel.

**3.4.1. UV/IR Procedure**

- The CSI should perform a functionality test using the UV/IR Camera to determine appropriate camera settings. The camera settings will not be the same every time it is used due to varying levels of ambient infrared light. Use the following settings as a guide:

<u>Environment</u>	<u>Camera Settings</u>
Laboratory	ISO 200, f/11, shutter speed 60, flash off
Daytime or Inside	ISO 200, f/11, shutter speed 60, flash in manual mode on 1/8 power (if flash is needed)
Nighttime	ISO 800, f/11, bulb, flash in manual mode on 1/1 power
Mid-range and Close-ups	ISO 200, f/11, shutter speed 60, flash in manual mode on 1/1 power

- The CSI should create a Custom White Balance each time a filter is placed on the lens. This will assist in removing the “pink tint” of the IR wavelengths on the images. To custom set a white balance (WB):
  - Click the right button on the back of the camera (this will bring up the default WB custom setting in the menu).
  - The camera will instruct the user to take an image with the shutter of the item you want to white balance.
  - Once clicking the shutter, it will adjust the image as shown in the LCD and clicking the OK/SET button will set the new WB. This custom WB will stay the same until you set it again.
- The CSI shall adjust the camera settings until the functionality test matches. See Sample Kit photos (in UV/IR kit). This user will ensure the functionality test matches each time the camera is used. This will be documented in the case notes.



- Adjusting the flash output of the Speedlight (if a flash is needed).
- If the shutter speed is slowed below 60 or slower than the focal length used to capture the image, place the camera on a tripod and use the shutter release remote control or shutter delay function.
- Photograph photo sheet/cover page.
- Photograph the selected evidence item(s).

The CSI will then need to photograph the evidence item(s) using a filter. Various filters are used with the Fujifilm X-T1. There is no set standard filter and light to be used. The CSI should check each filter and light combination to visually see which works best for the light, substrate and evidence that is being captured. After each filter and light combination has been visually tested, the CSI should photograph the evidence item(s) using the filter/light combination that provides the strongest results (see Appendix A for more information on each filter). Photographs should include both mid-range and close-up images and should be taken with and without scale.

- If capturing IR photographs, an infrared flashlight shall be used. HFSC provides a Nightfox XB5, 5W LED flashlight that is used to capture details within the Infrared (IR) range. The XB5 flashlight emits an 850nm infrared light which cannot be seen by the human eyes and can only be seen using the Fujifilm XT1 mirrorless camera system.
- A spot check of the photos captured will be completed prior to leaving the scene or completing processing in the lab. This will be documented in the case notes.
- The filter, light, number of photos captured and unique identifier for the camera shall be recorded in the case notes. Use of the UV/IR camera shall be included in the case record.

### 3.5. Videography

All homicide investigations and officer-involved shooting scenes shall be video recorded. If the requesting agency states that a video is not needed on a homicide or officer-involved shooting scene, a supervisor must approve the deviation. This deviation must also be documented in the case record. A video recording will be completed on any other scenes at the request of the agency involved.

CSIs shall spot check scene video recordings prior to departing from the scene to ensure the video saved properly to the memory card. The CSI shall document this check in the case record. Memory cards shall also be spot checked and will be replaced as needed. Video recordings shall be written to a CD or DVD and the CSI shall ensure the video is present on the CD/DVD prior to reformatting the memory card.

- All video recordings should start with the HFSC cover sheet.
  - The video shall include the address, business name or other identifying features of the scene.
- Videos are typically recorded after evidence markers are placed in the scene. However, circumstances such as lighting or weather may necessitate the video being recorded before evidence markers are placed or after evidence is collected.
  - The videographer should walk slowly through the scene, stopping to slowly pan



vertically and horizontally where appropriate.

- General crime scene videography should include the scene and surrounding areas, any decedents and relevant physical evidence
- Close-up video of each evidence item is not required if the items are clearly visible at some point during the recording.
- General scene video should be captured without sound unless specific narration is requested.
  - The CSI should avoid personal comments or capturing unintended audio.
- CSIs shall ensure enough lighting is available to provide acceptable video quality.

### 3.6. Crime Scene Searches

Prior to beginning scene processing, CSIs shall work with the requesting agency to determine what areas need to be searched and who will be assigned to search those areas. This conversation shall be documented in the case record. Searches of crime scenes, vehicles, open areas or other relevant locations shall be done in a methodical and systematic manner (see Appendix A for more information on search patterns). As the scene is processed, CSIs shall make an attempt to search under, over or around items of interest to identify other potential items of evidence.

Before departing from a crime scene, VEB case vehicle or other relevant location, the CSI shall conduct a final visual search of the scene, vehicle or open area to ensure all evidence was collected and no equipment was left behind.

CSU management recognizes there is a risk of CSIs not locating all relevant evidence during a scene search. Therefore, the CSI may contact the on-call supervisor to request additional personnel respond to the scene to conduct a secondary search for additional evidence.

#### 3.6.1. Metal Detector

The CSI shall performance check the metal detector prior to using it on scene. The check shall be documented in the CSI's case notes. A cartridge or cartridge case is included in the carrying case of each detector and may be used for the performance check.

- Another metal object may be used in lieu of the cartridge or cartridge case, but a description of the object used shall be documented in the case notes.
- An alert tone heard while the coil is above the known metallic object is a satisfactory performance check.

Decide on a search pattern prior to starting the search. Move the coil in a slow, side-to-side motion while holding it one to two inches from the ground or search area.

Detection of a metal object is indicated by an audible signal which increases in volume as the coil nears the object.

If an item of evidentiary value is located, it should be marked with an evidence marker, flag or cone, and documented in the case record.

### 3.7. Sketching



The crime scene sketch/diagram is a **layout** of the scene and the corresponding physical evidence. CSU utilizes three types of crime scene sketches:

- **Rough sketch**
- **Final diagram**
  - For more information on final diagrams, refer to the Section 23: Post-Scene Documentation section.
- **Orientation sketch**

The **rough sketch** is hand-drawn and should reflect what is depicted in photographs and video.

- A **rough** sketch is often drawn from a “birds-eye” or “overhead” perspective. Scenes which present evidence at various heights may be sketched using a side-view or elevation sketch (see Appendix A for more information on sketch perspectives).
  - Room dimensions, furniture, vehicles and other landmarks should be included to help the viewer understand the overall layout of the scene.
  - For interior scenes, indications should be made for openings in walls, doorways, windows, etc. as well as any points of entry/exit.
- The sketch must contain enough information that, when paired with the photographs, a recreation of the scene could be completed.
- A rough sketch shall be completed at every scene unless otherwise approved by a supervisor.
- **Rough sketches are not required** for the VEB, hospital rooms, interview rooms or other locations where a person or item is being processed for evidence.

The **final diagram** is computer generated utilizing software provided by HFSC.

CSIs shall include the following on all **rough sketches and final diagrams**:

- Agency case number
- North indicator
- Drawn by: Name
- “Not to scale” or “all measurements are approximate” indicator
- Scene location or address
- Date of the incident
- Legend for notations such as security cameras, green cones, evidence markers, etc.
- Reference point(s) used for measurements
- **Evidence items/evidence markers, if applicable**

**Orientation Sketch** is a small picture that helps explain what is written in the notes or is a visual representation used in lieu of notes. These sketches may be used to show staining on an object, path of travel, blood trails or placement of FARO scanners (see Section 3.9 for more information on FARO scanning).

- The orientation sketch shall be labeled to indicate it is for orientation purposes only.
- A final diagram does not have to be completed for an orientation only sketch.

The location of probative evidence found in the scene should be measured and recorded. Any evidence identifiers used on the sketch shall be the same as those used in the evidence list. Devices such as laser measurers, tape measures and roller wheels can be used to obtain



measurements. CSU can also measure and diagram scenes using the FARO (see Section 3.9 for more information on FARO).

### 3.8. Measuring Techniques

CSIs take measurements as supporting documentation for their scene sketches. This includes measuring the size of the scene, layout of items within the scene (furniture, landmarks, etc.) and items of evidence identified.

All length measuring devices shall be checked against the NIST traceable ruler and approved by a CSU supervisor prior to their initial use. The NIST traceable ruler shall be inspected annually for damage and shall be calibrated by an approved vendor once every accreditation cycle.

There are several techniques for taking measurements at a scene. **The three measurement techniques used by CSU are described below.** All techniques are based upon the determination of known starting points. These points should be permanent, if possible, allowing the **items of evidence to be fixed (or placed back into the same location if scene reconstruction is needed).** **These permanent points, or reference points, shall be documented on both the rough sketch and the final diagram.** Cell phones may be used to obtain GPS coordinates at a scene when no address or specific fixed points/landmarks are available. (i. e. to document the location of evidence in the woods).

#### 3.8.1. Rectangular coordinates

- Best for indoor scenes and smaller outdoor scenes that have a well-defined area.
- The CSI shall use two adjacent walls/items as reference points from which distances are measured at right angles.
- This may not "fix" larger items in the scene as measurements are to the center mass of the item.
- Measurements from two separate **reference** points are taken to each end or center mass of the item of evidence.

#### 3.8.2. Triangulation

- Best suited for larger outdoor scenes
- **Three measurements are recorded:**
  - Distance between the two reference points
  - Distance from each reference point to the individual items of evidence
  - The three lines of measurement will create a triangle

#### 3.8.3. Baseline

- Similar to the rectangular coordinates method and is suited for outdoor scenes that do not have landmarks.
- Extend a tape measure from a reference point. Ideally, the tape measure is extended in a cardinal direction (north, south, east or west) for as far as necessary. This tape measure becomes your baseline.
- If a reference point is not readily available, a point can be set by triangulating it to a set of nearby landmarks **or GPS coordinates.**
- Take measurements from the **reference point** down the baseline and then from



the baseline, at a right angle, to the item of evidence.

### 3.9. FARO

The FARO may be used at any scene that requires a diagram to be completed or as requested by CSU management. The CSI shall scan the location of the crime scene to include the exterior and front of structures, interior and its layout and items of evidence, if possible.

Upon completion of scans, the CSI shall create an orientation sketch for reference. This orientation sketch shall include the location of each scan number, north indicator and a reference measurement.

- The reference measurement is a measurement of a door frame, sidewalk or other item of a standard size.
- For outdoor scenes that do not have a structure, such as in a wooded area, the CSI may utilize the steel ruler in the FARO kit for the reference measurement.
- This documents a measurement for a performance check when the scene scans are rendered.

The FARO is considered critical equipment that may have a significant impact on results of examination. As such, each FARO scanner is uniquely identified, and the identifier shall be documented in the CSU case record. **In addition, the FARO shall:**

- **Be performance checked before each use as stated above.**
- **Be cleaned before being taken into a scene and after removal from the scene. An approved disinfectant or 90/10 bleach solution should be used to prevent contamination. Spray the cleaning or bleach solution onto a clean cloth rather than spraying it directly onto the unit.**
- **Be used only by authorized CSIs.**
- **Be removed from service when the FARO Company notifies HFSC the FARO needs maintenance and/or calibration. After either service is performed by the FARO Company, the unit must be performance checked before being returned to service.**
- **Be stored in a room temperature-controlled environment, such as the basement at 500 Jefferson, when not in use.**
- **Not be used when there is heavy moisture in the air, such as in rain or heavy fog, because the unit will not scan properly.**

See **Appendix C:** FARO Checklist for instructions on setting up and using the FARO on scene. Instructions can also be found in the FARO kit.

#### 3.9.1. Uploading FARO Data:

- The CSI shall upload all data associated with the scan(s) and final project(s) for all cases (HPD or non- HPD agencies) to HFSC network drive located at \\hfsj-stor-02\csu-faro under the CSU Scene folder.
- CSIs shall create a subfolder using the case number as the file's name.
- Memory cards should be formatted once all data uploading is complete.

#### 3.9.2. Computer Rendering (Scene 2go):



Only personnel authorized to render the data will create the final diagram via FARO SCENE (Scene 2go). FARO SCENE processes and manages scan data by using real time, on-site registration, automatic object recognition, scan registration and positioning to create a final project, Scene 2go.

The final project (including all required files: mac, manuals, source, win, SCENE.2GO, Start SCENE 2go on Mac.command and Start SCENE 2go on Windows) shall be saved to \\hfsj-stor-02\csu-faro the under the case number subfolder.

Once the FARO data is requested by the HPD or non-HPD agency, the CSI shall follow these instructions for downloading the data:

- Select the correct case number final project data from the CSU Scene folder.
- Copy the above listed files to the desktop (do not to use the 'cut' function at any time as this will delete the information).
- From the desktop, copy data to a USB.
- The USB is then turned over to the non-HPD agency or HPD using a CSU Chain of Custody form.
- A copy of the CSU Chain of Custody form is retained in the case record and a report shall be issued documenting the creation and release of the Scene 2go data.

#### 4. Evidence Documentation

CSIs are trained and have knowledge to assess each scene and determine what evidence is probative. Based upon their knowledge, the information received from the requesting agency and on-going communication with the lead investigator, the CSI will identify, document and collect all probative evidence.

- If there is a question whether an item should be collected, the CSI **should** collect the item or contact the on-call supervisor.
- If an item identified as probative while the CSI is on scene is not collected, the CSI shall document the reason in the case record.

##### 4.1. Evidence Collection and Transport

Prior to collection, all **probative** physical evidence shall be documented appropriately. **This may include** notes, photographs, sketches and video.

Evidence shall be uniquely identified **in the case record** to avoid confusion regarding the identity and original location of the items. Evidence marker numbers or letters **and item descriptions should** be used to uniquely identify items.

- If evidence markers are not used, the case notes shall contain enough identifying information to ensure like items, such as cartridge cases, are not confused with one another.

Prior to leaving the scene, identifying information shall be present on evidence packaging. At a minimum, this shall include:

- Case number
- Evidence marker number



- Item description (if no evidence marker used)

**Equipment and tools** used to collect evidence shall be clean to prevent contamination.

- Any non-disposable equipment, such as placards or cones used at a scene that may have been contaminated with biological fluids, shall be cleaned and disinfected **with a 90/10 bleach solution upon return from scene**. Disinfectant wipes may be used on cameras or other equipment when spraying or immersion is not practical.
- Single use/disposable supplies such as plastic tweezers, scalpels, etc. are kept in clean containers until ready for use. Single use/disposable equipment shall not be reused and shall be discarded in an appropriate manner.

If evidence is placed into a temporary transport container, the container shall be marked for identification as stated above and **closed to** prevent loss of the evidence. This may be accomplished by using binder clips on bags and paper clips or clasps on envelopes. **If necessary, transporting evidence from more than one scene in the same vehicle is acceptable.**

Upon completion of scene processing, the CSI should transport the collected evidence directly to the laboratory, Property Room or NOCC without making any unnecessary stops. Evidence shall be removed from the vehicle as soon as possible upon return to HFSC.

#### 4.2. Chain of Custody

**Chain of custody** is a record of each transfer of evidence between individuals and to/from storage locations. **Chains of custody (COC) can be in either paper or electronic form or a combination of the two.**

The CSI begins the chain of custody as items of evidence are collected or created (as in the case with FARO). The date, time, description of the items and locations from where the items were collected are all documented in the case record.

- **If the evidence being transferred is a mobile device or a firearm, the description in the COC must include the make, model and serial number. If the serial number is obliterated or is otherwise illegible, include this on the COC along with enough describing information that no two mobile devices or firearms of the same make and model could be confused with each other.**
- Evidence transfers that occur between CSIs who are at the same scene at the same time do not need to be documented on the chain of custody form because this information is required to be included in the case notes.
- **Transfers between persons and transfers to/from storage locations must be documented. Transfers that do not occur at the location where the evidence was collected or that occur between non-HFSC staff on or off scene shall be documented using a paper chain of custody form.**
- Each transfer documented on the chain of custody form shall contain the original signature of the person transferring custody and the signature of the person receiving the evidence.
- **Transfers to locations shall include the original signature of the CSI making the transfer and the identity of the storage location where the evidence is being transferred. Do not**



transfer evidence from one location to another without putting the evidence into your own custody.

- Each time an evidence item is transferred to a new location or person, the chain of custody form will be updated.
  - Evidence in a temporary storage location (see Section 22) is considered to be in the custody of the CSI who placed the evidence in the listed location until it is submitted to the Property Room or transferred to another individual.
  - The temporary storage location log is included in the case record.
- Copies made of the chain of custody form or temporary storage location log shall be marked "Copy."

#### 4.3. Evidence Packaging

All evidence shall be packaged in a manner that prevents contamination and deleterious change. Physical evidence shall be handled as little as possible and held in such a way that minimizes the chances of interfering with potential DNA, latent prints and/or any other forensic analysis.

See Section 22 for information on temporary storage, final packaging and non – HPD evidence.

## 5. Biological Evidence

### 5.1. Biological Safety and Contamination Precautions

#### 5.1.1. Safety Precautions

Use universal precautions (treat all human blood and bodily fluids as if they are infectious) when handling blood and other biological evidence. Notify a supervisor immediately if you think you have been exposed to blood or bodily fluids in a manner that could cause infection.

See Section 2 for additional information on personal protective equipment.

#### 5.1.2. Preventing Contamination

Because of the extreme sensitivity of DNA testing, care and caution shall be used to prevent carryover and cross contamination. CSIs shall:

- Wear only clean disposable gloves when collecting or handling biological evidence.
- Change gloves:
  - When they become contaminated with personal DNA via coughing, sneezing, touching hair, pens, etc.
  - When collecting items that may contain DNA by directly handling the item (such as clothing).
  - Change gloves after each item is collected.
    - Gloves do not have to be changed if swabs are used to collect the evidence (such as possible blood on a wall or cartridge cases collected using a swab stick).
- Wear a surgical or N95 face mask when working near DNA-bearing evidence, e.g., evidence with known/suspected biological material that may be subjected to DNA testing.
  - CSIs not wearing a mask shall refrain from being near DNA-bearing



evidence or whenever such material is being collected, processed or packaged.

- Use sterile, clean or disposable collection and packaging instruments to collect DNA/biological evidence.
  - Disposable equipment shall be properly discarded after use.
- When collecting evidence from more than one person, collect and/or process the evidence associated with each individual separately from evidence associated with any other individuals, whenever possible.

### 5.2. Contact DNA Samples

Areas that are suspected of containing DNA but have no visible staining can be swabbed for possible contact DNA. Examples include, but are not limited to, samples from steering wheels, gun grips and rims of drinking glasses or mouths of bottles.

- Moisten one sterile cotton swab with a small amount of distilled water (usually one - two drops). Avoid over-saturating the swab.
- Rub the moistened tip of the swab on the item, being cautious of areas that may be processed for latent fingerprints.
- Place the swab into a cardboard swab box and then into a paper envelope. Ensure packaging material, such as the flaps on the swab box, does not come in contact with gloves that may have DNA on them.

### 5.3. Alternate Light Source

CSU is equipped with Alternate Light Source units (ALS) which contain a white light and multiple additional wavelengths of light. An ALS is used to search for evidence such as body fluids and trace evidence.

To ensure optimal visualization, more than one wavelength shall be used if negative results are obtained with the initial wavelength. The CSI shall use the correct color of goggles when using an ALS. At a minimum, the recommended color shall be used for initial viewing, but other colors may be used to ensure optimal visualization. Below is a guide of manufacturer-recommended goggles/filters:

Wavelength (in nm)	Goggle/Filter Color
365	UV or yellow
390	UV or yellow
415	yellow
445	yellow
455	yellow or orange
475	orange
CSS short pass	orange
495	orange



515	orange
535	red
555	red
575	red
600	IR

ALS examination is done by illuminating the surface with the light in the 365nm to 600nm range and viewing the surface through a barrier filter. This barrier filter effectively blocks the light being emitted by the light source and allows the luminescence to be viewed. A barrier filter shall be used on the camera lens when photographing areas of fluorescence.

### 5.3.1. ALS Cautions

- All persons in the room shall wear protective goggles.
- Never direct the light beam into a person's eyes.
- Never look directly into the aperture emitting the light beam.
- The operator should be aware of the possibility a mirrored or shiny surface can reflect the beam into the eyes.

Prior to each use, the ALS shall be performance checked to ensure it is working properly. A known fluorescing sample is included in each ALS kit **and shall be used for this purpose. CSIs shall not use an ALS on scene until it has been determined to be working correctly. It may be necessary to contact a supervisor so that another ALS or another control sample can be brought to the scene.** Operate the ALS as follows:

- Turn on the power switch and ensure the fans are working.
- Wear the proper goggles.
- Turn on the lamp switch.
- Darken the room.
- Direct the ALS beam, tuned to CSS wavelength, at the sample.
- The sample must fluoresce, indicating a positive result.
- The area around the sample (which has not been treated **with a fluorescing substance**) must not fluoresce, indicating a negative result.
- **The results, positive or negative, must be documented in the case record.**
- The results of the performance check shall be recorded in the case notes.

The ALS is considered critical equipment and may have a significant impact on the results of the examination. Therefore, each ALS is uniquely identified, and the identifier shall be documented in the CSU case record. **In addition, the ALS shall be:**

- **Cleaned before being taken into a scene and after removal from the scene. An approved disinfectant or 90/10 bleach solution should be used to prevent contamination. Spray the cleaning or bleach solution onto a clean cloth rather than spraying it directly onto the unit.**
- **Used only by authorized CSIs.**
- **When not in use, store the ALS in a room temperature-controlled environment such as the basement at 500 Jefferson.**
- **Dried as soon as possible if used in the rain.**



### 5.3.2. Semen, Saliva and Urine Stains

These stains will show a varying degree of fluorescence with different wavelengths of light depending on the substrate on which the fluid is deposited.

If a swab is collected from a fluorescing item **and the entire item is collected as evidence**, the area from where the sample was taken **shall** be circled with a Sharpie or other permanent marker. **If the Biology section does additional analysis on the collected item, the circle will indicate the area from where the CSI saw fluorescence. Do not circle stains on items such as sofas or vehicles that are not collected.**

### 5.3.3. Photographing Suspected Semen, Saliva and Urine Stains Using an ALS

**If a fluorescing stain is visualized, it should be photographed.** See Section 3.3 for camera setup instructions. A camera filter and goggles of corresponding color must be used. When photographing a stain on an item, a small amount of white light should be added to the image to help visualize the item. The item should also be photographed in regular light with a marker to indicate any areas of interest.

## 5.4. Presumptive Testing

CSIs use presumptive tests to determine the possible presence of suspected substances such as blood. **CSU does not confirm the presence of blood. Therefore, when the word blood is used in this SOP or in case records, it is understood to mean presumptively positive, possible or suspected blood.** The CSI will use discretion when determining the need for a presumptive test. The test should only be used when enough sample exists for presumptive testing, collection and further analysis in the laboratory. If the stain is not large enough for the CSI to test presumptively and have enough for further testing, then the CSI shall collect the entire stain without doing the phenolphthalein test. If the stain appears to be diluted, the CSI shall collect the item or sample for further laboratory testing.

### 5.4.1. Phenolphthalein

The phenolphthalein reagent is a presumptive test for blood. Phenolphthalein reacts with the heme component in blood resulting in a pink color change.

The **master** phenolphthalein kit **includes solutions A, B and C. These bottles are received from the manufacturer with the following labels:**

- Name of the solution
- Preparation or expiration date
- Lot number
- Any applicable hazard warnings

**CSIs will receive individual kits made from the master phenolphthalein kit. Each individual kit shall be labeled with the:**

- Name of the solution
- Expiration date
- Lot number
- Hazard warning or label



No reagents are prepared in house. The individual kits are aliquots of solutions in the master kit, so it is not necessary to add a preparer's name to the kit label. None of the solutions are mixed chemicals. The individual kits are considered performance checked once positive and negative control tests are completed. If either control test fails, do not use the phenolphthalein kit. Obtain another kit from a supervisor.

The CSI shall perform positive and negative control tests to ensure the reagent is working properly before testing suspected/possible blood. The CSI must record all reagent lot numbers and results of control tests in the case notes.

#### For a Positive Control:

- Moisten a sterile cotton swab with either distilled water or Solution A.
- Rub the swab on a known bloodstain.
- Apply 2-3 drops of Solution B (phenolphthalein) to the swab. Wait a few seconds to ensure there is no color change to pink.
- Apply 2-3 drops of Solution C (hydrogen peroxide) to the swab.
- An immediate bright pink color change indicates the presence of blood and a satisfactory positive control test.

#### For a Negative Control

- Moisten a sterile cotton swab with distilled water or Solution A.
- Apply Solutions B and C (as described above) to the swab.
- No color change indicates a satisfactory negative control test.

#### Procedure for Testing

- If the suspected blood stain is dry, moisten a sterile cotton swab with distilled water. If the stain is wet, there is no need to moisten the swab.
- Swab a portion of the suspected blood.
- Follow the procedure listed above.

#### Interpretation

- Positive result: An immediate pink color change
- Inconclusive: A very slow or undeterminable color change
- Negative: no color reaction

#### Documentation

- Case notes shall include the lot number and an indication that control tests were performed and the outcome of the control tests.
- Case notes shall contain a sketch or other indication of where on an item the swabbed stain was located and if positive or negative results were obtained.

#### General Information

- Substances other than blood may yield a positive reaction. These substances include, but are not limited to, some metal ions, bleach and some dyes.
- Do not collect or reuse the swabs used in control testing.



- No conclusions shall be made as to the donor of the blood.
- Blood is not always a red or reddish-brown colored stain. Due to the environment, it may be a color such as black or green. Take this into consideration **when determining if a stain should be tested.**
- Phenolphthalein is only a presumptive test. Confirmation requires further testing.

#### Collection of Phenolphthalein Positive Evidence

- If a positive presumptive test result is obtained, collect a separate sample from the same stain or another stain in close proximity. **Collect the stain by gently swabbing a portion of the sample using one sterile cotton swab moistened with distilled water. If the stain is wet, it is not necessary to moisten the swab with water.**

#### 5.5. Collection of Biological Material

The following biological evidence collection methods should be considered. Prior handling of an item by fire, EMS or police personnel does not negate subsequent DNA swabbing.

- Collect the entire item on which the evidence is located.
  - This is the preferred method for clothing or other items made of fabric that can be easily collected and packaged.
- Collect a swab(s) of the stain/evidence.
  - If the stain is dry, moisten one sterile cotton swab using distilled water. Typically, one to two drops are sufficient. Do not over-saturate the swab since this could dilute the sample. Roll the moistened swab tip onto the stain.
  - If the stain is wet, roll the dry swab tip onto the stain.
  - Place the swab into a cardboard swab box and then into a paper envelope. Ensure packaging material, such as the flaps on the swab box, does not touch gloves that may have DNA on them.
- Collect a cutting of the stain/material.
  - This is a reasonable course of action when dealing with large furniture, vehicle upholstery, area rugs, carpeting, etc.
    - If processing under a search warrant, property damaged or destroyed while collecting evidence is covered by the court order.
    - If the search is performed under consent, the agency investigator or representative shall be notified of potential damage prior to evidence collection.
    - **Cut a sample that is at least the size of a quarter. If the stain is smaller than a quarter, cut out the entire stain.**
- Collect a scraping of the stain/material.
  - If the biological evidence is dried, it can be scraped with a sterile scalpel onto a piece of filter paper, folded into a bindle or "pharmacist fold" and secured in an envelope.
  - **Scrape enough of the stain to cover the head of a quarter. If unable to scrape enough to cover the head of a quarter, scrape the entire stain.**

#### 5.6. Bloodstain Swabbing

##### Blood Trails

- For lengthy blood trails **where the origin of the blood is in question**, a minimum of three



swabs should be taken (beginning, middle and end of the trail).

- When a trail has large gaps, it may be necessary to take additional swabs of different pattern areas due to the possibility of multiple bleeders.

#### Bloodstain Patterns

- A minimum of one swab should be taken from each observable pattern at the scene.
- If **there is a bloodstain pattern within another pattern**, the entire area shall be documented in case notes and photographs and **swabs** taken from relevant areas.
- **The preferred collection method for clothing is to collect the entire item. The clothing item shall be wrapped in paper so that the bloodstain pattern does not bleed through to other areas of the fabric, obscuring the original stain observed.**

#### 5.7. Packaging and Storage of Biological Evidence

- It may be necessary to place wet evidence into plastic packaging for transportation **from the scene**. However, the packaging shall not be completely sealed to allow air to flow through the package. The evidence shall be removed from the plastic as soon as possible.
- Wet biological evidence shall be dried prior to being placed into final packaging. See Section 22 for information on Drying Cabinets.
  - Wet items shall be thoroughly dried, then packaged in paper or another final package that is permeable by air to prevent/reduce the growth of bacteria **or mold**.
- Condoms: **Visible** contents of the condom shall be emptied into a specimen cup or other plastic container with a lid. The condom itself shall be placed into a separate plastic container with a lid. The containers shall be placed in a paper bag or envelope. The outer container shall be marked "Store Frozen" or other similar wording. When submitting to the HPD Property Room, ensure Property Room personnel know to **freeze the items**. **The CSI should document this conversation on the HPD Property receipt.**
- Items saturated with decomposition fluid will be allowed to dry and then packaged. **Items will then be** submitted to the HPD Property Room **for long-term frozen storage**. The outer container shall be marked "Store Frozen" packaging or other similar wording. When submitting to the HPD Property Room, ensure Property Room personnel know to **freeze the items**. **The CSI should document this conversation on the HPD Property receipt.**
- **Items such as saturated diapers or bed pads will be submitted to the HPD Property Room as soon as possible. The outer container shall be marked "Store Frozen" or other similar wording. When submitting to the HPD Property Room, ensure Property Room personnel know to freeze the items. The CSI should document this conversation on the HPD Property receipt.**
- Items contaminated with biological fluids that are typically placed in plastic containers for safety reasons (i.e. knives) shall instead be packaged in rigid, porous containers such as boxes. The **sharps** can be wrapped in paper to prevent dried flakes from escaping through openings in the box.
- See Section 10 for more information on Sharps.
- Packaging shall be labeled with the appropriate hazard warnings (sharps, biohazard, etc.).
- **For biological evidence types not listed here, ask your supervisor for assistance with packaging and long-term storage conditions.**



## 5.8. Blood Enhancement

Chemical enhancement may be used at crime scenes to search for and/or enhance bloodstains. The CSI shall carefully evaluate and coordinate the search for blood evidence with the lead investigator to preclude destruction of potentially valuable evidence. Occasionally, it will be necessary to decide which of two or more procedures may produce more valuable findings (i.e. the possibility of enhancing ridge detail to positively identify a suspect versus the potential value of serological findings). This decision-making process should be documented in the CSI's case record.

### 5.8.1. Blue Star

A positive Blue Star result (a bright blue color that does not require total darkness to visualize) indicates areas of interest that should be collected for DNA testing. If the blood is highly diluted, visualization will be easier if viewed in total darkness.

The CSI shall search for and collect visible blood prior to using Blue Star.

Blue Star should be the last process done on scene or on a vehicle.

Blue Star may be used in conjunction with a presumptive test such as phenolphthalein. The CSI may choose to use phenolphthalein if positive BlueStar results are obtained. See Section 5.4 for more information.

#### Instructions for Mixing Blue Star

- Open the spray bottle; add 125 ml (4 fl. ounces) of distilled water.
- Take a white tablet out of the white-top tube and close the tube immediately. Take a beige tablet out of the red-top tube and close the tube immediately. DO NOT switch caps. The white cap goes on the white-top tube and the red cap on the red-top tube.
- Add the pair of tablets to the distilled water. If you need more working solution, use 125 ml (4 fl. ounces) per pair of tablets.
- Firmly twist the head with its plunger onto the spray bottle.
- Allow about 1 or 2 minutes for complete dissolution and mixing of the chemicals, swirling gently with a circular motion of your hand. Do NOT shake the container upside down.

Positive and negative control tests shall be conducted prior to using Blue Star. Blue Star is considered performance checked once positive and negative control tests are completed. If either control test fails, do not use the Blue Star. Obtain another batch from your supervisor.

#### Positive Blue Star Control Test:

- Moisten a sterile cotton swab with distilled water.
- Rub the swab on a known bloodstain.
- Lightly spray the mixed Blue Star chemical on the swab.
- A bright blue color change within a few seconds indicates the presence of blood and a satisfactory positive control test.



**Negative Blue Star Control Test:**

- Moisten a sterile cotton swab with distilled water.
- Lightly spray the mixed Blue Star chemical on the swab.
- No color change indicates a satisfactory negative control test.
- Record control test results and the Blue Star lot number in the case notes.

**Blue Star Application Instructions:**

- The CSI shall photograph areas of interest prior to Blue Star use.
- Spray lightly, ahead of you, at least two feet away from the target, in a side-to-side sweeping motion; not pointing toward the ground. Do not overly saturate the stain because this could hinder DNA analysis. One four-ounce bottle should process approximately 250 square feet.
- When indoors, don't saturate walls and vertical surfaces to avoid excessive dripping.
- When outdoors, consider wind direction. Do not spray into the wind.
- Case notes shall contain **if positive or negative results were obtained**.

After application of Blue Star, the CSI will take additional photographs using procedures for long exposure photography (see Section 3.3). **The CSI should collect areas of interest for later DNA testing. If the area of interest is swabbed, swab each area with at least one swab.** These swabs can be tested later for DNA.

**Disposal of Blue Star Chemicals**

All mixed chemicals shall be properly disposed of after use in accordance with the HFSC Health and Safety Manual. Mixed chemicals shall not be stored for later use.

**5.8.2. Leuco Crystal Violet**

Leuco Crystal Violet (LCV) is an irritant and should only be used in well-ventilated areas. It is suitable for developing stains such as latent prints, shoeprints or other blood evidence on porous and non-porous items. It is a heme-reacting chemical that causes blood to become purple in color and will only reveal prints on blood-stained portions of an item. If the non-stained portions of the evidence are to be processed for latent prints, a procedure that develops latent prints based on the normal constituents of latent prints should be used. Background discoloration can be non-existent when LCV is applied properly.

Comparative quality photographs shall be taken of any visible prints prior to LCV use. Each impression shall be given a letter designation, which shall be visible in every photograph. The letter may be written on the scale along with the case information.

**Instructions for Mixing LCV**

- Open the bottle marked Part 2 and add it to the contents of the bottle marked Part 1. Recap Part 1 and shake well for several minutes.
- Add the contents of the bottle marked Part 3 to the Part 1 bottle. Recap Part 1 and



shake well for an additional several minutes. The reagent is now ready for use.

Positive and negative control tests shall be performed prior to each use of the LCV. **LCV is considered performance checked once positive and negative control tests are completed. If either control test fails, do not use the LCV.**

**Positive LCV Control Test:**

- Moisten a sterile cotton swab with distilled water.
- Rub the swab on a known bloodstain.
- Lightly spray the mixed LCV chemical on the swab.
- A bright purple color change within a few seconds indicates the presence of blood and a satisfactory control test.

**Negative LCV Control Test**

- Moisten a sterile cotton swab with distilled water.
- Lightly spray the mixed LCV chemical on the swab.
- No color change indicates a satisfactory negative control test.
- Document control test results and reagent lot numbers in the case notes.

**Using comparative quality photography,** photograph any visible ridge or pattern detail and, if needed, collect a sample of the bloodstain. Then apply the LCV by spraying the blood impression using a fine-mist sprayer.

- Use the finest mist possible since excess application may cause overdevelopment or running of the print impression.
- Non-porous item: Allow the impression to develop to the desired color (approximately 5-10 seconds) and remove excess reagent by absorbing with a paper towel or pouring it off.
- Allow the item to dry and then take comparative quality photographs of any usable prints or patterns.
- **Case notes shall contain if positive or negative results were obtained.**

The preceding steps can be repeated to possibly improve the contrast.

When using in direct sunlight, developed prints should be photographed as soon as possible to avoid unwanted background development caused by photoionization.

**Disposal of LCV Chemicals**

All mixed chemicals shall be properly disposed of after use in accordance with the HFSC Health and Safety Manual. Mixed chemicals shall not be stored for later use.

**6. Firearms**

The first consideration when handling a firearm is safety. All firearms must be treated as though they are loaded. **See the Trace Evidence Section 7.5 for information related to Gunshot Residue.**



### 6.1. Firearms Documentation and Swabbing

Document the location of the firearm with notes and photography. If the firearm has been moved prior to the CSI's arrival on scene, document this information in the case notes and photograph the firearm in its current location. Documentation may include, but is not limited to:

- Area of the firearm from where contact DNA swabs were collected
- Hammer position (cocked, not cocked)
- Position of safety
- Position of slide/breech bolt (closed, locked open, jammed)
- Visible damage
- Visible trace evidence (blood, tissue, hair)
- Location of possible blood swabs collected
- Magazine in or out, or not fully inserted
- Cartridge, cartridge case, or nothing in the chamber
- Revolver cylinder positions marked on both sides of the top strap, using a permanent marker
- Photographs or diagram of cylinder contents including the cartridge and/or cartridge case brand in each chamber.

In order to preserve potential DNA from firearms, all firearms and cartridges from firearms shall be swabbed for contact DNA. This includes officers' firearms, if it is believed a subject touched an officer's weapon. See Section 6.4 for more information. Before handling it, the CSI shall evaluate the location, position and condition of the firearm. If it safe to do so, one contact DNA swab can be collected from the textured area of the body of the firearm, ensuring the trigger and trigger area are avoided. This should be done prior to any significant movement of the firearm. If contact DNA is not collected prior to handling (for safety reasons), it shall be collected once the firearm is made safe (unloaded).

After contact DNA has been collected from the body of the firearm, the firearm shall be made safe. The following steps shall be followed:

- If a magazine is present, eject it from the magazine port. See section below for collection of contact DNA from magazines and cartridges.
- Verify the firearm is unloaded by using a light to ensure the chamber is not obstructed by a cartridge.
- An item, such as a zip-tie, shall be used to safely block the slide or keep the ejection port or cylinder from closing. Do not leave the slide locked back. Gently close the slide forward once the zip-tie or similar item has been inserted.
- Secure the firearm in an appropriate container.
- Do not place anything in the barrel of the firearm or through the trigger guard.

If a CSI is unable to make a firearm safe on scene, contact an officer on scene for assistance.

- The name and payroll of the assisting officer shall be documented in the notes.

If the firearm is still unable to be made safe, the CSI shall contact a supervisor before transport.



Transport the firearm to 500 Jefferson and place it in a basement gun locker. Send an email to the Firearms Section as well as CSU supervisors stating a loaded firearm has been placed in a locker.

Cartridges in the magazine shall be swabbed for contact DNA prior to being ejected from the magazine. **The magazine is preserved for potential latent print processing.**

- This process should be completed at HFSC if possible, rather than at the scene.
- Handle the magazine in a manner that will preserve any latent prints.
- Use one swab, lightly moistened with distilled water, to swab all visible areas of the cartridge while it is seated at the top of the magazine.
- Eject the cartridge and use the same swab for the next cartridge.
- Continue until all cartridges have been swabbed and removed from the magazine.
- The textured areas of the magazine, such as the bottom, may also be swabbed. The smooth areas shall be preserved for latent print processing.

Any possible blood observed on the firearm, magazine or cartridges shall be swabbed **using one sterile cotton swab**. This possible blood shall be swabbed separately from contact DNA (if possible).

- Mark the packaging of firearms evidence contaminated with biohazardous substances with a biohazard sticker or handwrite 'biohazard' or similar wording.
- The CSI should handwrite or stamp the letters "NVB" (no visible blood) on the packaging of any firearms evidence that does not contain visible biohazardous substances.

#### 6.1.1. Firearms Submerged in Water

- Firearms and all components found in water **shall** be packaged in a watertight container and submerged in the same water from which it was collected.
- The firearm and components do not need to be swabbed for contact DNA.
- The container(s) shall be transported to the CSU laboratory. During regular business hours, contact the Firearms Section to take custody of the container(s). After business hours, secure in a **basement gun locker at 500 Jefferson**.

#### 6.2. Cartridges and Cartridge Cases

A **cartridge** is a unit of ammunition consisting of the cartridge case, powder charge and projectile (e.g. bullet, shot pellets, etc.). A **cartridge case** is what remains after the cartridge is fired.

**Cartridges** and cartridge cases are generally described by the head stamp. The information on the head stamp may include the manufacturer and caliber. **If legible, the manufacturer and caliber shall be included in the case record. If it is not legible, the CSI will document this in the case record.**

**CSIs should conduct a search of the scene to locate any cartridges or cartridge cases. This may be done through a visual inspection of the scene or using a metal detector (see Section 3.6 and Appendix A for further information on metal detectors).**



The CSI shall mark each cartridge and/or cartridge case with an individual evidence marker **unless it is not feasible to do so (multiple cartridges or cases are grouped together making placement of individual markers impractical)**. Cartridges or cartridge cases in vehicles do not require evidence markers unless there is more than one like item in a similar location, such as on a passenger seat.

#### Packaging

- Cartridge cases shall be packaged **individually** in coin envelopes or similar packaging.
- Each envelope shall contain the evidence marker number or identifying information regarding the location from which it was recovered.

### 6.3. Possible Bullet Defects and Projectiles

**A bullet defect is a hole, divot or skid caused by a bullet strike.**

#### 6.3.1. Labeling Bullet Defects

CSU's labeling system includes using letters and written descriptions. The purpose of labeling is to account for the evidence and to locate relevant points along the flight path in the sketch and photographs.

The CSI must label all bullet defects within reasonable reach using the following labeling scheme:

- Use letters for bullet defects.
- The first defect encountered shall be labeled with "A".
- Any subsequent defects shall be labeled continuing the series of letters (B, C, D, etc.).
- If defects go beyond Z, any remaining defects shall be labeled with double letters beginning with AA, BB, CC, etc.
- If defects go beyond ZZ, any remaining defects shall be labeled with triple letters beginning with AAA, BBB, CCC etc.
- This pattern will continue until all defects have been labeled.
- Number subsequent defects that follow the same trajectory, such as the interior and exterior of a car door, with subsequent numbers (A1, A2, A3, etc.).
- By subsequently numbering bullet defects, the CSI is not reconstructing the scene but is indicating the defects appear to correlate.
- If the CSI is uncertain of the origin or trajectory, they shall label the bullet defects with the next letter, not with the subsequent number of the previous letter.
- The entry/exit path of thin items (i.e. blinds, paper, etc.) need not be labeled on both sides. Label only the entry side with a letter marker.
- Photograph and document in the case notes any defects that cannot be reached due to height and/or location.
- Documentation shall be completed before utilizing any trajectory rods.

#### 6.3.2. Possible Bullet Defects on Scene

Bullet defects that are found in stationary objects shall be photographed with a scale of measure and unique identifier.

- The unique identifier and location of defect shall be recorded in the case notes.



- Each bullet defect shall also be recorded on the rough sketch and measured (fixed) in the scene.
- See Section 3 for additional information on measurements.

**6.3.3. Possible Bullet Defects in Collected Items of Evidence:**

- While on scene, do not document bullet defects in items of evidence that are marked for collection. The items shall be documented as required and then brought back to the lab for additional photographs.
  - If the evidence is determined to be probative, the CSI will photograph the possible bullet defects at the lab. The photographs will be taken with a scale.

**6.3.4. Possible Bullet Defects in a Vehicle on Scene:**

**If the vehicle is being towed to the Vehicle Examination Building (VEB):**

- Photograph each bullet defect on the exterior of the vehicle with a scale of measure and unique identifier.
- Record the unique identifier and location of the defect in the case notes.
- Interior bullet defects do not need to be documented. This will be done at the VEB.
- The vehicle will be sketched and measured into the scene.

**If the vehicle is not Being towed to the VEB:**

- Photograph each bullet defect on the exterior and interior of the vehicle with a scale of measure and unique identifier.
- Record the unique identifier and location of defect in the case notes.
- If access to the interior of the vehicle cannot be obtained, this must be added to the case record.
- The vehicle will be sketched and measured into the scene.

**6.3.5. Flight Path**

**Trajectory rods** are straight probes often used with centering cones to track and illustrate the nominal path of a projectile. Trajectory rods should only be placed in non-moveable objects such as walls, vehicle exteriors, etc.

All photographic and measurement documentation shall be completed before utilizing any trajectory rods.

A minimum of two possible bullet holes are needed to illustrate possible flight path.

**6.3.6. Projectiles**

A **projectile** is an object propelled from a firearm barrel by the force of rapidly burning gases, e.g., bullet, shot pellets, shot slugs.

CSIs should be cautious when attempting to remove or extract projectiles, so as not to cause additional damage or scratches to them. Metal tools often create scratches or obliterations that can affect the examination of the projectile. It is better to cut out the



area around the lodged projectile when **removal** cannot be done cautiously. The CSI should also look for any trace evidence that may be on the projectile or left on the defect once the projectile has been removed. Any trace evidence observed shall be photographed.

If the projectile or metal fragment from a projectile is removed from a labeled bullet defect, include the bullet defect identifier on the exterior of the packaging and record it in the case notes. Projectiles and other metal fragments with sharp edges should be packaged so the edges do not cut through the packaging.

#### 6.4. Officer Involved Shootings

For information on processing persons, refer to Section 18.

Do the following on scenes where an officer's weapon was discharged:

- Photograph the officer(s) involved, including any injuries, debris, signs of struggle and body worn cameras. This information shall also be documented in the case notes.
- Swab the officer's firearm for contact DNA if the subject is believed to have touched the officer's weapon.
- Swab the firearm when there is visible biological evidence.
- Chart (document) all firearms and ammunition involved in the incident. This includes make, model, serial number, accessories, etc.
- Ask the officer to unload the firearm.
- Document and photograph ammunition information and position in the firearm and magazine, including the number of cartridges in the magazine and the capacity of the magazine.
- Unless otherwise instructed, return all weapons and component(s) to the officer.

When possible, the CSI should utilize an ammunition tray to contain cartridges during the documentation process. The CSI should also document any less-than-lethal weapons involved in the officer involved shooting, such as Tasers.

#### 7. Trace Evidence

Trace evidence may range in size from easily visible to microscopic and includes a variety of evidence genres including, but not limited to:

- Hairs and fibers
- Soil and dust
- Glass
- Paint and polymers
- Plant and geological material
- Gunshot residue

Trace evidence should be collected as soon as is practical. The collection can be done on scene or in the lab.

- Trace evidence should be collected on scene when the parent item (furniture, vehicle seat, etc.) is not being collected as evidence.
- Trace evidence should be collected at the lab when the parent item (clothing, bedding, etc.) is being collected as an item of evidence.



- If the parent item is being collected but the trace evidence (single hair on clothing item) may be lost in transit, the trace evidence should be collected prior to collection of the parent item.
- In the lab, an item to be examined for trace evidence shall be placed on clean butcher paper. This paper shall also be collected after the examination and evidence collection are complete.

It is not the intent nor is it possible to collect every particle of trace evidence adhering to an object. The purpose is to collect a representative sample of the trace evidence.

## 7.1. General Trace Evidence Collection

### 7.1.1. Collection Techniques

A variety of methods may be used to collect potential trace evidence. The CSI is expected to select the best method based upon evidence type and the collection surface.

The trace evidence should be first placed into an appropriate-sized container, such as a druggist fold, vial, etc. (unless otherwise instructed) then placed in a larger envelope for submission to the Property Room.

Always wear appropriate PPE when collecting trace evidence to minimize the potential for contamination. Keep known standards separated from samples and/or materials to be searched for trace evidence.

#### Particle Pick

Particle pick is using gloved fingers or equipment such as tweezers, forceps or a similar collection tool to pick small particles off an object. The particles may be found with the naked eye. This technique is generally used for the collection of loose hairs, fibers, paint, glass, vegetation, etc.

The particles may be placed onto folded paper, into a small plastic or glass container, or on the sticky side of tape. Do not place particles believed to be paint onto tape.

#### Adhesive Tape Lifts

Adhesive tape is useful when collecting trace evidence that is not readily visible and is the recommended technique for recovering potential trace evidence from surfaces such as upholstery, clothing and carpet. This method is not recommended for surfaces that will strongly adhere to the tape lift adhesive (e.g. paper products, cardboard, etc.).

Clear fingerprint tape should be used for the collection of hairs and fibers.

The tape may be used as a strip or folded around the hand in a circle with the adhesive side facing out. After the evidence is collected onto the tape, the CSI must place the tape into a clean plastic bag with the sticky side(s) of the tape against the plastic. The tape should not be wadded up or folded with the sticky sides together. If more than one piece of tape is used to collect evidence on the same item, all the pieces can be placed



into the same evidence container.

### Scraping

Scraping utilizes a spatula, wooden dowel rod or other scraping tool to loosen particulate debris which is then caught in/on clean paper.

## 7.2. Hair and Fiber Reference (Known) Samples

Reference (known) samples **can be compared to unknown trace evidence collected at crime scenes**. When obtaining reference samples, the amount of material listed below must be collected. The CSI **shall** add a description of the reference sample, such as source, location, color, condition, etc. to the case notes.

### 7.2.1. Head Hair Samples

- **Record the name and date of birth of the person from whom the head hair is collected in the case notes.**
- Examination and collection shall be done while the subject is standing on clean butcher paper.
- Collect the butcher paper after hair examination and collection are complete.
- Collect **at least 25 hairs** from 5 different areas of the scalp: center, front, back, and both sides. **If 25 hairs cannot be collected, collect as many as possible. Include the reason(s) why fewer than 25 were collected in the case record.**
- Hairs must be pulled by firmly grasping the hair near the root and pulling it quickly. Hairs that are cut are not appropriate standards.
- Loose or shedding hair may be collected by using tweezers or by combing the entire head while the subject is standing over a piece of clean paper to collect the dislodged hairs.
- **Collect the butcher paper after hair collection is complete.**
- Hairs shall be securely packaged to prevent loss or contamination.
- **See Section 18 for additional information on processing people.**

### 7.2.2. Pubic Hair Samples

- **Record the name and date of birth of the person from whom the pubic hair is collected in the case notes.**
- Examination and collection shall be done while the subject is standing on clean butcher paper.
  - **Collect the butcher paper after hair examination and collection are complete.**
- **The CSI must examine the pubic hair for indications of dried or moist secretions or presence of any foreign materials. If secretions are noted or suspected, collect the hair by cutting it, thereby collecting both the hair and the secretions.**
- Collect **at least 25 hairs** from different areas of the pubic region. **If 25 hairs cannot be collected, collect as many as possible. Include the reason(s) why fewer than 25 were collected in the case record.**
- Hairs must be pulled by firmly grasping the hair near the root and pulling it quickly.
- Loose or shedding hair may be collected by using tweezers or by combing through the pubic hair while the subject is standing over a clean piece of paper.



- Collect the butcher paper after hair collection is complete.
- Hairs shall be securely packaged to prevent loss or contamination.
- See Section 18 for additional information on processing people.

### 7.2.3. Fiber Standards

See Appendix A for more information.

When possible, collect the entire item. If the entire item, such as a vehicle or furniture, cannot be collected, use the following method to collect a known fiber sample:

- Cut a representative sample from various areas of the object.
- Collect samples that are visually different (e.g. different colored areas, areas that are faded due to sunlight, areas or sections that show signs of wear, etc.). Ensure the backing material is also recovered.

## 7.3. Paint Standards and Samples

### 7.3.1. Collecting Paint Standards:

- When possible, collect the entire item (i.e.: piece of car bumper).
- If the entire item cannot be collected, use a clean razor blade, scalpel or knife to gently pry, carve or chip the paint from the surface down to the foundation or substrate. Collect a sample that is approximately 1"X 1". If the sample is smaller than 1" x 1", collect the entire sample.
  - Collect paint standards near each damaged area. Include a description of the paint standard in the case notes, including from where it was collected.

### 7.3.2. Collecting Paint Samples:

- Use a clean razor blade, scalpel or knife to gently pry, carve or chip the paint from the surface down to the foundation or substrate.
- Collect a sample approximately 1"x 1" from a particularly damaged area, when possible.
  - Include a description of the paint sample in the case notes, including from where it was collected.

When contact between two painted surfaces is indicated or suspected, the possibility of cross-transfer must be considered. Collect both of the surfaces or collect paint standards from both surfaces.

## 7.4. Soil Collection

Known samples

- Collect two to three tablespoons. If you cannot collect two to three tablespoons, then collect the entire known sample.
- Allow to dry and place in a sealed container.

Clothing

- Allow soil to dry.
- Package in a separate paper bag or other porous container.



- Collect two to three tablespoons of soil. If you cannot collect two to three tablespoons, then collect all the soil observed.

#### Vehicles

- Search areas such as tires, wheel wells and floorboards for any soil debris.
- Collect soil samples using scraping or adhesive tape lifts (If adhesive tape lifts are used, they should be placed in a clear plastic bag for submission).
- Collect two to three tablespoons of soil. If you cannot collect two to three tablespoons, then collect all the soil observed.

#### Residences

- Samples should be collected near points of entry or shrubbery where a subject could hide.
- Samples should also be collected from pathways leading to the residence.
- Collect two to three tablespoons from each relevant point of entry, shrubbery and pathways. If you cannot collect two to three tablespoons, then collect all the soil observed.

The CSI should ensure all soil samples are dry before final packaging.

### 7.5. Gunshot Residue

See the Appendix A for more information.

#### 7.5.1. Gunshot Residue on Clothing

Clothing from the victim should be carefully preserved to prevent damage or disruption to powder residues deposited around the bullet holes. Avoid cutting or tearing clothing around these holes. Clothing from a suspected shooter should be considered as an option for further testing. Each item of clothing should be packaged separately in paper. If it is necessary to fold an article of clothing, place a piece of paper over the article to prevent contact and reduce the possibility of transferring residues to other areas of the clothing.

#### 7.5.2. Gunshot Residue (GSR) Kits

Gunshot residue samples shall be collected in accordance with the manufacturer's instructions provided in each kit. A kit should be used on a live subject as soon as possible and preferably within a four (4) hour window of the incident. The CSI will still collect the potential GSR if the incident is beyond the four-hour window and the evidence is requested by the requesting law enforcement agency.

A GSR kit shall not be used on deceased persons within Harris County. A GSR kit may be utilized on death investigation cases in other counties where a representative from the Medical Examiner's Office is not responding. However, this will only be done at the request or approval of a criminal justice official from the requesting county. If bags were placed on the hands of the decedent, the CSI shall collect the bags from the hands after GSR collection is complete.

**Fill out the Gunshot Residue Analysis form included in the GSR kit.**



- The section “Write a brief description of the subject’s activity...” **should** not be completed by the CSI.
- Leave the original document in the kit. Make a copy and place it in the case record.

Gunshot residue can also be collected from items such as car doors **and clothing**. **CSU supplies individual adhesive lift stubs for this purpose**. Each adhesive lift stub can be used for up to 100 pats or taps.

- When a subject’s hands are not conducive for GSR collection (i.e. the subject washed his/her hands, covered in blood, etc.), the clothing may be collected as an alternative.
- The CSI shall confer with the investigator regarding the collection of clothing.

#### **7.6. Ignitable Liquids and Ignitable Liquid Residues**

Ignitable liquids (ILs) and ignitable liquid residues (ILRs) can be readily lost through normal evaporation if not packaged properly. ILs and ILRs cannot be submitted to the HPD Property Room **but will be submitted to the Houston Fire Department Arson Division**.

To obtain an IL sample, the CSI shall:

- Take a sample of the liquid using two sterile cotton swabs or one gauze pad by dipping the swabs or the pad for approximately 15 seconds into the container containing the liquid. Transfer the swab or pad sample to an arson can.
  - Place the lid on the can then properly seal and label the can.
- Transfer custody of the can to the Houston Fire Department (HFD) Arson Division.
  - Provide the Arson Division with the location of the original scene and the name of the assigned detective.
- CSIs shall complete the **CSU** chain of custody form.
- Any remaining liquid shall be disposed of at the City of Houston Fleet Services.
- If the IL was in a container that was collected, the container shall also be submitted as evidence **to the HPD Property Room**.
- If the item appears to contain an ILR but there is not enough residue to collect as stated above, the CSI should collect the entire item and place it into an arson can or arson bag **for submission to the HFD Arson Division**.
- **If an IL or ILR sample is collected for an agency other than HPD or Houston Fire Department, the CSI will turn these samples over to the requesting agency on scene. A CSU chain of custody form shall be completed.**

### **8. Latent Print Processing**

#### **8.1. General Latent Print Information**

**See Appendix A for more information.**

#### **Categories of Latent Impressions**

**See Appendix A for more information.**

#### **Scene Considerations**

Surfaces (i.e. walls, doorknobs) and items within a scene shall be evaluated to determine if



friction ridge detail may be present and if latent print processing and/or DNA swabbing are appropriate. This includes searching for visible and latent impressions. Prior contact of an item or surface by personnel such as EMS or police officers does not negate subsequent latent print processing.

The CSI shall consider areas or items that may have been touched by the suspect(s) during the commission of the crime. This includes, but is not limited to, surfaces that were touched, moved, handled, damaged, etc. to commit the crime.

## 8.2. Latent Print Powder Processing

See Appendix A for more information.

HFSC uses two categories of fingerprint powders:

- conventional powders that are applied with a brush
- magnetic powders that have fine iron filings mixed with the powder and are applied with a magnetic wand

Select the appropriate powder for the surface, taking into consideration the color and type of surface to ensure good powder adherence and contrast. Powders should be checked periodically for clumping which is due to excess moisture and contamination. Unsuitable powder should be discarded.

Select the appropriate brush (feather, magnetic or fiberglass). Each brush should be used for only one type or color of powder. Used brushes may be cleaned using warm soapy water and then dried before reusing. Brushes may also be replaced in lieu of cleaning.

While using powders, the CSI should watch to see how the powder is reacting to the surface. If no powder residue is visible on the surface, or if it is coating the surface too heavily, another powder should be tried.

Various lighting techniques should be employed to ensure prints are visualized. This may include using oblique lighting, direct lighting, turning off overhead lights, etc. Often a certain angle of the light will show a print not previously visible.

The following are recommended guidelines for **conventional latent print powders**:

- Work from a portion of conventional powder in a shallow container.
- Touch only the ends of the brush bristles to the powder. The excess powder should be shaken or tapped off.
- When using a fiberglass brush, use a smooth twirling motion to apply the powder. A smooth brushing motion, like a paintbrush, may also be used.
- Powder does not need to be applied to the fiberglass brush for each application; powder can be added as needed.
- Excess powder should be removed from the evidence prior to lifting to prevent “fish-eye” artifacts in the latent print. This can be accomplished by using a feather or fiberglass brush to lightly brush the powder off the surface.



The following are recommended guidelines for **magnetic powders**:

- The procedure for using the magnetic wand and powders is similar to the dusting procedure for conventional powders.
- When the magnetic wand is inserted into the magnetic powder, the powder will be picked up with the tip of the wand forming a bristle-less brush.
- Only the powder should touch the surface being processed. A light, smooth stroking motion is used to guide the wand over the area to be processed. Effort should be made not to leave large gaps between the brush strokes (often creating a zig-zag effect). The powder is released from the tip of the wand by pulling up on the end of the rod.
- Remove excess powder from the work area by passing the wand over the area without touching the surface. A fiberglass or feather brush may also be used to clean excess powder from the print.
- Magnetic powder shall not be used on cellular telephones, computers, tablets or any other digital or multimedia device. Caution should be used when using magnetic powder on credit/debit cards or any other card with a magnetic strip because the magnet in the wand may interfere with data stored on the card. The officer or investigator should be consulted before this procedure is used.

#### Clean Powders and Brushes

- Clean powders and brushes are used to process surfaces that are subsequently swabbed for contact DNA in areas where no friction ridge detail is developed.
- The powder must be used with a new fiberglass brush or a magnetic wand that has been cleaned with a disinfectant or antimicrobial cleaner.
- The powder must **come from a sealed container or the powder must** have not previously touched any surface.

### 8.3. Small Particle Reagent (SPR)

See Appendix A for more information on SPR.

#### SPR Spray Method

- Shake the solution thoroughly before use. Fill another bottle with water from the supply of water located in the CSU vehicle or any other clean water source (such as tap or distilled).
- Test spray the solution away from any evidence to ensure the nozzle is clear.
- Spray the SPR solution on the area to be searched for latent prints.
- Shake the bottle between sprays as the particles tend to settle rapidly.
- Using the other bottle with clean water, rinse the treated area and watch for the separation of water from an area with latent prints.
- **Because latent tape can easily slip on wet surfaces, the CSI shall document the possible print(s) with comparative photography prior to a lift attempt on a wet surface. See Section 8.7 on photographing latent prints for more information.**
- Place lifting tape over the wet surface and utilize a squeegee to remove excess water from underneath the tape. Alternatively, the area can be allowed to dry, and then conventional lifting techniques can be used to recover the print.

#### Additional SPR Information



This technique is useful if there are oily prints on a wet surface. SPR is less effective on items that have dried after being wet. SPR is incompatible with porous surfaces and items that disintegrate in water solutions.

#### 8.4. Latent Lifting Techniques

Latent prints developed with powders are usually recovered using adhesive lift tape. Other mediums such as "Diff-Lift", poly (stretchable) tape, gel lifters or flexible casting material may be used on curved, round and/or textured surfaces. Prior to lifting, the surface area should be cleaned of any loose powder or other debris to avoid interference with the friction ridge detail.

##### To Use One of the Above Lifting Mediums:

- Place the edge of the **lifting medium** adjacent to the target area. Using light pressure and a smooth, deliberate movement, apply the tape to the target area.
- Exercise care to minimize the development of air bubbles. A piece of cork or a pencil eraser may be used to smooth the tape over the surface.
- Multiple prints near each other may be collected on the same lift.
- Remove the tape from the target area and place it onto a latent lift card.
- In some instances, multiple lifts of the same print may be needed to achieve the best detail and clarity. If multiple lifts of the same area are taken, the lifts should be labeled "Duplicate lift 1 of 2" "Duplicate lift 2 of 2", etc.

#### 8.5. Plastic and Patent Prints

These prints shall be photographed using comparative quality photography techniques before any recovery attempts are initiated. If possible, collect the entire item or portion of the item containing the print. Flexible casts or gel lifts may be used to recover the prints. [See Section 9 for more information on flexible casting.](#)

#### 8.6. Latent Print Cards

Before clearing the scene, the CSI shall document the lift cards as follows:

- The case number shall be written on at least one latent print card AND the outside container.
- Sketch and description of item/location from which the print was lifted shall be written on every card. Place an "X" on the sketch to indicate from where the print was lifted.
- Add an "up" or other orientation arrow to each card.
- Do not add letter or numeric designations to lift cards, other than the lift card number, which is written in the designated location on the card.
- Secure the envelope in such a manner to prevent loss, damage, or change to the contents.

Before submission to the HPD Property Room [or the HFSC Latent Print Unit](#), all required information shall be listed on **each** latent lift card. Adhesive labels may be used in lieu of writing the information by hand. The same information that is required on the card shall be on the label. When a vehicle is processed, the make, model and license plate number should be written on the first card. "CSU" should be written or stamped in red ink on the envelope to assist the HFSC Latent Print Unit in gathering data for use in statistical reports.

Latent lifts which may contain blood or other biohazardous substances shall be marked with



“biohazard”, “visible blood” or other similar wording. This may be handwritten, or a sticker may be used if it does not cover any part of the lift tape. The envelope shall also be marked as biohazard.

### **8.7. Latent Print Photography**

Latent prints shall be photographed using comparative quality photography whenever the surface (i.e. textured surfaces such as walls or doors) does not typically lend itself to successful lifting or if the CSI has any doubt that the lift will be successful.

If applicable, photograph the overall scene with markers for the fingerprints in place to orient the prints to the item on which they are located or to the scene itself (such as on a wall or doorframe). On surfaces that will not be collected (such as walls), the CSI shall label the developed print with a letter designation prior to photography.

#### **8.7.1. Camera Setup**

- A tripod or other stabilization device shall be used.
- All comparative quality images shall be digitally captured using the RAW + JPG setting on the camera.
- Aperture should be set at F-8 or F-11.
- ISO 100 should be used.
- Use a macro lens or other macro device(s).
- The following information should be visible in the first image:
  - Agency case number
  - Photographer’s name or initials
  - Item description and orientation, if applicable
    - If the information listed above is not captured at the scene, then the CSI shall annotate a copy of the image with the information once back at the laboratory.
- Ensure the image plane of the camera is parallel to the plane of the print. An angle finder can be utilized for this purpose. Obtain the angle of the as well as the angle of the image plane.
- Place a scale of measure near the friction ridge detail of interest, leaving a small gap between the scale and the ridges.
- Take overall photographs of the item with the scale in place.
- Fill the frame as much as possible with the print and scale.
- CSIs are expected to properly expose the image. This may require the CSI to try different flash angles or use no flash at all.

## **9. Impression Evidence**

Proper crime scene investigation techniques include a cautious approach while searching for any kind of evidence but especially impression evidence such as footwear, tire track and tool mark evidence. CSIs must consider how involved parties may have entered and exited the scene, as many surfaces may have been driven on, walked on, stepped on or pried open.

### **9.1. General Impression Information**

A variety of documentation and collection methods exist for this type of evidence. The methods that HFSC uses are:



- Photography
- Gel lifts
- Electrostatic dust print lifts (EDPL)
- Casts (both plaster and flexible casting)

See the Appendix A for more information.

## 9.2. Impression Evidence Photography

### 9.2.1. Footwear Photography

Prior to photographing footwear, the CSI shall assess the scene to determine how possible footwear impressions relate to the overall scene. If the CSI determines the footwear impressions are probative, documentation of the footwear evidence shall be completed. If documentation of the footwear impression is not completed, it was determined to be not probative by the CSI.

Photographs shall be taken of unknown footwear impressions to show relation to the scene and other items of evidence before adding photograph markers or attempting to collect the evidence.

Overall photographs shall be taken again after the placement of markers to show the relation of the evidence to the scene and/or depict a trail. This also includes two-dimensional prints on a flat surface such as a door or countertop.

After overall and mid-range photographs have been taken, the CSI shall take comparative quality photographs in accordance with the following:

- A tripod or similar camera stabilization device shall be used for all close-up images.
- All comparative quality images shall be digitally captured using the RAW +JPG setting on the camera.
- Depth of field should be set at F-8 or F-11.
- ISO 100 should be used.
- The camera lens should be set at 35mm focal length.
- Utilize a 300mm L-shaped scale to outline the impressions to be photographed.
  - The scale must be on the same plane as the impression. Exercise care when removing soil, snow, etc. around a three-dimensional impression.
- Ensure that a direction indicator (compass or hand-written) is visible in the image to allow proper orientation of the image within the scene.

The following information shall be visible in the first image captured:

- Agency case number
- Photographer's name or initials
- Photo marker (placard or another identifier)

The CSI should ensure the following:

- The camera is positioned so that the entire impression, scale and essential information are fully visible and fill the image frame.
- The image plane of the camera is parallel to the plane of the impression.



- The CSI must determine the angle of the impression as well as the angle of the image plane. An angle finder can be utilized for this purpose.
- The impression is evenly shaded.

When working with three-dimensional impressions, photographs shall be captured using a minimum of three (3) photographs with the flash at varying angles of light. These photographs should be taken with the flash at a low angle, approximately 3-4 feet away from the impression and at approximately 45 degrees from three different sides of the impression using an off-camera flash.

- The deeper the impression the greater (higher) the angle of the flash.
- The shallower the impression, the lower the flash angle can be.

Two dimensional **imprints** are photographed the same as three-dimensional impressions except the flash is held at an extremely low angle or with the flash pointing straight down.

- Three different angles of light are not needed.
- The angle of light used should be the one that produces the optimal image.

The CSI should consider if the item containing the footwear impression can be collected or if the impression can be enhanced.

- If the CSI chooses to collect the item containing the impression, the impression shall be photographed as comparative quality prior to any collection attempts.
- If the impression can be enhanced, the impression shall be photographed as comparative quality both before and after enhancement. See Section 5.8 or footwear impression enhancement.

Not all impression evidence requires comparative quality photographs. An example is impression evidence that does not show a pattern (such as possible footwear in tall grass or wet shoe marks on a cement floor). The CSI should consider photographing these marks with a scale so that size can be determined later, if needed.

The CSI should give consideration to footwear impressions left on scene by law enforcement or medical professionals. If the CSI believes impressions on scene were left by one of these entities:

- If the individual is present on scene, photograph the individual's shoe.
  - The photograph shall be taken with scale and the film plane parallel to the tread. Document the name and payroll of the individual.
  - Take at least one photograph of the impression within the scene using a scale.
- If the individual is not present on scene, the CSI shall document that in the case record.
  - Photograph the impression as an unknown footwear.

### 9.2.2. Tire Track Photography

When photographing tire tracks (impression or imprint), prior to tire track photography, the CSI shall assess the scene to determine how possible tire track impressions relate to



the overall scene. **If the CSI determines the tire track impressions are probative, documentation of the tire track evidence shall be completed.**

Photographs shall be taken of unknown tire track impressions to show relation to the scene and other items of evidence before adding photograph markers or attempting to collect the evidence.

Overall photographs shall be taken again after the placement of markers to show the relation of the evidence to the scene.

After overall and mid-range photographs have been taken, the CSI shall take comparative quality photographs in accordance with the following:

- A tripod or similar camera stabilization device shall be used for all close-up images.
- All comparative quality images shall be digitally captured using the RAW +JPG setting on the camera.
- Depth of field should be set at F-8 or F-11.
- ISO 100 should be used.
- The camera lens should be set at 35mm focal length.
- The 300mm L-shaped scale or other scale of measure that is at least the width of the track should be used. Place scale parallel to the track to measure the width.
- A tape measure shall be used when photographing tire tracks, unless the length of the track is such that it can be fully captured in one image. In these cases, the tape measure is not required.
  - The tape measure is placed alongside the tire mark to measure length. Tire marks usually must be captured in multiple images. The average 14-inch automobile tire has a circumference of about 8 feet.
  - If the entire mark is less than 8 feet in length, photograph the entire mark.
  - If the mark is greater than 8 feet, photograph the best 8-foot section of the mark.
  - Photograph the tire track in approximately 12-16-inch sections until the entire track is captured.
- Do not place any portion of the scale on or over the impression before it has been photographed.
- Ensure that a direction indicator (compass or hand-written) is visible in the image to allow proper orientation of the image within the scene.
- If the tracks from both sides of the vehicle are present at the scene, take the track width measurement.

**For Three-Dimensional Tire Impressions:**

- Take at least three images with various flash angles for each section.
- When taking the next image, overlap the end of the first segment by about 3-4 inches. (For example, the first segment of photographs is 0-13 inches. The second segment is 11-24 inches, and so on).
- Do not move the tape measure until the entire track is photographed.

**For Two-Dimensional Tire Impressions:**



- Photograph the same way as three-dimensional impressions, except the flash is held at an extremely low angle or with the flash pointing straight down.
- Three angles of light are not needed.
- The angle of light used should be the one that produces the optimal image.

### 9.2.3. Photographing Tool Marks

Overall and mid-range photographs shall be taken to show the physical location of the tool mark within the scene.

After overall and mid-range photographs have been taken, the CSI shall take comparative quality photographs in accordance with the following:

- A tripod or similar camera stabilization device shall be used for all close-up images.
- All comparative quality images shall be digitally captured using the RAW +JPG setting on the camera.
- Depth of field should be set at F-8 or F-11.
- ISO 100 should be used.
- The camera lens should be set at 35mm focal length.

The CSI should ensure the following:

- The camera is positioned so that the entire tool mark and scale are fully visible and fill the image frame.
- The image plane of the camera is parallel to the plane of the impression.
  - The CSI must determine the angle of the impression as well as the angle of the image plane. An angle finder can be utilized for this purpose.
- The impression is evenly shaded.

When working with tool mark impressions, photographs shall be captured using a minimum of three (3) photographs with the flash at varying angles of light. These photographs should be taken with the flash at a low angle, approximately 1-2 feet away from the impression and at approximately 45 degrees from three different sides of the impression using an off-camera flash.

- The deeper the impression, the greater (higher) the angle of the flash.
- The shallower the impression, the lower the flash angle can be.

### 9.3. Gel Lifts

Gel lifts can be used to collect impression evidence consisting of loose material on flat, smooth surfaces such as a dust impression, and to lift imprints developed by latent print processing powder techniques. They may also be used to lift developed or visible imprints from irregular surfaces such as doorknobs or slightly textured surfaces.

- Gel lifts **work best** at room temperature.
- The gel lift protective cover should be removed and the lift allowed to rest for approximately five minutes prior to use.
- Then apply the lift to the surface; a fingerprint roller may be used to smooth out any air bubbles.
- After application, the lift should be allowed to rest for approximately five more minutes.
- When the lift is removed from the surface, the CSI should place the original plastic cover



back onto the gel lift. The roller or other object may be used to smooth the cover back over the lift. Ensure no air bubbles exist between the cover and the lift.

- Record the following information on the back of each gel lift:
  - Case number
  - Date
  - CSI's name **or initials**
  - Impression number if more than one gel lift is collected
  - Address of the scene
  - Sketch if needed to show location (such as on a door)
  - Directional arrow, if applicable

When writing on a gel lift, take care to write in a corner or other part of the lift that does not coincide with the impression on the front, to avoid indentation from the pen showing through on the impression.

#### 9.4. Electrostatic Dust Print Lifter (EDPL)

The EDPL is used to transfer dust impressions from a surface onto Mylar film. Follow these requirements when using the EDPL:

- Comparative quality photographs shall be taken of any visible impressions prior to any lifting attempt.
- Place a clean lifting film over the impression. The black side of the film must face the impression and the silver side of the film must face up, towards the CSI. The film must be larger than the impression to ensure a full transfer.
- Mark the orientation of the film, if necessary, either by direction or relationship to the object.
- Place the metal grounding plate next to the Mylar.
- Place the two prongs on the bottom of the unit on the grounding plate and the prong at the top of the unit on the Mylar.
- Turn on the unit. **If the Mylar shows a static cling to the surface, the unit is said to be in proper working order. The EDPL is now considered performance checked and this documented in the case recorded.**
- If air bubbles are present, gently use the rubber roller to smooth them out.
  - Use the roller gently to avoid shifting or excessive pressure that could damage the impression.
- Turn off the power and remove the unit.
- Turn the film over and evaluate the lift. If nothing is visible, the lift should be examined in a darkened room using oblique lighting to evaluate the success of the lift.
- Subsequent lifts may be performed if the first lift was unsuccessful. This is typically due to a large quantity of transferred material. Second or third lifts may yield a "cleaner" impression as interfering background material may have been reduced during the first lift.
- A successful lift shall be secured inside a dust-free container to prevent movement or destruction of the lift during transport to the laboratory. Comparative quality photographs shall be taken of all successful lifts.
  - The images shall be recorded on a DVD and submitted to the HPD Property Room.
- Mylar with successful lifts shall be photographed and then **will** be discarded (**see footwear**



photography below).

- An unsuccessful lift (one that does not retain any detail) does not need to be photographed or maintained **but shall be recorded in the case record.**

#### 9.4.1. EDPL Documentation

- Case notes shall include information regarding the quantity and description of located and lifted impressions (unique identifier) and the date/time of collection.

#### 9.4.2. Footwear Photography Using EDPL

Photographing shoe prints lifted with the EDPL:

- Work in a darkened room with the overhead lights off, if possible. This helps eliminate the reflection of the lights on the Mylar.
- ISO 100 should be used.
- Start with F-11 and a 6 second shutter speed.
- Slowly pan a flashlight up and down from the top of the Mylar film to the bottom of the dust print.
- **See Section 9.2 for additional requirements for footwear photography.**

Upload the JPG images to Dataworks. The comparative quality images RAW + JPG will be written to a DVD and placed in the case record. A second copy of the DVD shall be submitted to the HPD Property room as an evidence item.

#### 9.4.3. EDPL Cautions

Not all dry impressions can be successfully lifted using the EDPL. Attempts to lift dust prints on dirty backgrounds may cause both the dust print and dirty background to lift together. Subsequent lifts on separate sheets should be attempted as they may be more successful.

Never slide the lifting film on the surface with the impression.

As a precaution, the EDPL should not be operated by persons with a pacemaker.

### 9.5. Casting Materials

**See Appendix A for more information.**

All three-dimensional impressions should be cast if there is clarity in the impression and the surface is conducive to casting.

#### 9.5.1. Plaster Casts

- If the impression is in soft, fine or loose dirt, the impression may be firmed up by spraying pump hair spray gently, evenly and indirectly over the impression.
- A frame may be used to help position and retain the casting compound.
- When casting on hard surfaces, place an item such as a wooden spatula or cardboard under the cast to assist with lifting after the cast is dry.
- Prepare the casting compound following manufacturer's instructions.
- Target an area near the impression to begin pouring the compound; do not pour directly onto the impression to avoid disturbing fine detail.



- Pour the casting compound in a smooth continual motion.
- Continue pouring onto the target area until the mixture covers the entire impression area. Do not stop and restart pouring as this can cause imperfections in the cast.
- Do not touch or move the cast until it is fully dry.
- Record the following case information on the back of the cast with a permanent marker:
  - Case number
  - Date of cast
  - CSI's name or initials
  - Impression number (if more than one cast is made)
  - Address of the scene
- Do not attempt to clean dirt or debris from the impression side of the cast.
- Allow the cast to dry for at least 48 hours prior to packaging.
- Package the cast in a way that protects it from damage.

#### 9.5.2. Underwater Impressions

Impressions that are within pooled water, puddles or under any form of standing water may still be cast. Excess water may be removed, taking care not to disturb the impression.

- A metal casting form may be placed around the impression.
- Lightly sprinkle unmixed casting material over the impression until it is covered by approximately one inch of the casting material. The material should settle at the bottom of the water-filled impression.
- Allow to set for at least 60 minutes.
- Allow the cast to dry for at least 48 hours prior to packaging.
- Record the information listed above on the back of the cast.
- Package the cast in a way that protects it from damage.

#### 9.5.3. Flexible Casting Material

Silicone based rubber casting material is useful in collecting and preserving three-dimensional marks, such as tool marks, from a scene. This material can also be used to lift latent prints developed on irregular surfaces.

- Comparative quality photographs shall be taken of all latent prints or tool marks prior to casting. **If the latent print is on a curved surface such as a bottleneck or door handle, consult with a CSU Supervisor on the best way to document the print prior to collection.**
- Brown casting material is recommended for the reproduction of tool mark impressions.
- **Prior to casting tool mark impressions, the CSI should consider the presence of latent prints and if the casting material would interfere with them.**
- White or clear casting material is recommended for lifting latent prints that have been developed with black-colored powders.
- The CSI may need to prepare a label for the cast, as it is not practical to write on the hardened silicone rubber. Latent print casts shall be affixed to a latent print card with tape. The CSI shall document the relevant case information on the card.



## 9.6. Impression Evidence Standards (Eliminations)

### 9.6.1. Footwear Standards

Some scenes where footwear evidence has been collected may require the collection of elimination shoeprints from **known** individuals associated with the scene. Collection of the shoes is preferred. However, several methods exist for collecting elimination footwear impressions if collecting the shoes is not possible. **The method used is left to the discretion of the CSI.**

#### Two-Dimensional Footwear Standards

- Coat the bottom of the shoe with the shine sponge.
- **Have the individual wearing the shoe walk as they normally would across a sheet of white paper.**
- Visually verify that the entire tread design transferred to the receiving surface.
- Apply black magnetic powder to the transferred impression.
- Place the paper in a paper or plastic bag, manila envelope or folder.
- Mark each standard with the following case information:
  - Case number
  - Date
  - Name of the person who owned/wore the shoes
  - **Agency name and payroll, if applicable**

#### Three-Dimensional Footwear Standards

A commercially purchased foam-type product, such as Bio-foam, can be used to obtain three-dimensional standards. The wearer of the shoe steps into the foam and then lifts the foot out. If not already in a pre-packaged container, the foam is placed in a sturdy container that cannot be crushed.

#### Mark each container with the following case information:

- Case number
- Date
- Name **or initials** of the CSI
- Name of the person who owned/wore the shoes
- **Agency name and payroll, if applicable**

### 9.6.2. Tire Track Standards

**If possible, collect the entire tire.**

**If the entire tire cannot be collected, contact a CSU Supervisor.**

### 9.6.3. Tool Mark Standards

**If possible, collect the tool.**

**If the tool cannot be collected, contact a CSU Supervisor.**

## 10. Sharps



Any evidence collected that presents a possibility of physical danger (knives, needles, other items with sharp edges, etc.) shall be packaged in an appropriate rigid container and clearly marked as such.

- Items contaminated with biological fluids that are typically placed in plastic containers for safety reasons (i.e. knives) shall instead be packaged in rigid, porous containers such as boxes.
- The **sharps** can be wrapped in paper to prevent dried flakes from escaping through openings in the box.

Refer to Section 2 and 5 for more information.

### 11. Liquids

Liquid foodstuff, such as milk from a bottle or other substances suspected of containing alcohol or other contaminants, should be placed in a glass container.

- The glass container should then be packaged inside another sturdy container to minimize the chance of breakage and to contain the liquid if the glass does break. **Another option is to place the liquid into a plastic container. A large zip-top or heat-sealed plastic bag may also be used as a secondary container.**
  - The outer packaging shall be marked with orientation arrows to indicate the proper orientation of the container and that the **contents need to be refrigerated.**
- **All liquids should** be submitted to the HPD Property Room immediately.
  - Tell Property Room personnel that the evidence needs to be refrigerated.
- Ensure the case investigator is aware of any perishable items that are available for testing.
- **For information on packaging ignitable liquids, see Section 7.**

### 12. Currency

**Currency shall be collected from a scene when of evidentiary value or probative to the investigation. If the CSI is unsure about the evidentiary nature of the currency, the CSI should communicate with the investigator or primary officer from the responding agency or contact a supervisor to determine if it should be collected.**

The collected currency (both US and foreign currency) shall be documented on the currency worksheet.

- Prior to leaving the scene, the CSI who collected the currency shall enter their information in the "On Scene Count Performed by" section of the worksheet.
- Counting and documenting at the scene shall be witnessed by a second person, either another CSI or law enforcement officer.
- Enter this information in the "On Scene Verification Performed by" section of the worksheet.

Money in excess of \$5 located in a vehicle being processed on scene or at the VEB shall be collected, unless otherwise authorized by the police investigator and a CSU supervisor. Counting money collected from vehicles at the VEB shall be witnessed by a second person.

- **If a second person is not available at the VEB, the CSI may complete a remote verification with a supervisor. CSI shall document this verification on the "On Scene Verification" line of the currency worksheet.**



- If no witness is available and a remote verification is not possible, the CSI shall document “no verifier available” on the “On Scene Verification” line of the currency worksheet.
  - If the amount is over \$100, the CSI shall leave the money secured in the vehicle until a witness is available.
  - If this goes past the end of a CSI’s shift, the CSI shall email all supervisors of the circumstances and include the email in the case record.
  - If possible, the CSI should complete all other processing of the vehicle.

Documentation and packaging of currency at CSU or the HPD Property Room shall be witnessed by another HFSC staff member or HPD employee.

If prepared for submission at CSU:

- Complete the “Count at Time of Packaging” section of the worksheet.
- Have a second person verify and complete the “Packaging Count Verification” section of the worksheet.
- If the money count verification differs, recount the money. If the amount is still different, contact a CSU supervisor.

If the currency is taken directly to the HPD Property Room, Property Room personnel will count the money.

- The Property Room provides a receipt/voucher which lists the amount of money being submitted.
- The CSI shall write “Refer to Property Voucher” or equivalent in the verification line of the “Count at Time of Packaging” section and the Property Voucher shall be included in the case record.

Currency in an amount over \$100 shall be submitted to the HPD Property Room by the end of the CSI’s shift, unless other arrangements have been made and approved by a CSU supervisor and documented in the case record.

Check all clothing, purses, backpacks, wallets and other containers reasonably expected to contain currency prior to leaving the scene or the VEB.

### 13. Mobile Cellular Devices

The CSI shall attempt to power off or place into airplane mode all mobile devices when they are collected so they do not connect with surrounding networks during transportation. Allowing the device to receive network or wireless signals can result in a change to the data contained on the device’s memory or allow remote wiping. The CSI shall include if the device was placed in airplane mode in the case notes. If the device was unable to be placed in airplane mode, this should be in the case notes as well. The HFSC Multimedia Unit prefers the CSI include a note on the outer packaging of all devices the CSI placed into airplane mode. This information may be important during later analysis by the Multimedia Unit.

The CSI shall include the make, model and serial number of mobile cellular devices in the case notes. If this information cannot be located, it shall be documented in the case notes along with a description of the mobile cellular devices so that each device can be easily distinguished from other



mobile devices.

#### 14. Video Evidence

CSIs shall attempt to collect video evidence in the following situations:

- Collection is needed after HFSC's normal business hours and video will be overwritten or will delete before the next business day.
- The DVR system or video will be damaged before the HFSC Multimedia Unit is able to respond.

CSU does not collect audio evidence. In the event the stakeholder has requested audio evidence, or the CSI is unable to collect DVR evidence, and one of the above instances is present, the CSI will contact the on-call supervisor.

If the CSI is tasked with collecting the video evidence, the CSI shall:

- Evaluate the DVR system to determine the functionality and if it is password protected.
- Determine if:
  - an export needs to be conducted at that time
  - or the system needs to be seized
  - or the export will be scheduled for a later time
  - or no video is needed
- If video needs to be retrieved, the CSI must:
  - Verify search authority **or consent**
  - Capture photographs of the following (if photographs cannot be taken the settings must be documented):
    - Make, model, serial number (if visible)
    - Time offset (actual time and DVR time)
    - Date/time and camera channels exported
  - Document the USB flash drive identifier (number)

It is the responsibility of the investigator to review the video in a timely manner to verify the time exported and/or to request additional processing (i.e. conversion). **(Any additional processing, including conversion, is completed by the HFSC Multimedia Section, not the CSU).** If the video evidence collection will be scheduled for a later time, ensure the police investigator knows to contact the HFSC Multimedia Section.

#### 15. Narcotics Evidence

CSIs are responsible for **documenting** suspected narcotics **on scene and at the VEB.**

- CSIs should **encourage** law enforcement agency representatives to collect and submit suspected narcotics.
- If this option is not available, CSIs will collect and submit the suspected narcotics to the HPD NOCC (Narcotics Operations Control Center). **All narcotic evidence must be submitted by the end of the CSI's work shift or turned over for an administrative assist.**
- **Narcotics collected by CSU for any non-HPD agency will be handed over to that agency's representative before the CSI leaves the scene.**
- **For safety reasons,** CSIs shall not open containers such as pill bottles, baggies, etc. to photograph, document or count the contents. **Refer to Section 2 for more information on Narcan.**



## 16. Entomological Evidence

HFSC CSIs do not routinely collect entomological evidence. However, general supplies used to collect this evidence are stocked in CSU response vehicles.

For maggot/larvae/pupae/egg collection at the scene or at the VEB:

- Collect approximately 10-15 maggots/pupae/eggs; various sizes are preferred.
- Using disposable plastic tweezers, place the sample into a plastic jar. Try not to squeeze or crush the sample.
- Bring the jar back to the lab and perform the following procedure:
  - Wash the maggots/larvae in warm water
    - Transfer them to a plastic or glass jar and cover with a 70% ethanol solution.
    - Seal and label the jar 'Fixed Maggot Specimen' or other similar wording.
  - Dried pupae casings and eggs should be placed into a separate jar.
    - Do not add ethanol solution to pupae and eggs.
    - Seal the jar.
  - The fixed specimen jars and the jars containing pupae/eggs can be placed into a box for submission to the Property Room or non-HPD entity to be stored at room temperature.
    - These boxes should be labeled 'fragile'.
    - Add an upward arrow to any boxes containing liquid (so the boxes are not turned upside down causing the solution to leak).
- If the police investigator assigned to the case was not present on scene, notify him/her that entomological evidence was collected.

## 17. Non-Routine Evidence

For non-routine evidence, including any evidence types not already described in this SOP manual, the CSI will consult with CSU management to ensure the evidence is collected, packaged and stored in a manner that preserves the evidentiary value of the evidence. CSU management will also work with the CSI to ensure an appropriate sample size is collected.

## 18. Processing Persons

This protocol covers the various processes, methods and procedures involved in processing victims, witnesses and/or suspects. All evidence shall be collected and packaged in accordance with accepted procedures for each type of evidence. Proper procedure ensuring safety and protection from contamination and cross-contamination shall be followed. **Individuals shall be processed separately from each other and evidence from different individuals shall be handled and packaged separately to avoid contamination. CSIs should take care to change PPE between processing of different subjects.** Processing individuals should be considered when it is important to link an individual to a crime or to an item of evidence or to link a crime or item of evidence to a person. Evidence should be collected from individuals as soon as possible since some evidence can be perishable or lost over time and with excessive movement.

Another HFSC or law enforcement **witness** shall be present if processing involves the breasts or genital area of a subject or the removal of underwear. **The witness should be the same sex as the**



subject being processed.

### 18.1. Personal Protective Equipment

CSIs shall use appropriate PPE when processing persons. Using PPE reduces the risk of exposure to potentially hazardous substances as well as minimizes the potential for contamination.

### 18.2. Documentation

The processing of persons shall be thoroughly documented using case notes, photographs, and sketches, as applicable. Documentation should include a detailed description of the person's physical appearance, clothing, injuries and other distinguishing features. **Distinguishing features may include:**

- Injuries
- Tattoos
- Scars/birthmarks
- Jewelry
- Clothing
- Stains

### 18.3. Photographing Persons

Photographs shall be taken to document both the presence and absence of visible injuries, suspected bloodstains, condition of clothing, etc. A cover sheet or any form of identification (such as a driver's license) with the person's name should be photographed prior to capturing images of the individual.

#### 18.3.1. Photographing Injuries on Persons

- Initial photographs include images from all four sides of the person, at full length, to include the type and condition of clothing.
- Each full-length photograph must include the subject's entire body.
  - Photograph individuals in hospital beds or those otherwise unable to stand as thoroughly as possible in their bed, chair, etc.
- Photograph the person's face and shoulders (a driver's license-type photograph) for identification.
- Photograph both sides of the hands.
- Photograph the general area (mid-range) of any injuries without a scale to establish the location of the area of interest.
- Photograph any injury or area of interest close-up, both with and without a scale.
  - All close-up injury photographs should be taken with the camera lens perpendicular to the injury to avoid distortion in the photographs.
- If unable to fully photograph a subject, document the reason in the case notes.

### 18.4. Evidentiary Items on Persons

#### 18.4.1. Biological Evidence

Examine the person and their clothing for visible biological evidence such as blood or other biological fluids.



Consider the possibility of potential touch DNA evidence on the person or their clothing.

If the person scratched another person, consideration should be given to collecting fingernail swabs. Fingernail swabs are collected using a sterile cotton swab moistened with distilled water.

#### 18.4.2. Trace Evidence

Examine the person and their clothing for visible trace evidence such as hairs, fibers, glass, etc. Ensure proper consent or a warrant has been obtained prior to any evidence collection.

#### 18.4.3. Bite Marks

Bite marks should be swabbed prior to processing to collect potential saliva or other DNA evidence that may be present on the wound. Bite marks shall be photographed with and without an "L" shaped scale (has an X and Y axis).

#### 18.4.4. Known DNA Samples (Buccal Swabs)

**Buccal swabs** are known DNA samples collected from the inside of a subject's cheek. They are collected under directive of law enforcement after the law enforcement agency has obtained consent or a search warrant.

Use appropriate PPE when handling and/or collecting buccal swabs. To collect the buccal swabs, use two sterile cotton swabs to rub the inside of the subject's cheek for approximately 15 seconds. Document the subject's name and date of birth in the case notes and in the written report.

Package the buccal swabs separately from evidence swabs in a labeled cardboard swab box. Buccal swabs from multiple individuals shall be packaged separately.

#### 18.4.5. Patterned Impressions on Skin or Clothing

- Impressions on clothing or skin shall be photographed using comparative quality procedures.
- Any notable features of the impression shall be described in the case notes and specific relevant information shall be included in the report.

#### 18.4.6. Penile Swabs

The following areas shall be swabbed using two sterile swabs moistened with distilled water:

- Penis - swab the entire penis, skin creases and area under the foreskin
- Scrotum – swab the upper and front scrotum area
- Pelvic area- swab the pelvic area around the base of the penis

#### 18.4.7. Pubic Hair Area

- Examine the subject while the subject is standing on clean butcher paper.
- Examine the pubic hair for indications of dried or moist secretions or presence of any foreign materials. If secretions are noted or suspected, the CSI must collect the hair by



cutting it, thereby collecting both the hair and the secretions. See **Section 7** for additional collection methods.

- Collect and package the butcher paper as evidence after collection is complete.

## **19. Deceased Persons Located Out of Harris County**

See **Appendix A** for more information.

Initial written and photographic documentation of the decedent is conducted as part of standard processing protocol, without any maneuvering of the decedent. **CSIs do not touch or maneuver bodies that are found within Harris County. This is the responsibility of the Harris County Institute of Forensic Science (Harris County Medical Examiner's Officer).**

Trace evidence should be collected before the decedent is moved. Obtain permission from the death investigator before maneuvering the decedent for documentation and evidence collection purposes. Record from whom permission was granted in the case notes. Search for and collect hairs, fibers or other relevant trace evidence. See **Section 7** for more information on collection of trace evidence. After trace evidence is collected or it is determined that trace evidence does not need to be collected, the CSI may continue photographic documentation of the body. This includes, but is not limited to:

- Front and back of the decedent
- Anything relevant on the clothing such as bullet holes or blood spatter patterns, with and without a scale of measure
- Front and back of both hands
- Both eyes (held open if possible)
- Interior of the mouth
- Insect activity
- Wounds with and without a scale of measure

Scene notes shall include a description of clothing items, the condition of the items, any jewelry/accessories and any insect activity.

In all homicide and firearm related investigations, bag the decedent's hands using clean, unused bags such as brown paper lunch bags. Wrap a bag around each wrist area. Do not place your own hand inside the bag to open it. **This could lead to contamination or loss of evidence.**

Do not collect any property from the body unless the HPD investigator requests you to do so and permission had been obtained from a death investigator **from the county in which the body was found.**

## **20. Bodies Found in Water**

Body in water death investigations can encompass any body of water, from a mop bucket to a bathtub or **bayous**. Many of these incidents are presented as accidental drownings, **but some incidents involve a criminal aspect and the CSI should consider all possible reasons for a drowning death.**

### **20.1. General Information**



When responding to an aquatic death scene, the CSI should work closely with the investigator and consider these questions:

- Is it logical that the decedent was in the water?
- Do the decedent's and witness/reporting party's location, posture and state make sense?
- Why is the decedent dead? Why didn't they survive being in the water?

If the decedent is a child, the CSI and investigator should assess if the child is of sufficient age and has the physical capability to **swim**, sit in a tub, sink, etc. unaided and/or pull themselves out of the water. The CSI should also examine the scene for evidence the decedent had been in the water.

- Does the scene demonstrate that the decedent was removed from the water (if applicable)?
  - For example, if the decedent was found in the bathtub, the CSI should work with the investigator to determine if the decedent normally took baths, was this the normal bath time, is the tub set up in the way the decedent would normally take baths, etc.
- Document the decedent's clothing. If it is wet, where the clothing is wet, etc.
- **If the decedent was found in a tub or pool**, document the **length, width and depth of the tub or pool**. Also document the surrounding area and position of **the tub** drain cover or plug lever and **if the tub is wet**.
- If the decedent was submerged for more than 30 minutes, the CSI should examine the palms and/or soles of the feet for signs of skin wrinkling.
- CSI should also document any post-mortem changes such as skin wrinkling, bloating, ocular changes and state of lividity.
- For bodies found in a tub or other container inside the house, patrol officers should be asked if the bathroom or any other areas were wet upon their arrival. Was the water still in the tub or container or was it drained/poured out?

## 20.2. Other Documentation for Bodies Found in Water

Other information to be documented includes:

- Water depth, if available
- Changes to the environment by first responders such as opening windows/doors, turning on heat, etc.
- Weather conditions
- Photograph and document the area under where the body was when initially discovered
- Items that are wet, damp and dry.

Examine **the surrounding areas**, laundry areas, diaper pails and garbage cans and consider the following questions:

- Is there a diaper that appears soaked from water immersion?
- Are there damp towels **or clothing present?**
- Does the garbage show that a child recently made a mess?

## 21. Processing Vehicles

See Appendix A for more information.



### 21.1. Vehicles at the Scene

Confirm with the investigating officer if the vehicle needs to be processed at the scene or if processing will take place at the VEB. **If the vehicle will be processed at the scene, treat the vehicle as a scene and document accordingly. For guidance on processing vehicles on scene, follow the steps listed below for processing vehicles at the VEB.**

Before a vehicle is towed to the VEB, document and photograph how the vehicle was found at the scene, including the condition and placement of the vehicle within the scene.

### 21.2. Vehicle Examination Building (VEB)

Vehicles are towed to the VEB under the authority of HPD officers. HPD officers or detectives are responsible for securing a warrant or consent to search and providing information to HFSC regarding the desired processing.

**If the vehicle is being towed to the VEB, the CSI shall complete the following on scene:**

- Photograph and document the following exterior features of the vehicle (See Section 3.2 for additional photography requirements). **This includes:**
  - All four sides of the vehicle and the license plate.
- Any damage to the vehicle, including bullet holes, broken glass and any damage caused by a collision. **See Section 6.3 on documentation of bullet defects in vehicles on scene.**
  - Damage caused by a collision directly related to the scene shall be photographed with a vertical scale of measure.
- Any debris from a collision or damage caused by the collision involving traffic controls, another vehicle, landscaping, etc.
- Any fluids, such as blood or engine fluids, on or around the vehicle or the ground.
- Items of possible evidentiary value in plain view inside the vehicle.
- In some cases, the specific location of a vehicle may be of important evidentiary value. In these cases, specific measurements to place the vehicle at the scene **shall** be collected. To properly place a vehicle at a specific location, two sets of measurements, a north/south and an east/west measurement, should be taken from at least two points on the vehicle. These measurements should be taken from fixed and permanent areas of reference at the scene.

**Document** any transient evidence or details regarding the condition of the vehicle in the case notes. This may include:

- Windows up or down
- Exterior wet/dry/condensation present
- Odors present in the vehicle
- Position of the gearshift
- Tire/wheel condition
- Steering column intact/damaged
- Lights on/off

Secure and/or protect any evidence that may be lost or destroyed during transport to the VEB.



This includes evidence on the vehicle itself, such as cartridge cases near the windshield wipers. Tape may be used to secure shattered glass that is intact in the window frame. A tarp may be used to secure evidence inside the vehicle if all windows are down/broken, etc. **If these actions are taken, they shall be recorded in the case notes.**

#### **Processing Vehicles at the VEB:**

CSIs who are assigned to process vehicles at the VEB are responsible for:

- Ensuring all required paperwork for the vehicle search is present and available for review.
- Retrieving and inspecting the paperwork for the vehicle they have been assigned to process. If the information regarding the processing is incomplete or unclear, the CSI must contact the requesting officer or detective for clarification.
  - If any instructions and/or information is provided verbally (i.e. detective advises he has written consent, but has not provided the document), the CSI shall document in the case record the name of the detective providing the information and the instructions given.
- Review available reports in RMS which may provide additional information about the crime and/or the vehicle. This information may assist the CSI with determining which processes and/or items in or on the vehicle may be relevant to the case.
- Updating the VEB vehicle log.
  - This log contains information on vehicles that are pending assignment to a CSI, those ready for processing and those that are completed.

#### **21.3. Photography**

The CSI shall photograph all four sides of the vehicle, license plate and any decals or custom accessories. Overall, mid-range and close-up photographs **shall** be taken of any relevant damage to the vehicle, including bullet holes with and without labels and scales of measure, as well as evidence in, on or under the vehicle.

Other areas of note may include the gas tank door opening, under the hood, or the undercarriage.

The CSI shall photograph the following interior areas of the vehicle (see [Section 3.2](#) for additional photography requirements):

- All passenger areas
- Trunk
- Console
- Glove compartment
- Door pockets

For vehicles involved in traffic collisions, include images of the interior safety devices such as air bags, seat belts, child seats, etc. to document their presence and condition.

#### **21.4. Fragile Evidence in or on a Vehicle**

The CSI should give immediate attention to the most fragile evidence prior to completing a full search of the entire vehicle. Evidence may become fragile with the passing of time, exposure to elements or environmental factors, movement and improper handling. If trace evidence is



collected, it shall be done upon initial entry into the vehicle.

### 21.5. Evidence Collection from Vehicles

The vehicle may be searched and processed in any order that suits the CSI, as long as the search is systematic and meticulous and does not result in cross-contamination. A bright white light and an alternate light source (ALS) should be used when searching for trace evidence or body fluids.

All areas of the vehicle that are relevant to the crime and included in the consent or warrant shall be searched. Some investigations may require a whole and complete search which may include, but is not limited to:

- Undercarriage of the vehicle
- Under the hood
- Inside the trunk
- Underneath and alongside the seats
- Inside compartments
  - Glove box, interior door pockets, center console, ashtray, seatback pockets, etc.
- Underneath visors
- Possible hidden compartments

Exercise caution when searching poor visibility areas (such as under seats or in hidden compartments). A small mirror and flashlight may allow the CSI to search these areas and reduce the risk of exposure to hazardous materials.

Photographs shall be taken of any damage caused by CSIs during the recovery of evidence. This may include but is not limited to: removal of door panels or cutting seats or carpet.

### 21.6. Bullet Defects in a Vehicle

See Section 6.3 for more information.

### 21.7. DNA Collection from Vehicles

DNA may be collected from items inside a vehicle including, but not limited to: commonly touched surfaces in the vehicle, cigarette or cigar butts, drinking straws, cups, bottles, makeup, airbags, etc. Rather than swabbing items for DNA or processing for fingerprints at the VEB, the CSI may choose to collect these items and do further processing in the laboratory.

A DNA sample collection consists of a cotton swab moistened with distilled water. The recommended areas for collecting contact DNA samples are as follows:

- Interior door handle, arm rest, etc. with one sample per door
- Exterior door handle, with one sample per door
- Steering wheel/gear shift, one sample
- Seat belt latches with one sample per seating area

The specific location of DNA sample collection (such as steering wheel, interior/exterior door handle, etc.) shall be documented in the case notes.

### 21.8. Vehicle Latent Print Processing



- All surfaces of a vehicle and all objects in or on a vehicle should be considered for processing, but what surfaces to process and what techniques to employ are left to the discretion of the CSI and agency investigator.
- DNA samples should be collected prior to latent print processing unless clean powder procedures are used.
- The vehicle information should be listed on the first latent print card.
  - If more than one vehicle in the same case is processed by the same CSI, the latent print cards shall be placed into separate envelopes, one envelope for each vehicle.

## 22. Securing and Packaging Evidence

CSU does not store evidence long-term. Evidence is stored long enough to ensure it is dry and properly packaged and then it is transferred to long-term storage outside of HFSC or is transferred to another HFSC discipline for storage and/or analysis. While in CSU, the evidence shall be stored under proper seal and protected from loss, cross-contamination and/or deleterious change in accordance with the HFSC Quality Manual. Evidence shall be secured in an approved short-term evidence storage location whenever it is not being actively processed by a CSI.

Because CSU is a limited access area, evidence in the process of examination may be left unattended for a short period of time.

- Unpackaged evidence shall not be brought into office areas; all processing and packaging shall be done in approved areas, such as the basement.
- Short periods of time typically include time needed for telephone calls or restroom breaks. During such times, the CSI shall take reasonable precautions to secure the evidence, such as covering the exam area with clean paper and/or a "Do not touch" sign.
- The CSI should write the case number and his/her name on this or another piece of paper.
- If the CSI suspects that an item might have been compromised, those circumstances shall be recorded.

Evidence shall be stored under proper seal and protected from loss, cross-contamination and/or deleterious change in accordance with the HFSC Quality Manual. Evidence shall be secured in an approved short-term evidence storage location whenever items are not being actively processed.

Evidence in the process of examination may be left unattended for a short period of time.

- This would typically include time needed for telephone calls or restroom breaks. The CSI shall take reasonable precautions to secure the evidence, such as covering the exam area with clean paper and/or a "Do not touch" sign.
- The CSI should write the case number and his/her name on this or another piece of paper.

CSIs shall thoroughly and accurately document evidence under their control by use of notes, sketches and/or photographs. Evidence descriptions may include:

- Type of item
- Color and/or size of item
- Manufacturer's markings or serial numbers
- Noticeable damage to the item
- Stains and/or unusual stains
- Unusual markings



If the original collection package/container cannot be used for submission (usually due to the presence of biological material on the package), the CSI shall repackage the item in a new container. The original collection container/package shall also be submitted with the evidence. This may be a separate item or included with the evidence item. If it is included with the evidence item(s), this shall be documented in the case notes.

The Firearms Unit prefers that items of evidence not be placed in more than two containers. For example, a cartridge case may be placed in a coin envelope then into a larger manila envelope. No further packaging should be used.

#### Interior Packaging

The agency case number and a brief description of the contents shall be written on interior packaging, such as coin envelopes. If the contents are a biological hazard such as blood, both the interior and exterior containers shall be marked as biohazard. All interior packages should be secured so the contents cannot escape. Swab box flaps should not be taped.

#### Outer Packaging

Final outer packaging shall be an appropriate container that is properly sealed. A container is properly sealed if its contents cannot readily escape and if entering the container results in obvious damage/alteration to the container or its seal. The seal on the evidence package shall contain the date and initials or signature of the person sealing the container, written over the container and the seal. A proper container is one that protects the evidence from loss, cross-contamination or deleterious change during long term storage. CSIs shall ensure all evidence is appropriately packaged before transporting it to the Property Room or to a non-HPD agency for long-term storage.

The container exterior shall contain at minimum, the following information:

- Case number
- Evidence marker number (if applicable)
- Description of item(s)
- Biohazard (if applicable)
- CSI's name

#### 22.1. Authorized Temporary Storage

HFSC storage lockers, cages and evidence drying cabinets (see Section 4.2 for further information on chain of custody) are authorized temporary evidence storage locations. Items will be secured in these locations for processing when the direct submission of evidence to the HPD Property Room is not feasible. Evidence pending submission to the HPD Property Room shall be secured in an authorized temporary storage location by the end of the CSI's work shift. An integrity tag shall be used to secure each locker and drying cabinet. The tag number shall be recorded in the CSI's case notes.

CSIs must complete the Temporary Evidence Storage Log sheet any time evidence is placed into a cabinet or locker. A copy of the log documenting the initial entry and the final removal shall be included in the case record. Evidence temporarily removed by the submitting CSI for processing, photography, etc. is documented in each CSI's case notes.



Supervisor approval is required if a CSI other than the one who placed the evidence into the storage location removes the evidence from that location. Any CSI other than the submitting CSI or supervisor, who removes an integrity tag for any reason, shall email the submitting CSI and the supervisors, detailing any actions taken with the evidence. This email shall be included in the case record.

3-HFSC is a generic virtual designation used by the Houston Police Department (HPD) evidence management system (EMS). Items carrying the 3-HFSC designation have been entered into the HPD EMS but are being temporarily stored at HFSC for additional processing by HFSC. Items of this nature include, but are not limited to, firearms evidence and fragile evidence awaiting latent print processing.

- A chain custody shall accompany items placed in 3-HFSC. CSIs shall not use the 3-HFSC designation for chain of custody purposes. When 3-HFSC is used by CSU it must be accompanied by temporary storage locker location (i.e.: 3-HFSC Locker 103).

## 22.2. Drying Cabinets

Drying cabinets are temporary storage locations used by CSIs to secure damp evidence during the drying process. The air flowing through the cabinet is circulated through an activated HEPA filter. Wet evidence shall be fully dried before packaging.

### 22.2.1. Maintenance and Use

Evidence placed in the drying cabinets shall be handled in the following manner:

- CSIs shall wear gloves while handling items.
- The cabinets shall be cleaned using an approved disinfectant or a 90/10 bleach solution both before and after each use to prevent cross-contamination of evidence.
- Allow the bleach solution to sit for approximately 60 seconds and then wipe the area clean and dry it thoroughly.
- Place a piece of clean butcher paper at the bottom of the cabinet before adding evidence.
- Evidence from the same case can be placed in the same drying cabinet unless the evidence is obtained from different individuals.
- Items in the drying cabinet shall be spread out to facilitate rapid drying.
- The internal fan must be on and working correctly since it assists in the drying process. The internal fan shall be 'on' anytime evidence is in the cabinet.
- To ensure proper airflow, make sure all door handles are twisted closed.
- Drying cabinets shall be secured with integrity tags while evidence is in them.
- Document the placement and removal of items on the drying cabinet log affixed to each cabinet. **Wear gloves when removing items from the cabinets.**
- The CSI shall monitor the drying process of items in the cabinet. When the items are dry, remove them and either place them in a locker or package and submit them to the HPD Property Room. **Non-HPD evidence shall be returned to the proper law enforcement agency.**
- Dry contaminated materials will be properly packaged and placed in a container marked with biohazard warnings before being submitted to the Property Room or



returned to the agency.

- The drying cabinet is equipped with a low airflow alarm. If the alarm sounds, turn the unit off and wait approximately one minute before restarting.
- Each cabinet is also equipped with an alarm that indicates when the HEPA filter needs to be changed.
  - Pre-filters in the door and interior top of the cabinet should be changed approximately once every 90 days.
- If the drying cabinet is not functioning properly, hang an 'out of order' sign on the door and inform a supervisor.

### 22.3. Other Evidence Drying Equipment

If hangers are used in the drying cabinet, only plastic hangers shall be utilized. These plastic hangers shall be cleaned with approved disinfectant or a 90/10 bleach solution after each use. If clips or clothespins are used to hang items, they shall be discarded after each use.

### 22.4. Non-HPD Evidence

Evidence collected for an agency other than the Houston Police Department shall not be submitted to HPD's Property Room. Non-HPD evidence shall be returned to the agency representative either at the scene or after the CSI has completed processing or documentation in the laboratory. The evidence shall be properly documented and packaged for transfer prior to return to the requesting agency.

All photographs and video recording(s) shall be transferred to media such as a CD, DVD or thumb drive. This media shall be packaged and sealed as an evidence item and be included in the chain of custody.

## 23. Post-Scene Documentation

### 23.1. Uploading Images

CSIs shall upload .jpg scene images for HPD cases to Dataworks, the digital imaging storage system. After uploading, the CSI shall verify that **the number of photos uploaded matches the number of photographs counted by Dataworks**. CSIs should upload the images by the end of their work shift. The images themselves cannot be altered. To preserve and maintain original image integrity and chain of custody of digital images, all captured images shall be imported prior to any other application of image handling, enhancement, processing, analysis or reproduction. **The automatically generated email confirmation of successful import into Dataworks shall be printed and placed in the case record. If the confirmation email is not received, that shall be documented in the case notes.**

Uncompressed file format images (such as comparative quality images taken in RAW) are not uploaded to Dataworks. These images are written to a CD or DVD and submitted as an evidence item to the HPD Property Room. **These CDs and/or DVDs will be checked prior to submission and the check will be documented in the case record.** Memory cards should be formatted once all image uploading and CD/DVD writing is complete.

See **Section 22.4** regarding images taken for non-HPD cases.



### 23.2. Report Writing

Reports shall be written for all casework completed. Casework includes, but is not limited to, crime scenes, administrative assists such as submitting evidence to the HPD Property Room or NOCC, completing FARO renderings, etc. If the CSI responds to a scene but no forensic services are provided, the CSI shall document this in the case record and write a report stating such. The CSU standardized wording guide shall be followed for all reports, where applicable. The reports shall be free of hearsay and/or unsupported conclusions. There are some unique situations/scenarios that are not listed in the standardized wording guide. The CSI should consult with a supervisor to develop wording that best fits the situation.

Descriptions and other observations will be made in clearly understood language avoiding esoteric terms or slang, whether common or industry related. Non-standard abbreviations will not be used in the report unless they are defined in the report.

In addition to information required for the laboratory information management system (LIMS; as of the effective date of this SOP, CSU is using JusticeTrax LIMS) report entry, reports shall also include:

- The date(s) of all examinations/inspections performed, including any follow-up processing or photography
- Identifying information of items collected (evidence marker or descriptive information)
- Results of examinations, searches, and/or presumptive tests performed
- Dates of evidence submission
- A statement denoting "All measurements are approximate" when measurements are included in the report

CSIs shall not include the names of undercover police officers in reports.

### 23.3. Final Scene Diagram

A final diagram shall be completed for every scene where a rough sketch is completed, unless otherwise authorized by a supervisor. Although the final diagram is not to scale, it should represent as proportionately as possible the spatial relationship between items in the diagram.

The final diagram shall include the following:

- Agency case number
- Date and type of incident
- Address/location of the scene depicted on the diagram
- Name of the person completing the diagram
- A statement indicating the drawing is "Not to Scale"
- Legend or key to identify all evidence items and reference points
- Directional arrow
- Measurements, either on the diagram or a separate sheet.
  - A statement that "all measurements are approximate" will be included on the diagram.
- HFSC logo
- ANAB accreditation statement or logo



- Date diagram was completed

The diagram shall be **uploaded as an attachment in JusticeTrax. The CSI should also keep a copy of the digital version of the sketch in the event it needs to be edited at a later date.**

#### **23.4. Case Records**

Case records, **as defined in the HFSC Quality Manual, may be in either** hard copy or electronic form **(or a combination of both)** and shall contain the following documentation (applicable to the type of scene processed):

- Final report
- All crime scene notes
- All rough sketches
- Final diagram
- Forms and/or paperwork used to support, or document casework requested or performed
- VEB paperwork
- NOCC (Narcotics Operations Control Center) paperwork
- CSU cover pages
- CSU case file divider pages
- HPD Property Room receipts
- Emails or other correspondence regarding case information
- Chain of custody forms
- Temporary evidence storage location logs
- Confirmation of images uploaded to Dataworks
- CD or DVD of photographs and/or video

Unless authorized by a supervisor, the case record will not include:

- Copies of papers, cards, identification, etc. when the original is submitted as evidence
- Copies of reports written by HPD or other law enforcement officers
- Copies of latent print cards
- Photocopies of CDs or DVDs

##### **23.4.1. Case Record Reviews**

**CSIs shall review their own case record prior to submission to supervisor for review. Draft completing their case record serves as documentation of this review.** All casework shall be administratively reviewed. All casework performed by trainees shall also be technically reviewed. Otherwise, a minimum of 50% of casework performed by CSIs conducting independent casework shall be technically reviewed. Guidelines for administrative and technical reviews are in the HFSC Quality Manual. **See Appendix B for the CSU Case Record Review checklist.**

Preliminary evidence lists created by CSIs and sent to the investigator after completion of a scene are not subject to review prior to being released to the investigator. This list is reviewed with the entire case record during the AR/TR process. If changes are made to the evidence list during the AR/TR process, the revised list will be made available to the investigator as part of the final report. The revised list shall also be emailed to the investigator.



All technical reviewers have been authorized and have sufficient knowledge of crime scene processing and investigations to ensure the case records show that CSU procedures were followed, and correct processes and methods were used. Administrative and technical reviews may also be used in part to monitor personnel for satisfactory performance and as a means of identifying training needs.

ARCHIVED



## Appendices

### Appendix A: Technical Details

#### Biological Evidence

DNA is found in all nucleated cells in the body. This includes blood, saliva, semen, vaginal secretions, skin, perspiration, ears, nasal secretions, bone, and hair. A DNA profile can often be obtained from less than one nanogram of DNA. That is equivalent to fewer than 150 cells which can be found in a bloodstain the size of a pin head. This means that DNA profiles can be obtained from various types of evidence and that the potential presence of DNA should be evaluated based upon the normal use of an item, even if there is no visible stain. An example of this is the rim of a drinking glass or the interior band of a hat.

#### Blue Star

Blue Star is a latent blood visualizing agent that is effective on fresh, very old or altered bloodstains, either pure or diluted, and does not alter DNA. It is used to reveal bloodstain patterns on surfaces from which blood has been cleaned or surfaces on which blood is not readily visible.

#### Deceased Persons Located Outside Harris County

Several areas of Houston are within the jurisdiction of the City of Houston and the Houston Police Department but are not within Harris County. The Harris County Institute of Forensic Science (Harris County Medical Examiner's Office) will not respond to death investigations outside of Harris County. If a county does not have a Medical Examiner, they often operate on the Justice of the Peace (JP) system and dispatch an on-call JP Death Investigator for the scene investigation. These counties contract with a neighboring county's Medical Examiner's (ME) Office to perform autopsies. A JP/Judge must send the investigator to the scene and sign a release allowing the decedent to be transported to the contracted ME's office. This transport is often done by a contracted funeral home.

The CSI will coordinate with the HPD investigator on scene regarding when to contact the JP death investigator and if trace evidence needs to be collected from the decedent. When the death investigator arrives, the CSI will record their name, title, and the precinct they represent.

#### End of Shift Duties

##### Items that must be completed by the end of your shift if a call or VEB was received:

- You must respond to the VEB once the assignment is received.
- No OT will be authorized for VEB assignments unless a Supervisor instructs otherwise.
- If you cannot complete your vehicle, place the vehicle on hold.
- If you cannot complete your required end of shift duties before the end of shift, ask a supervisor about next steps.
- Fill out call log.
- Upload photos to Dataworks and forward video CD to appropriate division, if applicable.
- Email evidence list to the CSU Support Specialist and cc all supervisors.
- Money greater than \$100 must be submitted to the Property Room.
- Narcotics must be submitted to NOCC.
- Firearms evidence (cartridge cases, firearms, cartridges and projectiles) must be submitted to the Property Room and/or 3-HFSC.



**If it is your Friday when you return from a call or VEB and/or you have less than two (2) hours left in your shift, in addition to the items above, you must:**

- Turn narcotics, cartridge cases, firearms and/or DNA swabs (contact/blood/saliva) collected over to a CSI on the next shift using a COC form.
- That CSI will submit the evidence and complete a brief supplement (coded as AA "Admin Assist" in the call log).

All evidence must be packaged/sealed by the collecting CSI prior to release. For cases with large amounts of evidence, ask supervisor about who should package/seal evidence.

The submitting (AA) CSI may do the RMS entry.

### **Fiber Standards**

Fiber comparisons can be performed on both natural and synthetic fibers. A potential fiber source may have one or more different kinds and colors of fibers present and the differences may only be apparent using microscopic or instrumental techniques. Therefore, it is important to obtain a fiber standard that adequately represents all the fiber types and colors present in the potential source.

### **Footwear and Tire Track Information**

Footwear and tire tracks may contain individual or class characteristics. Individual characteristics can be identified to a specific object or person. Class characteristics are common to several objects or people. The CSI **does not** make a determination between class and individual characteristics. That will be done by a footwear/tire track expert if needed.

CSIs should look for footwear evidence in the following areas:

- In soil and/or dirt
  - These impressions may be apparent with visible light or may need to be visualized using oblique lighting techniques.
- Impressions from water or rain
  - These need to be photographed quickly before evaporation begins.
- Freshly waxed floors or furniture
- Vegetation or wide leaves
- Tiled, carpeted or linoleum floors
- Countertops
- Forced points of entry such as doors or windowsills

Footwear impressions may not be readily visible under various lighting techniques and the CSI may need to enhance the area with powder or chemicals.

### **Gunshot Residue**

When a firearm is discharged, unburned and partially burned particles of gunpowder, gas, soot, metallic particles and vaporized metal are propelled forward and backward out of the barrel. If the muzzle of the weapon is sufficiently close, these products will be deposited forward onto the target area and/or backward onto the shooter. It is the distribution of gunpowder particles and other discharge residues around the bullet hole that permits an assessment of the distance from which a firearm was discharged.



- Zone search – This is often utilized for small, confined areas such as a vehicle. The area is broken down into zones and the searcher deals with each one individually.

### Impression Evidence

Impressions are viewed as three-dimensional, such as shoeprints in mud or snow or a pry mark on a door. Imprints are viewed as two-dimensional, such as prints in dust or transferred in another medium such as blood or grease. For purposes of this SOP manual, the term “impression” also means “imprint” evidence unless specifically stated otherwise. Impression evidence can be found on hard and soft surfaces. Tire, footwear and fingerprint evidence can be either three-dimensional (i.e. an impression deposited in soft dirt or a fingerprint in wax or clay) or two-dimensional (i.e. deposited in grease or dust on a hard surface or bloody fingerprints). Tool marks are typically found at areas of forced entry in the form of cutting, prying, pinching or sheering.

### Casting Material for Impression Evidence

Casts are beneficial because they provide a lifelike molding of the original impression. They can reproduce microscopic characteristics and, in deep impressions, characteristics on the side of the outsole and midsole of footwear and on tire tracks. Casts can also support photographs with a tangible, three-dimensional piece of physical evidence.

### Latent Print Processing

Fingerprint identification is based on the following two premises:

- Friction ridge skin is formed on the palmar surfaces of the hands and the plantar surfaces of the feet during fetal development and will remain permanent throughout the life of the individual, except through damage by scarring or certain diseases.
- Friction ridge skin on the hands or feet of one person is different from the friction ridge skin of all other persons.

When the friction skin area of the palmar or plantar regions of the body touches another surface, a reproduction of the ridges of the friction skin may be left behind on that surface.

### Categories of Latent Print Impressions

Friction ridge impressions can be divided into three categories:

- Latent – invisible prints made by the transfer of perspiration and other secretions from the skin to a surface. Latent prints require development by physical or chemical methods. An Alternate Light Source or side-lighting the target area with white light is often used to locate prints that may otherwise remain undetected.
- Plastic – visible prints made by a friction ridge impression in soft, pliable surfaces such as putty, modeling clay, etc.
- Patent – visible prints made by the transfer of a foreign material such as blood, paint, or ink.

### Latent Print Powder Processing

CSIs are provided with a container in which to keep supplies for latent print processing. CSIs are responsible for keeping the kit stocked and the supplies kept in bags or similar containers to minimize leakage of fingerprint powders. All secondary containers (powder, distilled water,



etc.) shall be appropriately labeled.

Fingerprint dusting powders adhere to the moisture and oils left on an object when it is touched by friction skin. Powders work best on non-porous surfaces since the moisture and oils remain on the surface and adhere better to prints that are recently deposited and/or contain a greater amount of moisture or oil residue. Hard, smooth non-porous surfaces can be dusted with fingerprint powders and found prints can be lifted with tape and placed on latent print cards. Dusting and lifting are not recommended as initial processing technique for surfaces contaminated with blood, grease, oil or similar materials. Powders are not recommended for use on porous materials, but magnetic powder may be used in certain circumstances when collection of the item is not practical. Powders also adhere to deposits on items processed with cyanoacrylate vapors and are useful in making prints visible after fuming.

#### **Small Particle Reagent (SPR)**

SPR is a suspension of molybdenum disulfide (powder) particles in a detergent solution. SPR is a physical development technique where these small particles adhere to the fatty substances left in fingerprint residue. SPR is most well-known for its ability to develop latent prints on wet surfaces such as vehicles wet with rain, dew or immersed in water.

#### **Metal Detector**

The metal detector is used to aid the CSI in detecting and locating metal objects. It may be used on any surface but is most useful when the evidence item is buried or at an obscure level, such as in sandy, grassy, overgrown or wooded areas. The metal detector operates using audible tones to alert the user to the possible presence of a metallic object within the area under the coil.

#### **Paint**

The CSI should consider the possibility of physically matching unknown paint chips to the source when determining how to collect paint standards. When possible, collect the entire item. Comparisons can be performed on a variety of paint types including, but not limited to, automotive paints, architectural paints, spray paints, etc. A potential paint source such as a vehicle, may have more than one kind or color of paint present and the differences may only be apparent using microscopic or instrumental techniques. Therefore, it is important to obtain paint standards that adequately represent all the paint types present on the item.

If paint transfer is located on another painted surface such as an automobile body, collect a paint standard from an area close to, but not within, the damaged area. When processing a vehicle or scene and a request is made for physical match comparison, collect all the damaged vehicle body components that have paint transfer, rather than attempting to remove paint samples and standards.

If you cannot collect the entire item, collect a sample or standard using a clean razor blade, scalpel or knife to gently pry, carve or chip the paint from the surface down to the foundation or substrate. If possible, do not remove the paint by scraping as all paint layers may not be represented and/or the layer structure may be Collect a sample approximately 1"x 1" from a particularly damaged area, when possible. Collect paint standards near each damaged area in the same manner. Include a description of the paint standard or sample in the case notes, including from where it was collected.



### Processing Vehicles

During a criminal investigation, the CSI may be called upon to process a vehicle for physical evidence relating to a crime. This vehicle may or may not be the primary location of the crime and should be treated as a crime scene and given the same attention as a primary scene. The evidence inside a vehicle may yield information valuable to solving the investigation or identifying people involved with the offense. The type of evidence that should be searched for in a vehicle will be dependent on the type of crime being investigated and the involvement of the vehicle in the offense. It is important for the CSI to establish a specific and organized approach to processing a vehicle. The CSI shall attempt to contact the requesting officer to obtain relevant information to sufficiently and thoroughly process the vehicle. If no response is received by 48 hours after the CSI completes processing, the vehicle may be released.

### Search Patterns

There are four basic crime scene search patterns. Each search should be done in a methodical and systematic manner.

- **Spiral search** – This should be utilized for outdoor scenes and should only be used to locate large evidentiary items (such as clothing or weapons). The searcher should start at the center of the scene and follow a uniform, spiral path outward from the center until the perimeter of the scene is reached.
- **Line search** – This is often utilized for outdoor scenes when a large area is being searched. The scene should be divided into narrow lanes; no more than an arm's length on either side of the searcher if more than one person is searching, and that person searches only their designated lane. Each line is searched until the entire search has been completed.
- **Grid search** – This is a variation of the line search. The area is divided up into two sets of lines that run at 90-degree angles to each other. The searcher moves up and down each line until the area is completed, then starts a second search using the second set of lines which are at right angles to the first.
- **Zone search** – This is often utilized for small, confined areas such as a vehicle. The area is broken down into zones and the searcher deals with each one individually.

### Sketch Perspectives

- **Birds Eye or Overhead**– items are drawn on a horizontal plane as viewed from above; most common sketch type
- **Side View or Elevation** – items are drawn on a vertical plane; most commonly used for bullet defects or bloodstain patterns on a wall
- **Exploded** – Combination of bird's eye and side view; items are drawn as if in a room with the walls laid flat (like an open box)

### Soil and Pollen

Soil can help law enforcement agencies in associating certain persons or objects with specific places. Soil, dirt and dust are common elements at almost every scene. Samples of soil collected from clothing, skin, hair, shoes or car of a victim may prove useful in linking the victim with the location where the crime occurred. The same would be true of suspects believed to be associated with a crime. Mud found on a stolen vehicle or a vehicle used in a crime could link the vehicle with the scene or place from which it was stolen. Dirt found on objects such as bicycles, motorcycles, etc. may also yield pollen evidence useful in linking those items with a specific crime or specific geographical



location. Examples of where soil, dirt, dust or pollen samples should be collected are numerous. Professional judgment and awareness of what types of information a CSI might get from soil/pollen samples should be a primary guide for collection. In addition, steps must be taken to ensure the samples do not become contaminated.

**SPR** – see Latent Print Powder Processing

### **UV/IR Camera Filters**

- **B+W 39mm UV/IR Cut MRC 486M Filter**
  - Used to “Cut” the UV/IR from the capture of images. While IR will still leak through the glass filter, this filter assists with making the captured photographs appear to be standard as a non-full spectrum camera. A custom white balance should be used before capturing images using this filter because it will assist in removing the pink tint left in the photographs by IR leakage.
- **B+W 39mm – UV (Long) Black 403 Filter**
  - Blocks visible light but allows UV A Radiation (320-385nm) to pass through. The UV black filter appears completely black and is used in combination with various light sources. Depending on the type and amount of illumination and materials being used, the filter factor ranges from 8 to 20, or roughly losing 3 to 4.3 stops of light. Use an UV light source with this filter.
- **B+W 39mm – IR Dark Red 092 Filter**
  - Blocks visible light up to 650nm, allows to pass 50% of radiation just below 700nm, as well as passes >90% of radiation from 730-2000nm. 695nm – transmission peak. Use an IR light source, including the sunlight with this filter.
- **B+W 39mm – IR 093 Filter**
  - Blocks visible light up to 650nm yet allows 50% of the radiation just below 700nm to pass through. Also, it passes <90% of the radiation from 730-2000nm. Has a transmission peak at 695nm.
- **Schneider 39mm 098 Filter**
  - Blocks visible light up to 800nm. Has a transmission peak at 775nm. Use an IR light source, including the sunlight with this filter.



## Appendix B: CSU Case Record Review Checklist

CSIs should follow these guidelines when completing administrative or technical reviews of CSU case records. Case records can be on paper, electronic or a combination of both. This checklist applies to items in either format.

- Is the report free from spelling and grammatical errors?
- Are the names and titles of law enforcement investigators, other CSIs, supervisors and subjects spelled correctly and consistently in the notes and report?
- Are the addresses listed in the report, notes, cover sheets and photo cover sheet correct and consistent?
- Do case notes contain all relevant information including scene description, locations, evidence information and information verbalized to the CSI by the investigator or other personnel?
- Do the details in the report match the case notes? Are all details in the report included in the notes?
- Is the case record free from obliterations and write-overs? Are errors struck through with a single line that is initialed?
  - If additional information is added to the notes, is the date the information was added and the initials of the person adding the information present?
- Does the report properly describe all actions taken on scene by the CSI? Does the report also include any negative results?
- Are original field notes and correct forms included, including VEB paperwork, request forms, e-mails, etc.?
- Are the case number, page number and CSI's name or initials on every page in the case record?
- Are all items of evidence listed in the notes also on the RMS report, the Property Room receipt and in the report?
- Are forms used the current version?
- Are all transfers of evidence captured on the Chain of Custody (COC) form?
  - Is the COC signed by the correct people?
- Is the currency worksheet completed correctly?
  - Is the worksheet signed by the correct people?
- Are all photographs properly exposed and are all aspects of the scene accurately captured? Does the photographic record include overall, mid-range and close-up photos?
- Was a video recording completed for scenes on which it is required?
  - Does the video cover the entire scene and is the quality sufficient (not moving too fast or out of focus)?
- Are all areas processed for latent prints in the notes and report (do they correlate) including areas that were processed but no lift cards collected?
- Were appropriate processing methods used? Did the CSI record lot numbers and control test information? Is the statement "all measurements are approximate" present in all reports listing measurements?
- Does the final diagram contain the date of the crime scene and the date completed?
- Is the accreditation statement included in the diagram header?
- Are all data transfers from the rough sketch to the final sketch accurate?



## Appendix C: FARO Checklist

### Items needed for FARO scanning:

- FARO Case
  - FARO
  - Batteries (at least 2)
  - Battery car chargers (2)
  - SD Card(s)
- Tripod
- Targets (if needed)

### On Scene Checklist:

- Secure the scanner on the tripod
  - Leave it loose enough that the FARO can still move
- Insert SD card
- Insert battery
- Power on the FARO
- Ensure the date and time are correct
- Format the SD card (if necessary)
  - Manage → Service → SD Card → Format
- Create a new project
  - Manage
- Set the project name
  - Case number with no dash (123456720)
  - No underscore at the end
- Set the Parent Project to “No Parent Project”
- Set the File Base Name
  - Case number with an underscore (123456720\_)
- Set the Initial Scan Number
  - Set to 1 or 01 (unless other scans of scene were done previously)
- Check the appropriate profile for recommended settings and modify as needed
  - Set the Resolution
    - ↳ Home Parameters
      - $\frac{1}{5}$  for indoors or vehicle scans
      - $\frac{1}{4}$  for outdoors
      - $\frac{1}{4}$  or  $\frac{1}{2}$  for bloodstain and flight path
    - Set the Quality to 3X or higher
    - Ensure all Sensors are turned on (GPS if outdoors, **NO** GPS if indoors)
    - Set the Color Settings (AKA Exposure)
      - Even Weighted for outdoors
      - Horizon Weighted for indoors
      - Zenith Weighted for bright rooms
  - Set the Scan with Color option



- Turn on for color (indoors or daylight **only when evidence is present**)
- Turn off for black and white (low light or night)
- If using targets, set them up
  - Max distance:
    - o 35ft for  $\frac{1}{5}$  resolution
    - o 55ft for  $\frac{1}{4}$  resolution
- Have a minimum 35% overlap between scans
  - Approximately 55ft or less between scans
  - Better to take more scans than needed
- SCAN ALL THRESHOLDS**
  - Scan may be done in black and white AND 1/10 resolution to save time
- TAKE REFERENCE MEASUREMENT**
  - Can be anything such as height of permanent item, width of doorway, width of sidewalk, etc.
  - If in a location without anything to measure, CSI may utilize the steel ruler in the FARO kit
- DRAW ROUGH SKETCH FOR REFERENCE WITH SCAN LOCATIONS NOTED**
  - Note on sketch "For orientation purposes only"
  - Don't forget north arrow

**After Scene Checklist:**

- Place batteries on chargers
- Remove SD card **after** turning FARO off

**Other Considerations:**

- FARO Unique ID is either 1 or 3
- Ensure all close-ups of evidence items have been photographed

**Tips:**

Threshold scans:

- Don't need them to be high quality
  - o Can be done in black and white
- Scan even if the door is glass