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REVISION HISTORY

Effective Date	Brief Description of Change(s)
1/21/2020	Original Issue Previous revision history for individual chapters included in archived documents

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01 OVERVIEW

CSR-TM-01-01 OVERVIEW OF THE CRIME SCENE RESPONSE TRAINING PROGRAM

1 Introduction

This training program is designed to train Crime Scene Team members with the Texas Department of Public Safety Crime Laboratory. Trainees will learn to properly identify, process, collect, and preserve evidence with the suggested techniques and procedures outlined in this training program.

Upon successful completion of this training program, the Crime Scene Team member will be authorized to respond to crime scenes as a generalist. A generalist is a team member who is cross-trained in the disciplines and techniques outlined in this training program.

2 Purpose

The Crime Scene Response Training Manual is designed to provide the trainee with sufficient background, education, competency, and hands-on experience to respond to crime scenes with minimal supervision. Trainees having prior crime scene experience and/or experience in discipline-specific collection and preservation procedures may be evaluated to determine if a modified training plan can be used. The modified training plan will be documented and approved by the trainer and the System Quality Manager.

3 Program Format

- A. The training program is divided into several units, each consisting of a set of modules. The modules may consist of discussions and demonstrations with the trainer, practical exercises, practical exam(s), and written exercises. The modules may be dependent or independent of other modules within the unit and the prerequisite modules/units will be noted.
1. **Crime Scene Documentation** will introduce the trainee to the responsibilities of crime scene team members, legal requirements, general documentation, scene assessment, sketching and measurements, search techniques, evidence collection, and report writing.
 2. **Crime Scene Photography** will introduce the trainee to photographic techniques relevant to general crime scene documentation and evidence specific documentation.
 3. **Trace Evidence** will introduce the trainee to the documentation, collection, and preservation of trace evidence, including impression evidence, encountered at a crime scene.
 4. **Biological Evidence** will introduce the trainee to the documentation, collection, and preservation of biological evidence encountered at a crime scene.
 5. **Friction Ridge** will introduce the trainee to the documentation, collection, and preservation of friction ridge evidence encountered at a crime scene.
 6. **Firearms and Toolmarks Evidence** will introduce the trainee to the documentation, collection, and preservation of firearms and toolmark evidence encountered at a crime scene.

7. **Digital/Multimedia** will introduce the trainee to the documentation, collection, and preservation of digital/multimedia evidence encountered at a crime scene.
 8. **Forensic Document Examination** will introduce the trainee to the documentation, collection, and preservation of questioned document evidence encountered at a crime scene.
 9. **Other Topics in Crime Scene Investigation** will introduce the trainee to other situations/other types of evidence that may be encountered at a crime scene.
- B. Non-team members can attend scenes in an observational capacity only, unless circumstances require a specialized or discipline specific response.
 - C. At a minimum, team members must complete the Crime Scene Documentation Training Unit to attend and document a scene, excluding photography.
 - D. Team members must complete the Crime Scene Documentation, Crime Scene Photography, Trace Evidence, Biological Evidence, and Friction Ridge Training Units to respond to a crime scene as a generalist.
 - E. In addition, team members must complete the Firearms and Toolmarks, Digital/Multimedia, Questioned Document Examination, and Other Topics Training Units to respond to a crime scene as a Team Leader.
 - F. Major Crime Scene Team members may receive additional in-depth crime scene training in order to lead, direct, and coordinate the training and response activities of the crime scene team members. Training may be internal or external.

4 Safety

Safety precautions outlined in the Texas DPS Safety Manual will be followed at all times during the training program. Any specific safety considerations will be designated within the modules.

5 Assignment of Trainer

The trainer will be a Major Crime Scene Team member or designee.

- A. Meetings between the trainee, the trainer, and/or supervisor should be held regularly in order to evaluate the trainee's progress, plan future study and practical assignments, and address any deficiencies which may require additional training.
- B. The trainer will compose a memo documenting type and number of crime scene cases and/or reports reviewed for inclusion in the trainee's notebook.

6 Trainee Responsibilities

The trainee is required to maintain a training notebook. The trainee is responsible for completing reading assignments and other tasks in a timely manner according to their trainer's guidance. The trainee is responsible for informing his/her trainer or supervisor when issues or concerns arise at any time during the training period.

7 Training Notebook

Note: No case numbers will be used in a training notebook, with the exception of cases listed on the Supervised Work Log (LAB-307).

- A. During the training program, the trainee is responsible for keeping records in a notebook of his/her training to include written exercises, practical exercises, examinations, and other training module documentation. Completion of module requirements will be documented, dated, and approved by the trainer on the respective training record.
- B. The following is a list of items maintained in the training notebook:
 1. Training record (Training Checklist)
 - a) *List of reading literature completed (may be captured on training checklist)*
 - b) *List of in-house training videos viewed and lectures attended (may be captured on training checklist)*
 2. Observed/Supervised/Independent Exercises
 3. Competency tests and results
 4. Comprehensive written examinations
 5. Memo from trainer documenting type and number of crime scene cases and/or reports reviewed
 6. Courtroom testimony attended and observations/evaluations

8 Review and Authorization

8.1 Module and Unit Assessment

- A. Each unit may consist of several training modules. Each module is assessed upon the completion of the associated readings, practical exercises, practical exams and/or written exercises, as applicable. Once all module requirements in a unit have been satisfactorily completed, the trainee will complete a comprehensive written examination.
- B. A comprehensive mock scene will be performed upon the completion of the Crime Scene Documentation, Crime Scene Photography, Trace Evidence, Biological Evidence, and Friction Ridge Training Units. Document completion of the mock crime scene on the Crime Scene Response Final Assessment Training Checklist (LAB-CSR-TM-10).
- C. Training Units

The Crime Scene Response training requirements will conclude with examiner authorization to conduct supervised crime scenes by the Laboratory Director when the following are met:

1. All required reading assignments are completed.
2. All observed/supervised/independent exercises are successfully completed, as applicable.
3. A written examination at the end of each unit is successfully completed.
4. Successful participation of a mock crime scene after completion of the Crime Scene Documentation, Crime Scene Photography, Trace Evidence, Biological Evidence, and Friction Ridge Training Units.
5. The training notebook and other training records documenting completion of training requirements are reviewed by the trainer and SQA.

6. The trainer(s) recommend that the trainee be approved for supervised crime scenes.

8.2 Courtroom Testimony

- A. Courtroom testimony requirements shall be completed prior to independent work authorization. Document completion of the testimony requirements on the Crime Scene Response Final Assessment Training Checklist (LAB-CSR-TM-10). Requirements are met when the trainee has completed the following:
- B. The trainee will observe or discuss with a trainer examples of testimony covering relevant units. The examples of testimony can include past or current trials. In order to maximize the benefit to the trainee, the testimonies should include prosecution and defense questioning.
- C. The trainee will present one supervised crime scene or mock crime scene in a mock trial. The case will be chosen by the trainer and should allow for prosecution and defense questioning.
- D. Evaluation of the mock trial is documented on the LAB-313 and LAB-314

8.3 Supervised Crime Scenes

- A. Completion of supervised crime scene requirements will conclude with independent authorization.
- B. A minimum of 3 supervised crime scenes must be completed in order for the examiner to be authorized for independent crime scene work as a crime scene team member.
 1. The examiner is authorized for independent work in a unit when he/she is supervised performing work satisfactorily for at least one crime scene in each of these specific units:
 - a) *Crime Scene Documentation,*
 - b) *Crime Scene Photography Indoor/Outdoor,*
 - c) *Crime Scene Photography Vehicle,*
 - d) *Trace Evidence,*
 - e) *Trace Evidence Impression,*
 - f) *Biological Evidence, and*
 - g) *Friction Ridge Evidence.*
 2. An examiner can be supervised performing work in more than one discipline per crime scene.
- C. Supervised Crime Scene work is not required in the examiner's principle area of expertise.
- D. Mock crime scenes may be used to fulfill this requirement when necessary.
- E. The trainer/supervisor must initial all relevant pages/results in the crime scene documentation indicating that they concur with the examination/results.
- F. The trainer/supervisor should be consulted at each step of the crime scene processing prior to the trainee proceeding with that step.
- G. The trainee will maintain a record of supervised crime scene work (LAB-307).

- H. The trainer(s) will recommend to the Quality Manager that the examiner be authorized for independent crime scenes as a generalist using the Work Authorization Form (LAB-309).
- I. Crime Scene Team members that go on to successfully complete training in the Firearms and Toolmarks Evidence, Digital/Multimedia Evidence, Questioned Document Evidence, and Other Topics Units can be qualified to act as a Team Leader by being supervised as the Team Leader for one crime scene and then submitting a request for continued authorization, using the Work Authorization Form (LAB-309).

8.4 Evaluation of Training

- A. The trainee and trainer will complete the appropriate unit training checklist.
- B. The trainee will complete an evaluation of the unit content and the trainer using the Laboratory Training Program Evaluation Form (LAB-304).

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02 CRIME SCENE DOCUMENTATION TRAINING UNIT

CSR-TM-02-01 OVERVIEW OF CRIME SCENE RESPONSE AND DOCUMENTATION

Duration 3 to 5 days

Purpose The purpose of this module is to introduce the trainee to the tasks and responsibilities of the laboratory while participating in a crime scene response, including documentation and DPS forms.

Prerequisite None

1 Objectives

1.1 Theoretical

An important component of the service offered by the DPS Crime Laboratory is crime scene response. It is important for the crime scene responder to possess the skills to process a scene in the most efficient, effective, and professional manner, even under extreme circumstances. It is also important for the responder to understand law enforcement's role in the crime scene so that both parties can work together to accomplish the common goal.

It is important to remember that the goal of this module is to raise the awareness of the team member for all possible sources of evidence. It is expected that they will more readily recognize all evidentiary potential and therefore preserve and protect the evidence for disciplines outside their own specialty.

1.1 Practical

Upon completion of module, the trainee will be able to:

- A. Understand the general legal processes involved in a crime scene response.
- B. Review safety, evidence management, and agency policies important to a crime scene response.
- C. Become familiar with the various responsibilities of the crime scene team and correlate with the job titles detailed in the Crime Scene Response SOPs.
- D. Become familiar with the tasks required to process a crime scene, such as sketching, search methods, documentation, evidence collection and preservation, and recognizing evidence.

2 Training Outline

2.1 Lesson Plan

- A. Critical concepts
 1. Legal
 - a) *A scene is under the jurisdiction of a law enforcement agency.*
 - b) *Laboratory services are usually requested by the authority having jurisdiction or by the Texas Rangers on the jurisdictional authority's behalf.*
 - c) *With few specific legal exceptions, permission for law enforcement to seize evidence must be granted by a judicial authority (magistrate), through a search warrant.*

- d) *Law enforcement personnel must complete an affidavit articulating probable cause, and descriptions of what will be searched and what will be taken.*
 - e) *A **search warrant** may be issued for drugs, illegal weapons, and other prohibited items.*
 - f) *An **evidentiary search warrant** is requested for something that is not inherently illegal, such as clothing and fingerprints.*
 - g) *Evidence from a crime scene must be anticipated in advance and described in the affidavit signed by the judge issuing the warrant. Failure to adhere to the limits of the warrant may cause evidence to be invalidated.*
 - h) *Review the Texas Code of Criminal Procedure:*
 - i. *Chapter 1, Art. 1.06: Searches and Seizures*
 - ii. *Chapter 18, Art. 18.01: Search Warrant*
 - iii. *Chapter 18, Art. 18.10: How Return Made*
2. Safety
- a) *Law enforcement has the responsibility to provide continued security to laboratory personnel.*
 - b) *Law enforcement is responsible to render safe or clear the scene in hazardous material (HAZMAT) situations (presence of explosives, flammable and combustible substances, poisons, and radioactive materials).*
 - c) *Review safety module the General Laboratory Training Manual: General Safety and Safety Manual, as directed by the trainer.*
 - d) *Review the DPS General Manual (section 08.10.01)*
 - e) *Review venomous snakes, spiders, insect, and plant literature*
 - f) *Review clandestine lab safety*
 - g) *Review heat related injury and prevention literature*
3. Ethics
- a) *Confidentiality*
 - b) *Removal of anything from scene without permission and documentation is prohibited. The warrant is specific to what can be removed, and the rights of the property owner must be respected.*
4. All DPS policies apply
- a) *Review standards of conduct: General Manual Chapter 6*
 - b) *Review public statement policies: General Manual Chapter 5, Sections 05.76.00, 05.78.00, and 05.79.00*
5. All personnel must read the Laboratory Crime Scene Response Manual
- a) *Crime Scene Response SOPs relevant to pending scene*
 - i. *CSR-01-01 Crime Scene Processing*
 - ii. *CSR-01-02 Vehicle Processing*
 - b) *Types of evidence; collection and packaging (see CSR-TM-01-05)*

B. Laboratory System Response Overview

1. Request for assistance is made from law enforcement.
2. Personnel must notify appropriate chain of command up to Assistant Laboratory Director, as soon as practical. This notification must be documented in case record.
3. Regional Directors and Rangers should be notified if the request for assistance comes from a non-DPS agency. If notification is made, it must be documented in the case record.
4. Before the scene
 - a) *The Crime Scene Team is assembled.*
 - b) *Information is gathered about the crime committed and details about the scene.*
 - c) *Duty assignments are made.*
 - d) *Logistics plans are made for departure, conveyance, and supplies.*
 - e) *Functionality of supplies and equipment are verified before loading.*
 - f) *If a warrant is required for the scene, the laboratory investigation must wait to enter the scene until a warrant has been issued. It is most important for the response team to understand what had been articulated in the evidentiary search warrant because the warrant limits what can be seized from the scene.*
5. The Crime Scene Team is deployed and arrives at the crime scene. The team leader makes contact with the on-site law enforcement leader. The briefing should include review of warrant items, scene hazards, safe walkways, and review of details about the crime. Limitations of laboratory services and law enforcement expectations should be clarified.

C. Crime Scene Documentation

1. Begin with the end in mind. The purpose of the laboratory's presence is to gather physical evidence relevant to the crime and to fully document the evidence and the team's on-site activities for eventual presentation in a court of law.
2. Information gathering begins with the initial assistance request and continues throughout the entire process. Take notes to be able to complete the crime scene response request (LAB-CSR-01).
3. Scene assessment (see CSR-TM-01-02)
4. Crime scene sketches (see CSR-TM-01-03)
5. Systematic search methods (see CSR-TM-01-04)
6. Evidence collection and documentation (see CSR-TM-01-05)

D. Conclusion of a Crime Scene Response

1. Team leader should confer with on-site law enforcement leader to conclude the laboratory's investigation.
2. Everything brought to the scene should be removed.

3. Contaminated equipment must be decontaminated and personal protective equipment (PPE) must be properly decontaminated or disposed per chemical or biological guidelines.
4. All documentation is completed and reviewed for accuracy.
5. Supplies are restocked.
6. Crime Scene Response Report is written. (see CSR-TM-01-06)

2.2 Required Readings

- A. Texas Code of Criminal Procedures.
 1. Chapter 1, Art. 1.06 – Searches and Seizures
 2. Chapter 18, Art. 18.01 – Search Warrant
 3. Chapter 18, Art. 18.10 – How Return Made
- B. Safety Manual, Texas DPS.
 1. General Lab Safety
 2. Personal Protective Equipment
 3. Firearm Safety
 4. Biological Pathogen Exposure Control Plan
- C. General Manual, Texas DPS.
 1. Chapter 5 – Doctrines, Policies, and Operating Procedures
 - a) 05.76.00 – Public Speeches and Articles
 - b) 05.78.00 – Public Statements
 - c) 05.79.00 – Social Networking Policy
 2. Chapter 6 – Professional Conduct
- D. Crime Scene Response Standard Operating Procedures, Texas DPS.
 1. CSR-01-01 – Crime Scene Response Overview
 2. CSR-01-02 – Crime Scene Processing
 3. CSR-01-03 – Vehicle Processing
- E. Gardner, RM. *Practical Crime Scene Processing and Investigation*, 3rd ed., CRC Press, 2012.
 1. Chapter 4 – Processing Methodology
 2. Chapter 5 – Assessing the Scene, pages 118-124
- F. Texas Parks and Wildlife Department website.
 1. Venomous Texas Snakes: <https://tpwd.texas.gov/education/resources/texas-junior-naturalists/snakes-alive/venomous-texas-snakes>
 2. Insects: <https://tpwd.texas.gov/education/resources/texas-junior-naturalists/be-nature-safe/insects>

3. Spiders and Their Kin: <https://tpwd.texas.gov/education/resources/texas-junior-naturalists/be-nature-safe/arachnids>
4. Plants: <https://tpwd.texas.gov/education/resources/texas-junior-naturalists/be-nature-safe/plants>
- G. New Zealand Police. Clandestine Drug Laboratories Hazard Identification and Safety Information.
- H. U.S. Department of Homeland Security. *Advanced Forensic Investigations for Hazardous Environments, Participant Guide*. Version 2.1, pp. G15-G21.
- I. McDonnell, O. "Protecting Yourself at the Crime Scene." *Forensic Magazine*, September 2016, pp. 24-26.

3 Practice

3.1 Safety

None

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Independent Exercises

- A. Review documentation from specified crime scenes and complete a Crime Scene Response Reporting Form (LAB-CSR-01) for each (minimum of three).
- B. Review warrant/consent to search forms (minimum of three).

4 Assessment

Successful completion of this module is determined by the trainer. The trainee and the trainer will complete the Crime Scene Response Overview and Documentation Training Checklist (LAB-CSR-TM-01).

CSR-TM-02-02 SCENE ASSESSMENT

Duration 1 day

Purpose The purpose of this module is to introduce the trainee to information gathering and scene assessment activities, as well as the documentation requirements that go along with those tasks.

Prerequisite Overview of Crime Scene Response and Documentation

1 Objectives

1.1 Theoretical

Every crime scene is different. Crime Scene Team members will need to quickly and accurately assess each scene and determine the best course of action for the Crime Scene Team's response.

1.2 Practical

Upon completion of this module, the trainee will be able to:

- A. Assess the crime scene and determine its scope
- B. Become familiar with ways to maintain scene integrity and control contamination
- C. Assemble a crime scene team and designate duties
- D. Create a scene processing plan
- E. Become familiar with the necessary elements of investigative notes

2 Training Outline

2.1 Lesson Plan

- A. Initial walk-through to determine scene scope: receive briefing from law enforcement contact, to include:
 1. Scene scope and nature
 2. Changes to the scene (EMS, etc.)
 3. Status of involved parties
 4. Scene security
- B. Scene integrity and contamination control
 1. Perimeter
 - a) *Is the existing boundary sufficient or should the area be expanded?*
 - b) *Are all points of entry and exit secure?*
 2. Set up a staging area outside the immediate scene
 3. Create a walking path that will not affect possible evidence
 4. Entry/exit log
 - a) *Only allow people with a legitimate reason to enter the scene*
 - b) *Keep a log of who entered, when, for what reason, and what time they exit (usually maintained by investigating agency)*

- C. Designate duties (CSR-01-02)
- D. Scene processing plan, including search method (CSR-TM-02-04)
- E. Notes
 - 1. Notification of crime
 - a) *Location*
 - b) *Time and date of arrival*
 - 2. Scene description
 - a) *Detailed description*
 - b) *Relationship to surrounding areas (ex. Cross streets, buildings, etc.)*
 - 3. Conditions of scene upon arrival including, but not limited to:
 - a) *Temperature and weather conditions*
 - b) *Time of day*
 - c) *Status of doors and windows (Open? Closed? Broken? Locked?)*
 - d) *Lights on/off*
 - e) *Transient evidence (ex: smells, evidence that could be damaged by rain or wind, etc.)*
 - f) *Rooms in disarray versus apparently undisturbed*
 - g) *Entry and exit points*
 - 4. Actions taken
 - a) *Photography, sketching, etc. (LAB-CSR-02)*
 - b) *Processing techniques used*
 - c) *Positive and negative results*
 - d) *Record the time at which you do something*
 - e) *Evidence collected (LAB-CSR-03)*

2.2 Required Readings

- A. National Forensic Science Technology Center (NFSTC). *Crime Scene Investigation: A Guide for Law Enforcement*, 2013, Sections A (all), B (all), C1, and C2.
- B. Gardner, RM. *Practical Crime Scene Processing and Investigation*, 2nd ed., CRC Press, 2012.
 - 1. Chapter 5 – Assessing the Scene, pages 95-108
 - 2. Chapter 8 – Narrative Descriptions: Crime Scene Notes and Reports, pages 223-228

3 Practice

3.1 Safety

None

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Supervised Performance

- A. Perform a mock briefing with notes.
- B. Use the “Eight-Step Descriptive Set” to describe five (5) items in a mock scenario.

4 Assessment

Successful completion of this module is determined by the trainer. The trainee and the trainer will complete the Crime Scene Response Overview and Documentation Training Checklist (LAB-CSR-TM-01).

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CSR-TM-02-03 SKETCHING AND MEASUREMENT TECHNIQUES

Duration 3 to 5 days

Purpose The purpose of this module is to introduce the trainee to the various sketching and measurement techniques that can be used at crime scenes.

Prerequisite Overview of Crime Scene Response and Documentation, Scene Assessment; Concurrent with Search Techniques

1 Objectives

1.1 Theoretical

Crime scenes should be measured, or “mapped,” and sketched. Sketches support photographs and notes and can show the interrelationships of evidence items in the scene. Sketches, particularly final sketches completed using computer software, make excellent demonstrative aids for juries. Measurements are necessary for reconstruction, as they fix evidence items into a scene. Measurements can also allow for accurate computer-generated to-scale sketches.

1.2 Practical

Following the completion of training the trainee will be able to:

- A. Name the different sketching and measurement techniques.
- B. Discuss the pros and cons of each technique.
- C. Determine the optimal techniques for certain scene conditions.

2 Training Outline

2.1 Lesson Plan

A. Sketching

1. Sketches support the photographs and notes for the crime scene. They help to show the interrelationships of the scene and evidence, without including extraneous items that may be seen in photographs. Sketches and mapping also aid in scene reconstruction
2. Rough Sketch Components (see Crime Scene Sketch Form – LAB-CSR-02)
 - a) *Diagram area*
 - b) *Administrative information*
 - i. *Case number*
 - ii. *Name of sketcher*
 - iii. *Name of person taking measurements, as applicable*
 - iv. *Location of scene*
 - v. *Date*
 - c) *Legend for any annotations (or reference to Evidence Recovery Log numbers)*
 - d) *Scale (if applicable; if no scale, write “Not to Scale”)*
 - e) *“North” symbol (magnetic or reference)*

3. Types of Sketches

a) Projection / Bird's Eye View

- i. Usually one viewpoint and depicts objects on the horizontal plane.
- ii. This is the standard, most-used sketch.

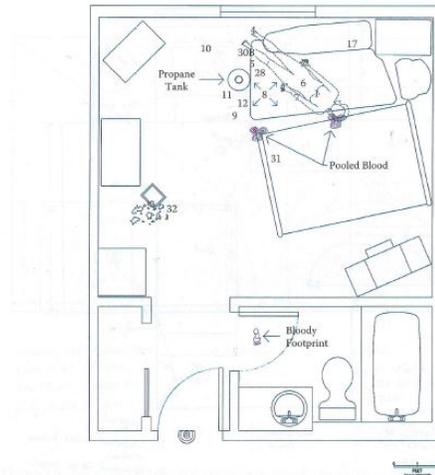


Figure 7.3 The typical crime scene sketch is that of a bird's-eye view. It looks down on the scene from above and effectively captures elements found on any horizontal plane (floors, tables, counters, etc.). [Courtesy of Ranger John A. Martin and the Texas Rangers. With permission.]

Image source: Gardner, RM. *Practical Crime Scene Processing and Investigation, Second Edition*. CRC Press, Boca Raton, 2012. Chapter 7.

b) Exploded / Cross Projection

- i. Contains more than one view point and can be used in modeling. It can show relationships of items in location, depth, and height.
- ii. The walls are folded down and are on the same plane as the floor.
- iii. Great for bloodstains and bullet defects that may be found on walls.

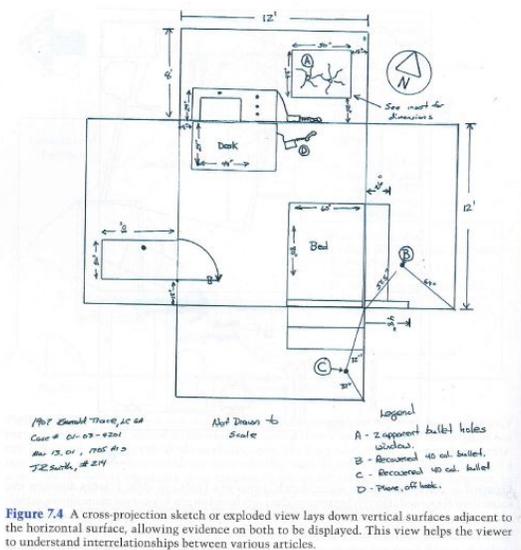


Figure 7.4 A cross-projection sketch or exploded view lays down vertical surfaces adjacent to the horizontal surface, allowing evidence on both to be displayed. This view helps the viewer to understand interrelationships between various articles.

Image source: Gardner, RM. *Practical Crime Scene Processing and Investigation, Second Edition*. CRC Press, Boca Raton, 2012. Chapter 7.

c) **Elevation**

- i. Used to depict a vertical surface like a wall or door.
- ii. Ideal for mapping bloodstains and bullet defects, as well as extended exterior scenes, to show the orientation of buildings.

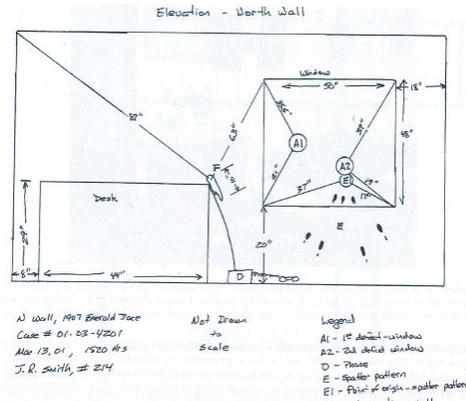


Figure 7.5 The elevation view in a crime scene sketch allows the technician to capture information relevant to vertical surfaces and the orientation of various vertical surfaces to one another.

Image source: Gardner, RM. Practical Crime Scene Processing and Investigation, Second Edition. CRC Press, Boca Raton, 2012. Chapter 7.

d) **3D / Perspective**

- i. Contains a vanishing point and depicts objects of evidence as they would appear to the eye with reference to a relative distance and depth.
- ii. Difficult to draw free-hand, so usually sketched using computer software programs.

4. **Computer Sketching**

- a) AutoCad programs are used to turn rough sketches made at the scene into clean sketches that can be used to aid the jury.
- b) Computer sketching programs can be done in 2D or 3D renderings.
- c) These programs allow for the sketch to be easily drawn to near scale with the measurements taken at the scene.

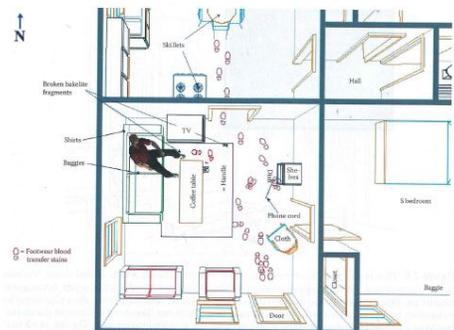


Figure 7.7 A three-dimensional sketch created from the crime scene documentation of the scene in Figure 7.6. Even with the significant amount of data used (the scene measurements) to produce this drawing, it is still demonstrative. For example, the placement of the bloody footwear transfers is not intended to be exact. The sketch demonstrates their generalized positions and orientations, whereas the scene photographs will effectively establish their specific positions and orientations if this is an issue.

Image source: Gardner, RM. Practical Crime Scene Processing and Investigation, Second Edition. CRC Press, Boca Raton, 2012. Chapter 7.

B. Measurements

1. Two main factors should be considered when choosing the method of mapping/measurement:
 - a) *The need for precise interrelationships in the scene*
 - b) *The type of scene (outdoor, indoor, lack of landmarks).*
2. Measuring objects can be intrusive and can lead to the movement of those objects.
3. Photographs should be taken before any measurements are made.
4. Measure the evidence locations before any furniture or other static items.
5. Types of Measurements
 - a) *Rectangular Coordinate*
 - i. *Used when measuring the distance to an object from two perpendicular objects (like walls).*
 - ii. *Ideal for measuring indoor scenes with clear, specific boundaries.*
 - iii. *This method is fast and effective, but less precise. Evidence items are usually measured to center mass with rectangular coordination, so the items are not completely "fixed" in the scene.*

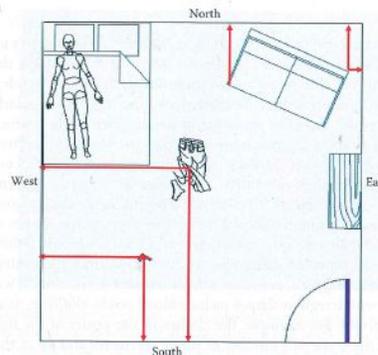


Figure 7.9 Rectangular coordinates used to document two specific articles of evidence, a pair of pants and a pistol. Rectangular coordinates require only two measurements from any item of evidence, but even with these measurements, the pistol can still be rotated 360°, and thus it is not fixed. Rectangular coordinates are effective, but they are not as precise as other techniques.

Image source: Gardner, RM. *Practical Crime Scene Processing and Investigation, Second Edition.* CRC Press, Boca Raton, 2012. Chapter 7.

- b) *Triangulated Coordinate / Triangulation*
 - i. *Uses two fixed permanent objects within the crime scene. The measurements are taken from each fixed point to each evidence item. The fixed objects are referred to as reference points.*
 - ii. *For indoor scenes use two adjacent corners of the room for reference points.*
 - iii. *It is important to use permanent objects for reconstruction purposes. Choose items like telephone poles, light poles, the corners of rooms, etc. Items like trees and bushes may be too transient (for reconstruction that may come years later). If this is not possible, or if the initial reference points are too far from the evidence to make an accurate measurement, additional reference points can be created. For example, sticky notes can be posted along a wall and labeled as reference points. These can be measured back to fixed points, like corners.*

- iv. You can use a stake as a reference point in a large outdoor scene. Obtain the GPS coordinates of the stake, so it can be placed back in the location at a later date.
- v. Do not make triangulation measurements from an item that itself has been triangulated.

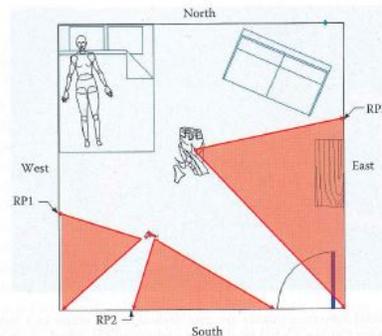


Figure 7.12 An example of triangulation used to fix regularly and irregularly shaped articles. Regularly shaped items require two triangles (four measurements), and irregularly shaped articles require only one triangle (two measurements).

Image source: Gardner, RM. *Practical Crime Scene Processing and Investigation, Second Edition.* CRC Press, Boca Raton, 2012. Chapter 7.

c) **Baseline Coordinate**

- i. A tape measure is placed so that it crosses an entire room/area, extending from a datum point (can set by triangulating to nearby landmark). The tape measure is laid out along a cardinal direction from the datum point and it **MUST** be a straight line.
- ii. Perpendicular distance measured from a single baseline out to evidence. Record the distance between the baseline and the evidence, as well as the distance between the datum point and the perpendicular tape measure. This fixes the evidence or item in relation to the datum point and baseline.
- iii. Useful in outdoor and/or large scenes, especially those without landmarks to use.



Figure 7.18 As shown in this photograph, it is important to ensure that the measurement from the evidence to the baseline is at a right angle by visually squaring the two tape measures. The position on the baseline [the white tape measure] and the measurement off the baseline [the yellow tape measure] create a fixing coordinate for the evidence that is similar to that obtained using rectangular coordinates.

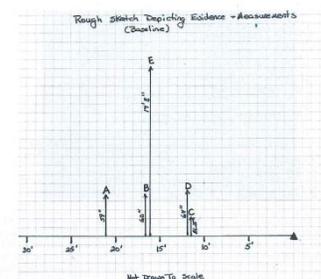


Figure 7.21 An example of a measurement sketch prepared using the baseline method. The five items of evidence from the field of evidence in Figure 7.19 are mapped.

Image source: Gardner, RM. *Practical Crime Scene Processing and Investigation, Second Edition.* CRC Press, Boca Raton, 2012. Chapter 7.

d) **Polar Coordinates**

- i. Set up a datum/reference point by using GPS, triangulation to landmarks, or by physical location by pipe/rebar (if this last method is used, drive the pipe/rebar into the ground so it can be located with a metal detector if the scene needs to be revisited).
- ii. Choose a location at which most evidence/items have a direct line of sight to the sighting device. Multiple datum points can be used when line of sight is obstructed.
- iii. Center a sighting device over the datum point.
- iv. Take three measurements to the item being measured:
 - **Horizontal angle (measured in degrees, this is the rotation of the sighting device from North)**
 - **Horizontal distance (datum point to evidence/item)**
 - **Difference in elevation between datum point and evidence/item (not always done)**
- v. Can be converted to Northing (y) and Easting (x)
- vi. Good for large, outdoor scenes where evidence is scattered over a significant area (ex. airplane crashes, scattered remains, bombing scenes).
- vii. Not great in dense, outdoor scenes like forests because of interference between the sighting device and the item of interest.

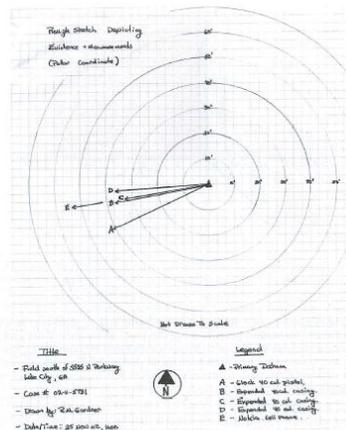


Figure 7.29 An example of a measurement sketch prepared using the polar coordinate method.

Image source: Gardner, RM. Practical Crime Scene Processing and Investigation, Second Edition. CRC Press, Boca Raton, 2012. Chapter 7.

e) **Grid Coordinate**

- i. Perpendicular distance measured from each axis of a coordinate plane relative to the origin (rectangular coordinates for smaller scenes; triangular coordinates for larger scenes).
- ii. X, Y axes. The datum point is typically selected so that the grid is only in the positive quadrant (positive x and y). If evidence is later discovered outside of the quadrant, the grid can easily expand into the other quadrants.
- iii. Origin/datum point should be fixed point so one could return to the scene and repeat measurements.

- iv. *Excellent for outdoor scenes, large scale scenes with multiple mapping teams, scenes with no significant landmarks, or small scale scenes like gravesites.*

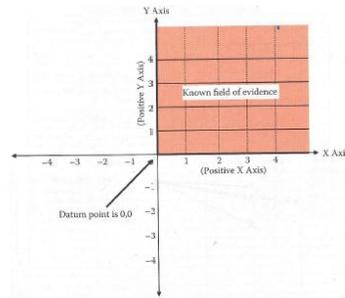


Figure 7.30 Grid systems require setting a datum point and establishing, at a minimum, positive X- and Y-axes. The datum point is set in the lower left corner of the grid (point 0,0). Whatever the size of the grid, the upper right quadrant should encompass the known field of evidence. If for any reason evidence were later found outside of this area, the grid could be expanded using standard Cartesian coordinates to include any item found in any relationship to the original grid.

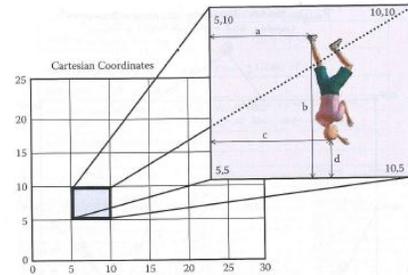


Figure 7.35 The use of rectangular coordinates in a grid system. This method is most effective when excavating gravesites and other localized areas. The measurements are made from the evidence to the nearest interior grid side and not to the exterior of the overall grid. The interior grid in effect becomes a subdatum point. Oftentimes, to aid in making these measurements, a fixed grid (constructed of wood or PVC pipe) is placed over the area, rather than running strings between the stakes of the grid.

Image source: Gardner, RM. Practical Crime Scene Processing and Investigation, Second Edition. CRC Press, Boca Raton, 2012. Chapter 7.

- f) **Total Station**
 - i. *Device that will plot points and print out a diagram.*
 - ii. *Great for outdoor scenes like accident reconstruction.*
 - g) **GPS**
 - i. *Gives coordinates, but is only accurate within feet*
 - ii. *Good for location only in desolate outdoor scenes.*
 - iii. *Not good for actual marking of evidence items because of the inaccuracies in small distances.*
6. **Measuring to Evidence Items**
- a) *Raw measurement – obtain coordinate measurement to one corner/edge of object and then take dimensional measurements of that object*
 - b) *With bodies, measure to head and feet unless contorted (then use three points).*
 - c) *If it's a small item, it can be measured to the center of the item.*
 - d) *If it's a larger item, measure both ends.*

2.2 Required Readings

- A. National Forensic Science Technology Center (NFSTC). *Crime Scene Investigation: A Guide for Law Enforcement*, 2013, Section C3 (sketching only).
- B. Gardner, RM. *Practical Crime Scene Processing and Investigation*, 2nd ed., CRC Press, 2012. Chapter 7 – Crime Scene Sketching and Mapping

3 Practice

3.1 Safety

None

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Supervised Performance

Measure and sketch a mock scene using baseline and triangulation coordinates using bird's eye and elevation views.

4 Assessment

Successful completion of this module is determined by the trainer. The trainee and the trainer will complete the Crime Scene Response Overview and Documentation Training Checklist (LAB-CSR-TM-01)

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CSR-TM-02-04 SEARCH TECHNIQUES

Duration 1 day

Purpose The purpose of this module is to introduce the trainee to the various search techniques used in crime scene response.

Prerequisite Overview of Crime Scene Response and Documentation, Scene Assessment; Concurrent with Sketching and Measurements

1 Objectives

1.1 Theoretical

A crime scene search must be methodical and systematic. It is up to the crime scene team to determine which search technique is best for the scene being worked. By using documented search techniques, the crime scene team can be assured that the search is detailed and complete.

1.2 Practical

Following the completion of training the trainee will be able to:

- F. Name the different documented search techniques seen in literature.
- G. Discuss the pros and cons of each technique.
- H. Determine the optimal technique for certain scene conditions.

2 Training Outline

2.1 Lesson Plan

- A. Factors that affect search swath (area viewed by searcher)
 - 1. Nature of the ground being searched
 - 2. Lighting conditions
 - 3. Environmental conditions
 - 4. Size of specific items the searcher is attempting to locate
- B. Common search methodologies
 - 1. Circle / Spiral Search
 - a) *Great for interior scenes*
 - b) *Begin on outside of room and spiral in, or start in the center and spiral out*

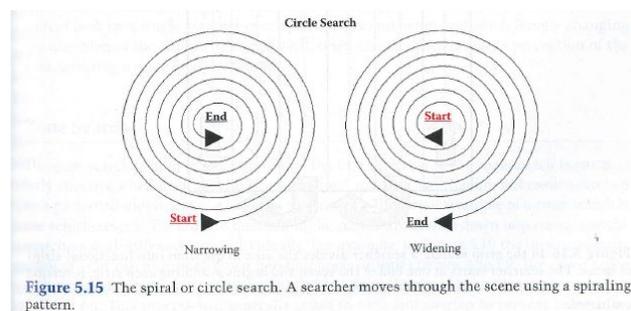


Image source: Gardner, RM. Practical Crime Scene Processing and Investigation, Second Edition. CRC Press, Boca Raton, 2012. Chapter 5.

2. Strip and Line Searches

a) Strip

- i. *Ideal for exterior scenes or large areas*
- ii. *Designate swath size, then subdivide area into equal strips (can physically designate with tape or string)*
- iii. *Searcher walks in parallel lanes, alternating direction at the end of the lane*

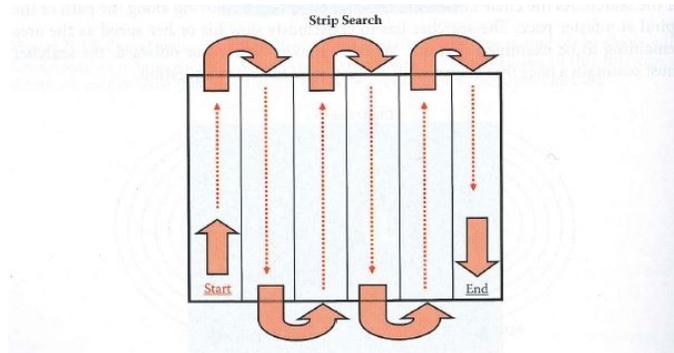


Figure 5.16 In the strip search, a searcher divides the area in question into functional strips or lanes. The searcher starts at one end of the scene and begins searching each strip, reversing direction at the end of a lane and searching the next adjacent strip until all areas have been evaluated.

Image source: Gardner, RM. Practical Crime Scene Processing and Investigation, Second Edition. CRC Press, Boca Raton, 2012. Chapter 5.

b) Line

- i. *Ideal for searching rough terrain*
- ii. *Variation of strip search*
- iii. *Large group of searchers move down designated strips together, all moving in one direction*

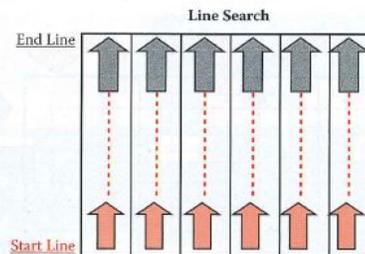


Figure 5.17 The line search is a variation on the strip search. It is effective when dealing with uneven terrain. A group of searchers is lined up along the lanes and moves in a single direction from a start line to an end line. Each searcher is responsible for evaluating a single lane. To keep the line moving, as items are encountered, the evidence is flagged and a team comes in behind the searchers to process the evidence.

Image source: Gardner, RM. Practical Crime Scene Processing and Investigation, Second Edition. CRC Press, Boca Raton, 2012. Chapter 5.

3. Grid Search

- a) *Thorough variation of strip search*
- b) *Area divided into two sets of strips/lanes that run perpendicular*

- c) Search in one direction, then start perpendicular. Repeat until entire area is covered.

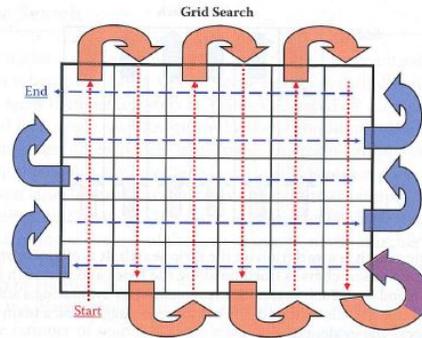


Figure 5.18 The grid search is also a variation on the strip search. Instead of a single group of lanes, two groups are established at 90° angles to each other. Starting at one end, the searcher moves along the first group in the same fashion as a normal strip search. When the searcher reaches the end, he or she begins the second look over the same terrain, following the second set of lanes. This results in one searcher checking the area twice from two different perspectives.

Image source: Gardner, RM. Practical Crime Scene Processing and Investigation, Second Edition. CRC Press, Boca Raton, 2012. Chapter 5.

4. Zone Search

a) Variation #1

- i. Effective in small, confined spaces that are not conducive to other patterned searches
- ii. Search each zone individually, allowing for overlap

Ex. vehicle search

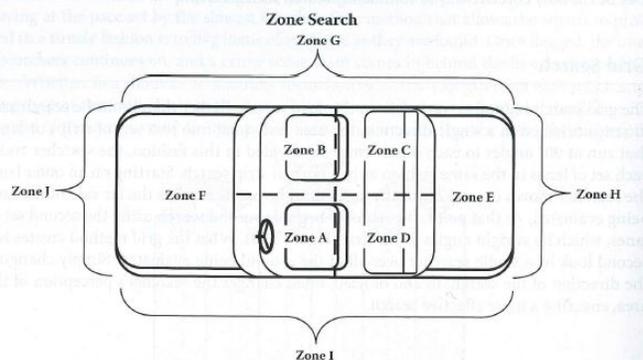


Figure 5.19 One variation of the zone search is to break down an area that is not easily checked with another patterned search into small, defined areas. The searcher checks each section independently before moving on to the next.

Image source: Gardner, RM. Practical Crime Scene Processing and Investigation, Second Edition. CRC Press, Boca Raton, 2012. Chapter 5.

b) Variation #2

- i. Ideal for large exterior scenes with many pieces of evidence, scattered remains, aircraft crashes, etc.
 - **Subdivide a larger scene into smaller, more manageable pieces**
- ii. Can use another patterned search in the smaller zone

- iii. *Can physically divide zones with tape, rope, or staked intersections (assign letters/numbers to grid intersections)*
- iv. *Labeled intersections also help with small scale measurements*
- v. *Ideal for large exterior scenes with many pieces of evidence, scattered remains, aircraft crashes, etc.*

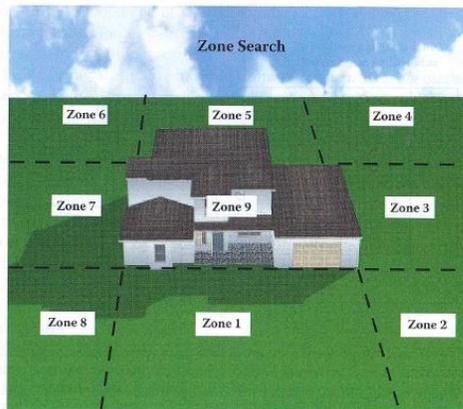


Figure 5.20 Another variation of the zone search is to break a large area up into smaller areas to be searched independently by different teams. Once the area has been broken down and assigned, the team uses another search pattern (e.g., strip or grid) to check these smaller zones.

Image source: Gardner, RM. Practical Crime Scene Processing and Investigation, Second Edition. CRC Press, Boca Raton, 2012. Chapter 5.

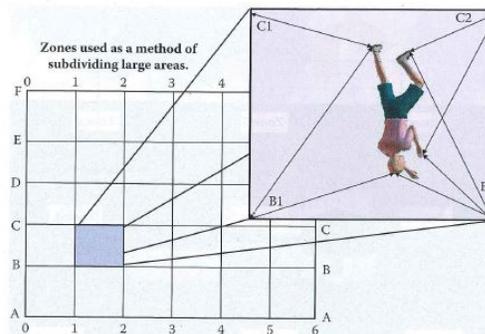


Figure 5.21 In extremely large scenes, zones can be formally assigned and a grid established using stakes or barrier tape. The use of barrier tape is not as functional, as searchers must move around the tape. The use of stakes is effective and has been employed by the Federal Transportation Safety Board (FTSB) at aircraft crashes. The teams use each intersection as a reference point for evidence-fixing measurements.

Image source: Gardner, RM. Practical Crime Scene Processing and Investigation, Second Edition. CRC Press, Boca Raton, 2012. Chapter 5.

- 5. Point-to-Point Search
 - a) *Not used often in the U.S.*
 - b) *Searching evidence item to evidence item*
- C. Fire scenes – Law enforcement investigation routinely proceeds from areas of least damage to areas of most damage. This may be a useful practice for the laboratory investigation at a fire crime scene as well.
- D. Scenes are three-dimensional; Do not limit the search to the floor, but practice methodical searches of walls, ceilings, and furniture, as well as the floor.

2.2 Required Readings

- A. National Forensic Science Technology Center (NFSTC). *Crime Scene Investigation: A Guide for Law Enforcement*, 2013, Sections C4, C5, and D2.
- B. Gardner, RM. *Practical Crime Scene Processing and Investigation*, 2nd ed., CRC Press, 2012. Chapter 5 – Assessing the Scene, pages 108-118

3 Practice

3.1 Safety

None

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Supervised Performance

Describe which search pattern is best utilized in the following scenarios:

1. Vehicle
2. Wooded area
3. House with multiple rooms
4. Open field

4 Assessment

Successful completion of this module is determined by the trainer. The trainee and the trainer will complete the Crime Scene Response Overview and Documentation Training Checklist (LAB-CSR-TM-01).

CSR-TM-02-05 EVIDENCE COLLECTION

Duration 1 day

Purpose The purpose of this module is to familiarize the trainee with the concepts and practices of evidence integrity, security, proper seals, thorough documentation, and chain of custody from the crime scene through submission to Evidence Coordination.

Prerequisite Overview of Crime Scene Response and Documentation, Scene Assessment, General Laboratory Training: Fundamentals Unit

1 Objectives

1.1 Theoretical

Evidence integrity and an intact chain of custody are crucial factors for the admissibility of evidence in a court of law. Comprehensive record keeping and documentation of evidence tracking at the crime scene and within the laboratory are essential to good forensic laboratory practices. The precautions taken to prevent contamination, loss, and deleterious change to evidence are of utmost importance during collection, storage, and examinations. It is critical for all laboratory personnel who come in contact with evidence in any capacity, whether at a crime scene or in the laboratory, to recognize and preserve its potential evidentiary value for all disciplines.

1.2 Practical

Following the completion of training the trainee will be able to:

- A. Recognize potential evidence, regardless of discipline
- B. Collect and package evidence properly
- C. Document collection on an Evidence Recovery Log (LAB-CSR-03)
- D. Submit evidence to Evidence Coordination in an organized and timely manner

2 Training Outline

2.1 Lesson Plan

- A. General evidence collection
 1. Any examiner in the role of the crime scene responder should recognize all evidentiary potential and therefore is responsible to preserve and protect the evidence for other disciplines outside his/her own specialty.
 2. Evidence collected will be documented on an Evidence Recovery Log (LAB-CSR-03).
- B. Discipline-specific evidence collection
 1. Digital evidence, DNA, firearms, latent prints, questioned documents, and trace evidence collection will be covered in other modules.

2. DPS does not interpret or report blood pattern interpretations. Bloodstain patterns are included for awareness, to assist a crime scene responder to recognize how patterns may have been created, and to give some insight into the events of the crime.
 - a) *Consideration should be given to documenting bloodstain patterns prior to collection.*
 - b) *No interpretive opinions shall be rendered by DPS crime scene personnel.*
- C. Evidence packaging
1. Packaging for evidence items should include the following information:
 - a) *Case number*
 - b) *Item number*
 - c) *Person collecting*
 - d) *Date collected*
 - e) *Item description (optional)*
 2. Proper seals
 - a) *All evidence should be properly sealed before leaving the crime scene.*
 - b) *This may not always be possible in cases of large/irregular items.*
- D. Inventory
1. Before leaving the crime scene, an inventory of all collected evidence should be made. Reference the Evidence Recovery Log to ensure that all collected evidence has been documented and is being returned to the laboratory.
 2. If custody of any collected evidence items is turned over to another agency, this should be documented in notes and/or on the Evidence Recovery Log.
 3. Conduct a final check of documentation on packaging and the presence of proper seals.
 4. When possible, a copy of the Evidence Recovery Log should be left with investigating agency.
- E. At the Laboratory
1. Evidence should be secured upon return to the laboratory, even if it may not be submitted to Evidence Coordination until the next business day.
 2. Wet evidence should be placed in a drying cabinet and a proper seal shall be placed on the door.
 3. The Team Lead will separate evidence for different disciplines and package into larger outer containers as necessary.
 4. A Laboratory Submission Form (LAB-201) will be filled out by the Team Lead. The evidence may be listed on the Submission Form or the Evidence Recovery Log can be attached.
 5. The evidence collected at the crime scene should be submitted to Evidence Coordination within the next business day.

2.2 Required Readings

- A. Crime Laboratory Service Manual, Texas DPS.
 - 1. General Evidence Collection Guidelines and Packaging Requirements
 - 2. Receipt and Review of Laboratory Requests for Service
 - 3. Submission and Receipt of Evidence
 - 4. Evidence and Database Sample Integrity
 - 5. Evidence Processing
 - 6. Return of Evidence
- B. National Forensic Science Technology Center (NFSTC). *Crime Scene Investigation: A Guide for Law Enforcement*, 2013, Section C6

3 Practice

None

4 Assessment

Successful completion of this module is determined by the trainer. The trainee and the trainer will complete the Crime Scene Response Overview and Documentation Training Checklist (LAB-CSR-TM-01).

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CSR-TM-02-06 REPORT WRITING

Duration 1 to 3 days

Purpose The purpose of this module is to introduce the trainee to the specific requirements of Crime Scene Response reports.

Prerequisite Overview of Crime Scene Response and Documentation, Scene Assessment

1 Objectives

1.1 Theoretical

Crime Scene Response Reports are used to inform the customer what was examined and processed by the Laboratory during a crime scene investigation. Reports should be objective outlining what was done, what was found, what was collected, and what actions are required/suggested moving forward. Reports should not include subjective feeling or any bias.

1.2 Practical

Following the completion of training the trainee will be able to:

- A. Write a Crime Scene Response Report
- B. Perform Technical Review

2 Training Outline

2.1 Lesson Plan

- A. CSR Report Writing
 - 1. Response Information
 - a) *Date/Time of initial contact*
 - b) *Requestor*
 - c) *Scene location*
 - d) *Team information*
 - i. *Include all team members*
 - ii. *Designate Team Lead*
 - 2. Synopsis – provide a brief synopsis including
 - a) *Scene type (vehicle, house, etc.);*
 - b) *Reason/request for Crime Scene Team response*
 - 3. Scene Information
 - a) *Team arrival information (time and date)*
 - b) *Additional information provided by officer and/or agency representative as applicable*
 - c) *Initial observations and general characteristics and conditions of scene*
 - d) *Areas searched*
 - e) *Evidence items collected*
 - f) *Items/areas examined and processed and results*

- g) *Team departure information (time and date)*
- 4. Investigative Leads and Requirements for Further Analysis
 - a) *Request any known standards required based on examinations performed on scene and evidence collected for analysis at the Laboratory*
 - b) *Include a statement regarding availability of crime scene photographs and Evidence Recovery Log*
- 5. Disposition – include a statement regarding the retention of evidence pending analyses
- B. Technical Case Review
 - 1. All case records involving crime scene processing will be technically reviewed prior to the release of results and/or issuing the crime scene report.
 - 2. The results should be supported by the examination records and communicated properly and clearly to officers and attorneys.
 - 3. Refer to the Crime Scene Response Technical Review Checklist to technically review the case record and report.

2.2 Required Readings

- A. Crime Laboratory Service Manual, Texas DPS.
 - 1. Laboratory Reports, Letters, and Certificates: *Crime Scene Response Reports* section
 - 2. Review of Laboratory Records
- B. LIMS Manual, Texas DPS – Crime Scene Response Report
- C. Gardner, RM. *Practical Crime Scene Processing and Investigation*, 2nd ed., CRC Press, 2012. Chapter 8 – Narrative Descriptions: Crime Scene Notes and Reports, pages 228-237
- D. National Forensic Science Technology Center (NFSTC). *Crime Scene Investigation: A Guide for Law Enforcement*, 2013, Sections D1 and D3

3 Practice

3.1 Safety

None

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Independent Exercises

- A. Review specified Crime Scene Response Reports (minimum of three including at least one vehicle).

- B. Review documentation for specified crime scenes and write a Crime Scene Response Report for each.
 - 1. A minimum of two reports shall be written (at least one vehicle).
 - 2. A variety of scene types should be considered.
- C. Technically review Crime Scene Response Reports (minimum of three including at least one vehicle).

4 Assessment

4.1 Competency and Qualifying Examination

The trainee must successfully complete the following:

- A. A comprehensive mock crime scene
- B. A mock trial exercise (evaluation by trainer documented on the LAB-313 and LAB-314)
- C. A comprehensive written examination

4.2 Evaluation of Training

Successful completion of this module is determined by the trainer. The trainee and the trainer will complete the Crime Scene Response Overview and Documentation Training Checklist (LAB-CSR-TM-01).

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03 CRIME SCENE PHOTOGRAPHY TRAINING UNIT

CSR-TM-03-01 INTRODUCTION TO PHOTOGRAPHY EQUIPMENT

Duration 1 to 2 days

Purpose The purpose of this module is to familiarize the trainee with relevant photographic equipment.

Prerequisite None

1 Objectives

1.1 Theoretical

Many components are required to successfully document the subject matter photographically. Before one can attempt photography, it is important to become familiar with those components and their functions.

1.2 Practical

Upon completion of this module the trainee will:

- A. Be able to properly identify different photographic equipment
- B. Understand the intended function of photographic equipment items

2 Training Outline

2.1 Lesson Plan

- A. Camera body and operation
 - 1. White balance
 - 2. Resolution
 - 3. File types
 - 4. Manual vs. automatic
 - 5. Metadata
- B. Lenses and proper utilization
 - 1. Wide angle
 - 2. Telephoto
 - 3. Macro
 - 4. Fast lens
 - 5. Care and cleaning
- C. Flash operation
- D. Peripherals
 - 1. Tripod
 - 2. Cables
 - a) *Flash sync*
 - b) *Shutter release*

- c) *Other relevant cables*
- 3. Memory cards
- 4. Batteries
- 5. Scales
 - a) *Sticky scales*
 - b) *Small L scale*
 - c) *Large L scale*
 - d) *Other types of scales*
- 6. Filters
- 7. Reflector
- 8. Operating manuals

2.2 Required Readings

- A. London, Barbara, and Jim Stone. *A Short Course in Digital Photography*, 2nd ed., Prentice Hall, 2012.
 - 1. Chapter 1 – Camera
 - 2. Chapter 2 – Lens
- B. Nikon Digital Camera User's Manual for crime scene response camera. (Sections involving introduction to the camera and basic operation)
- C. Nikon Speedlight User's Manual for crime scene response flash unit. (Sections: Preparation, Operation)

3 Practice

3.1 Safety

None

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Independent Exercises

The trainee will complete the following exercises:

- A. Compile a checklist of everything included in a crime scene response camera kit
- B. Answer the following questions:
 - 1. What lens would be appropriate to use for overall photographs?
 - 2. What lens would be appropriate to use for close-up photographs?
 - 3. What setting controls the color of the image?
 - 4. In what situation would you use a fast lens?
 - 5. What file type would you use for comparison-quality photographs?

4 Assessment

Successful completion of this module is determined by the trainer. The trainee and the trainer will complete the Crime Scene Response Photography Training Checklist (LAB-CSR-TM-02).

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CSR-TM-03-02 BASIC PHOTOGRAPHY

Duration 3 to 5 days

Purpose The purpose of this module is to familiarize the trainee with utilizing different items of photography equipment to capture properly exposed photographs in a number of different settings.

Prerequisite Introduction to Photography Equipment

1 Objectives

1.1 Theoretical

Photography is comprised of a balance between the physics of optics and the mental acuity to correctly compose and expose a photograph. Carefully composed photographs will provide a true and accurate representation of the subject as it appears in reality. Additionally, understanding the elements of exposure will ensure the subject matter is correctly depicted.

1.2 Practical

Upon completion of this module the trainee will be able to:

- A. Properly compose photographs
- B. Properly expose photographs in varying light situations
- C. Properly expose photographs with varying depths of field
- D. Properly expose photographs with varying shutter speeds
- E. Understand the photographic concepts of reciprocity and bracketing

2 Training Outline

2.1 Lesson Plan

- A. Composition
- B. Focus
 1. Manual vs. Automatic
 2. Focus Points
- C. Metering
 1. Modes
 - a) *Center-weighted*
 - b) *Spot*
 - c) *Matrix*
 2. Histogram
- D. Exposure
 1. ISO
 2. Shutter Speed
 3. Aperture
 4. Reciprocity

- E. Bracketing
- F. Flash

2.2 Required Readings

- A. London, Barbara, and Jim Stone. *A Short Course in Digital Photography*, 2nd ed., Prentice Hall, 2012.
 - 1. Chapter 3 – Light and Exposure
 - 2. Chapter 8 – Lighting, pages 140-143
- B. Robinson, Edward M. *Crime Scene Photography*, 2nd ed., Amsterdam: Academic/Elsevier, 2010.
 - 1. Chapter 2 – Composition and Cardinal Rules
 - 2. Chapter 3 – Basic Exposure (Non-Flash) Concepts
 - 3. Chapter 4 – Focus, Depth of Field, and Lenses
 - 4. Chapter 5 – Electronic Flash, pages 251-303
- C. Nikon Digital Camera User's Manual for crime scene response camera. (Sections involving exposure, ISO, white balance, camera modes, focus, image recording options)

3 Practice

3.1 Safety

None

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Supervised Performance

The trainee will complete the following exercises:

- A. Take ten (10) varying properly exposed photographs outdoors
- B. Take ten (10) varying properly exposed photographs indoors without flash
- C. Take three (3) varying photographs with a shallow depth of field
- D. Take three (3) varying photographs with a great depth of field
- E. Take three (3) varying photographs of a moving object with a fast shutter speed
- F. Take three (3) varying photographs of a moving object with a slow shutter speed
- G. Take ten (10) varying properly exposed photographs indoors with flash
- H. Take ten (10) varying properly exposed photographs outdoors with fill flash
- I. Take three (3) varying photographs of three (3) different subjects with equivalent exposures using the concept of reciprocity
- J. Take three (3) varying photographs of three (3) different subjects with varying exposures using the concept of bracketing

- K. Take three (3) varying wide angle photographs
- L. Take three (3) varying macro photographs
- M. Take three (3) varying photographs using the fast lens in a low light situation
- N. Take ten (10) varying photographs in low light with long exposure
- O. Take ten (10) varying photographs in low light and paint with light

4 Assessment

Successful completion of this module will be determined by the trainer. The trainee and the trainer will complete the Crime Scene Response Photography Training Checklist (LAB-CSR-TM-02).

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CSR-TM-03-03 FORENSIC PHOTOGRAPHY

Duration 10 to 14 days

Purpose The purpose of this module is to familiarize the trainee with the application of basic photography concepts to forensic applications.

Prerequisite Introduction to Photography Equipment, Basic Photography

1 Objectives

1.1 Theoretical

The purpose of crime scene photography is to provide a true and accurate visual record of evidence, crime scene, and related areas. Examples of various types of photographed crime scenes may include: death scenes, sexual assault, residential and commercial burglaries, hit and run, narcotics search, and autopsy. In many situations evidence cannot be removed from a scene. In these situations the photograph becomes the only representation of the evidence available for analysis. It is imperative the evidence be captured accurately to assist in the investigation.

1.2 Practical

Upon completion of this module the trainee will be able to:

- A. Properly compose overall photographs
- B. Identify and properly photographically document items of interest
- C. Understand what necessary photographs must be taken
- D. Troubleshoot difficult photography situations and establish a functional solution
- E. Apply photographic concepts to discipline specific applications

2 Training Outline

2.1 Lesson Plan

- A. Overall photographs of the scene before anything else
- B. Overall, orientation, macro
- C. Vehicle-specific photographs (VIN, license plates, etc.)
- D. Scene abnormalities, inconsistencies, or items of interest
- E. Bodies and wounds
- F. General lighting techniques
 1. Oblique
 2. Bounce
 3. Other
- G. Discipline-specific applications
 1. Trace Evidence
 2. Biology/DNA
 3. Friction Ridge

4. Firearms and Toolmarks
 5. Digital/Multimedia
 6. Forensic Document Examination
- H. Special photography situations
1. Accident
 2. Aerial
 3. Low light
 4. Other
- I. Image storage and management
1. ADAMS Digital Workplace (Foray)
 2. Acquiring images
 3. Contact sheets
 4. Hard copy archives

2.2 Required Readings

- A. Crime Scene Response Standard Operating Procedures, Crime Scene Photography
- B. London, Barbara, and Jim Stone. *A Short Course in Digital Photography*, 2nd ed., Prentice Hall, 2012. Chapter 7 – Organizing and Storing
- C. Robinson, Edward M. *Crime Scene Photography*, 2nd ed., Amsterdam: Academic/Elsevier, 2010.
1. Chapter 5 – Electronic Flash, pages 258-300
 2. Chapter 6 – Crime Scene Photography
 3. Chapter 7 – Ultraviolet, Infrared, and Fluorescence
 4. Chapter 9 – Special Photography Situations
 5. Chapter 10 – Digital Imaging Technologies, pages 518-525
- D. LIMS Manual, Storage of Evidentiary Images in DIMS

3 Practice

3.1 Safety

None

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Supervised Performance

- A. Take examination quality photographs of three (3) small, three (3) medium, and three (3) large objects

B. Vehicle

1. Take overall photographs
2. Photograph vehicle-specific identifiers
3. Take coordinating orientation and macro photographs of potential items of interest
4. Take macro photographs, perpendicular to the subject, with a scale
5. Take macro photographs with a scale of any abnormalities, inconsistencies, identifiable characteristics, and features of interest

C. Indoor scene

1. Take overall photographs
2. Take coordinating orientation and macro photographs of potential items of interest
3. Take macro photographs, perpendicular to the subject, with a scale
4. Take macro photographs with a scale of any abnormalities, inconsistencies, identifiable characteristics, and features of interest

D. Outdoor scene

1. Take overall photographs
2. Take coordinating orientation and macro photographs of potential items of interest
3. Take macro photographs, perpendicular to the subject, with a scale
4. Take macro photographs with a scale of any abnormalities, inconsistencies, identifiable characteristics, and features of interest

4 Assessment

4.1 Competency and Qualifying Examination

A comprehensive written examination will be completed for the unit.

4.2 Evaluation of Training

Successful completion of this module is determined by the trainer. The trainee and the trainer will complete the Crime Scene Response Photography Training Checklist (LAB-CSR-TM-02).

04 TRACE EVIDENCE TRAINING UNIT

CSR-TM-04-01 GENERAL TRACE EVIDENCE COLLECTION

Duration 7 to 14 days

Purpose The purpose of this module is to familiarize the trainee with various techniques used to collect and preserve transfer evidence such as hair, fibers, paint, and glass.

Prerequisite Crime Scene Documentation Unit, Photography Unit

1 Objectives

1.1 Theoretical

The Locard Exchange Principle states that whenever two objects come into contact, a transfer of material will take place. This transferred material can be used to associate objects, people and/or locations. Material transferred during the commission of a crime must be collected and preserved to allow for its analysis, assessment of its significance, and admission into court as evidence.

1.2 Practical

Upon completion of this module, the trainee will be able to:

- A. Properly document the original condition of an item of evidence,
- B. Evaluate an item to determine the appropriate techniques needed to collect and preserve the various types of trace evidence that may be present, and
- C. Apply these techniques while maintaining the integrity of the evidence and prevent loss or contamination.

2 Training Outline

2.1 Lesson Plan

- A. Trace Evidence Overview – The trainer will discuss with the trainee the various different types of transfer evidence to include general characteristics, persistence, and special considerations
 1. Hair Evidence
 2. Fiber Evidence
 3. Paint Evidence
 4. Glass Evidence
- B. Item documentation
 1. Written
 - a) *Physical condition including any damage or stains*
 - b) *Any identifying information, such as tag information on a garment*
 - c) *Drawing a sketch*
 2. Photographic
 - a) *Overall condition*
 - b) *Areas of interest, such as stains or smears*

- C. Locating transfer evidence
 - 1. Visual inspection
 - 2. Oblique lighting
 - 3. Alternate Light Source
 - 4. Hand loupe/magnification techniques
- D. Introduction to recovery techniques including demonstration and case record documentation; each technique will be demonstrated by an experienced examiner
 - 1. Techniques
 - a) *Picking*
 - b) *Tape lifting*
 - c) *Scraping*
 - d) *Combing*
 - e) *Clipping*
 - f) *Vacuum sweeping*
 - 2. Discussion of recovery techniques
 - a) *When to use each technique*
 - b) *How to prevent loss and/or contamination for each technique*
 - c) *Advantages and disadvantages of each technique*
 - d) *Proper documentation*
- E. The trainer and trainee will discuss collection of standards for various types of evidence including, but not limited to, fiber standards, hair standards, paint, and glass standards
 - 1. When to collect a standard
 - 2. How to collect a standard
 - 3. Proper documentation
- F. Automotive Filament Recovery – The trainer will discuss the various types of automotive lamps and factors to consider when collecting automotive lamps
 - 1. Documentation
 - 2. Bulb recovery
 - 3. Packaging

2.2 Required Readings:

- A. Trace Evidence Standard Operating Procedures:
 - 1. Physical Evidence Examination
 - 2. Evidence Recovery – Picking
 - 3. Evidence Recovery – Taping
 - 4. Evidence Recovery – Scraping

5. Evidence Recovery – Vacuuming
6. Evidence Recovery – Combing
- B. Technical Working Group for Materials Analysis. *Trace Evidence Recovery Guidelines*, January 1998, For Sci Comm. October 1999, 1(3).
- C. Caddy B, ed. *Forensic Examination of Glass and Paint Analysis and Interpretation*, 2nd ed., Taylor and Francis, 2001, Chapter 1 – What is trace evidence?, pp. 1-25.
- D. Saferstein R, ed. *Forensic Science Handbook*, vol. II, Prentice-Hall, 1988.
 1. Chapter 4 – Microscopy and Microchemistry of Physical Evidence, pp. 161-168.
 2. Chapter 5 – The Forensic Aspects of Textile Fiber Examination, pp. 214-221
- E. Robertson J, ed. *Forensic Examination of Fibres*, Ellis Horwood, 1992, Section 2.4 – Recovery of Fibres, pp. 50-52.
- F. Pounds CA. *The Recovery of Fibres from the Surface of Clothing for Forensic Examination*, J. For Sci Soc. 15, pp. 127-132.
- G. Robertson J. and Grieve M., ed. *Forensic Examination of Fibers*. Taylor and Francis, Philadelphia, Pennsylvania, 1999, Chapter 5 – From the Crime Scene to the Laboratory, pp. 89-100.
- H. Saferstein R, ed. *Forensic Science Handbook*, vol. I. 2nd ed., Prentice-Hall, 2002.
 1. Chapter 7 – The Forensic Identification and Association of Human Hair, pp. 401-406, 415-417
 2. Chapter 8 – Forensic Paint Examination, pp. 472-473
- I. Robertson J, ed. *Forensic Examination of Hair*, Taylor and Francis, 1999, Chapter 7 – Evidential Value of Hair Examination, pp. 243-248.
- J. Baker JS, Aycok TL, Lindquist T. *Lamp Examination for On or Off in Traffic Accidents*, Northwestern University Traffic Institute, 1999.

3 Practice

3.1 Safety

None

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Supervised Performance

- A. The trainee will practice the individual recovery techniques on different items of evidence. The trainee must demonstrate proper documentation, application of technique, and proper attention to loss and contamination potential.
- B. The trainee will practice recovery of standards on different items of evidence. The trainee must demonstrate proper documentation, application of technique, and proper attention to loss and contamination potential.

- C. The trainee will demonstrate the proper documentation and packaging of different types of automotive filaments.

3.5 Independent Exercises

- A. The trainer will provide the trainee with at least 5 mock items of evidence. The trainee will
1. Determine the best way to document each item,
 2. Determine what technique of evidence recovery and preservation should be used and apply that technique,
 3. Recover standards, if appropriate, and
 4. Prevent loss and/or contamination.
- B. The trainee will provide a written response to the following questions:
1. What is the most efficient recovery technique used for trace evidence?
 2. What is the least efficient recovery technique used for trace evidence?
 3. What is the proper way to collect a fiber standard for comparison?
 4. What potential trace evidence could exist on clothing from a hit and run victim?
 5. Name at least two things you can do to prevent loss and/or contamination.
 6. How would you process wet evidence?
 7. Why is it important to mark the orientation of an automotive lamp before removing it?

4 Assessment

Successful completion of this module is determined by the trainer. The trainee and the trainer will complete the Crime Scene Response Trace Evidence Training Checklist (LAB-CSR-TM-03).

CSR-TM-04-02 COLLECTION OF GUNSHOT PRIMER RESIDUE SAMPLES

Duration 7 days

Purpose The purpose of this module is to familiarize the trainee with the collection of gunshot primer residue samples from clothing and other inanimate surfaces.

Prerequisite Crime Scene Documentation Unit, Photography Unit

1 Objectives

1.1 Theoretical

Gunshot primer residue is deposited by the firing of a weapon. The residue is expelled from the barrel and other openings of the weapon. The residue, primarily as a gaseous cloud, expands and may deposit gunshot primer residue particles on nearby objects. The detection of gunshot primer residue particles may indicate an association between an inanimate surface and the firing of a weapon.

1.2 Practical

Upon completion of this module, the trainee will be able to:

- A. Understand GSR formation and deposition
- B. Collect and preserve possible gunshot primer residue particles from clothing and other inanimate surfaces.

2 Training Outline

2.1 Lesson Plan

- A. Introduction to gunshot primer residue
 1. Particle morphology and composition
 2. Formation and deposition of particles
 3. Items suitable for gunshot primer residue collection
 4. Significance and limitations of analysis procedure
 5. Other gunshot residue deposits
- B. Preparations for collection
 1. SEM stubs
 2. Site preparation
- C. Sample collection
 1. Control sample
 2. Clothing
 3. Other inanimate objects
 4. Hands
- D. Documentation of samples

2.2 Required Readings

- A. Wright DM, and Trimpe MA. *Summary of the FBI Laboratory's Gunshot Residue Symposium*, May 31-June 3, 2005, For Sci Comm. July 2006, 8(3), pp. 1-19.
- B. Mann M, and Espinoza EO. *The Incidence of Transient Particulate Gunshot Primer Residue in Oregon and Washington Bow Hunters*, J For Sci. 1993, 38, pp. 23-27.
- C. Chavez D, Crowe C, and Franco L. *The Retention of Gunshot Residue on Clothing After Laundering*, SWAFS Journal, 1998, 8(2), pp. 22-29.

3 Practice

3.1 Safety

None

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Supervised Performance

- A. The trainee will practice collecting gunshot primer residue from a vehicle, hands, and other inanimate objects.
- B. The trainee will explain and demonstrate the collection of gunshot primer residue by stubbing at least two inanimate objects.

3.5 Independent Exercises

The trainee will provide a written response to the following questions:

1. What types of objects are not appropriate for the collection of GSR samples?
2. Why is it important to collect a control sample?
3. What are the considerations/limitations for sample collection?
4. How are gunshot primer residue particles formed and deposited?

4 Assessment

Successful completion of this module is determined by the trainer. The trainee and the trainer will complete the Crime Scene Response Trace Evidence Training Checklist (LAB-CSR-TM-03).

CSR-TM-04-03 DETECTION, RECOVERY, AND ENHANCEMENT OF IMPRESSION EVIDENCE

Duration 14 days

Purpose The purpose of this module is to familiarize the trainee with the techniques used to detect, recover, preserve, and chemically enhance footwear and tire track impression evidence.

Prerequisite Crime Scene Documentation Unit, Photography Unit

1 Objectives

1.1 Theoretical

Impression evidence is left anytime two objects come into contact and there is a transfer of pattern. These impressions can be left in a variety of substrates such as dust, mud, or bodily fluid. This makes impression evidence likely at a crime scene, but possibly difficult to detect. Different lighting and photographic techniques are available to help detect impressions in both dry and wet substances. It is also possible to detect some wet impressions using chemical techniques which will be addressed during chemical enhancement training.

The next step is to recover and preserve the impression for analysis and comparison. Recovery can be challenging depending on whether the impression is wet or dry, on a collectable item such as tile or on a permanent object such as a driveway, two dimensional or three dimensional. Photography is critical to all recovery and preservation efforts followed by casting and or lifting techniques.

Some impressions may be obvious to the unaided eye while others may be very faint or not seen at all. Detection and enhancement of these faint impressions with chemical treatments may cause them to become of sufficient quality to allow comparison to suspected footwear or tires. The chemical techniques discussed here are most often used to detect and enhance bloody impression evidence.

1.2 Practical

Upon completion of this module, the trainee will be able to:

- A. Detect and recover wet, dry, two- and three-dimensional impression evidence using photography, lifting, and casting techniques.
- B. Detect and enhance faint impressions on a variety of substrates.

2 Training Outline

2.1 Lesson Plan

- A. Introduction to detection of impressions including shoe, tire, and fabric impressions
 1. Oblique lighting
 2. Alternate light source
- B. Specific discussion and demonstration of impression recovery techniques
 1. Photography (documentation vs. examination quality photos)
 2. Physical removal
 3. Dusting

4. Techniques used for casting of impressions
 5. Electrostatic lifting
 6. Gel lifts
- C. Evaluation of recovery techniques
1. Advantages
 2. Disadvantages
- D. Chemical enhancement techniques
1. Amido black
 2. Leucocrystal violet
 3. Luminol/Blue star
- E. Evaluation of techniques
1. Advantages
 2. Disadvantages
- F. Documentation and quality control
- G. Effects of other testing before and after chemical treatments
- H. Collection of known standards
1. Footwear
 2. Tires
- 2.2 Required Readings:**
- A. Trace Evidence Standard Operating Procedures
1. Detection of Impression Evidence by Oblique Lighting
 2. Recovery of Impressions using Electrostatic Lifting
 3. Casting of Impression Evidence
 4. Sulfosalicylic Acid Fixer Solution
 5. Enhancement of Impressions by Amido Black
 6. Detection of Blood Impressions by Luminol
 7. Gelatin Lift
 8. Enhancement of Impressions by Leucocrystal Violet
- B. Bodziak, WJ. *Footwear Impression Evidence*, 2nd ed., CRC Press, 2000.
1. Chapter 1 – Awareness, Detection, and Treatment of Footwear Impression Evidence
 2. Chapter 2 – Photography of Footwear Impressions
 3. Chapter 3 – Casting Three-Dimensional Footwear Impressions
 4. Chapter 4 – Treatment of Two-Dimensional Footwear Impressions
 5. Chapter 5 – The Enhancement of Footwear Impressions

- C. Bodziak, WJ. *Tire Tread and Tire Track Evidence: Recovery and Forensic Examination*, CRC Press, 2008. Chapter 3 – Documenting and Recovering Tire Impression Evidence
- D. McDonald, P. *Tire Imprint Evidence*, Elsevier, 1993. Chapter 7 – Recording Tire Imprints
- E. Safety Data Sheets for:
 - 1. 5-sulfosalicylic acid;
 - 2. 3,3-Diaminobenzidine tetrahydrochloride,
 - 3. Amido black,
 - 4. glacial acetic acid,
 - 5. methanol,
 - 6. citric acid,
 - 7. luminol,
 - 8. sodium carbonate,
 - 9. sodium perborate,
 - 10. sodium acetate, and
 - 11. Leucocrystal violet dye.

3 Practice

3.1 Safety

- A. Wear personal protective equipment. This may include, but is not limited to, gloves, lab coat, and eye protection.
- B. When using the electrostatic lifting device, it is possible to receive electrical shocks from the lifting film, the ground plate and the metal probe. These shocks can be avoided by not touching those parts when the current is on and by allowing the probe to remain on the metalized portion of the lifting film for at least 5 seconds after the unit is turned off, thus allowing any remaining charge to dissipate.
- C. Amido black should only be mixed in a vent hood.
- D. Amido black is mixed with methanol which is highly flammable; extreme caution should be taken when at a crime scene as to make sure all pilot lights on gas heaters and stoves are not lit. Use in a well-ventilated area.
- E. Caution should always be exercised around a bloody crime scene or handling evidence which contains blood. Blood may contain infectious agents. Use universal precautions during evidence handling.

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Supervised Performance

- A. The trainee will photograph impressions (footwear/tire) in different substrates and environments in order to obtain both documentation and examination quality photos.

- B. The trainee will recover impressions (footwear/tire) using the discussed techniques. The trainer will provide impressions that are suitable for the particular technique being used. The amount of samples for each technique will be determined by the trainer depending on the performance of the trainee.
 - 1. Castings
 - 2. Electrostatic lifting
 - 3. Gel lifts
 - 4. Adhesive lifting
- C. The trainer will provide the trainee with several bloody impressions on different substrates to chemically enhance. There should be enough impressions for multiple enhancements with each technique covered.
- D. The trainee will demonstrate proper documentation before and after enhancement so an evaluation by the trainer can be completed.
- E. The trainee will demonstrate proper documentation and quality control of the following:
 - 1. Amido black
 - 2. Luminol
 - 3. Leucocrystal violet
- F. The trainee will demonstrate proper documentation and collection of known tire standards.

3.5 Independent Exercises

- A. The trainee will be provided multiple impressions to detect, document, and preserve. At least one example for each recovery technique should be provided by the trainer.
- B. The trainee will be provided bloody impressions to chemically enhance.
 - 1. Proper selection and documentation of the enhancement solution and technique(s) used should be completed by the trainee.
 - 2. Proper documentation of the bloody impression before and after enhancement should be completed by the trainee
- C. The trainee will provide a written response to the following questions:
 - 1. What is oblique lighting and what is its purpose?
 - 2. What is the difference between an examination quality photograph and general photograph? Give examples of each as it applies at a crime scene.
 - 3. What general options should a camera being used for examination photos have? Describe the proper procedure to take an examination quality photograph of an impression.
 - 4. What does a casting of an impression capture that a photograph does not and why is this important?
 - 5. When is an electrostatic lifter typically used? Describe the general procedure and some of the safe guards that need to be taken while processing and during storage of the evidence.

6. What is the purpose of chemically enhancing a bloody impression and how do you decide which method to use?
7. Describe what needs to be done before enhancing a bloody impression with the impression itself and the solutions being used?
8. Where would you get the safety information for the reagents used to make the enhancement solutions? Please provide an example copy(s) of the relevant paperwork along with a brief explanation.

4 Assessment

4.1 Competency and Qualifying Examination

A comprehensive written examination will be completed for the unit.

4.2 Evaluation of Training

Successful completion of this module is determined by the trainer. The trainee and the trainer will complete the Crime Scene Response Trace Evidence Training Checklist (LAB-CSR-TM-03).

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05 BIOLOGICAL EVIDENCE TRAINING UNIT

CSR-TM-05-01 BIOLOGICAL EVIDENCE SCREENING AND COLLECTION

Duration 3 to 5 days

Purpose The purpose of this module is to familiarize the trainee with various techniques used to identify, collect, and preserve biological evidence.

Prerequisite Crime Scene Documentation Unit, Photography Unit

1 Objectives

1.1 Theoretical

The recognition and identification of biological evidence such as blood, semen, or other sources of DNA can be of importance in crime scene investigations. It is imperative that crime scene personnel be able to identify possible body fluids, properly perform presumptive testing, and collect and preserve any evidence identified at a crime scene while ensuring the integrity of the biological evidence at all times.

1.2 Practical

Upon completion of this module, the trainee will be able to:

- A. Handle biological evidence in a manner that maintains the integrity of the evidence and reduces the risks of contamination.
- B. Recognize potential stains and understand their evidentiary value by utilizing available presumptive testing techniques to determine their need for collection and further testing.
- C. Properly document and collect biological evidence at a crime scene.

2 Training Outline

2.1 Lesson Plan

- A. Chemicals and environmental insults promoting the degradation and loss of DNA
 1. Bleach, detergents, and other cleaners
 2. Heat and humidity
 3. Ultraviolet light (sunlight)
 4. Bacteria and other microorganisms
- B. Actions taken to preserve DNA
 1. Proper collection of biological material
 2. Proper storage of evidence
- C. Possible sources of contamination at a crime scene
 1. People
 2. Equipment
 3. Other items of evidence
- D. Necessary precautions taken to prevent contamination at a crime scene
 1. Proper personal protective equipment

2. Limit personnel in a scene
 3. Limit interactions with the evidence
 4. Proper cleaning of tools, utensils, and workspaces
- E. Item documentation
1. Written
 - a) *Location*
 - b) *General characteristics and description*
 - c) *Sketch if necessary*
 2. Photography
 - a) *Before testing*
 - b) *After testing*
- F. Collection techniques
1. Swabbing
 2. Cutting
 3. Other
- G. Tape lifting
- H. Alternate Light Source (ALS)
1. Appearance
 2. Limitations
- I. Blood screening
1. Composition of blood and blood components
 - a) *Hemoglobin*
 - b) *Red and white blood cells*
 2. Visual examination
 - a) *Use of different light sources*
 - b) *Basic bloodstain pattern interpretation*
 3. Presumptive testing
 - a) *Tests – use, chemical basis, sensitivity, stability, and specificity*
 - b) *Quality control*
 - i. *False positives*
 - ii. *Reagent controls – use and interpretation*
 4. Luminol
 - a) *Chemical basis*
 - b) *Appearance*
 - c) *Limitations*
 - d) *Photography*

5. Species determination
 - a) *Hematrace*
 - b) *Limitations*
 - J. Semen screening
 1. Composition of semen and seminal components
 - a) *Acid phosphatase*
 - b) *P30 / Prostate Specific Antigen (PSA)*
 - c) *Spermatozoa*
 2. Locating semen stains
 - a) *ALS*
 - b) *Appearance*
 - c) *Limitations*
 3. Presumptive testing
 - a) *Tests – use, chemical basis, sensitivity, stability, and specificity*
 - b) *Quality control*
 - i. *False positives*
 - ii. *Reagent controls – use and interpretation*
 - K. Selection of stains/samples for collection
 - L. Touch Samples
 1. Possible sources
 2. Proper collection
 3. Limitations
- 2.2 Required Readings**
- A. DNA Standard Operating Procedures
 1. Evidence Handling
 2. Physical Evidence Examination
 3. Alternate Light Source
 4. Presumptive Blood Tests – PHT, TMB, and LMG
 5. Presumptive Blood Test – Luminol
 6. Presumptive Semen Test – Acid Phosphatase (AP)
 7. Presumptive Species Origin Determination - Hematrace
 8. AP Test Reagent
 9. Leucomalachite Green (LMG) Solution
 10. Phenolphthalin (PHT) Solution
 11. Tetramethylbenzidine (TMB) Solution

- B. Crime Laboratory Service Manual – Biology/DNA Analysis
- C. Crime Scene Response Standard Operating Procedure – Collection and Preservation of Biology/DNA Evidence
- D. Safety Manual
 - 1. Personal Protective Equipment,
 - 2. Biological Pathogen Exposure Control Plan
- E. Butler, JM. *Advanced Topics in Forensic DNA Typing: Methodology*, Elsevier, Inc., 2012, pp. 1-10 and 18-19.
- F. Farley, M and Harrington, J. *Forensic DNA Technology*, Lewis Publishers, Inc., 1991, pp. 75-78.
- G. Inman, K and Rudin, N. *An Introduction to Forensic DNA Analysis*, 1st ed., CRC Press, 1997, pp. 11-14.
- H. Houck, M and Siegel, J. *Fundamentals of Forensic Science*, Academic Press, 2010, pp. 229-244.
- I. Taupin, JM and Cwiklik, C. *Scientific Protocols for Forensic Examination of Clothing*. CRC Press, 2011. Sections:
 - 1. 7.1 – Blood
 - 2. 7.2 – Semen
- J. Bevel, T and Gardner, RM. *Bloodstain Pattern Analysis with an Introduction to Crime Scene Reconstruction*, 3rd ed., 2008.
 - 1. Chapter 1 – Bloodstain Pattern Analysis: Its Function and a Historical Perspective
 - 2. Chapter 2 – Bloodstain Pattern Terminology
 - 3. Chapter 5 – The Medium of Blood
 - 4. Chapter 11 – Bloodstain Clothing Issues
- K. Lytle and Hedgecock. *Chemiluminescence in the Visualization of Forensic Bloodstains*. J For Sci., 1978, 23(3), pp. 550-562.
- L. Safety Data Sheets for
 - 1. Luminol,
 - 2. Sodium Carbonate,
 - 3. Sodium Perborate,
 - 4. Phenolphthalin,
 - 5. 3,3,5,5-Tetramethylbenzidine,
 - 6. Leucomalacite green,
 - 7. 1-Naphthyl Phosphate Calcium Salt Trihydrate (Acid Phosphatase)

2.3 Suggested Readings

Bevel, T and Gardner, RM. *Bloodstain Pattern Analysis with an Introduction to Crime Scene Reconstruction*, 3rd ed., 2008.

1. Chapter 3 – Bloodstain Classification
2. Chapter 4 – A Methodology for Bloodstain Pattern Analysis

3 Practice

3.1 Safety

- A. Gloves must be worn during reagent preparation and testing. Clothing may protect unbroken skin; broken skin should be covered. Eye protection is recommended during reagent preparation and handling of liquid body fluids. Chemicals used may be carcinogenic or caustic. Blood may contain infectious agents. Use universal precautions during evidence handling.
- B. Always wear appropriate eye protection while using the alternate light source and avoid looking directly into the light. Follow safety and use directions provided with the instrument.
- C. α -Naphthyl acid phosphate and o-dianisidine are suspected carcinogens. Application of the AP spot test reagent using a spray bottle must be performed in a chemical fume hood.
- D. Luminol is an irritant. Sodium perborate and sodium carbonate are toxic and irritating. Avoid breathing dust; do not get in eyes, on skin, or on clothing. Avoid breathing sprayed solution. Spray will deposit a light white film on surfaces. Appropriate personal protective equipment must be worn during preparation and use.

3.2 Standards, Controls, Reagent Preparation

Consult associated SOP(s)

3.3 Equipment

Consult associated SOP(s)

3.4 Supervised Performance

- A. Demonstrate and practice proper procedures for cleaning tools and utensils.
- B. Demonstrate proper recognition and documentation of at least five (5) different stains/samples.
- C. Demonstrate proper presumptive testing of at least five (5) different stains/samples (blood and semen).
- D. Demonstrate proper evidence collection of at least five (5) different stains/samples.

3.5 Independent Exercises

- A. The trainer will provide the trainee with at least 10 different mock items of evidence. The trainee will determine the appropriate testing to be performed on each item, as well as proper documentation and collection of each item.
- B. The trainee will provide a written response to the following questions:
 1. List at least 3 environmental factors that can cause the degradation of DNA.
 2. List at least three possible sources of contamination.

3. What component in blood does the presumptive tests react to?
4. What component of semen does the AP test react to?
5. When do you tape lift an item?

4 Assessment

4.1 Competency and Qualifying Examination

A comprehensive written examination will be completed for the unit.

4.2 Evaluation of Training

Successful completion of this module is determined by the trainer. The trainee and trainer will complete the Crime Scene Response Biological Evidence Training Checklist (LAB-CSR-TM-04).

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06 FRICTION RIDGE TRAINING UNIT

CSR-TM-06-01 OVERVIEW OF FRICTION RIDGE EVIDENCE

Duration 2 to 3 days

Purpose The purpose of this module is to familiarize the trainee with basic latent print concepts and terminology.

Prerequisite Crime Scene Documentation Unit, Photography Unit

1 Objectives

1.1 Theoretical

The skin functions to protect the inner contents of the body, allows for body temperature regulation, and provides a means for a sense of touch. On the palmar and plantar surfaces of the body, the skin is corrugated with ridges and furrows, and is known as friction ridge skin. This unique arrangement of friction ridge skin is formed in utero and remains unchanged except for size until after death, barring illness or injury. The trainee will gain a broad understanding of the terminology and anatomy for the human hands and feet. The trainee will also develop an understanding of the human sweat glands and the components of natural latent print residue.

The trainee will encounter three general categories of friction ridge impressions on evidence: latent, patent, and plastic prints. Latent prints are generally comprised of perspiration or sebaceous material. They are typically not visible to the naked eye and require some type of development technique to be visualized. Patent prints are visible and are made in material other than perspiration, such as blood or paint, and may or may not require additional development. Plastic prints are also visible, but are three-dimensional prints that do not require further development.

The perspiration which makes up latent print residue is exuded from minute sweat pores that run along the ridges of friction ridge skin. When friction ridge skin comes into contact with an object, this material may be transferred to that surface, leaving a latent print. This latent print residue is comprised of approximately 98.5% water. The remaining material includes various organic and inorganic compounds. Different latent print development techniques will react with specific components of latent print residue. Some development techniques may be utilized in sequence to maximize latent print development. Several techniques require fluorescent examination with a LASER or alternate light source. The trainee must always be cognizant of which latent print development techniques will interfere with examination by other forensic disciplines.

The trainee will gain a broad understanding of the factors involved in latent print recovery and how the components of latent print residue guide the selection and sequence of latent print development techniques.

1.2 Practical

Upon completion of this module, the trainee will:

- A. Have a basic understanding of the anatomy of the hands and feet as applicable to latent print identification.
- B. Understand that friction ridge skin is formed during fetal development and the friction ridge skin arrangement is persistent throughout time barring injury or disease.
- C. Understand that the friction ridge skin arrangement is unique to an individual.
- D. Have a basic understanding of human sweat glands and latent print residue components.

- E. Recognize the presence or absence of friction ridge detail.
- F. Understand when to preserve ridge detail.

2 Training Outline

2.1 Lesson Plan

- A. Friction ridge skin basics
 - 1. Physiology
 - a) *Friction ridges*
 - b) *Chemical composition of human sweat and latent print residue*
 - c) *Sweat glands*
 - 2. Ridge events/minutia
 - a) *Specific ridge path*
 - b) *Galton details*
 - i. *Bifurcation*
 - ii. *Ending ridge*
 - iii. *Dot*
- B. Types of prints
 - 1. Latent
 - 2. Patent
 - 3. Plastic
- C. Searching for latent prints
 - 1. Normal handling of objects/surfaces
 - a) *Porous*
 - b) *Non porous*
 - c) *Semi-porous*
 - 2. Oblique lighting
- D. Determining whether or not to preserve (digitally and/or lifting)
 - 1. Ridge detail versus other impressions
 - a) *Fabric impressions*
 - b) *Non friction ridge skin*
 - 2. Friction ridge detail versus smudges

2.2 Required Readings

- A. Crime Laboratory Service Manual – Friction Ridge Examination
- B. Crime Scene Response Standard Operating Procedures – Collection and Preservation of Friction Ridge Evidence

- C. DOJ. National Institute of Justice. *The Fingerprint Sourcebook*, 2011. Sections
1. 7.1 – Introduction
 2. 7.2 – The Composition of Latent Print Residue (through 7.2.5)

3 Practice

3.1 Safety

None

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Independent Exercises

- A. Document if ridge detail is present or absent on the handout provided by the trainer.
- B. The trainee will provide a written response to the following questions:
 1. Describe the three different types of prints.
 2. List components of residue for each type of print.

4 Assessment

Successful completion of this module is determined by the trainer. The trainee and trainer will complete the Crime Scene Response Friction Ridge Training Checklist (LAB-CSR-TM-05).

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CSR-TM-06-02 COLLECTION OF FRICTION RIDGE EXEMPLARS

Duration 1 day

Purpose The purpose of this module is to educate the trainee on types of friction ridge skin exemplars utilized for comparison purposes and the proper methods to record exemplars.

Prerequisite Crime Scene Documentation Unit, Photography Unit

1 Objectives

1.1 Theoretical

Exemplars may be compared to suitable latent prints or other exemplars. Exemplars recorded of an individual's friction ridge skin may include finger, palm, toe, and sole prints. Good quality, completely rolled exemplars are important to obtain because latent prints are generally fragmentary. The trainee will gain a broad understanding of the methods for and purpose of recording friction ridge detail.

1.2 Practical

Following the completion of training, the trainee will:

- A. Properly record and document friction ridge skin exemplars
- B. Discuss the proper method for recording friction ridge detail

2 Training Outline

2.1 Lesson Plan

- A. Collection of exemplars – living subjects
 - 1. Standard fingerprint exemplars
 - a) *Fingerprint card information*
 - b) *Obtaining fully rolled fingerprint exemplars*
 - i. *Recording sequence*
 - ii. *Rolled nail-to-nail*
 - iii. *Simultaneous impressions*
 - 2. Palm print exemplars
 - a) *Cardboard roller*
 - b) *Obtaining fully rolled palm print exemplars*
 - i. *Hypothenar*
 - ii. *Thenar*
 - iii. *Interdigital*
 - iv. *Joints*
 - 3. Major case prints
 - 4. Footprint exemplars

- B. Collection of exemplars – deceased subjects
 - 1. Unique challenges
 - 2. Breaking rigor – laws governing the removal of fingers, hands, and feet
 - 3. Decomposed, macerated, desiccated, rehydrated, and charred friction ridge skin
 - a) *Photography*
 - b) *Powdering*
 - c) *Lifting*
 - d) *Casting*

2.2 Required Readings

- A. Latent Prints Standard Operating Procedures
 - 1. Collection of Friction Ridge Exemplar from Living Subjects
 - 2. Collection of Friction Ridge Exemplar from Deceased Subjects
- B. DOJ. National Institute of Justice. *The Fingerprint Sourcebook*, 2011. Chapter 4 – Recording Living and Postmortem Friction Ridge Exemplars

3 Practice

3.1 Safety

Wear appropriate personal protective equipment. This includes, but is not limited to, gloves, lab coat, and eye protection. The extent of protection is proportional to the amount of perceived risk involved, and some activities will require more extensive protection.

3.2 Standards, Controls, Reagent Preparation

Consult associated SOP(s)

3.3 Equipment

Consult associated SOP(s)

3.4 Supervised Performance

The trainee will complete the following exercises:

- A. Obtain a complete set of major case prints from one (1) subject.
- B. Obtain a complete set of inked footprints from one (1) subject.
- C. Obtain a complete set of finger and palm print exemplars from a “deceased” subject (both ink and powder methods).
- D. Obtain a cast of one (1) finger.

4 Assessment

Successful completion of this module is determined by the trainer. The trainee and trainer will complete the Crime Scene Response Friction Ridge Training Checklist (LAB-CSR-TM-05).

CSR-TM-06-03 FRICTION RIDGE DEVELOPMENT AND PRESERVATION TECHNIQUES

Duration 3 days

Purpose The purpose of this module is to familiarize the trainee with appropriate latent print processing and preservation techniques for crime scenes.

Prerequisite Crime Scene Documentation Unit, Photography Unit

1 Objectives

1.1 Theoretical

The trainee will gain a broad understanding of the factors involved in latent print recovery and how the components of latent print residue guide the selection and sequence of latent print development techniques.

1.2 Practical

Following the completion of training, the trainee will be able to:

- A. Search for latent print evidence and apply appropriate latent print development techniques in proper sequence in order to maximize latent print development on an extensive range of surfaces.
- B. Make the determination on what should be processed in the field and what should be collected for laboratory processing.
- C. Preserve friction ridge evidence through various lifting and photography techniques.
- D. Properly document friction ridge evidence.

2 Training Outline

2.1 Lesson Plan

- A. Visual examination
- B. Powder development techniques
 1. Black/bichromatic/fluorescent powders
 2. Magnetic powders
- C. Blood development technique: Amido black
- D. Photography
- E. Lifting with tapes
 1. Clear/frosted/poly tape
 2. 2", 4" tapes

2.2 Required Readings

- A. Friction Ridge Standard Operating Procedures
 - 1. Powder Processing
 - 2. Magnetic Powder Processing
 - 3. Amido Black Processing
 - 4. Lifting Techniques
- B. DOJ. National Institute of Justice. *The Fingerprint Sourcebook*, 2011. Sections
 - 1. 7.3 – Latent Print Powders
 - 2. 7.12 – Blood Enhancement Techniques
 - 3. 8.5 – Modern Photography
 - 4. 8.6 – Other Methods of Friction Ridge Preservation
 - 5. 10.2.1 – General Crime Scene Documentation
 - 6. 10.2.2 – Collecting Items of Evidence
 - 7. 10.2.3 – Latent Print Development and Recovery on Scene
 - 8. 11.1 – Introduction
 - 9. 11.2 – Crime Scene Equipment
- C. Safety Data Sheets for
 - 1. Powders
 - 2. Amido Black

3 Practice

3.1 Safety

- A. Wear personal protective equipment. This may include but is not limited to gloves, lab coat, and eye protection.
- B. Fingerprint powder can easily be inhaled.
- C. Amido black should only be mixed in a vent hood.
- D. Amido black is mixed with methanol which is highly flammable; extreme caution should be taken when at a crime scene as to make sure all pilot lights on gas heaters and stoves are not lit. Use in a well-ventilated area.
- E. Caution should always be exercised around a bloody crime scene or handling evidence which contains blood. Blood may contain infectious agents. Use universal precautions during evidence handling.
- F. Be careful of serrated edges of tape dispensers.

3.2 Standards, Controls, Reagent Preparation

Consult associated SOP(s)

3.3 Equipment

Consult associated SOP(s)

3.4 Supervised Performance

The trainee will complete the following exercises:

- A. Photograph visible latent, patent, and plastic prints. Use various lighting techniques on samples to compare results. Samples provided by trainer.
- B. Process various substrates with various powders and Amido Black for latent prints.
- C. Make 10 lifts (total) utilizing clear, frosted, and polyethylene tape.
- D. Process a vehicle with various powders and make lifts (minimum of 5). At least one lift shall be a palm print or simultaneous impression utilizing overlapping tape.

4 Assessment

4.1 Competency and Qualifying Examination

A comprehensive written examination will be completed for the unit.

4.2 Evaluation of Training

Successful completion of this module is determined by the trainer. The trainee and trainer will complete the Crime Scene Response Friction Ridge Training Checklist (LAB-CSR-TM-05).

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07 FIREARMS & TOOLMARKS TRAINING UNIT

CSR-TM-07-01 FIREARMS AND TOOLMARKS OVERVIEW

Duration ½ day

Purpose The purpose of this module is to introduce the trainee to the services offered by the Firearms and Toolmarks section of the Crime Laboratory Service.

Prerequisite Crime Scene Documentation Unit, Crime Scene Photography Unit, Trace Evidence Unit, Biological Evidence Unit, Friction Ridge Unit

1 Objectives

1.1 Theoretical

The Firearms and Toolmarks section of the Crime Laboratory Service provides a number of analyses to the Law Enforcement agencies throughout Texas. An understanding of the types of analysis the laboratory is capable of offering is essential in ensuring all relevant evidence from a crime scene is collected and submitted to the correct laboratory.

1.2 Practical

Upon completion of this module, the trainee will be able to understand the types of analysis conducted by the Firearms and Toolmarks section as which laboratories in the System provide which services.

2 Training Outline

2.1 Lesson Plan

- A. Analyses offered by Firearms and Toolmarks section
 - 1. Firearms analysis
 - 2. Muzzle to Garment Distance Determination
 - 3. Serial Number Restoration
 - 4. Ejection Pattern Testing
 - 5. Trajectory
- B. Service map

2.2 Required Readings

- A. Crime Laboratory Service Manual – Firearms & Toolmarks Analysis
- B. Haag, M. and Haag, L. *Shooting Incident Reconstruction*, 2nd ed., Academic Press, 2011, Chapter 2 – Working Shooting Scenes, pp. 13 – 31.

3 Practice

3.1 Safety

None

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Independent Exercises

The trainee will provide a written response to the following questions:

1. List the four (4) services offered by the DPS Firearms and Toolmarks section.
2. List three (3) of the possible exams offered during firearms analysis.
3. List five (5) items that must be submitted for Muzzle to Garment Distance Determination?
4. What must be documented at the scene in order to conduct Ejection Pattern testing and how must those items be documented?

4 Assessment

Successful completion of this module is determined by the trainer. The trainee and trainer will complete the Crime Scene Response Firearms & Toolmarks Training Checklist (LAB-CSR-TM-06).

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CSR-TM-07-02 FIREARMS SAFETY

Duration 1 day

Purpose The purpose of this module is to introduce and familiarize the trainee with general firearms safety and proper handle procedures.

Prerequisite Overview of Firearms and Toolmarks

1 Objectives

1.1 Theoretical

Upon completion of this module, the trainee will:

- A. Understand the rules of firearm safety
- B. Know the general components of a firearm
- C. Know how to clear a firearm
- D. Know how to render a firearm safe for submission to a laboratory

1.2 Practical

Upon completion of this module, the trainee will be able to handle, clear, and render a firearm safe for laboratory submission.

2 Training Outline

2.1 Lesson Plan

- A. Three rules of firearm safety
 1. Always treat a firearm as if it is loaded
 2. Always point a firearm in a safe direction
 3. Always keep your finger off the trigger.
- B. General components of a firearm
 1. Trigger
 2. Barrel
 3. Frame
 4. Trigger guard
 5. Chamber
- C. Clearing a firearm
 1. Hand gun
 - a) *Pistol*
 - b) *Revolver*
 - c) *Other*
 2. Long Gun
 - a) *Rifle*
 - b) *Shotgun*
 - c) *Other*

- D. Rendering a firearm safe

2.2 Required Readings

- A. Firearms and Toolmarks Standard Operating Procedures – Firearm Safety
- B. Bussard, M. and Wormley Jr., S. *NRA Firearms Sourcebook*, Fairfax, VA: National Rifle Association, 2006.
 - 1. Chapter 1 – Safety, pp. 3 – 18
 - 2. Chapter 5 – Nomenclature

3 Practice

3.1 Safety

Appropriate hearing and eye protection must be worn when applicable.

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Supervised Performance

Under supervision of a Firearms analyst, the trainee will

- A. Demonstrate how to clear various types of revolvers, pistols, shotguns, and rifles.
- B. Verbally explain or, if supplies are available, demonstrate how to secure and package the cleared firearms for submission to the laboratory.
- C. Document the make, model, caliber, serial number, and a photograph of the firearms used in this exercise.

3.5 Independent Exercises

The trainee will provide a written response to the following questions:

1. What are the three (3) general rules when dealing with any firearm?
2. What are three (3) of the major components that all firearms have?
3. What is the process for clearing a pistol?
4. What is the proper procedure for packaging a revolver?
5. What needs to be written on the outer most packaging of a firearm that was not able to be cleared?

4 Assessment

Successful completion of this module is determined by the trainer. The trainee and trainer will complete the Crime Scene Response Firearms & Toolmarks Training Checklist (LAB-CSR-TM-06).

CSR-TM-07-03 TOOLMARKS

Duration ½ day

Purpose The purpose of this module is to introduce and familiarize the trainee with recognizing, collecting, and packaging of toolmark evidence.

Prerequisite Overview of Firearms and Toolmarks

1 Objectives

1.1 Theoretical

Following the completion of this module the trainee will have an understanding of:

- A. The guiding principle of toolmark analysis
- B. The various classes and types of tools
- C. Which types of evidence to collect
- D. The methods for collecting toolmark evidence and what scenes toolmark evidence collection may be needed
- E. How to package tools and toolmark evidence for laboratory submission

1.2 Practical

Upon completion of this module, the trainee will be able to recognize, preserve, and collect toolmark evidence.

2 Training Outline

2.1 Lesson Plan

- A. Define toolmarks
- B. Classes and types of tools
 1. Shearing
 2. Pinching
 3. Scraping
 4. Impressing
 5. Slicing
- C. Identifying evidence to collect
 1. Tools
 2. Toolmark evidence
 3. Reference/test material
- D. Collection methods
 1. Direct collection
 2. Casting
- E. Packing for submission
 1. Tools

2. Toolmark evidence
3. Reference / test material

2.2 Required Readings

- A. Petraco, N. Color Atlas of Forensic Toolmark Identification, CRC Press, 2010.
 1. Introduction
 2. Chapter 5 – Collection and Documentation of Toolmarks, pp. 49 – 58
 3. Chapter 9 – Common Hand Tools Seen in Casework, pp. 111 – 149
- B. Federal Bureau of Investigation, Law Enforcement Bulletin, Sept. 1950.

3 Practice

3.1 Safety

Consult associated SOP(s)

3.2 Standards, Controls, Reagent Preparation

Consult associated SOP(s)

3.3 Equipment

Consult associated SOP(s)

3.4 Supervised Performance

Collect (5) Toolmarks using various collection methods.

3.5 Independent Exercises

The trainee will provide a written response to the following questions:

1. What is the basic foundational principle that allows for toolmark analysis?
2. Name four (4) common tools that may be found at a crime scene?
3. Based on current DPS policy, what are the two (2) requirements for toolmark analysis?
4. What material should be collected from a scene if toolmark analysis is going to be requested?
5. What are the two primary collection methods for evidence collection in a toolmark case?
6. True or False: An analyst is able to do comparisons based on macro photographs of evidence at the scene?
7. What must you do to toolmark evidence if it had to be cut out when it was collected from the scene?

4 Assessment

Successful completion of this module is determined by the trainer. The trainee and trainer will complete the Crime Scene Response Firearms & Toolmarks Training Checklist (LAB-CSR-TM-06).

CSR-TM-07-04 FIREARMS

Duration ½ days

Purpose The purpose of this module is to introduce and familiarize the trainee with recognizing, collecting, and packaging of firearms evidence.

Prerequisite Overview of Firearms and Toolmarks, Firearms Safety, Toolmarks

1 Objectives

1.1 Theoretical

Upon completion of this module, the trainee will be able to understand:

- A. The principles of firearms analysis
- B. The types of firearms
- C. The components of ammunition
- D. How to collect firearms and firearms related evidence
- E. How to package a firearm or firearms evidence for submission to a laboratory

1.2 Practical

Upon completion of this module, the trainee will be able to recognize, preserve, and collect firearms evidence.

2 Training Outline

2.1 Lesson Plan

- A. Principle of firearms analysis
- B. Types of firearms
 1. Handgun
 2. Long gun
 3. Homemade / improvised
- C. Ammunition and ammunition components
- D. Firearms accessories
- E. Collection
 1. Firearms
 2. Ammunition
 3. Fired components
 4. Special situations
- F. Packaging

2.2 Required Readings

- A. Heard, Brian J. *Firearms and Ballistics*, 2nd Ed. John Wiley & Sons Ltd, 2008, Chapter 1 – Firearms, pp. 19-31.

- B. Heard, Brian J. *Forensic Ballistics in Court*, John Wiley & Sons Ltd, 2013.
 - 1. Chapter 2.1 – Gas and Air Powered Weapons, pp. 25 – 31
 - 2. Chapter 2.3 – Home-made, Improvised and Converted Firearms, pp. 43 – 50
- C. Di Maio, Vincent JM. *Gunshot Wounds*, 2nd ed., CRC Press, 1999.
 - 1. Chapter 1 – Firearms and Ammunition, pp. 1 – 31
 - 2. Chapter 10 – Miscellaneous Weapons and Ammunition, pp. 277 – 314
- D. Haag, Michael G and Haag, Lucien C. *Shooting Incident Reconstruction*, 2nd ed., Elsevier, 2011, Chapter 2 – Working Shooting Scenes, pp. 13 – 31.
- E. *The 13 Critical Tasks*, 2nd ed., pp. 77-85.

3 Practice

3.1 Safety

None

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Independent Exercises

The trainee will provide a written response to the following questions:

1. Name four items (if present) that should be collected from a scene.
2. What is an improvised firearm and what makes them more dangerous than a traditional firearm?
3. What are the four basic components to a pistol cartridge?
4. When must unfired ammunition from a crime scene absolutely be collected?
5. What is the proper way to collect and package a firearm that was found underwater?
6. What is the proper way to package a firearm that is collected from a scene, please include the one thing you should never do when packaging a firearm?
7. What kind of containers should you avoid when packaging fired components?

4 Assessment

4.1 Competency and Qualifying Examination

A comprehensive written examination will be completed for the unit.

4.2 Evaluation of Training

Successful completion of this module is determined by the trainer. The trainee and trainer will complete the Crime Scene Response Firearms & Toolmarks Training Checklist (LAB-CSR-TM-06).

08 DIGITAL/MULTIMEDIA TRAINING UNIT

CSR-TM-08-01 DIGITAL/MULTIMEDIA EVIDENCE

Duration 1 day

Purpose The trainee will become familiar with the collection and preservation of digital/multimedia evidence.

Prerequisite Crime Scene Documentation Unit, Crime Scene Photography Unit

1 Objectives

1.1 Theoretical

Nearly every home has multiple computers or mobile electronic devices. When discovered at a crime scene, these devices should be considered as possible evidence; they can be used to store evidence of homicide, sexual assaults, questioned death, child pornography, records of drug transactions, financial and other crimes. Examples of some of the commonly submitted types of digital evidence include: computer towers and laptops, iPads or other tablets, iPods, PDAs, cellular telephones and smart phones, peripheral devices such as USB drives (or thumb drives), camera cards, and Global Positioning Systems (GPS devices). The examination of these items is performed in the Digital/Multimedia Section.

1.2 Practical

Upon completion of this module, the trainee will be able to recognize, preserve, and collect digital/multimedia evidence.

2 Training Outline

2.1 Lesson Plan

Documentation, collection, and packaging of:

- A. Computers/laptops
- B. Cell phones/tablets
- C. Peripheral devices
- D. Audio/video devices

2.2 Required Readings

Crime Laboratory Service Manual – Digital/Multimedia Analysis

3 Practice

3.1 Safety

None

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Independent Exercises

The trainee will answer the following questions:

1. What are two ways data can be lost on an evidence mobile phone if not powered off or isolated from the cellular network?
2. Why is it recommended to remove power from evidence computers and digital video recorders by pulling the plug from the back of the device rather than from the wall?
3. True or False: If a crime scene involves a business using networked computers, it is advisable to direct the system administrator to independently collect and preserve the data.
4. List six (6) items that can be considered digital evidence.
5. If a laptop does not shut down when the power cord is removed, what should be the next step of the collection process?
6. Why is it important to document the displayed time as it relates to actual time on a digital video recorder?
7. True or False: Computers and digital media collected for evidence analysis should be transported in close proximity to electromagnetic radio, i.e., police car radios.

4 Assessment

4.1 Competency and Qualifying Examination

A comprehensive written examination will be completed for the unit.

4.2 Evaluation of Training

Successful completion of this module is determined by the trainer. The trainee and trainer will complete the Crime Scene Response Digital/Multimedia Training Checklist (LAB-CSR-TM-07).

09 FORENSIC DOCUMENT EXAMINATION TRAINING UNIT

CSR-TM-09-01 COLLECTION OF FORENSIC DOCUMENT EVIDENCE

Duration 1 day

Purpose The purpose of this module is to familiarize the trainee with the collection and preservation of forensic document evidence.

Prerequisite Crime Scene Documentation Unit, Crime Scene Photography Unit

1 Objectives

1.1 Theoretical

The Forensic Document Examination (FDE) discipline offers the laboratory service of forensic document examination. The forensic document examiner may:

- A. Identify or eliminate a subject as the writer of a particular document(s) by the comparison of questioned and known handwriting,
- B. Identify the source of a document,
- C. Identify the machine(s) that produced a document, or
- D. Ascertain information related to how a document was created or altered which may be of value in a criminal investigation.

1.2 Practical

Upon completion of this module, the trainee will be able to recognize, preserve, and collect forensic document evidence

2 Training Outline

2.1 Lesson Plan

- A. Types of examinations available
- B. Saturated/Charred documents
- C. Protection of indented writing
- D. Writing instruments and writing surfaces
- E. Photography
- F. Collection and preservation of documents
- G. Collection of standards

2.2 Required Readings

- A. Forensic Document Examination Brochure. Texas DPS. Current Version.
- B. Kelly, JS and Lindblom, B. *Scientific Examination of Questioned Documents*, 2nd ed., 2006, Chapter 4 – Care and Handling of Documents, pp. 21-27.

3 Practice

3.1 Safety

None

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Independent Exercises

The trainee will provide a written response to the following questions:

1. Name 3 things a crime scene investigator should not do to a questioned document found at a crime scene.
2. You find a deceased person with a gunshot wound to the head inside a vehicle. There is a folded piece of paper that is saturated with apparent blood in the subject's pocket. How do you collect and store this evidence?
3. You walk into a residence where there is handwriting on the walls and floors. How do you properly photograph the handwriting?

4 Assessment

4.1 Competency and Qualifying Examination

A comprehensive written examination will be completed for the unit.

4.2 Evaluation of Training

Successful completion of this module is determined by the trainer. The trainee and trainer will complete the Crime Scene Response Forensic Document Examination Training Checklist (LAB-CSR-TM-08).

10 OTHER TOPICS

CSR-TM-10-01 OTHER TOPICS ENCOUNTERED IN CRIME SCENE RESPONSES

Duration 7 days

Purpose The purpose of this module is to familiarize and introduce the trainee to other situations/types of evidence they may encounter at a crime scene.

Prerequisite Crime Scene Documentation Unit, Photography Unit

1 Objectives

1.1 Theoretical

Crime scenes are unpredictable in nature and require examiners to be placed into situations which are uncommon. The examiner must be able to assess the scene and determine the best approach. There are many types of evidence at a scene that may be probative to the case that are not analyzed within the DPS Crime Laboratory Service or may be atypical for most crime scenes. The knowledge and understanding of this evidence is critical and must be evaluated for all scenes.

1.2 Practical

Upon completion of this module, the trainee will be familiar with:

- A. Fire/explosive scenes and how they are handled
- B. Landfill recoveries
- C. Recovery of skeletal/buried/scattered remains
- D. Collection of entomological samples
- E. Collection of soil samples
- F. Awareness of bloodstain pattern analysis
- G. Collection of drug evidence

2 Training Outline

2.1 Required Readings

- A. Fire/Explosive Scenes
 1. Gardner R.M. *Practical Crime Scene Processing and Investigation*, 2nd ed., 2012, Chapter 13 – Special Scene Considerations, pp. 383-394.
 2. Saferstein R. *Forensic Science Handbook*, vol. I, 2nd ed., 2002, Chapter 9 – Arson and Explosive Investigation, pp. 480-484.
 3. Fisher B.A.J. *Techniques of Crime Scene Investigation*, 7th ed., 2004, Chapter 11 – Arson and Explosives.
 4. National Forensic Science Technology Center (NFSTC). “*Crime Scene Investigation: A Guide for Law Enforcement*”, 2013, page 56.
 5. National Institute of Justice (NIJ). “*Fire and Arson Scene Evidence: A Guide for Public Safety Personnel*”, June 2000.

B. Landfill Recoveries

Gardner R.M. *Practical Crime Scene Processing and Investigation*, 2nd ed., 2012, Chapter 13 – Special Scene Considerations, pp. 394-399.

C. Buried/Scattered Remains

1. Gardner R.M. *Practical Crime Scene Processing and Investigation*, 2nd ed., 2012, Chapter 13 – Special Scene Considerations, pp. 399-407.
2. Oliver, Billy. *Discovery And Recovery: Applications Of Forensic Archeology*. 1st ed., North Carolina State University, Forensic Technology Center of Excellence, 17 Aug. 2016. <https://forensiccoe.org/workshop/discovery-and-recovery/>
3. Oliver, Billy. *Discovery and Recovery of Human Remains*, North Carolina State University, Forensic Technology Center of Excellence, 17 Aug. 2016. <https://forensiccoe.org/workshop/discovery-and-recovery/>
4. Ross, Ann. *Skeletal Anatomy and Human vs. Non-Human*, North Carolina State University, Forensic Technology Center of Excellence, 17 Aug. 2016. <https://forensiccoe.org/workshop/discovery-and-recovery/>
5. Ross, Ann. *Skeletal Anatomy and Human vs. Non-Human Laboratory*, North Carolina State University, Forensic Technology Center of Excellence, 17 Aug. 2016. <https://forensiccoe.org/workshop/discovery-and-recovery/>
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D. Entomological Information

1. Gardner R.M. *Practical Crime Scene Processing and Investigation*, 2nd ed., 2012, Chapter 13 – Special Scene Considerations, pp. 407-408.
2. “Forensic Entomology or the use of insects in death investigations,” SFU Museum of Archaeology and Ethnology, 2010. Web. Dec. 22, 2015. http://www.sfu.museum/forensics/eng/pg_media-media_pg/entomologie-entomology/
3. Byrd, Jason. *Forensic Entomology: Introduction*, 1st ed. North Carolina State University, Forensic Technology Center of Excellence. <https://forensiccoe.org/private/5dd6ea4a10cbc>.
4. Byrd, Jason. *Forensic Entomology: Insects and Indicators of the Postmortem Interval*, 1st ed. North Carolina State University, Forensic Technology Center of Excellence, 17 Aug. 2016. <https://forensiccoe.org/workshop/discovery-and-recovery/>
5. Byrd, Jason.. *Estimation of PMI Using Entomological Evidence*, North Carolina State University, Forensic Technology Center of Excellence, 17 Aug. 2016. <https://forensiccoe.org/workshop/discovery-and-recovery/>.
6. Byrd, Jason. *Entomological Field Collection Techniques*, North Carolina State University, Forensic Technology Center of Excellence, 17 Aug. 2016. <https://forensiccoe.org/workshop/discovery-and-recovery/>
7. Byrd, Jason. *History and Overview of Forensic Entomology*, Part 1, North Carolina State University, Forensic Technology Center of Excellence, 17 Aug. 2016. <https://forensiccoe.org/workshop/discovery-and-recovery/>

8. Byrd, Jason. *History and Overview of Forensic Entomology*, Part 2, North Carolina State University, Forensic Technology Center of Excellence, 17 Aug. 2016. <https://forensiccoe.org/workshop/discovery-and-recovery/>

E. Soil Information

Saferstein R. *Forensic Science Handbook*, vol. I, 2nd ed., 2002, Chapter 11 – Forensic Examination of Soil, pp. 616-619.

F. Bloodstain Pattern Information

1. Bevel T., Gardner R.M. *Bloodstain Pattern Analysis*, 3rd ed., 2008.
 - a) *Chapter 2 – Bloodstain Pattern Terminology*
 - b) *Chapter 3 – Bloodstain Classification*
 - c) *Chapter 10 – Understanding and Applying Characteristic Patterns of Blood*
 - d) *Chapter 13 – Documenting Bloodstains*
2. C. Latham, H. Latham. *Basic Bloodstain Pattern Analysis Course*, Latham Forensics 2013, PowerPoint Slides.

G. Drug Evidence

Crime Laboratory Service Manual – Seized Drugs Analysis

3 Practice

3.1 Safety

None

3.2 Standards, Controls, Reagent Preparation

None

3.3 Equipment

None

3.4 Independent Exercises

The trainee will provide a written response to the following questions:

1. What are some safety considerations that need to be considered when at a fire scene?
2. What is the definition of arson?
3. What should an item that is suspected of having an ignitable fluid on it be packaged in?
4. What are some methods utilized to detonate an improvised explosive device?
5. Describe the methodology for landfill searches/recoveries.
6. What are two things used to determine human vs. non-human bones?
7. Describe the strategy and methodology for burial investigations in regards to identification of a burial site and excavation.
8. What is the most common use for entomological evidence?

9. How do you collect and package entomological evidence?
10. What can dry soil samples be packaged in? Wet samples?
11. What are the four steps a blood drop goes through as it contacts a surface?
12. Explain the difference between a transfer pattern, swipe, and wipe.
13. How do you determine what direction a blood drop was traveling by examining the stain?
14. How are fresh drug substances collected?

4 Assessment

4.1 Competency and Qualifying Examination

A comprehensive written examination will be completed for the unit.

4.2 Evaluation of Training

Successful completion of this module is determined by the trainer. The trainee and trainer will complete the Crime Scene Response Other Topics Training Checklist (LAB-CSR-TM-09).

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11 FORMS

TRAINING FORMS

	Document Name	FRN
1	Crime Scene Overview and Documentation Training Checklist	LAB-CSR-TM-01
2	Crime Scene Response Photography Training Checklist	LAB-CSR-TM-02
3	Crime Scene Response Trace Evidence Training Checklist	LAB-CSR-TM-03
4	Crime Scene Response Biological Evidence Training Checklist	LAB-CSR-TM-04
5	Crime Scene Response Friction Ridge Training Checklist	LAB-CSR-TM-05
6	Crime Scene Response Firearms & Toolmarks Training Checklist	LAB-CSR-TM-06
7	Crime Scene Response Digital/Multimedia Training Checklist	LAB-CSR-TM-07
8	Crime Scene Response Forensic Document Examination Training Checklist	LAB-CSR-TM-08
9	Crime Scene Response Other Topics Training Checklist	LAB-CSR-TM-09
10	Crime Scene Response Final Assessment Training Checklist	LAB-CSR-TM-10