



Idaho State Police Forensic Services

Field Services Quality Manual & Analytical Methods

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Revision History

Revision #	Description of Changes
1	First Qualtrax revision. Changes to table of contents and section headings: Section 5 now "Crime Scene Security and Precautions", Section 6 now "Crime Scene Investigation Methodology", Section 7 now "Observations and Notes", Section 8 now "Photography", Section 9 now "Diagrams", Section 10 now "Presumptive Blood Tests", Section 11 now "Biological Evidence Collection", Section 12 now "Blood Enhancement Chemicals", Section 13 now "Recognition and Documentation of Evidence in Bloodshed and/or Shooting Scenes", Section 14 now "Latent Print Development and Preservation", Section 15 now "Impression Evidence", Section 16 now "Trace Evidence", Section 17 now "Firearms and Tool Mark Evidence", Section 18 now "Vehicle Processing", Section 19 now "Human Remains and Buried Body Excavations", Section 20 now "Entomology", Section 21 now "Fire and Arson Investigation", Section 22 now "Documentation and Evidence Collection from Victims, Subjects, and Suspects", Section 23 now "Validation", Section 24 now "Forms", Section 25 now "Equipment Calibration and Maintenance", Section 26 now "Chemicals, Supplies, and Reagent Preparation", Section 27 now "Report Writing", Section 28 now "Review", Section 29 now "Proficiency Testing", and Section 30 now "Safety." Addition of Presumptive Blood Testing (section 10), including addition of safety sections, clarifying language, and formatting changes. Addition of Organization and Management (section 3), Personnel (section 4), Crime Scene Investigation Methodology (section 6), Observations and Notes (section 7), Biological Evidence Collection (section 11), Latent Print Development and Preservation (section 14), Impression Evidence (section 15), Trace Evidence (section 16), Vehicle Processing (section 18), Validation (section 23), Forms (section 24). Change of manual name. Addition of references. Formatting and grammatical changes throughout.
2	Addition of Firearms and Tool Mark Evidence (section 17), Documentation and Evidence Collection from Victims, Subjects, and Suspects (section 22), Scene Security and Precautions (Section 5), Diagrams (Section 9), Blood Enhancement Chemicals (Section 12), Buried Body Excavations and Scattered Human Remains(Section 19),

	Review (Section 28), Proficiency Testing (Section 29), Fire Scenes (Section 21), Tools and Equipment (Section 25), Recognition and Documentation of Evidence in Bloodshed and/or Shooting Scenes (Section 13). Section 7.5.5.4.1 was added for bindings and ligatures. Section 7.6.2.1 added for use of markers. Section 27.2 added for ILIMS entries. Section 11.11 was modified to add menstrual cups and period panties. Section 8.24.4.3 was added to clarify photography of evidence in a crime scene. Section 8.7.1 was modified to include documentation of unintended photos. Section entitled "Chemicals, Supplies, and Reagent Preparation" was deleted; subsequent sections renumbered. Additions to definitions: Crime Scene, Defect, Evidence, Shotshell case/hull, and Transient Evidence. Update name of digital imaging system from Foray to Adams Web throughout. Update VIN list to include years 2020-2022. Title of Section 29 changed to Buried Body Excavations and Scattered Human Remains. Add additional references, formatting, clarifying language, and grammatical changes throughout.
3	Add terms, definitions, and content from "Guiding Principles for Crime Scene Investigation and Reconstruction", "Standard Guide for Crime Scene Photography", "Safe Handling of Firearms and Ammunition", "Bloodstain Pattern Analysis", "Best Practices for the Preparation of Test Impressions from Footwear and Tires", "Best Practice Recommendation for Lifting of Footwear and Tire Impressions", "Terminology Used for Forensic Footwear and Tire Evidence", "Standard Terminology Relating to Examination of Fire Debris", "NFPA 921", "Postmortem Impression Recovery: Guidance and Best Practices for Disaster Victim Identification", and "Standard Guide for Collection of Soils and Other Geological Evidence for Criminal Forensic Applications", add methodology for post-mortem exemplars, added Section 11 "Evidence" and all subsequent section numbers were altered; replace "will" with "shall" as appropriate; add additional references; clarifying language and grammatical changes throughout.
4	Add section 5 "Coordination with the Investigating Agency", added several definitions, added additional language to multiple sections as per OSAC and ASTM guidelines, clarifying language and grammatical changes throughout.
5	Formatting issues; minor grammatical changes throughout; change "Crime Scene Coordinator" to "Crime Scene Discipline Lead" throughout; add additional scene security 5.1.1; add annotation on photos 8.8; add use of tablet 9.5.2; add Field Services requests in the Laboratory (Section 25); add Crime Scene Response Vehicle (Section

	26); add additional forms; add clarification to requirement for name of person who conducted tests to be listed in the report 30.8.6.2.4 and 31.7.3; add heat injury to safety 33.7; add vicarious trauma resources 33.8.3; add APPENDIX (Section 34) header page, add language to conform with current OSAC standards.
6	Fix formatting issues.
7	Spelling and grammar changes throughout; formatting issues throughout. Remove 4.2.6. Add: 5.5 scene environmental issues; 5.7 travel for crime scene response; 8.6.4/9.25.2.1/15.9.2.1 use of NIST rulers; 9.3.1.1.1 LizQ archiving; 9.3.12 photography chain of custody; 10.2.2.2 measurements as descriptions; Section 11 (several places) lot #s, notes, expiration dates; 12.2.1 evidence temporary storage on scene; 12.3 general parameters for filling out evidence packaging; 15.9 training requirements for shooting reconstruction documentation; 19.7.3 GSR collection parameters; 20.3.2 addition of years to VIN; 29.1 cleaning and maintenance of tools; 30.2.9.1 specify review parameters; 30 add sentence for report writing.
8	Spelling, grammar changes, and formatting issues throughout. References added and/or modified. Changed “analyst” to “CSI” and “Coroner” to “Medicolegal Authority” throughout. Definitions modified or added: accelerant, accidental discharge, ballistics, buccal swab, bullet path, bullet wipe, cognitive bias, coning effect, contamination, coroner, defect, diagram, dithiooxamide test, downrange, drop-off distance, exterior ballistics, gunshot residue pattern, headspace, incident command system, interior ballistics, keyhole, larva, lossless compression, lossy compression, medicolegal authority, medicolegal investigation, non-penetrating impact, nymph, pellet pattern, penetrating injury, perforating injury, personal protective equipment, photogrammetry, physical evidence, point of impact, potential DNA material, possible DNA material, powder stippling, preserved samples, primer gunshot residue, projectile, projectile fragment, projectile impact, pseudostippling, pupa, range, reference measurement standard, shooting reconstruction, shot pattern, sodium rhodizonate test, spall, suppression, target, terminal ballistics, trajectory, unintentional discharge, uprange, and vertical angle. 5.2.3 addition of personal protective equipment. 7.1.1-7.1.2 addition of factors related to bias. Section 9 added camera and photography equipment and procedures. Section 10 added details about taking measurements. Section 12 added packaging parameters, Wet Items/Gasses section, Digital Evidence section, additional parameters related to soil collection. 13.3.1 added timing of blood

	stain collection and 13.13 Collection of Buccal Swabs. Section 14 added Water-based Amido Black chemical. 15.5.7 added environmental/physical scene conditions that could affect blood stain patterns. Section 16 added procedures to collection of Known Exemplars and Post Mortem Exemplars. Section 17 added clarification to the use of gelatin lifters. 18.3.3.1.1 clarification for using Adhesive lifters. Section 19 added chemical testing of impacts, additional methods for collection of gunshot residue, and documentation of accounting of firearms evidence. Section 21 added CSI training, marking of potential evidence, collection of vegetation, and use of north indicator in photography. Section 22 additional procedures for the collection of entomology evidence. 23.9 documentation of the position of knobs and switches. Section 24 collection of evidence from domestic animals.
9	Add equipment information and resources for Crime Lite Auto and Polilight Flare+2, add maintenance for several pieces of equipment, modification of VIN documentation, minor grammatical changes throughout.
10	Combined sections; deleted definitions not used on scene; changed format to create analytical methods; changed many shalls to should; added Biological Evidence section

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1.0 QM: Introduction

1.1 Statement of Purpose/Background

The purpose of the Idaho State Police (ISP) Crime Scene Response Unit is to provide an evaluation and examination of the crime scene for the purpose of recovering physical evidence and documenting the scene's condition for use by the criminal justice system. The ISP Quality Manual and the ISP Crime Scene Manual provide the structure for these objectives.

1.2 Objectives/Scope:

- 1.2.1 To develop and maintain, through annual review and revision, a system of quality procedures, analytical methods, and controls.
- 1.2.2 To ensure that personnel have quality, relevant, and timely training in the subjects for which they'll conduct analyses at crime scenes.
- 1.2.3 To remain scientifically neutral by basing evidence collection and analysis decisions, case reports, and testimony on scientific rationale.
- 1.2.4 To provide high quality training, technical and informational assistance, analyses, written reports, and testimony.
- 1.2.5 To provide services in a timely and cost-effective manner.

1.3 References

- 1.3.1 Idaho State Police Forensic Services – Quality Manual Section 2.0 NORMATIVE REFERENCES.
- 1.3.2 Practical Crime Scene Processing and Investigation, Second Edition, Ross M. Gardner
- 1.3.3 Practical Homicide Investigation, Fourth Edition, Vernon J. Geberth
- 1.3.4 Principles of Bloodstain Pattern Analysis, Theory and Practice, Stuart H. James, Paul E. Kish, and T. Paulette Sutton
- 1.3.5 Practical Crime Scene Analysis and Reconstruction, Ross M. Gardner and Tom Bevel
- 1.3.6 United States Department of Labor, Occupational Safety and Health Administration (OSHA) website (www.osha.gov)
- 1.3.7 A Short Course in Photography, Third Edition, Barbara London and Jim Stone
- 1.3.8 Association of Firearm and Toolmark Examiners (AFTE) Glossary, 6th Ed.
- 1.3.9 International Association for Property and Evidence, Inc., "Professional Standards", REV March 8, 2015, (<http://home.iape.org/>)
- 1.3.10 Advances in Fingerprint Technology, Henry Lee and R.E. Gaensslen.
- 1.3.11 Scott's Fingerprint Mechanics, Robert D. Olsen, 1978.
- 1.3.12 Fingerprint Techniques, Andre A. Moenssens, 1971.
- 1.3.13 Manual of Fingerprint Development Techniques Home Office Police Scientific Development Branch, 1998.
- 1.3.14 Friction Ridge Skin, Comparison and Identification of Fingerprints, James F. Cowger, 1993.

- 1.3.15 "Decoding a Sample VIN", DMV.ORG
- 1.3.16 Ada County Sheriff's Office, Crime Scene Analytical Method, Impression Evidence.
- 1.3.17 "Latent Print Development", The Fingerprint Sourcebook, US Department of Justice, 2011, Section 7.10.4, Brian Yamashita and Mike French.
- 1.3.18 "Buried Body & Surface Skeleton Workshop" course notebook, "Handbook of Forensic Archaeology & Anthropology", edited by Dan Morse, Jack Duncan, and James Stoutamire, 1983.
- 1.3.19 ISPFS quality and analytical methods for various disciplines, including latent prints, biology, fire, and firearms.
- 1.3.20 "Handbook of Forensic Pathology", Vincent J.M DiMaio and Suzanna E. Dana, 2017.
- 1.3.21 "Guiding Principles for Crime Scene Investigation and Reconstruction," Organization of Scientific Area Committees for Forensic Science, Version 2.0.
- 1.3.22 "Standard Guide for Crime Scene Photography", American Society for Testing and Materials.
- 1.3.23 "Safe Handling of Firearms and Ammunition", American Academy of Forensic Sciences Standards Board, First Edition, 2020.
- 1.3.24 "Terms and Definitions in Bloodstain Pattern Analysis", American Academy of Forensic Sciences Standards Board, ASB Technical Report 033, First Edition, 2017.
- 1.3.25 "Terminology Used for Forensic Footwear and Tire Evidence", American Academy of Forensic Sciences Standards Board, ASB Technical Report 097, First Edition, 2019.
- 1.3.26 "Best Practices for the Preparation of Test Impressions from Footwear and Tires", American Academy of Forensic Sciences Standards Board, ANSI/ASB Best Practice Recommendation 021, First Edition, 2019.
- 1.3.27 "Best Practice Recommendation for Lifting of Footwear and Tire Impressions", American Academy of Forensic Sciences Standards Board, ANSI/ASB Best Practice Recommendation 049, First Edition, 2020.
- 1.3.28 "Standard Terminology Relating to Examination of Fire Debris", E3197-23, American Society for Testing and Materials.
- 1.3.29 "Guide for Fire and Explosion Investigations", NFPA 921, 2021.
- 1.3.30 "Postmortem Impression Recovery: Guidance and Best Practices for Disaster Victim Identification", American Academy of Forensic Sciences Standards Board, ANSI/ASB Best Practice Recommendation 094, First Edition, 2021.
- 1.3.31 "Standard for On-Scene Collection and Preservation of Document Evidence", Organization of Scientific Area Committees for Forensic Science, Version 2.0.
- 1.3.32 "Best Practice Recommendation for the Detection and Collection of Footwear and Tire Impression Evidence".
- 1.3.33 "Standard for Methodology in Bloodstain Pattern Analysis", Organization of Scientific Area Committees for Forensic Science, Draft edition.
- 1.3.34 "Standard for Scene Response: Initial Response by Scene Investigators", Organization of Scientific Area Committees for Forensic Science, Version 2.0.
- 1.3.35 "Collecting and Preserving Entomological Evidence from a Terrestrial Environment", Organization of Scientific Area Committees for Forensic Science, OSAC 2022-N-0039.

- 1.3.36 "Medicolegal Death Investigation: Terms and Definitions", Organization of Scientific Area Committees for Forensic Science, Version 2.0.
- 1.3.37 "Best Practice Recommendation for the Chemical Processing of Footwear and Tire Impression Evidence", Organization of Scientific Area Committees for Forensic Science, Version 1.0.
- 1.3.38 "Best Practice Recommendation for Casting Footwear and Tire Impression Evidence at the Crime Scene", American Academy of Forensic Sciences Standards Board, ANSI/ASB Best Practice Recommendation 126, First Edition, 2020, Errata 1, 2022.
- 1.3.39 "Standard for Photographing Dental Evidence", Organization of Scientific Area Committees for Forensic Science, OSAC 2024-S-0013.
- 1.3.40 "Standard Guide for Photographing Scars, Marks, and Tattoos", Organization of Scientific Area Committees for Forensic Science, OSAC 2023-S-0006.
- 1.3.41 "Standard for Forensic Trace Evidence Recovery", Organization of Scientific Area Committees for Forensic Science, OSAC 2023-N-0027.
- 1.3.42 "Standard Practice for The Collection of Primer Gunshot Residue (pGSR) Particles from Clothing, Vehicles, and Other Inanimate Objects using Scanning Electron Microscopy (SEM) Stubs, Organization of Scientific Area Committees for Forensic Science, OSAC 2023-N-0010.
- 1.3.43 "Standard Practice for the Collection and Preservation of Organic Gunshot Residue", Organization of Scientific Area Committees for Forensic Science, OSAC 2021-N-0009.
- 1.3.44 "Standard Method for the Chemical Testing of Copper and Lead from Suspected Projectile Impacts", Organization of Scientific Area Committees for Forensic Science, OSAC 2022-S-0036.
- 1.3.45 "Standard for Scene Documentation Procedures", Organization of Scientific Area Committees for Forensic Science, OSAC 2023-N-0002.
- 1.3.46 "Standard for Diagramming Scenes", Organization of Scientific Area Committees for Forensic Science, OSAC 2023-N-0003.
- 1.3.47 "Standard Practice for the Documentation and Processing of Shooting Scenes", Organization of Scientific Area Committees for Forensic Science, OSAC 2021-N-0019.
- 1.3.48 "Standard for On-Scene Collection and Preservation of Physical Evidence", Organization of Scientific Area Committees for Forensic Science, OSAC 2021-N-0018.
- 1.3.49 "Standard Terminology for Shooting Reconstruction", Organization of Scientific Area Committees for Forensic Science, OSAC 2025-N-0003.
- 1.3.50 "Best Practice Recommendation for Photographic Documentation of Footwear and Tire Impression Evidence", American Academy of Forensic Sciences Standards Board, ANSI/ASB Best Practice Recommendation 050, First Edition 2021.
- 1.3.51 "Standard for Collection of Known DNA Samples from Domestic Mammals", American Academy of Forensic Sciences Standards Board, ANSI/ASB Standard 138, First Edition 2022.

- 1.3.52 “Mass Fatality Scene Processing: Best Practice Recommendations for the Medicolegal Authority”, American Academy of Forensic Sciences Standards Board, ANSI/ASB Best Practice Recommendation 008, First Edition, 2021.
- 1.3.53 “Best Practice Recommendations for Lifting of Footwear and Tire Impressions” American Academy of Forensic Sciences Standards Board, ANSI/ASB Best Practice Recommendation 049, First Edition, 2020.
- 1.3.54 “Standard for Scene Investigation and Reconstruction- Foundational Principles”, American Academy of Forensic Sciences Standards Board, ANSI/ASB Standard 159, First Edition, 2024.
- 1.3.55 “Standard for Developing Standard Operating Procedures in Bloodstain Pattern Analysis”, American Academy of Forensic Sciences Standards Board, ANSI/ASB Standard 158, First Edition, 2023.
- 1.3.56 “Postmortem Impression Recovery: Guidance and Best Practices for Disaster Victim Identification”, American Academy of Forensic Sciences Standards Board, ANSI/ASB Best Practice Recommendation 094, First Edition, 2021.
- 1.3.57 “Scene Detection and Processing in Forensic Anthropology”, American Academy of Forensic Sciences Standards Board, ANSI/ASB Standard 135, First Edition, 2023.
- 1.3.58 “Standard Guide for Collection of Soils and Other Geological Evidence for Criminal Forensic Applications”, American Society for Testing and Materials, E3272-21.
- 1.3.59 “Standard Practice for Latent Print Evidence Imaging Resolution”, American Society for Testing and Materials, E3235-21.
- 1.3.60 Crime-lite AUTO User Manual, February 2022.
- 1.3.61 “Infrared Imaging of the Crime Scene: Possibilities and Pitfalls”, Gerda Edelman, Richelle Hoveling, Martin Roos, Ton van Leeuwen, and Maurice Aalders; Journal of Forensic Science, September 2013, Vol. 58, No.5.
- 1.3.62 “Forensic Light Sources for Detection of Biological Evidences in Crime Scene Investigation: A Review”, Wee-Chuen Lee and Bee-Ee Khoo. Malaysian Journal of Forensic Sciences, 2010, Vol 1.
- 1.3.63 “Standard for the Documentation and Processing of Shooting Scenes”, American Academy of Forensic Sciences Standards Board, ANSI/ASB Standard 196, First Edition, 2026

2.0 QM: Definitions

*Crime scene comprises multiple disciplines; some of these definitions are particular to the discipline and may have other definitions outside of that discipline.

ABRASION – An injury to the skin in which the superficial epithelial layer of the skin (the epidermis) is removed due to friction against a rough surface with resultant scraping away of the superficial portions of the epidermis; wearing away of the skin in small shreds by friction.

ABRASION COLLAR – the circular perforation and blackening effect on the edges of the skin as the bullet passes through the skin.

ABSORPTION – the penetration of one substance into the inner structure of another. Can be observed when using an Alternate Light Source (ALS) and blood is present.

ACCELERANT – a fuel or oxidizer, often an ignitable liquid, intentionally used to initiate a fire or increase the rate of growth or spread of fire.

ACCIDENTAL – unexpected or unforeseen death due to injury without intent to harm or cause death; one of the manners of death.

ACCIDENTAL DISCHARGE – the inadvertent discharge of a firearm as a result of a mechanical failure on the part of the firearm.

ACCOMPANYING DROP – a small blood drop produced as a by-product of drop formation.

ACTION – the working mechanism of a firearm; the combination of the receiver or frame, the breech bolt, and the other parts of the mechanism by which a firearm is loaded, fired, and unloaded.

ADHESIVE LIFTER – any variety of adhesive-coated material or tapes, commonly used to lift fingerprints or footwear impressions; may also be employed to lift trace materials from a surface.

ADIPOCERE – waxy, soap-like substance formed during the decomposition of animal bodies buried in moist places; consists principally of insoluble salts of fatty acids; also called “grave wax”.

AGGREGATE(S) (CLUMPS) – a group of soil particles that cohere to each other more strongly than to other surrounding particles.

AIRBORNE PATHOGENS – infectious disease-causing microorganisms, which may be present in biological fluids, and are spread through the air via coughing, sneezing, talking, spitting, etc.

AIR GUN – a gun that uses compressed air or gas (carbon dioxide) to propel a projectile.

ALTERED STAIN – a blood stain with characteristics that indicate a physical change has occurred.

ALTERNATE LIGHT SOURCE (ALS)/FORENSIC LIGHT SOURCE – light source that produces a high-intensity light, ranging from ultraviolet to infrared, which may be used to facilitate the recovery of evidence such as latent prints, hairs, fibers, and bodily fluids.

AMBIENT LIGHT (AVAILABLE LIGHT) – the light that already exists (as opposed to being added by the photographer) where a photograph is to be made.

AMBIENT TEMPERATURE – the temperature of the air circulating around a given location.

AMMO/ AMMUNITION – one or more loaded cartridges consisting of a primed cartridge case, propellant, and with or without one or more projectiles; often abbreviated as AMMO.

ANGLE OF IMPACT – the angle (alpha), relative to the plane of a target, at which a projectile strikes a target.

ANTEMORTEM – before death.

ANTERIOR – (Ventral) the front; indicates the front or belly side of the body.

APERTURE – the lens opening formed by the iris diaphragm inside the lens. The size is variable and adjusted by the aperture control.

APERTURE PRIORITY MODE – an automatic exposure system in which the photographer sets the aperture (f-stop) and the camera selects a shutter speed for normal exposure; often designated by the letter “A” on the camera mode dial.

AREA OF CONVERGENCE – the space in two dimensions to which the directionalities of spatter stains can be retraced to determine the location of the spatter producing event.

AREA OF ORIGIN – the three-dimensional area to which stains within a bloodstain pattern can be reconstructed in space, using the common area of convergence and the angles of impact, to determine the location of the spatter producing event.

ARTERIAL PATTERN – a pattern resulting from blood exiting the body under pressure from a breached artery.

AUTOMATIC EXPOSURE – a mode of camera operation in which the camera automatically adjusts either the aperture, the shutter speed, or both for normal exposure.

AUTOMATIC FLASH – an electronic flash unit that uses its light-sensitive cell (or the camera’s) to determine the duration of the flash for normal exposure by measuring the light reflected back from the subject.

AUTOPSY – the internal and external examination of the body after death.

BACK SPATTER – blood droplets directed back toward the force or energy that caused the spatter, often associated with gunshot wounds of entrance.

BACKSTRAP – the exposed metal strip at the rear of a pistol or revolver grip.

BALL – typically refers to a cylinder-shaped bullet with either a rounded or pointed nose and is typically used with muzzle-loaded firearms.

BALLISTICS – the study of projectile motion and effects; may be divided into three parts: see interior ballistics, exterior ballistics, and terminal ballistics.

BARREL – that part of a firearm through which a projectile or shot charge travels under the impetus of powder gasses, compressed air, or other like means; a barrel may be rifled or smooth.

BARREL ARRANGEMENT – the relationship to each other, in which multiple barrel systems are positioned in firearms (e.g. over and under, side-by-side, etc.).

BB – the designation of spherical shot having a diameter of .180" used in shotshell loads; also used to designate steel or lead air gun shot of .175" diameter.

BLACK POWDER (firearms) – the earliest form of firearm propellant; modern form is smokeless powder.

BLOODSTAIN – a stain on a surface caused by blood.

BLOODSTAIN PATTERN – a grouping or distribution of bloodstains that indicates through regular or repetitive form, order, or arrangement the manner in which the pattern was deposited.

BOLT ACTION – a firearm in which the breech closure is in line with the bore at all times, manually reciprocates to load, unload, and cock, and is locked in place by breech bolt lugs and engaging abutments, usually in the receiver.

BOUNCE LIGHT – indirect light produced by pointing the light source at a ceiling or other surface to reflect the light back toward the subject; softer and less harsh than direct light.

BRACKETING – taking several photographs of the same scene at different exposure settings, some greater than and some less than the setting indicated by the meter, to ensure at least one well-exposed image.

BUBBLE RING – circular outlines in bloodstains that form when blood containing air bubbles dries and retains the circular configuration of the original bubble.

BUCCAL SWAB – a cotton swab or similar collection substrate; used in a relatively non-invasive sample collection technique for scraping the inside of a mouth to collect cells from the inner

cheek lining; common method for collecting and preserving samples for DNA testing from known individuals.

BULLET – a non-spherical projectile for use in a rifled barrel.

BULLET CORE – the inner portion of a jacketed bullet often made of lead.

BULLET JACKET – the envelope enclosing the core of a projectile that is typically of metallic construction.

BULLET PATH – the arched path of a projectile from the muzzle to the target.

BULLET WIPE – the discolored area on the immediate periphery of a bullet hole, caused by the transfer of residues from the bearing surface of the bullet. The transfer can be composed of projectile lubricant, copper, lead, combustion products, bore debris, and/or projectile material.

BUTT – in handguns, it is the bottom part of the grip; in long guns, it is the rear or shoulder end of the stock.

CABLE RELEASE – an encased wire that attaches at one end to the shutter release on the camera and has a shutter release button on the other end that the photographer depresses to activate the shutter; used to avoid camera movement or to activate the shutter from a distance.

CALIBER – a term used to designate the specific cartridge for which a firearm is chambered; the approximate diameter of the circle formed by the tops of the lands of a rifled barrel, typically expressed in hundredths of an inch (.38 caliber) or millimeters (9mm caliber); in ammunition, caliber is a numerical term, without the decimal point, included in a cartridge name to indicate the nominal bullet diameter.

CAMERA BODY – the light-tight box that contains the camera mechanisms and protects the sensor from light until an exposure is made.

CARTRIDGE – a single unit of ammunition consisting of the cartridge case, primer, propellant, and with or without one or more projectile(s).

CARTRIDGE CASE – the container for all the other components which comprise a cartridge.

CAST-OFF PATTERN – a pattern, usually linear in configuration, created when blood is released or flung from a blood-bearing object in motion.

CAST/ CASTING – the filling of a three-dimensional footwear, tire track, tool mark, or other impression with material that takes on and retains the characteristics that were left in the impression by the original footwear, tire, etc.

CASTING MATERIAL – dental stone or other suitable materials specifically used to accurately recover three-dimensional impressions. Some casting materials are also successful for lifting two dimensional impressions.

CAUSE OF DEATH – any injury or disease that produces a physiological disruption in the body resulting in death.

CESSATION CAST-OFF PATTERN – a pattern resulting from the rapid deceleration of an object wet with blood.

CENTER WEIGHTED METER – a through-the-lens exposure meter that measures light values from the entire scene but gives greater emphasis to those in the center of the image area.

CF CARD – compact flash card; a memory card format utilized with digital cameras, including the camera used in the LizQ imaging system.

CHAMBER – the rear part of the barrel bore that has been formed to accept a specific cartridge or shotshell; in a revolver, the holes in the cylinder represent multiple chambers.

CLIP – a container that holds a group of cartridges, which may either be transferred or inserted into a firearm.

COGNITIVE BIAS – a set of factors (e.g. an individual's preexisting beliefs, expectations, motives, and situational context) that may influence one's collection, perception, or interpretation of information, or affect the reliability and validity of one's judgments, observations, confidence, and conclusions.

COMBUSTIBLE – any substance that will burn, regardless of its auto-ignition temperature, or whether it is a solid, liquid, or gas.

COMBUSTION – a usually rapid chemical process (as oxidation) that produces heat and usually light.

COMPARISON SAMPLE (fire) – 1: a sample of material collected from a fire scene which is, to the best of the investigator's knowledge, similar with respect to relevant characteristics to a sample suspected of containing ignitable substance; 2: a sample of suspected ignitable substance submitted for the purpose of comparing with any ignitable substance separated from debris.

COMPRESSION – a means of reducing the size of a digital image file in order to reduce storage requirements for transmission time across a network. "Lossy" techniques permanently eliminate some information to obtain highly compressed, very small files. Lossless techniques compress images without losing any information in the file.

CONCENTRIC FRACTURES – fractures or cracks in glass or other similar brittle or ceramic material that take a generally circular form around the bullet hole or impact site in such materials.

CONING EFFECT – the characteristic cone shape on the exit side of a projectile hole through a relative brittle medium (e.g. glass, bone, etc.) caused by the spalling around the exit; also known as **CONE FRACTURE**.

CONTACT WOUND – an injury that occurs when a firearm is pressed against a surface of the body. Gases from the explosion expand between the skin and the bone, producing a bursting effect and a ragged wound. Gas, soot, metallic particles, vaporized metal from the bullet and cartridge case, primer residue, and powder particles can all be driven into the wound track.

CONTRAST – the difference between the light and dark parts of a scene or photograph.

CONTROL – material of established origin that is used to evaluate the performance of materials.

CORONER – an elected official, or their agent, responsible for overseeing medicolegal death investigation; also referred to as Medicolegal Authority or Medicolegal Investigator.

CRIME SCENE – an area or person that contains potential evidence of a criminal incident.

CRIME SCENE INVESTIGATION – a methodical, scientific approach to examining a scene to document, search for, identify, collect, interpret, and preserve items of evidentiary value to help in understanding the elements of an incident.

CRIME SCENE INVESTIGATOR (CSI) – a forensic science practitioner, however named, whose responsibility is to use the appropriate combination of knowledge, skills, training, and experience or undertake one or more of the following tasks in relation to crime scene investigation: document, search for, identify, collect, interpret, and preserve evidence.

CROP – to trim the edges of an image, often to improve the composition. Cropping can be done by moving the camera position while viewing a scene, during image editing, or by trimming the finished print.

CYLINDER – the rotating component of a firearm that contains the chambers.

CYLINDER GAP – in a revolver, the maximum space between the cylinder and the barrel.

DEBRIS – 1. In fire scenes, the ruins or rubble which results from the burning of roof materials;
2. Scattered pieces of waste or remains.

DAGGER – a short weapon for stabbing that is usually considered to be double edged.

DECOMPOSITION – postmortem degeneration of the body.

DEFECT – a generic term for any damage to a surface or item.

DEFENSE WOUNDS – cuts, abrasions, and contusions of the hands, wrists, forearms, and arms, which occur during a violent struggle as the victim attempts to ward off the attacker.

DEFLECTION – *as differentiated from ricochet*: a deviation in the projectile's normal path through the atmosphere as a consequence of an impact with some object; *as a consequence of ricochet*: is used to describe any lateral component of the ricocheted projectile's departure path relative to the plane of the impacted surface as viewed from the shooter's position and with the plane of the surface normalized to a horizontal attitude; *as a consequence of perforating or striking an object*: is used to describe deviations in any direction from the projectile's normal flight path as a consequence of perforating or striking an object rather than rebounding off of surfaces.

DEPTH OF FIELD (DOF)– the distance between the nearest and farthest points that appear in acceptably sharp focus in a photograph. Depth of field varies with lens aperture, focal length, and camera-to-subject distance.

DERRINGER – the generic term applied to many variations of small one-, two-, or even four-shot pistols, using both percussion caps and cartridges.

DIAGRAM – two-dimensional representations of features found at the scene that are derived from measurements or visual data collected by hand, electronically, or a combination of both.

DIAPHRAGM (IRIS DIAPHRAGM) – the mechanism controlling the size of the lens opening, therefore the amount of light that reaches the sensor. It consists of overlapping metal leaves inside the lens that form a circular opening of variable sizes. The size of the opening is referred to as the f-stop or aperture.

DIFFUSED LIGHT – light that has been scattered by reflection or by passing through a translucent material; an even, often shadowless, light.

DIGITAL CAMERA – a camera that records an image directly in digital form, instead of on conventional silver film.

DIRECTIONAL ANGLE – the angle (gamma) between the long axis of a spatter stain and a defined reference line on the target.

DIRECT LIGHT – light shining directly on the subject and producing strong highlights and deep shadows.

DIRECTIONALITY – 1. in bloodstain pattern analysis, the characteristic of a stain that indicates the direction blood was moving at the time of deposition; 2. in shooting reconstruction, the shape and characteristics of a bullet hole that indicates which side is from the bullet entry and which side is from the bullet exit.

DITHIOOXAMIDE TEST – a chemical test for the detection of copper.

DOUBLE BARREL – two barrels in a firearm mounted to one frame; may be vertically (over-under) or horizontally (side-by-side) aligned.

DOWNRANGE – any location forward of the plane of the muzzle of a firearm.

DRAWBACK EFFECT – the presence of blood in the barrel of a firearm that has been drawn back into the muzzle.

DRIP PATTERN – a bloodstain pattern created by free-falling drops of blood striking already-existing blood (or other liquid) on a surface commonly associated with satellite spatter. The parent stain on the surface is larger than what would be associated with a single free-falling drop and is usually associated with satellite spatter.

DRIP STAIN – a bloodstain resulting from a falling drop that formed due to gravity.

DRIP TRAIL – a bloodstain pattern resulting from the movement of a source of drip stains between two points.

DSLR – digital single lens reflex; a type of camera with one lens that is used both for viewing and for taking the picture. A mirror inside the camera reflects the image up into the viewfinder. When the picture is taken, this mirror moves out of the way, allowing the light entering the lens to travel directly to the sensor.

EDGE CHARACTERISTIC – a physical feature of the periphery of a bloodstain.

EJECTION PORT – an opening in the receiver or slide to allow for ejection of a cartridge, cartridge case, or shotshell.

EJECTOR – a mechanical device of a firearm which expels a cartridge, cartridge case, or shotshell.

ELECTRONIC FLASH (STROBE) – a camera accessory that provides a brief but powerful flash of light; a battery-powered unit requires occasional recharging or battery replacement but can be used repeatedly.

ELECTROSTATIC LIFTING DEVICE – a device consisting of a high-voltage supply used with a special conductive lifting film to transfer a dry origin footwear impression electrostatically from a surface to a film.

ENTOMOLOGY – branch of science dealing with the study of insects.

EVIDENCE – a physical item that may be used to prove or disprove a fact.

EXEMPLARS – for finger/palm/sole prints: the prints of an individual, associated with a known or claimed identity, and deliberately recorded, by ink, or by another medium (also known as known prints); for shoe/tire prints: an item of footwear or tire from a specific source that is deliberately recorded by ink or another medium (also known as known prints).

EXPIRATED BLOOD/PATTERN – blood that has been blown from the nose, the mouth, or a wound in the respiratory system as the result of air flow or pressure.

EXPOSURE (photography) – the act of allowing light to strike a light sensitive surface; the amount of light reaching that surface, controlled by the combination of aperture and shutter speed.

EXPOSURE METER (LIGHT METER) – an instrument that measures the amount of light and provides aperture and shutter-speed combinations for correct exposure. Exposure meters may be built into the camera or they may be separate instruments.

EXTERIOR BALLISTICS – the branch of ballistics that studies a projectile's flight in air.

EXTRACTOR – a device that pulls (hooks) cartridge cases out of a chamber.

FILE – a quantity of data storage on a computer. Each digital image is saved as a single file.

FIREARM – an assembly of a barrel and action from which a projectile(s) is propelled by products of combustion.

FIRE DEBRIS – material of interest at a fire scene that can be collected by an investigator as evidence to analyze.

FIRING PIN – that part of a firearm mechanism which strikes the primer or rim of a cartridge to initiate ignition in order to fire a cartridge or shotshell.

FIRING PIN IMPRESSION – the indentation of the primer of a centerfire cartridge case or in the rim of a rimfire cartridge case caused when it is struck by the firing pin.

FIXED BLADE – any knife in which the blade does not fold or retract into the handle.

FLASH – 1. a short burst of light emitted by an electronic flash unit or strobe to illuminate the scene being photographed. 2. the equipment used to produce this light.

FLOW PATTERN – a volume of blood on a surface that moves in one or more directions as a result of the influence of gravity or movement of the target.

FOCAL LENGTH – the distance from an internal part of the lens to the image plane when the lens is focused on infinity. The focal length is usually expressed in millimeters (mm) and determines the angle of view (how much of the scene can be included in the picture) and the

size of objects in the image. A 100mm lens, for example, has a narrower angle of view and magnifies objects more than a lens of shorter focal length.

FOCUS – 1. The point at which the rays of light coming through the lens converge to form a sharp image. The picture is “in focus” or sharpest when this point coincides with the focal plane. 2. To change the lens-to-sensor distance until the image is sharp.

FORWARD SPATTER PATTERN – blood droplets directed away from the force or energy that caused the spatter, often associated with gunshot wounds of exit.

FRICTION RIDGE SKIN – a specialized type of skin present on the palmar portion of the hands and the plantar portion of the feet.

F-STOP – a numerical designation ($f/2$, $f/2.8$, etc.) indicating the size of the aperture (lens opening).

FULL METAL JACKET (FMJ) – a projectile in which the bullet jacket encloses the entire bullet, with the usual exception of the base.

GAUGE – a term used in the identification of a shotgun bore. The gauge is equal to the number of round lead balls of bore diameter that equal one pound.

GELATIN LIFTER – a commercial product with gelatin applied to a pliable backing used to lift impressions.

GRAY CARD – a card that reflects a known percentage of light falling on it. Often has a gray side reflecting 18% and a white side reflecting 90% of the light. Used to take accurate exposure meter readings (meters base their exposures on a gray tone of 18% reflectance).

GRIP – in handguns, the handle; in long guns, the portion of the stock located behind the action which is normally grasped by the shooter’s trigger hand; in knives, the part of the hilt that is normally held in the hand.

GRIP SAFETY – an auxiliary locking device on the grip of some handguns which prevents firing until it is depressed, typically accomplished by grasping the grip correctly.

GUIDE NUMBER – a number rating for a flash unit that can be used to calculate the correct aperture for a particular ISO speed and flash-to-subject distance.

GUNPOWDER – any of various powders used as the propellant in a cartridge or shotshell.

GUNSHOT RESIDUE (GSR) – the total residues resulting from the discharge of a firearm.

GUNSHOT RESIDUE PATTERN – the form, density, and spatial distribution of combustion products deposited on a surface from the discharge of a firearm.

HAMMER – a component of the firing mechanism which strikes the firing pin or primer.

HANDGUN – a firearm designed to be held and fired with one hand.

HAND HOLD – to support the camera by hand rather than with a tripod or other fixed support.

HEADSTAMP – numerals, letters, and symbols (or a combination thereof) stamped into the head of a cartridge case or shotshell to identify the manufacturer, caliber, gauge, or other additional information.

HILT – the handle of a sword or dagger.

HISTOGRAM – a graph that shows the distribution of tones or colors in a digital image.

HOLLOW POINT BULLET – a projectile with a cavity in the nose to facilitate expansion.

HOMICIDE – death as a result of an act committed by one person against another person; one of the manners of death.

HOT SHOE – a clip on the top of the camera that attaches a flash unit and provides an electrical link to synchronize the flash with the camera shutter, eliminating the need for a sync cord.

IDENTIFICATION PHOTOGRAPH – a photograph taken to distinguish an item of importance within the scene, often something to be collected as evidence.

IGNITABLE LIQUID – any liquid that is capable of fueling a fire.

IMPACT PATTERN – a bloodstain pattern resulting from an object striking liquid blood.

INCENDIARY – chemical compound, metal, or mixture capable of producing intense heat.

INCENDIARY DEVICE – a device or mechanism used to initiate an incendiary fire.

INCISION – a wound inflicted by an instrument with a sharp cutting edge; characteristically longer than it is deep.

INCLINOMETER – a device for measuring or displaying the angle of a surface relative to the horizontal or vertical plane.

INFINITY – the farthest distance marked on the focusing ring of the lens, generally about 50 feet. When the camera is focused on infinity, all objects at that distance or farther away will be sharp.

INFRARED – wavelengths of electromagnetic radiation, like light but slightly longer than those in the visible spectrum. Photographs can be made from reflected infrared radiation with special equipment.

INTERIOR BALLISTICS – the study of a projectile’s initial acceleration and performance in the weapon and the related processes; also known as internal ballistics.

INTERMEDIATE TARGET – refers to something located between the firearm and the target at the time of shooting.

ISO (photography) – a numerical rating that indicates the sensitivity (speed) of a sensor.

JPEG – a “lossy” format for saving digital images that compresses data to preserve space in the computer’s memory.

KEYHOLE – a projectile impact that retains the general profile of a bullet that was destabilized and impacted the target surface at a canted angle.

LACERATION – a split or tear of the skin produced by blunt force.

LAMINATED GLASS – layers of glass bonded to a plastic material; may also be referred to as safety glass.

LARVA (PLURAL- LARVAE) – an immature stage of an insect, between an egg and pupa, that undergoes complete metamorphosis.

LATENT PRINT– impression of friction ridge detail not readily visible without enhancement or development; generic term used for questioned friction ridge detail.

LCD – liquid crystal display; the kind of thin, flat visual display screen often used for on-camera monitors and data displays.

LEAD – a CSI on-scene that will be the point of contact for agencies and other CSIs and will direct in scene processing decisions.

LEAD-IN MARK – a visible, thin, elongated deposition of bullet wipe transferred to a surface as a bullet first makes contact with that surface at a shallow incident angle; is useful in establishing the direction of fire and travel of the projectile.

LENS – one or more pieces of optical glass used to gather and focus light rays to form an image.

LENS HOOD – a shield that fits around the lens to prevent unwanted light from entering the lens and causing flare.

LEVER ACTION – a design wherein the breech mechanism is cycled by an external lever generally below the receiver.

LIFT – an adhesive or other medium used to transfer an impression (e.g. fingerprint, footwear impression) from a substrate; the act of collecting an impression.

LIGATURE – anything which binds or ties.

LIVIDITY (LIVOR MORTIS) – postmortem discoloration of the body due to the settling of blood in the dependent areas of the body.

LOADED – a firearm with ammunition in the firearm magazine or chamber.

LONG-FOCAL-LENGTH LENS (TELEPHOTO LENS) – a lens that provides a narrow angle of view of a scene, including less of a scene than a lens of normal focal length and therefore magnifying objects in the image.

LONG GUN – any firearm fitted with a stock and designed to be used while held with both hands and supported by a shoulder.

MACRO LENS – a lens specifically designed for close-up photography and capable of good optical performance when used very close to a subject.

MACRO PHOTOGRAPHY – production of images on the sensor that are life size or larger.

MAGAZINE – a container for cartridges which has a spring and follower to feed those cartridges into the chamber of the firearm.

MAGAZINE RELEASE – the device that retains or releases the magazine in a firearm.

MAGAZINE WELL – that opening in a firearm that receives the detachable magazine.

MAJOR CASE PRINTS/ COMPLETE FRICTION RIDGE EXEMPLARS – a systematic recording of all of the friction ridge detail appearing on the palmar sides of the hands. This includes the extreme sides of the palms, joints, tips, and sides of the fingers. Under special circumstances, complete friction ridge exemplars may also need to be taken from the plantar portion of the feet.

MANNER OF DEATH – classification system based on the circumstances under which death occurred; medicolegal manners of death are homicide, suicide, accidental, natural, and undetermined.

MANUAL EXPOSURE – a nonautomatic mode of camera operation in which the photographer sets the aperture, shutter speed, and ISO; often designated by the letter “M” on the camera mode dial.

MANUAL FLASH – a nonautomatic mode of flash operation in which the photographer controls the exposure by adjusting the size of the camera’s lens aperture.

MEDICOLEGAL AUTHORITY -- an elected official, or their agent, responsible for overseeing medicolegal death investigation; in Idaho, commonly an elected Coroner or a Deputy Coroner.

MEMORY CARD – an in-camera, removable, and reusable storage device that records and saves images captured by the camera until transferred to a computer or other storage device and reformatted.

MIRROR – a polished, metallic reflector set inside a DSLR camera body at a 45-degree angle to the lens to reflect the image up onto the focusing screen. When a picture is taken, the mirror moves out of the way so that light can reach the sensor.

MISFEED – any malfunction during the feeding cycle of a repeating firearm resulting in the failure of a cartridge or shotshell to enter the chamber completely.

MISFIRE – a failure of the priming mixture to be initiated after the primer has been struck by an adequate blow by a firing pin or the failure of the initiated primer to ignite the powder.

MISTING – blood that has been atomized to a fine spray by the application of force, usually associated with a gunshot or explosion event.

MUZZLE – the end of a firearm barrel from which the projectile emerges.

MUZZLE IMPRINT – a general term describing the marks produced by the muzzle, front sight, magazine tube, spring housing, etc., and caused by the contact discharge of a firearm.

NATURAL – death due solely to natural disease; one of the manners of death.

NEGATIVE CONTROL – a test performed to demonstrate that no false positives result from the performance of a procedure.

NOISE – pixels of random colors and brightness, most often appearing in the dark areas of a digital image.

NON-PENETRATING IMPACT – projectile damage where the projectile strikes but does not penetrate a target.

NORMAL FOCAL LENGTH (STANDARD LENS) – a lens that provides about the same angle of view of a scene as the human eye; also called NORMAL LENS.

OBLIQUE LIGHTING – light positioned at a low angle of incidence relative to the surface being examined or photographed; also referred to as side lighting.

ORIENTATION PHOTOGRAPH – a photograph taken to document the general condition and layout of the scene; historically referred to as an overall photograph.

OVEREXPOSE – to make an exposure with too much light, creating a picture that is too bright/light.

OVER AND UNDER – a firearm with two barrels, arranged with one barrel placed over the other.

PAINT BY LIGHT – a technique used in low-light situations in which the photographer sets the shutter release to open and adds light to the darker areas of an object or scene, often using a flashlight or other type of constant light.

PALM PRINT – an impression of the friction ridge of all or any part of the palmar surface of the hand.

PARENT STAIN OR DROP – a bloodstain from which satellite spatter or wave cast-off stains originate.

PASSIVE BLOODSTAINS – stains and patterns whose physical features indicate that they were created without any significant outside force other than gravity and friction.

PATENT PRINT – a friction ridge impression of unknown origin, visible without development.

PATTERN – the distribution of shot fired from a shotgun; the arrangement of blood stains, based on the action that caused them.

PELLET PATTERN – the distribution of shot pellets fired from a firearm that may be used to estimate the muzzle-to-target distance.

PELLETS – the common name for the spherical projectiles loaded into shotshells; a nonspherical projectile used in some air rifles and air pistols.

PENETRATING INJURY/IMPACT – caused by an object entering but not exiting the body/surface.

PERFORATING INJURY/IMPACT – caused by an object passing through the body/surface.

PERIMETER STAIN – an altered stain consisting of its edge characteristics, the central area having been partially or entirely removed.

PERIMORTEM – near or around the time of death.

PETECHIAE – round purplish-red spots of blood, pinpoint to pinhead in size, that appear on the tissue (e.g. skin) as a result of bleeding into layers of the tissue.

PINCH POINT – in painted metal surfaces, a small area of surviving paint that was pinched between the initial contact point of a low incident angle bullet and the painted metal surface. The pinch point establishes the entry side of an impact or ricochet mark and thereby the bullet's direction of travel.

PISTOL – a handgun in which the chamber is integral with the barrel.

PIXEL – short for picture element; the smallest unit, usually square, of a digital image that can be displayed or changed.

PLASTIC PRINT – a friction ridge impression of unknown origin that is impressed in a soft substrate to create a three-dimensional impression, visible without development.

POINT OF IMPACT – the point at which a bullet hits a target.

POLARIZING FILTER – a filter placed in front of the camera lens to reduce reflections from nonmetallic surfaces like glass or water, or to darken the sky.

POOL – a bloodstain resulting from an accumulation of liquid blood on a surface.

POSITIVE CONTROL – a test performed prior to or in parallel with evidentiary samples that is designed to demonstrate that a procedure works correctly.

POSTERIOR (DORSAL) – indicates the back side of the body.

POSTMORTEM – after death.

POWDER STIPPLING – small hemorrhagic marks on the skin produced by the impact of gunpowder particles; on inanimate objects, it is the creation of small pits or defects caused by the impact of unburned and partially burned gunpowder particles.

POWDER TATTOOING – the embedding of unburned and partially burned gunpowder particles in the skin or other tissue with accompanying hemorrhagic marks associated with living tissue.

PPI – pixels per inch, a measure of the resolution of an image that has a physical size.

PRESERVED SAMPLES – insect samples that are killed and placed in a fixative.

PRIMER – the ignition component of a cartridge.

PRIMER GUNSHOT RESIDUE (PGSR) – a subcategory of GSR considering only chemicals generated from the priming mixture; typically composed of very small particles containing lead, barium, and antimony.

PROGRAMMED AUTOMATIC – a mode of automatic exposure in which the camera sets both the shutter speed and the aperture for a normal exposure; often designated by the letter “P” on the camera mode dial.

PROJECTED BLOODSTAIN PATTERN – a bloodstain pattern resulting from the ejection of blood under hydraulic pressure, typically from a breach in the circulatory system.

PROJECTILE – an object propelled with an initial velocity then acted upon by gravity, air drag, and other outside forces.

PROJECTILE FRAGMENT – any portion of a projectile that retains characteristics permitting it to be identified as having been part of a projectile.

PROJECTILE IMPACT – damage determined to have been caused by a projectile.

PSEUDOSTIPPLING – small hemorrhagic lesions on the skin produced by the impact of ejecta (e.g. fine fragments of glass or other brittle materials).

PUGILISTIC ATTITUDE – position that a body often assumes in fire deaths in which the muscle fibers contract due to the heat of the fire, causing the limbs to be drawn in.

PUMP ACTION – see slide action.

PUPA (PLURAL- PUPAE) – the insect life stage during which complete metamorphosis from larvae to adult occurs.

PURGE FLUID – decomposition fluid that drains from an orifice of the body; may be mistaken for blood.

PUTREFACTION – postmortem decomposition of soft tissues by bacteria, fermentation, and enzymes.

RADIAL FRACTURES – the fractures or cracks that radiate out from an impact side in non-crystalline material such as glass, ceramics, bone, and certain plastics.

RANGE – the distance from a firearm to the initial projectile impact.

RAW/CAMERA RAW – a digital camera file that contains picture information exactly as it is acquired. Most RAW file formats used in cameras are proprietary, or specific to the camera manufacturer, and must be interpreted before editing.

RECEIVER – the basic unit of a firearm which houses the firing and breech mechanism and to which the barrel and stock are assembled; in revolver, pistols, and break-open firearms, it is called the frame.

REFERENCE MEASUREMENT STANDARD – a measurement standard designated for the calibration or validation of other measurement standards for quantities of a given kind at a given location.

RELATIONSHIP PHOTOGRAPH – a photograph taken in order to frame an item of evidence in conjunction with some obvious landmark present within the scene.

RESOLUTION – the total number of pixels in a camera sensor; the number of pixels per unit length, generally a measure of maximum image quality; usually measured in pixels per inch (PPI).

REVOLVER – a firearm, usually a handgun, with a cylinder having several chambers so arranged as to rotate around an axis.

RICOCHET – the continued flight of a rebounded projectile and/or major projectile fragments after a low angle impact with a surface or object.

RIFLE – a firearm with a rifled bore designed to be fired from the shoulder.

RIGOR MORTIS – rigidity or stiffening of the muscle tissue of the body after death.

ROLLING CIRCUMFERENCE – the linear distance traveled by a tire in one revolution under load.

SABOT – a lightweight carrier in which a smaller caliber projectile is placed to permit firing it from a larger bore firearm.

SAFETY MECHANISM – a device on a firearm intended to help provide protection against accidental discharge under normal usage when properly engaged; such a mechanism is considered “on” when the position of the safety device is set in a manner to provide against accidental discharge under normal usage; such a mechanism is considered “off” when it is set to allow the firearm to be discharged by a normal pull of the trigger.

SATELLITE STAIN – a smaller bloodstain that originated during the formation of the parent stain, as a result of blood impacting a surface.

SATURATION STAIN – a bloodstain resulting from the accumulation of liquid blood in an absorbent material.

SCALLOPING – a serrated edge characteristic of bloodstains.

SCENE – a place or object that is subject to and/or requires forensic examination. Note: A crime scene is a common description of a scene where a presumed crime has been committed. The scene can be a person or an animal.

SD CARD – Secure Digital card; a memory card format utilized with digital cameras.

SERUM STAIN – a yellowish stain resulting from the separation of serum from the retraction of a blood clot.

SHOE – a clip on a camera for attaching a flash unit.

SHOOTING RECONSTRUCTION – a scene reconstruction focused on the discharge of a firearm(s).

SHORT-FOCAL-LENGTH LENS (WIDE ANGLE LENS) – a lens that provides a wide angle-of-view of a scene, including more of the subject area than a lens of normal focal length.

SHOT – generally, spherical pellets used in loading shotshells or cartridges.

SHOTGUN – a long gun designed to shoot from the shoulder, typically having a smooth bore and designed to fire shotshells.

SHOT PATTERN – the distribution of multiple projectile impacts from a fired shotshell.

SHOTSHELL – a complete round of ammunition having a plastic body, a base wad that may or may not be a single unit, and a metallic head.

SHOTSHELL CASE/HULL – an empty plastic shell that previously held components (case); an empty plastic shell that is used to load components (hull).

SHUTTER – a device in the camera that opens and closes to expose the sensor to light for a measured length of time (i.e. shutter speed).

SHUTTER PRIORITY MODE – an automatic exposure system in which the photographer sets the shutter speed and the camera selects the aperture (f-stop) for normal exposure; often designated by the letter “S” on the camera mode dial.

SHUTTER RELEASE – the mechanism, usually a button on the top of the camera, which activates the shutter to expose the sensor.

SHUTTER SPEED – the camera control that selects the length of time the sensor is exposed to light.

SIDE-BY-SIDE – a firearm with two barrels arranged with one barrel next to the other.

SILENCER – a colloquial term used to describe a device attached to the barrel of a firearm designed to reduce the noise of discharge; such a device is more accurately identified as a sound suppressor.

SIMULTANEOUS IMPRESSION – two or more friction ridge impressions from the same hand or foot deposited concurrently.

SKELETONIZED BLOODSTAIN – a bloodstain that consists of a darkened outer peripheral rim with the central portion of the stain having been removed by wiping through the partially dry stain. A skeletonized bloodstain is also produced by the flaking of the central portion of a completely dried stain.

SLIDE ACTION – an action which features a movable forearm that is manually actuated in a motion parallel to the barrel by the shooter; also known as pump action.

SLUG – a single projectile for shotshells; a slang term for a fired bullet.

SOIL – sediments or other unconsolidated accumulations of solid particles (e.g. minerals and organic matter) that are produced by the physical, chemical, and biological disintegration of parent material, or which has the ability to support rooted plants in a natural environment, or both; and which can include manufactured materials.

SODIUM RHODIZONATE TEST – a chemical test for the detection of lead.

SPATTER – bloodstains that exhibit directionality and variation in size and are associated with a source of blood being subjected to external force(s).

SPINES – an edge characteristic of bloodstains consisting of narrow, elongated projections from the central area of the stain.

SPLASH – a bloodstain created by a free-falling volume of blood in excess of 1.0 ml onto a surface from a distance of at least four inches, OR an altered bloodstain pattern characterized by a preexisting volume on a surface that has been subjected to additional force creating elongated narrow spines, such as stepping into blood.

STAB WOUND – injury caused by sharp instrument; wounds are deeper than they are wide.

STAGED SCENE – a crime scene in which the perpetrator purposely alters the crime scene to mislead or redirect the investigation.

STELLATE – star-shaped wound; characteristic of contact wounds in regions of the body where only a thin layer of skin and tissue overlies the bone (e.g. head).

STOCK – the wood or plastic component(s) to which the metal parts of a firearm are attached to enable the shooter to hold the firearm.

STOP – an aperture setting that indicates the size of the lens opening; a change in exposure by a factor of 2. Changing the aperture from one full setting to the next full setting doubles or halves the amount of light reaching the sensor.

STOVE-PIPE – a failure to eject in which the cartridge case is caught in the ejection port by the forward motion of the bolt or slide.

STIPPLING – pinpoint hemorrhages due to the discharge of burning gunpowder against the skin; also referred to as tattooing.

SUICIDE – death resulting from a self-inflicted act; one of the manners of death.

SWIPE – a bloodstain resulting from the transfer of blood from a blood-bearing surface onto another surface, with characteristics that indicate relative motion between the two surfaces.

SYNCHRONIZATION (SYNC) CORD – a wire that links a flash unit to a camera's shutter-release mechanism.

TARGET – a surface on which blood has been deposited; any object struck by a projectile, regardless of whether it was struck intentionally.

TELEPHOTO LENS – see LONG-FOCAL-LENGTH LENS

TERMINAL BALLISTICS – the branch of ballistics that studies the effect of a projectile's impact with the target.

TERMINAL VELOCITY – the maximum velocity that a free-falling drop of blood can accelerate in air, determined to be approximately 25.1 feet per second.

THROUGH-THE-LENS (TTL) METER – an exposure meter built into the camera that takes light readings through the lens.

TIFF – a lossless, open-source (non-proprietary) format for saving digital images that is readable by most graphic software.

TOTAL METAL JACKET (TMJ) – a projectile made by copper plating a lead core to create a jacket that encloses the entire bullet.

TRACE EVIDENCE – evidence such as hairs, fibers, glass fragments, wood splinters, and microscopic evidence, often as a broken part of a larger item.

TRAJECTORY – the curved, aerial path traveled by a projectile; typically modeled as a straight line for short-range paths.

TRANSFER STAIN – a bloodstain resulting from contact between a blood-bearing surface and another surface.

TRANSIENT EVIDENCE – evidence that is changing over time, which may be affected by the scene conditions; evidentiary value will be lost if not preserved, protected, or documented (e.g. smells, a wet surface that is drying).

TRIGGER – that part of a firearm mechanism that is moved manually to cause the firearm to discharge.

TRIGGER GUARD – a rigid loop which partially surrounds the trigger to prevent damage or an accidental discharge.

UNDEREXPOSE – to make an exposure with too little light, making a picture that is too dark.

UNDETERMINED – manner of death used when the information pointing to one manner of death is no more compelling than another when the circumstances surrounding the death are unknown; one of the manners of death.

UNINTENTIONAL DISCHARGE – the inadvertent discharge of a firearm in the absence of a mechanical malfunction of the firearm.

UNIVERSAL PRECAUTIONS – approach to infection control to treat all human body fluids as if they are known to be infectious.

UPRANGE – any location behind the plane of the muzzle of a firearm.

VERTICAL ANGLE -- the angle in a vertical plane typically between the path of a bullet and level, also known as elevation angle.

VOID – the absence of blood in an otherwise continuous bloodstain pattern that suggests the presence of an intermediate target that may have been removed.

WAD – a felt, paper, cardboard, or plastic component used in a shotshell for various purposes.

WAVE CAST-OFF – a small stain that has originated from a parent stain as the results of the wavelike action of the original drop striking a surface at an angle of less than 90 degrees.

WHEEL BASE – the distance between the front and rear axles of a vehicle. An approximation of this dimension can be obtained by measuring the distance from the leading edge of the rear tire track to the leading edge of the front tire track on the same side of the vehicle.

WHITE BALANCE – the color balance of a white light source; a setting or adjustment on a camera that adjusts the overall image colors for the light source in which it was captured.

WICK – material that, by capillary action, draws up a supply of ignitable liquid or oil to be burned, as in a candle or Molotov cocktail.

WIDE ANGLE LENS – see SHORT-FOCAL-LENGTH LENS

WIDE-ANGLE DISTORTION – an unusual perspective caused by using a wide-angle lens very close to a subject; objects appear stretched out or farther apart than they really are.

WIPE – an alteration of a preexisting wet or partially dry bloodstain caused by movement through the existing stain.

3.0 QM: Organization and Management

- 3.1 An organizational chart for the Idaho State Police appears in the ISP Policy Manual.
- 3.2 An organizational chart for ISP Forensic Services (ISPFS) appears in the ISP Forensic Services Qlutch System.
- 3.3 The organizational chart that includes the Crime Scene Discipline Lead position appears in the Latent Prints Quality Manual.
 - 3.3.1 A Crime Scene Lead Worker may share the duties and responsibilities with the Crime Scene Discipline Lead.

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4.0 QM: Personnel

4.1 CRIME SCENE DISCIPLINE LEAD

- 4.1.1 The Crime Scene Discipline Lead is responsible for coordinating ISPFS responses to crime scenes state-wide.
- 4.1.2 The Crime Scene Discipline Lead participates in equipment maintenance and troubleshooting; supplies crime scene attire, personal protective equipment (PPE) (e.g. booties, disposable gloves, disposable clothing, etc.), supplies, and equipment state-wide; develops and maintains crime scene methods and manuals; provides assistance at crime scenes.
- 4.1.3 The Crime Scene Discipline Lead shall assist with training; working with analysts' supervisors to create a training plan and ensures training records are on file with the Quality Manager.

4.2 CRIME SCENE INVESTIGATORS (CSI)

- 4.2.1 Crime Scene Investigators are responsible for adhering to established methods, safety practices, and policies/procedures.
- 4.2.2 Crime Scene Investigators come from different disciplines within the lab system. If a CSI has specialized training as a part of their primary discipline (e.g. bullet strike testing, acid phosphatase testing, development of bloody impressions with blood-reactive chemicals), then they can perform those tests/analyses at crime scenes.
- 4.2.3 CSI duties may include, but are not limited to:
 - 4.2.3.1 Documentation of crime scenes through photography, notes, and sketches/diagrams;
 - 4.2.3.2 Conducting presumptive blood tests;
 - 4.2.3.3 Search for, collection, and preservation of evidence;
 - 4.2.3.4 Recognition and documentation of evidence in bloodshed and/or shooting scenes;
 - 4.2.3.5 Latent print processing;
 - 4.2.3.6 Processing vehicles;
 - 4.2.3.7 Buried body excavations;
 - 4.2.3.8 Documentation and evidence collection from persons;
 - 4.2.3.9 Issuing reports of crime scene activities;
 - 4.2.3.10 Performing technical and administrative casework reviews;
 - 4.2.3.11 Satisfactorily completing annual proficiency tests;
 - 4.2.3.12 Presenting expert testimony in court.
- 4.2.4 As the team of Crime Scene Investigators grows, CSIs may be tasked with learning aspects of disciplines outside of their primary discipline in order to elicit a more efficient and timely response for our customers.
- 4.2.5 If a CSI is going to learn to do tests/analyses that are not part of a discipline for which they have completed training, then they shall go through a training process, be competency tested on the tests/analyses, and be regularly proficiency

tested. Training for crime scene investigators is outlined in the Crime Scene Training Manual. Only those CSIs that have been trained and competency tested in tests and analyses that are outlined in the Crime Scene Training Manual (i.e. presumptive blood testing, powder processing) shall perform those tests/analyses.

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5.0 QM: Coordination with the Investigating Agency

- 5.1 The Crime Scene Discipline Lead and/or the lead CSI shall determine what steps have been taken by the responding law enforcement officer(s) to preserve the scene in order to maintain the integrity of the scene until designated CSIs respond. Prior to arrival, if the investigating agency notifies the responding CSI that conditions exist in the scene that could compromise the integrity or value of evidence, the responding CSI shall advise the investigating agency what mitigation, if any, should be performed.
- 5.2 CSIs should participate in a briefing with the investigating agency upon their arrival to the scene. The information provided during the briefing will be recorded in the case notes. Additional information provided during the course of scene processing should be added.
- 5.3 The CSIs should obtain or have access to, at a minimum, the following information: the names and agencies of the officers present; the date and time of the original incident if known; the condition of the scene at the time of the investigating agency's arrival; the size and extent of the scene including the existence of any secondary scene(s); information from the investigating agency pertinent to executing the scene examination.
- 5.4 The CSI should ensure that a path for authorized personnel to enter and exit the scene has been established and is appropriate for the preservation of evidence integrity.
- 5.5 The CSI shall conduct themselves with the expectation that their work may be used in every step of the legal process, and therefore shall ensure that they comply with applicable legal standards including those of search and seizure.
- 5.6 Crime scene investigations are governed by the authorization obtained by the investigating agency.
 - 5.6.1 If the agency has obtained a search warrant, the parameters of the search warrant shall be reviewed by the CSIs prior to any scene processing. Only the types of evidence outlined in the search warrant shall be collected by CSIs.
 - 5.6.2 If the agency has obtained consent, and someone within the ISP command staff has authorized the processing of the scene based on consent, the parameters of the consent shall be noted. If a consent form was used, the form shall be reviewed prior to any scene processing.

6.0 QM: Scene Security and Precautions

6.1 Crime scenes should be secured by the investigating agency.

6.1.1 The investigating agency should supply enough personnel to adequately manage the security of the crime scene, including access points, the perimeter, and possible routes of entry/exit.

6.1.1.1 If the scene has been held for a prolonged period of time, during which there was minimal law enforcement staffing for security, the CSI can request the scene be recleared.

6.1.1.1.1 The investigating agency may consider placing seals across the access point(s) of the crime scene (e.g. front door, windows) so that personnel can easily see if a seal has been broken, indicating that someone has entered the crime scene.

6.1.1.2 For any circumstance in which a CSI determines that additional personnel are needed to ensure their safety on scene, ISP Detectives and/or Troopers may be dispatched to provide additional safety.

6.1.2 The scene should be cordoned off with crime scene perimeter tape.

6.1.2.1 The CSI shall review and document the boundaries established by the investigating agency in order to determine whether the existing physical barriers are adequate or if alterations are required. If existing physical barriers are not adequate, the CSI shall request alteration. Movement throughout the scene should be limited to essential scene investigation personnel only.

6.1.2.2 Case circumstances may be such that crime scene perimeter tape is not necessary or appropriate.

6.1.3 The CSI shall document the agency's control of the scene (personnel entering or exiting the scene including the time of their arrival and departure and their reason for entry). Upon arrival, if such documentation has not been started, the CSI should request the process to begin. The entry log should not be the responsibility of the CSI.

6.1.3.1 Upon arrival, the CSI shall check-in with the officer posted with a crime scene log and provide personnel information.

6.2 CSIs should inquire about hazards before entering a scene.

6.2.1 Hazards may be present as a result of actions taken in the crime scene (e.g. carbon monoxide, structural damage due to fire, etc.), may be natural hazards (e.g. uneven terrain, cliffs, bodies of water, etc.), may be due to the type and/or quantity of evidence present in the scene (e.g. loaded weapons that are not secure), and/or due to the way the scene was maintained by the users/owners (e.g. hoarding, rodents/droppings).

6.2.2 CSIs should not enter a crime scene until any hazards have been mitigated to allow for safe exposure to the scene (if possible).

- 6.2.2.1 The investigating agency should request assistance from appropriate agencies if hazards such as chemical, radiological, biological, animal, physical, or utility (e.g. electrical or gas) are suspected or discovered.
- 6.2.3 CSIs shall have appropriate PPE to mitigate hazards presented by the scene and by any processing tools, equipment, or reagents used. PPE may include gloves, protective clothing, masks, eye protection, and respiratory equipment. The scene should be constantly reevaluated to determine if alteration to the level of PPE are needed for adequate personal protection.
- 6.2.4 CSIs shall be trained in the proper use of PPE. PPE can be a source of cross-contamination. PPE shall be changed as appropriate to prevent cross-contamination.
- 6.2.5 PPE considerations should include, but not be limited to, protection of eyes and face, head, foot and leg, hand and arm, body (torso), respiratory system, and hearing.
- 6.2.6 When working a scene on a roadway in which traffic is still moving through the area, safety equipment (e.g. cones, flares, reflective vests, etc.) should be utilized.
- 6.3 CSIs should not enter a scene until it is static and all involved living parties (e.g. victim, suspect, witnesses, family members, etc.) have been removed from the scene.
- 6.3.1 If a living subject/suspect/victim is still on scene and they are to be documented prior to removal, they should be moved away from areas containing evidence to avoid contamination.
- 6.4 When searching a crime scene for evidence, CSIs should be cautious as to hidden hazards (e.g. needles, razor blades, loaded firearms, etc.) that may be inside other items.
- 6.5 Environmental conditions may not be conducive to the work to be accomplished. Temperature, light, and weather conditions may create circumstances in which evidence could be missed (e.g. low light) or when CSIs can't adequately perform quality work (e.g. very cold/hot temperatures). CSIs should have an ongoing conversation with the investigating agency/detective about the potential negative impact to evidence and personnel if work continues. There may come a time to halt scene processing until the conditions improve.
- 6.5.1 When processing a vehicle, moving the vehicle to a controlled environment (e.g. garage bay) should be considered and discussed; this may allow processing to continue.
- 6.6 CSIs should take periodic breaks for rest and sustenance, especially if wearing Tyvek clothing, when outdoors, during inclement weather, or during long periods of time on scene.
- 6.7 Responding to crime scenes may involve traveling considerable distances. Overnight stays should be considered for every crime scene response.
- 6.7.1 The following factors should be considered in determining whether or not an overnight stay is warranted: number of hours worked in the last 24-hour period; number of hours required to return to the laboratory; time of arrival at the laboratory.
- 6.7.2 It is better to err on the side of caution and stay overnight rather than risk driving while tired.

6.8 CSIs shall follow safety guidelines as outlined in the ISPFS Health and Safety manual as applicable.

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7.0 QM: Proficiency Testing

- 7.1 Annual proficiency testing shall be conducted for any disciplines, processing, or testing that a CSI has satisfactorily completed the training program.
 - 7.1.1 CSIs who complete annual proficiency testing in their primary discipline shall not perform an additional proficiency test for crime scene if they also perform the duties of their primary discipline at crime scenes.
 - 7.1.1.1 For example, a latent print examiner who completes a processing proficiency test in the latent print discipline shall not have to complete an additional proficiency test in order to perform latent print processing at crime scenes.
- 7.2 Testing shall be in accordance with the ISPFS Quality/Procedure Manual.

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8.0 AM 1: Scene Investigation Methodology

8.1 Background

8.1.1 There is no one right way to process a crime scene. The methods and the order in which those methods are employed are determined by the particulars of the scene and the experience of the CSIs. The purpose of processing the crime scene is to collect as much information and evidence as possible, in as pristine a condition as possible. Evidence collection is more than the physical collection of items from the scene; cataloging the interrelationships of where items are in the scene, noting the physical layout of the scene, and documenting observations of things that cannot be physically collected are all integral parts of collecting evidence. Content and context of the scene are both important aspects. Crime scene investigations take place in environments that have variable conditions. Due to this, equipment and reagents may not perform as expected. Should a piece of equipment or a reagent fail, the CSI should attempt to determine the cause of the failure and whether the failure will affect scene processing. Notes shall be made about the equipment or reagent failure(s). CSIs should notify the Crime Scene Discipline Lead as necessary.

8.1.2 Each scene is unique and requires CSIs to continuously evaluate how to proceed with processing in a manner that is safe and best preserves the evidence and its context. All decisions made by a CSI before, during, and after a scene is processed should consider the following factors: legal considerations, personnel safety, scientific reliability and validity, preserving context, maintaining evidence integrity, transparency, and managing bias. Scene circumstances could require a CSI to give greater weight to one factor over another.

8.1.3 Influences from internal and external sources may affect objectivity (e.g. time constraints, personal beliefs, contextual information about the scene and/or suspect/victim). Information provided to the CSI during an investigation should be objectively documented and continuously evaluated within the context of the evidence. The CSI should remain open to all hypotheses and potential evidence.

8.1.4 Field services examinations may be conducted in the laboratory with advance notice and preparation. If a circumstance arises that warrants consideration of laboratory processing for field services, the Crime Scene Discipline Lead should be contacted.

8.2 Scope

8.2.1 This analytical method applies to all crime scenes.

8.3 Equipment/Reagents

8.3.1 Rechargeable Flashlights

Rechargeable flashlights can be used for searching a scene.

The flashlight intensity can be adjusted; hold the button to cycle through the options.

To charge the flashlight, turn it off and insert it into the black charger. The switch (below the head) fits into a mating recess in the charger.

The LEDs on the charger will tell you it is working; if the battery is not working properly, it will emit a rapid flash.

The exterior of the flashlight can be cleaned with a disinfecting wipe.

Note taking supplies

Camera and Camera bag

8.4 Procedure

8.4.1 At any crime scene, the CSI should proceed through six actions.

8.4.1.1 Assessing

8.4.1.1.1 Before any action is taken on the scene, the CSI shall assess the circumstances in order to decide on a proper course of action. This assessment includes resource determination, risks, and task/procedure determination. This assessment, also known as a walk-through, should contain any pertinent information related to the incident. Assessment is an ongoing process. The CSI should continuously assess the situation and adjust the processing plan as necessary; this includes the consideration of the existence of multiple scenes. Remaining flexible is a critical aspect of responding to and dealing with the crime scene.

8.4.1.1.2 Measures shall be instituted to preserve and protect evidence that may be lost or compromised due to environmental conditions or the nature of the evidence item. Such measures may include prioritized collection or use of protective measures that also prevent contamination, tampering, alteration, or loss of evidence.

8.4.1.1.3 There may be the need for immediate documentation and collection of evidence prior to the full completion of the scene assessment to prevent contamination, alteration, or loss of evidence.

8.4.1.1.4 CSIs should take steps to mitigate the effects of cognitive biases on their work. The CSI must consider various possible hypotheses about what happened and should endeavor to locate, document, collect, and preserve evidence relevant to all plausible hypotheses. When searching for relevant evidence, the CSI should consider both evidence that may support various hypotheses as well as evidence that might contradict those hypotheses. Both the presence and the absence of such items should be documented. Decisions made by CSIs depend on and require some contextual information and hypotheses formulation, which guide them in their search for evidence. It is critical that hypotheses are well informed and based on observations, as they can lead to identification and collection of important evidence, or alternatively, lead to the exclusion and lack of collection of important evidence.

8.4.2 Observing

8.4.2.1 Looking at and mentally registering the condition of the scene and artifacts found in the scene is the most basic aspect of crime scene processing. During observations, the CSI moves around in the scene, which may alter the scene. In most cases, observation is not intrusive. However, when combined with search efforts, it may become an intrusive act. After proper documentation has been completed, more intrusive observations may be undertaken.

8.4.3 Documenting

8.4.3.1 Documentation includes written recordings of observations, photography of the scene, and the creation of sketches and/or diagrams. Documentation shall be undertaken from the least intrusive to the most intrusive. In this way, documentation of observations should precede photography; photography should precede sketching and measuring; detailed photography and reconstruction documentation should be the last types of documentation completed. Documentation is the critical component; it is through documentation that CSIs can properly preserve the original condition and context of the scene, before any alteration. Documentation shall be ongoing as searching, collecting, and processing of the scene take place. Documentation shall include the steps taken during the processing of the scene. The documentation of a scene shall preserve the context of the evidence to ensure others can later understand not just what was collected, but also where, how, and in what condition it was found.

8.4.3.2 Items should be documented as to their condition as found (e.g. shirt inside out, shoes laced, etc.). The condition may be relevant and should not be altered until documentation is complete, and ideally, not altered at all.

8.4.4 Searching

8.4.4.1 The nature of any search and associated activity is intrusive, so it should not be undertaken until documentation is complete. During searches, items may be moved to be more thoroughly examined, which alters the scene. Multiple searches, at varying levels of depth, may be conducted throughout the scene, as appropriate.

8.4.4.2 Crime scene searches should be methodical (i.e. ordered and systematic). The type of search to be conducted should be determined based on the nature of the terrain/area being searched, lighting conditions, environmental conditions, and the size of the item(s) being searched for (if applicable).

8.4.4.3 Circle/Spiral searches are common when searching interior scenes. Generally, the CSI starts at the perimeter of the room and works inward in a spiral pattern.

8.4.4.4 Strip/Line searches are often used when searching exterior scenes (e.g. parking lot, yard). The area is divided into parallel strips based on an area that can be examined by a single searcher. When a searcher has finished searching a strip of land, they would move one strip over, and repeat the process, until each strip had been searched. If multiple searchers are utilized, they may go through their strips side-by-side, until all strips are searched.

8.4.4.5 Grid searches are a variation of the strip/line search. Instead of only searching in one direction like in a strip/line search, the area is divided into two sets of strips that are perpendicular to one another. Once the searcher has moved through the strips in one direction, they begin a second search, using the strips that run perpendicular to the first strips.

8.4.4.5.1 When conducting grid searches, it may be helpful to assign letters and numbers to the rows and columns created, so that the location and/or orientation of evidence can be more quickly ascertained.

8.4.4.6 Zone searches are conducted by breaking an area into smaller sections. A zone search may be utilized in small areas (e.g. inside a vehicle) where the other types of searches could not be conducted. A vehicle may be broken down into driver's area, front passenger area, rear driver side area, rear passenger side area, cargo area, trunk, and engine compartment, or other similar areas, based on the vehicle design. A zone search may also be utilized to break a very large area into smaller sections that can be searched by another method, such as when searching a residential street. The street may be broken down by lanes, and the residences on the street may be broken down by front yard, driveway, side yard, etc.

8.4.4.7 The process of documentation and searching is cyclical. As additional items of evidence are discovered during searches, additional documentation is necessary. This process continues throughout the scene until the scene has been searched in its entirety.

8.4.5 Collecting

8.4.5.1 Physical collection of items in the scene is always an intrusive process. Once an item has been moved, the context of the scene is changed forever. If an item is moved prior to the completion of documentation, notes shall be made as to the item's original location/orientation and the reason for moving it. An item should not be returned to its original location/orientation to attempt to photograph it.

8.4.5.2 Ideally, an item should not be altered prior to collection (e.g. inside-out jeans should not be righted). Some items (e.g. firearms) may be altered prior to collection for specific reasons (e.g. safety). If an item's condition is inadvertently altered during collection, it shall be noted.

8.4.6 Processing

8.4.6.1 The act of chemically or physically processing the scene is significantly intrusive, so it should almost always be one of the last actions undertaken.

8.4.8 If the scene dictates a deviation to the requirements of this manual, the CSI shall contact the Discipline Lead to start the process of a deviation.

8.4.9 A staging area should be established outside the crime scene, but within an established secure area. Tools, equipment, and other materials should be kept in the staging area when not being utilized in processing.

8.4.10 The CSI shall establish a secure area on scene for the temporary storage of evidence following initial collection to preserve evidence integrity and chain of custody.

8.4.11 CSIs shall ensure that their tools, equipment, and other materials used in processing the scene do not alter with any elements of the scene. Tools and equipment should not be included in photographs of the scene, unless they're being used to assist with documentation (e.g. adhesive rulers, evidence markers, etc.). CSIs shall ensure tools are clean to prevent contamination or cross contamination of items in the scene.

8.4.12 The CSI should establish an area designated for trash, including biohazards, and used supplies. If the area is established within a scene, the CSI shall ensure the designated area has been documented, searched, and deemed safe to assume that role.

8.4.13 Before releasing a scene, the response team should review their actions taken in the crime scene. Notes, sketches, photography, and evidence should be checked against one another to ensure that all information has been documented and all evidence has been collected.

8.4.14 Prior to leaving the scene, CSIs should check to ensure that all of their tools, equipment, and trash have been collected from the scene.

8.6 Safety

8.6.1 Refer to QM 6.0: Scene Security and Precautions

9.0 AM 2: Documentation

9.1 Background

9.1.1 Documentation of observations in the scene requires significant effort. Overall observations are best documented via handwritten and/or electronic notes. A diagram or sketch of the crime scene serves as a graphic document to show the layout, orientation, and interrelationships of the scene and the evidence. It depicts pertinent portions of the scene and supports the photographs and notes taken at the scene.

9.2 Scope

9.2.1 This analytical method applies to all crime scenes.

9.3 Equipment

9.3.1 Note taking supplies
Infrared thermometer

See section 23 on Entomology for further information about this device.

Laser Measuring Device

A laser measuring device can be used to take measurements easily and quickly in scenes.

The settings on the unit can be changed so that it measures from either the front, middle or end of the unit.

You can retrieve up to 30 measurements on the unit. To do this, you press [Func] and use the plus or minus buttons to cycle until "Memory" is selected. Press the black triangle button and then use the plus or minus buttons to scroll through the recorded measurements.

The laser should not be pointed at any person, for safety.

The exterior can be wiped with a disinfecting wipe.

9.4 Procedures

9.4.1 The scene should be documented in such a way that it preserves the context of the evidence to ensure others can later understand not just what was collected, but also where, how, and in what condition it was found. Documentation is a continuous process.

9.4.1.1 CSIs should take steps to mitigate negative impacts of cognitive biases on their work. Some contextual information is necessary to help guide CSIs in their search for evidence; however, CSIs should remain as independent as possible from potentially biasing case information.

9.4.2 Notes should begin with notification of the crime, identify involved personnel, note conditions and actions upon arrival, and provide a clear and detailed record of all

observations and actions taken while in the scene. Descriptions of techniques employed, areas where the techniques were employed, who employed them, and the results of such techniques shall be included in the notes.

9.4.3 Notes should include areas that are undisturbed or in which nothing significant was observed. The absence of activity or disturbance may be relevant.

9.4.4 Some information present in a scene is transient. Observations of transient evidence (e.g. smells, rain washing away apparent blood, wet footprints that are drying, etc.) should be documented when observed to be certain that they are recorded before they are lost.

9.4.5 When describing items, you should be objective. For example, describe a chair as resting on its right side, not as being overturned, which would imply a particular action.

9.4.6 Description of vehicles, buildings, and other scenes

9.4.6.1 Vehicle descriptions should include the year, color, make, model, license plate number, and Vehicle Identification Number (VIN). The vehicle's location and the condition of any seals shall be noted, including the time the seals were broken. The general condition of the vehicle and its contents should be noted. Note if the license plate and/or VIN plate/sticker is missing.

9.4.6.2 Building descriptions shall include the type of building, the number of stories, the direction it faces, the type of location, and the number and types of rooms contained therein. The general condition of the building and rooms of importance shall be noted. Specifically note any damage or absence of damage that may be pertinent to point of entry or exit or to the incident itself.

9.4.6.3 Other types of scenes shall be described using cardinal directions referenced from a landmark or location or described generally, including GPS coordinates.

9.4.7 Description of rooms of importance

9.4.7.1 Starting with the doorway to the room, moving around the room (either clockwise or counterclockwise), CSIs should describe the furniture and items in the room, including structures. CSIs should note the condition of lights (on, off), window shades (up, down, open, closed), appliances, etc.

9.4.7.2 The description of the furniture and structure of the room may be more easily accomplished by making a sketch. If a sketch is used, it should be supplemented by handwritten notes for observations not easily referenced in a sketch.

9.4.8 Description of deceased person(s)

9.4.8.1 Until the Medicolegal Authority arrives, the body cannot be moved or altered in any way, as the Medicolegal Authority has jurisdiction over the body.

9.4.8.2 CSIs should describe the body's position in the scene, including the general direction of the head and feet. The way the head is turned, the position of an arm or leg, whether straight or bent, etc. should be noted.

9.4.8.3 CSIs should describe all clothing, visible jewelry, and accessories. Note their position and condition, if unusual and/or relevant.

9.4.8.4 CSIs should note the location of any visible injuries and note the presence of apparent blood or other fluids, if present.

9.4.8.5 Once the Medicolegal Authority is on scene, the CSI may ask for their assistance in additional examinations and/or documentation that would require moving the clothing and/or body.

9.4.8.5.1 If photographing using an ABFO scale, take care to keep it from touching the body.

9.4.8.5.2 If there is evidence on the clothing that could be destroyed during transport (e.g. bloodstain pattern, GSR, etc.), ask to remove the clothing. If removing any clothing, care should be taken to avoid cutting through any patterns and/or defects related to the cause of death.

9.4.8.5.3 If there is evidence on the body that could be lost during transport (e.g. hairs, fibers, broken fingernail), CSIs shall ask to collect that prior to moving the body.

9.4.8.5.4 Any evidence or items being removed from the body at the scene shall be carefully documented via notes and photography so that the individual performing autopsy has images to review, since they won't be able to examine the body in situ.

9.4.8.5.5 Any bindings or ligatures are not to be disturbed on the body. If they attach the body to the scene, they should be cut in an area away from the body so that the ends on the body are not altered. The number of cuts should be minimized and the cuts made during the investigation should be labeled.

9.4.8.5.6 If any decisions are made regarding evidence collection from the body, or removal of items from the body, CSIs shall note who specifically gave authorization for those actions.

9.4.8.5.7 Best practice is to place clean paper bags over the hands of all deceased persons to preserve evidence on the hands. Paper bags can be secured at the wrists by wrapping tape or zip ties around the bag; it should be tight enough that the bag won't slide off the hands, but not so tight as to impart artifacts into the skin. If continued blood loss could saturate the paper bags, plastic bags may be loosely placed over the paper bags to keep them from becoming saturated.

9.4.8.5.8 The name and county of the Medicolegal Authority who took custody of the body should be noted. Indicate the time of removal, and by which mortuary/funeral home (if applicable). If the body bag is sealed, note the seal number; the seal may be photographed for additional documentation. If the body bag is not sealed, it shall be noted.

9.4.9 Description of items of evidence in the scene

9.4.9.1 When describing an item of interest, the following aspects of the item should be noted: quantity, size, color, material, item, identifying features, condition, and location (e.g. two small black plastic fragments, stained with apparent

blood, on the floor east of the dresser; one black metal bar, bent in half, with apparent blood, tissue, and hair adhering to one end, on the floor southwest of the victim's head).

9.4.9.2 Describe the item of evidence sufficiently enough that it can be distinguished from other similar items of evidence. CSIs should use serial numbers or identifying numbers, brands, or labels, as applicable. Include evidence markers with descriptions. If the investigating agency assigns their own item number to an item of evidence, that number may be included so that the items can be easily correlated with that agency's reports.

9.4.9.3 In large scenes (e.g. schools, hospitals, commercial buildings), it may be helpful to assign groups of letters and/or numbers based on location. For example, numbers 1-99 may be used inside the waiting room, 100-199 may be used in the nurses' station, and 200-299 may be used in the cafeteria. By utilizing this type of grouping, one can easily determine the area of recovery based on the item number. If all of the numbers of a particular grouping are not utilized, it should be noted.

9.4.9.4 If an agency has placed evidence markers in the scene prior to ISPFS's arrival, it may be beneficial to leave a gap between the sequence of numbers and/or letters used by that agency and those used by ISPFS. For example, if markers 1-12 were used by the agency, CSIs may want to start at marker 30 for any evidence they mark. By leaving this gap, it's easier to discern which markers were placed by whom.

9.4.9.5 Evidence placards/labels can be used in different ways in a scene. Generally, for evidence on horizontal surfaces (e.g. floors, tables, car seats, etc.), placards should be utilized. For evidence on vertical surfaces (e.g. bloodstains, bullet holes, etc.), adhesive evidence labels should be utilized.

9.4.9.6 Evidence placards/labels are available with numbers or letters. Generally, evidence numbers should be utilized for evidence that are to be collected and evidence letters should be utilized for evidence that is to be documented (e.g. footwear, tire tracks, bloodstain patterns, bullet holes) but cannot be picked up and collected.

9.4.9.7 Size may be important when documenting an item. While some items are only manufactured in one size, other items are made in a variety of sizes.

Approximate sizes should be noted for items in which size may be significant (e.g. knives, tools, items used in blunt force injuries); approximate sizes are for descriptive purposes.

9.4.10 Results from testing and/or processing

9.4.10.1 Results from all tests conducted shall be noted, whether positive, negative, or inconclusive.

9.4.10.2 Results from all types of processing conducted shall be noted.

9.4.10.3 Evidence may be collected after testing and/or processing an area or item. The method of collection (e.g. swabs, comparison photograph, gel lift, etc.) shall be noted.

9.4.11 Collection of evidence from the scene

- 9.4.11.1 All items that are collected by ISPFS personnel shall be noted. The “Evidence Collection Notes” page may be utilized, if desired.
- 9.4.11.2 CSIs shall take appropriate steps to maintain evidence integrity by preventing contamination, tampering, alteration, or loss of evidence. Procedures and documents shall be utilized to account for the integrity and possession of evidence by tracking its handling from the point it is collected until it is turned over to the investigating agency.
- 9.4.11.3 Note whether or not the evidence was sealed by ISPFS personnel; evidence packaging may or may not be sealed prior to turning the evidence over to the investigating agency, based on that agency’s policy or how the evidence must be handled (e.g. drying bloody clothing).
- 9.4.11.4 When items of evidence are turned over to the investigating agency, the date, time, and person receiving the evidence shall be noted.
- 9.4.11.5 The CSI shall document any damage that was done by ISPFS personnel in the collection and/or processing of evidence (e.g. cut out section of drywall to remove bullet fragment, staining of surfaces processed with amido black, etc.) and the agency personnel who authorized the activity.
- 9.4.12 Diagramming/sketching
- 9.4.12.1 The term “sketch” often refers to a hand-drawn depiction that is created on scene. The term “diagram” often refers to a formally drawn or computer-created depiction of the scene that is created at a later date. The terms may be used interchangeably.
- 9.4.12.2 A diagram/sketch should include five basic elements: heading, diagram area, legend, title block, scale and direction notations.
- 9.4.12.3 A heading indicates why the sketch was created. A heading may be as simple as the title of the room depicted (e.g. Primary Bedroom), or may note a particular type of evidence (e.g. Firearms Evidence, Blood Stains, etc.).
- 9.4.12.4 The diagram area is the drawing itself. The diagram/sketch should depict the scene and primary evidence. Items of furniture, structural elements (e.g. doors, windows, closets, etc.), and items of evidence should be included.
- 9.4.12.5 Measurements should be included in the diagram/sketch. Measurements may be included in the diagram area or they may be listed in another area of the diagram/sketch, such as in a table. The type of measurement notation shall be determined based on the number of items in the diagram/sketch and the creator’s preference. If noting measurements in the diagram area would make the diagram/sketch difficult to read, a table or other similar notation should be used.
- 9.4.12.5.1 Measurements should be made using a tape measure and/or laser handheld distance measuring devices.

- 9.4.12.5.2 The handling procedures for measuring devices can significantly affect the resulting value (e.g. sag in measuring tape, not perpendicular, laser device position).
- 9.4.12.5.3 Measuring tapes should be held taut when measuring distances.
- 9.4.12.5.4 Measuring tapes should be checked to ensure they're perpendicular or parallel to the surfaces being measured, and not at an odd angle.
- 9.4.12.5.5 Laser measuring devices should be checked to see from which portion of the device (e.g. front, rear) the measurement is being taken.
- 9.4.12.5.6 All measurements are approximate and are used for descriptive purposes and to note an item's approximate location within a scene.
- 9.4.12.5.7 Measurements may be rounded down to the nearest ¼ inch or nearest mm, depending on the type of measurement being taken.
- 9.4.12.5.8 For excessively cluttered scenes, a representation of non-pertinent items may be made (e.g. pile of clothes) without drawing each individual item.
- 9.4.12.5.9 Footwear and Tire impressions may be included in the sketch to show the paths and movements of persons leaving the impressions.
- 9.4.12.5.10 Colored pens/pencils may be used in sketches/diagrams to more accurately represent the details of the scene.
- 9.4.12.5.11 A legend indicates what the various labels used in the diagram/sketch depict. Letters, numbers, symbols, colors, etc. may be used as labels.
- 9.4.12.5.12 If using evidence markers with letters or numbers in the scene, those letters or numbers should be used in the diagram.
- 9.4.12.5.13 A letter or number should not be used in the diagram/sketch that is for a different item than the same evidence markers was used for in the scene.
- 9.4.12.5.14 The title block provides information relevant to the location of scene and the creator of the diagram/sketch. The title block should include the lab number, agency case number, the physical address of the scene, the name of the person who created it, and the date it was drawn.
- 9.4.12.5.15 A direction notation should indicate, at a minimum, the direction of North in relation to the scene. If a scale of reference is used, usually in a final diagram, the scale reference should be indicated. Whether a scale reference is used or not, a notation of "not to scale" should be included.
- 9.4.12.5.16 When creating a final diagram, it is preferable to make one version that includes the "shell" of the scene, representing the

structure and furniture, and a second version that includes all of the pertinent evidence.

9.4.12.5.16.1 The first version may be utilized in court testimony without concern for biasing the jury, while the second one is useful for the CSI and/or other involved parties to reference when discussing the details of the case.

9.4.12.5.17 The standard crime scene sketch is a bird's-eye view of the scene. In some instances, additional viewpoints may be necessary to fully document the scene.

9.4.12.5.18 A cross-projection or exploded diagram/sketch combines the bird's-eye view of the horizontal surfaces of a room, while at the same time "laying down" a wall or walls to depict evidence present on the vertical surfaces. This type of diagram/sketch is often effective when dealing with walls that have bullet holes or blood stains on them and shows the interrelationships of the evidence on the horizontal and vertical surfaces.

9.4.12.5.19 An elevation diagram/sketch depicts a side view of a portion of the scene, typically an interior wall or similar vertical structure. This type of diagram/sketch may be utilized when dealing with vertical surfaces that have bullet holes or blood stains on them. It may also be used when a particular vertical surface is the area of focus.

9.4.12.5.20 In order to create an accurate scene diagram/sketch, supporting documentation that defines the approximate size of the scene and the location of items within the scene should be taken. By taking these measurements, each element's location may be fixed within the scene.

9.4.12.5.21 The type of scene (e.g. outdoor, indoor, no landmarks) may determine which measuring methodology would be most effective.

9.4.12.5.22 Relevant furniture should be documented by measuring its length, width, and height, in addition to its location in the scene.

9.4.12.5.23 The rectangular coordinates (i.e. rectangulation) method is best suited for scenes with clear and specific boundaries (e.g. interior walls).

9.4.12.5.23.1 Generally, items are measured against two walls; north/south and east/west, depending on the area.

9.4.12.5.23.2 Measurements may be taken from center mass, unless the specific position of an item is relevant; in that case, measurements are taken from different locations on the same item (e.g. end of barrel and butt of handgun).

9.4.12.5.24 The triangulation method utilizes measurements from two distinct landmarks in the area to two distinct points on the item. Each pair of measurements create a triangle.

9.4.12.5.24.1 Typical landmarks used in triangulation are base corners of walls and doors. In complex scenes, a reference point (RP) may be established and its location documented; the RP may then be used to measure against within the scene. Multiple RP's may be established, depending on the scene circumstances. The location of RP's should be noted in the diagram.

9.4.12.5.24.2 Measurements may be taken from center mass, unless the specific position of an item is relevant; in that case, measurements should be taken from different locations on the same item (e.g. end of barrel and butt of handgun).

9.4.12.5.25 The baseline method is best suited for exterior scenes without evidence landmarks, although it can be used indoors.

9.4.12.5.25.1 Baseline begins by determining a reference point (RP) from which the baseline extends; it is then extended along a cardinal direction (i.e. north, south, east, west) as far as necessary. This is frequently accomplished by extending an actual tape measure. The location of RP's should be noted in the diagram.

9.4.12.5.25.2 Once the baseline is established, each item can be measured to its location along the baseline (i.e. distance from the RP), and then is measured at a right angle to the baseline. For example, if the baseline is extended north in a scene, an item would be measured by the distance north of the RP, and then the distance, either east or west, off the baseline.

9.4.12.5.25.3 Measurements may be taken from center mass, unless the specific position of an item is relevant; in that case, measurements are taken from different locations on the same item (e.g. end of barrel and butt of handgun).

9.5 Safety

9.5.1 N/A-listed in other sections

10.0 AM 3: Photography

10.1 Background

10.1.1 The intent of crime scene photography is to document the condition, orientation, and spatial relationships in the scene and to show details of specific items found in the scene to provide CSIs, investigators, and ultimately, the jury, with a visual representation of the elements and nature of the scene. Photographs taken for general crime scene documentation are considered part of the note taking process. Crime scene photographs should lead the viewer of the photographs through the scene, from an overall perspective up to the details of specific items of evidence.

10.2 Scope

10.2.1 Photography should be done on all responses. This method applies to any and all photography done.

10.3 Equipment/Reagents

10.3.1 Field Services Camera bag, which should include: camera, SD cards, batteries, battery charger, scale, header card (s), lens (s), lens hood, alternate light source filters, SD card adapter, external flash and cord.

10.3.2 Tripod

10.3.3 LizQ Imaging system, which should include: LizQ camera and system, SD cards, battery, and battery charger.

10.3.4 LizQ surveyor's tripod

10.3.5 LizQ backpack, which should include: laptop, laptop charger, multiple thumb drives of varying sizes, SD card adapter, and mouse.

10.4 Procedures

10.4.1 A header card should be filled out with case information (e.g. date, location, agency, case number, etc.) and should be photographed as the first photograph in the series from a crime scene.

10.4.1.1 If multiple scenes and/or vehicles are to be photographed subsequent to one another, the photographer may use a new header card between each separate scene/vehicle, if desired.

10.4.2 Settings

10.4.2.1 Prior to starting photography of a scene, the CSI shall check the camera's settings and adjust them as necessary, based on the scene lighting and the types of photograph(s) to be taken. A quick reference guide for camera settings is included in each camera case. The camera

lens should be set to approximately 34mm in order to photograph the approximate equivalent to what a human eye sees.

10.4.2.2 The date automatically updates and should be current. The time does not adjust for daylight savings time. These settings should be checked prior to beginning photography to confirm correctness.

10.4.2.3 Camera lenses can be adjusted to either manual focus or auto focus. The CSI should be cognizant of which area in the composed photograph is in focus; this can be monitored by the indicator(s) that illuminate(s) when looking through the viewfinder.

10.4.2.3.1 Taking photographs with the camera in Manual mode is the preferred setting so that all elements of the photograph capture can be adjusted.

10.4.2.4 White balance should be set to “auto” unless the CSI has received specialized training in the proper use of alternate settings.

10.4.2.5 CSIs may choose to select aperture-priority mode, shutter priority mode, and/or programmed auto mode as appropriate for the scene.

10.4.2.6 The exposure can be controlled using the ISO, f-stop, and shutter speed settings within the camera and external lighting, utilizing either an electronic flash and/or other lighting methods.

10.4.2.6.1 The exposure should be adjusted so that the resulting photograph is neither over nor under exposed.

10.4.2.6.2 Intentionally over or under exposing an image may be necessary to capture details of the scene, but shall not be the regular photographic practice.

10.4.2.6.3 Electronic flash and/or other lighting methods should be placed in a way that eliminates bright, over exposed areas in the photograph.

10.4.2.7 ISO is a numerical rating that indicates the sensitivity of a sensor.

Increasing the ISO setting increases the amount of light captured by the sensor.

10.4.2.7.1 At a very high ISO setting, there is the possibility of digital noise in the image.

10.4.2.8 Depth of field is adjusted by changing the f-stop setting. The CSI should adjust the f-stop setting based on what elements of the scene should be in focus. Because the f-stop is a fraction, $f/2$ is a larger lens opening than $f/22$.

10.4.2.9 Shutter speed is the amount of time that the lens is open, exposing the sensor to light. Shutter speed is measured in fractions of seconds (e.g. $1/250$) or in whole seconds (e.g. 2”).

10.4.2.9.1 When hand-holding the camera, the shutter speed should not be set to slower than $1/60$ of a second.

- 10.4.2.9.2 If the shutter speed is set to slower than 1/60 of a second, the camera should be mounted on a tripod.
- 10.4.2.9.3 When taking a very long exposure, the best practice is to use a shutter-release cable to eliminate potential movement of the camera that would occur by pressing the shutter release button on the camera body.
- 10.4.2.9.4 At a very long shutter speed setting, there is the possibility of digital noise in the image.
- 10.4.2.10 Electronic (off-camera) flashes may be utilized to provide a brief flash of light.
 - 10.4.2.10.1 Electronic flash settings can be set to manual, automatic, or by through-the-lens (TTL) metering; flashes should be set to TTL metering unless the CSI has received specialized training in other settings.
 - 10.4.2.10.2 Additional sources of light, such as flashlights, may be utilized to illuminate an area in order to get a properly exposed photograph.
 - 10.4.2.10.3 With the shutter release open, the CSI can use a flashlight to direct light over an area or object that has less light than the other areas of the scene (i.e. paint by light technique).
- 10.4.2.11 An ultraviolet (UV) filter should be kept on the primary camera lens (e.g. 18-200mm, 18-105mm) at all times unless its use conflicts with the use of another filter or a photographic process.
- 10.4.2.12 When photographing a pool of water, a reflection of light on the surface is captured; a polarizing filter may be utilized in order to visualize below the surface, into the pool of water.
- 10.4.2.13 When utilizing an alternate light source (ALS), a colored filter that corresponds to the color of viewing goggle(s) utilized with the ALS shall be installed on the lens in order to visualize the area reacting to the ALS.
- 10.4.2.14 Image Quality
 - 10.4.2.14.1 Digital images can be stored in different file formats, which affect the quality of the images. File formats include JPEG, TIFF, and RAW. Image quality changes can be selected from the shooting menu of the camera.
 - 10.4.2.14.2 JPEG images are of sufficient quality for general crime scene documentation. An image quality of "JPEG fine" is preferred.
 - 10.4.2.14.3 RAW images are of ideal quality for comparison quality photographs.
 - 10.4.2.14.4 In order to concurrently capture both a documentation photograph and a comparison quality photograph of a

subject, the “NEF (RAW) + JPEG fine” (Nikon camera) or similar option should be selected from the image quality menu.

10.4.3 General Photography Documentation

10.4.3.1 Photographs shall be taken in a systematic method. The photographs shall include three types of photographs: Orientation, Relationship, and Identification.

10.4.3.2 The CSI should photograph in a logical flow (i.e. moving clockwise or counter-clockwise around a room).

10.4.3.3 Overall Photos

10.4.3.3.1 The purpose of overall photographs is to depict the general condition and layout of the scene.

10.4.3.3.2 Overall photographs are generally taken with a wide-angle lens to capture a wider field of view in a single photo.

10.4.3.3.3 The camera should be positioned to take photographs in a landscape orientation for the majority of overall photographs; the camera may be turned to a portrait orientation as is necessary, based on the scene.

10.4.3.3.4 Overall photographs are taken so that they overlap one another, creating a panoramic view of the area.

10.4.3.3.4.1 There are different methods to achieve this. Two examples are the corner method and the side method.

10.4.3.3.5 Overall photographs should be taken at least twice. The first occurs prior to the introduction of any scales, evidence markers, etc. The next occurs after evidence markers and/or scales have been placed and may be repeated as additional evidence markers are placed.

10.4.3.3.6 If, during processing of the scene, areas are significantly altered (e.g. application of blood reactive chemicals) or damaged (e.g. cutting out a section of drywall), photographs of the altered/damaged areas should be taken prior to leaving the scene.

10.4.3.3.7 If witness reports are available, overall photographs should be taken of the area from which a witness is reported to have seen something. This should include their location and their point of view.

10.4.3.4 Relationship Photos

10.4.3.4.1 The purpose of relationship photographs is to frame the evidence item in conjunction with some obvious landmark evident in the overall photographs.

10.4.3.4.1.1 When dealing with a number of similar items (e.g. cartridge cases), the addition of evidence markers allows the viewer to discern one item of evidence from another. The CSI should photograph each item of evidence in relation to a landmark within the scene.

10.4.3.5 Identification Photos

10.4.3.5.1 The purpose of identification photographs is to distinguish an item of importance within the scene, often something to be collected as evidence.

10.4.3.5.2 The CSI should fill the frame with the item of interest.

10.4.3.5.3 The CSI should use a scale.

10.4.3.5.4 At least one of the photographs should show the marker, if utilized, or other identifying information in order to distinguish the item from other similar items.

10.4.3.5.5 If an item of evidence is going to be photographed once it has been moved from its original location, it should be set on a clean surface (e.g. butcher paper, plain evidence sack, plain envelope, etc.) to avoid contamination or cross-contamination.

10.4.3.6 Scene Specific Procedures

10.4.3.6.1 Indoor scenes may contain numerous rooms or areas. A CSI shall photograph the entire scene for overall location and condition.

10.4.3.6.2 Depending on the location of a scene, it shall be documented by a street address, a business sign, or other equally identifiable marking. The scene may not have a specific identifiable marking.

10.4.3.6.3 The location of outdoor scenes may be difficult to document photographically, as they don't necessarily have identifying markings readily visible.

10.4.3.6.3.1 When available, use landmarks such as street signs, power line towers, or other items as a point of reference to document the location, as well as to be an anchor point for photography.

10.4.3.6.4 When photographing a living person, identification and condition photographs should be taken.

10.4.3.6.4.1 The background should be considered. The background should be neutral and should not be prejudicial to the subject being photographed.

10.4.3.6.4.2 To document the identification of a person, a minimum of five photographs should be taken: front of person (head-to-toe), left side of person (head-to-toe), back of person (head-to-toe), right side of person (head-to-toe), and a close up of the person's face. If the person is wearing any clothing or accessories (e.g. hat, sunglasses), they should be first photographed with those items in place, and then photographed again without those items obscuring their features.

10.4.3.6.4.3 When the condition of a person's clothing or body is important to document, relationship and identification photographs should be taken.

10.4.3.6.4.3.1 If there is a defect in the clothing or an injury to the person, the area should be photographed both without and with a scale for reference.

10.4.3.6.4.3.2 When relevant, identifying characteristics (e.g. tattoos, piercings, unique skin markings) should be photographed both for relationship and identification.

10.4.3.6.4.3.2.1 Photograph these areas first without a scale and then with a scale. An ABFO no.2 or other L-shaped scale should be used.

10.4.3.6.4.3.3 If a tattoo is obscured by darker skin tones, mummification, decomposition, or other factors, consider using a polarized filter or a forensic light source, which may affect how the tattoo appears.

10.4.3.6.4.3.4 An alternate light source (ALS) may be used to visualize a tattoo; the ALS should be used per this manual.

10.4.3.6.4.3.5 If the circumstances indicate that there was contact between individuals, the areas of contact

should be photographed. If hands were involved, both the fronts and backs of the hands should be photographed.

10.4.3.6.4.3.6 Depending on the nature of any injury, it may be necessary to photograph it as found and then photograph again after it has been cleaned; each set of photographs should be taken both without and with a scale for reference.

10.4.3.6.5 When photographing a deceased person, location, identification, and condition photographs should be taken.

10.4.3.6.5.1 Photographs of the decedent should include, as available, an overall photo of the body, from head to toe. As well as clothing, jewelry, and injuries.

10.4.3.6.5.2 When relevant, identifying characteristics (e.g. tattoos, piercings, unique skin markings) should be photographed both for relationship and identification.

10.4.3.6.5.3 When the body is removed from the scene, any areas of the body that were previously obscured should be photographed. Another set of overalls should be taken of where the body was removed from.

10.4.3.6.6 When photographing a vehicle, location, identification and condition photographs should be taken.

10.4.3.6.6.1 To document the exterior of a vehicle, a minimum of four photographs shall be taken of the body of the vehicle: front, left side, back, and right side; ideally, four additional photographs, taken from each corner of the vehicle, each showing one end and one side, should also be taken.

10.4.3.6.6.2 The Vehicle Identification Number (VIN), should be photographed from at least one location, if present.

10.4.3.6.6.3 The front and rear license plates shall be photographed if present.

10.4.3.6.6.4 The overall condition of the interior of the vehicle shall be photographed as general documentation.

10.4.3.6.6.5 The condition of the exterior of the vehicle shall be captured in the overall documentation photography.

10.4.3.6.6.6 Relationship and identification photographs should be taken of any evidence collected by CSIs, utilizing a scale where relevant.

10.4.3.7 Comparison Quality Photographs

10.4.3.7.1 Comparison quality photographs are most often taken as a way to capture evidence that may not be collected, or whose collection may not fully document the details of the evidence.

10.4.3.7.2 The CSI should utilize these six best practices when taking comparison quality photographs: fill the frame, use a scale, ensure the camera is at a 90 degree angle to the impression, use RAW or Tiff format, use manual focus, use a macro lens.

10.4.3.7.3 The camera should be mounted on a tripod or quadrapod, using a remote shutter release.

10.4.3.7.4 When photographing footwear and tire impressions, the following procedures should be followed:

10.4.3.7.4.1 Capture overall photographs from at least four different angles around the perimeter of the scene;

10.4.3.7.4.2 The tripod should be positioned higher than necessary and the lens adjusted in order to fill the frame with the impression.

10.4.3.7.4.3 Focus on the mid-plane of the impression; capture at least one image with ambient light.

10.4.3.7.4.4 Photograph the impression with the light source held at an angle from at least three different positions around the impression.

10.4.3.7.4.5 The light source should be held approximately 3-5 feet away and directed at the impression.

10.4.3.7.5 When photographing dental evidence, the following parameters should be considered:

10.4.3.7.5.1 The smallest aperture should be used to create the greatest depth of field.

10.4.3.7.5.2 An external light source should be used.

10.4.3.7.5.3 A gray card or scale with 18% gray should be used to allow for accurate color balance in post-processing.

10.4.3.7.5.4 An ABFO scale is preferred over other styles of scales. If the dental evidence is on a curved surface, a minimum of three images should be taken to capture the area of interest in focus.

10.4.3.7.5.5 The camera's lowest ISO setting (typically ISO 100) should be used.

10.4.3.8 Photography Digital Acquire

10.4.3.8.1 Digital images (i.e. photographs) are frequently captured for documentation of crime scenes, vehicles, evidence and people.

10.4.3.8.2 Adams Web is a digital imaging system that provides a way of storing, filing, annotating, and viewing digital imagers. The digital image name assigned by the camera shall be included in Adams Web as the "File Name". Information about the Event/Location may be entered in the "Description" field. "Tags" may be used to group images for convenience.

10.4.3.8.3 All digital images taken during a field services response shall be uploaded to the Adams Web digital imaging system as soon as practical.

10.4.3.8.3.1 Folders in Adams Web shall be named by the lab case number.

10.4.3.8.3.2 When uploading digital images, the lab number, crime and the date of crime should be entered. The "Category" should be selected as "Crime Scene Documentation".

10.4.3.8.4 All photographs taken at a crime scene shall be provided to the investigating agency. Images may be saved to digital media (e.g. compact disc, removable drive, SD card), downloaded from the camera's memory card to the agency's digital imaging system, or other equivalent transfer.

10.4.3.8.4.1 If the images are transferred directly to the agency, the date, time, and name of person conducting/facilitating the transfer shall be noted.

10.4.3.8.4.2 If the images are saved to digital media to be provided to the agency at a later date, the date of transfer to digital media, as well as the intended method of delivery, shall be made in the case notes.

10.4.3.8.4.2.1 After finalization of the case notes pages, any notes related to delivery and/or pick up of digital media should be made in the case correspondence area in ILIMS.

10.4.3.9 LizQ Procedure and Digital Acquire

10.4.3.9.1 When using the LizQ system, the LizQ should be kept on the auto settings as dictated by the app on the phone or iPod.

10.4.3.9.2 The exception to the above is when the CSI is capturing in a low light environment; the LizQ Manual should be consulted for options in this situation.

10.4.3.9.3 When capturing with the system, the CSI shall use the surveyor tripod.

10.4.3.9.3.1 The tripod should be raised to 5' for the low capture and 55 cm for the high capture.

10.4.3.9.4 If a LizQ capture is cancelled by the CSI or the CSI is concerned that there was an error in the capture process, the affected capture/series may be deleted. Any deleted captures shall be repeated.

10.4.3.9.5 The LizQ system assigns both image numbers and spherical numbers; the numbers cannot be changed. Spherical numbers shall be documented in crime scene notes.

10.4.3.9.6 Once the CSI has captured the images with the system, they should move them from the SD card to the laptop to speed up the creation of the sphericals.

10.4.3.9.6.1 The sphericals should be rendered by the CSI while at scene, in case there is an error with the captures.

10.4.3.9.6.2 When a folder is created on the laptop for the captures, while on scene, (prior to the assignment of a lab number), the folder should be labeled with the date, location of the scene, or other distinguishing information. The folder should be renamed once a lab number is assigned.

10.4.3.9.7 Due to the size of LizQ image captures, the images and resulting sphericals shall not be uploaded to Adams Web or equivalent digital imaging system. Captures and sphericals shall be saved to tandem external hard drives; one hard drive as the file save location, the second hard drive as the file backup location. Images shall be saved in a folder named the same as the lab number associated with the response (e.g. M2022-9876).

10.4.3.9.8 The images and the sphericals taken shall be provided to the investigating agency along with the viewing software and instructions. The CSI should use a thumb drive to transfer these images. Varying sizes of thumb drives are in the LizQ Meridian backpack.

10.4.3.9.8.1 If the CSI has to use another thumb drive, the CSI should check to make sure the thumb drive is properly formatted. To do this, you insert the thumb drive into a computer. Once the computer recognizes it, you right click on the thumb drive icon and click "format". Another screen pops up that will tell you the current format of the thumb drive. All thumb drives should be either NTFS or exFAT. The CSI should not use a thumb drive that is formatted as FAT32.

10.4.3.9.8.1.1 If the thumb drive is not currently set up as NTFS or exFAT, then chose one of these formats and click "start" at the bottom.

Note that all images and data on the thumb drive will be erased.

10.4.3.9.9 If the images are transferred directly to the agency, the date, time, and name of person conducting/facilitating the transfer shall be noted.

10.4.3.9.9.1 If the images are saved to digital media to be provided to the agency at a later date, the date of transfer to digital media, as well as the intended method of delivery, shall be made in the case notes.

10.4.4.3.9.10 After finalization of the case notes pages, any notes related to delivery and/or pick up of digital media should be made in the case correspondence area in ILIMS.

10.4.4.3.9.11 The Discipline Lead or designee shall be responsible for archiving LizQ files.

10.4.3.10 Additional Information

10.4.3.10.1 Digital images are numbered sequentially as they are captured. In the camera's Shooting/display menu, "File number sequence" shall be set to "ON"; this allows the image file numbers to continue sequentially from 0001 to 9999 before recycling image numbers.

10.4.3.10.2 The file numbers of images captured for each scene shall be documented in the case notes and in ILIMS.

10.4.3.10.3 Digital images shall not be deleted. If an image is not as the photographer intended (e.g. flash didn't fire, image not focused, etc.), they shall retain the unintended image and shall take additional images as necessary to capture the subject.

10.4.3.10.4 If there is any possibility of confusion between intended photographs and unintended photographs (e.g. unintended photograph of our vehicle's trunk while photographing a vehicle being processed), a notation should be made in the case notes or in Adams Web.

10.4.3.10.5 Memory cards shall be utilized to store all images taken when using the camera, rather than saving images to the camera's internal storage.

10.4.3.10.5.1 Memory cards shall be formatted prior to use. Simply deleting images from memory cards is not sufficient to completely erase all digital artifacts.

10.4.3.10.6 A designated tablet (if available) may be used to capture a digital image of an item/area for which the CSI wishes to make annotations on the digital image. Such annotations may be made in order to be more succinct and exact as to the actions taken regarding that item/area.

10.4.3.10.7 The camera should be turned off prior to adding or removing any auxiliary equipment.

10.4.3.10.8 The photographer should be cognizant of potential contamination of scene photographs. Other personnel, CSI tools and/or materials, response vehicles, and other items that are not important to the scene should not be contained in the photographs. If a person or item is inadvertently photographed, the image should be captured again with the person or item out of the frame.

10.5 Safety

10.5.1 N/A-listed in other sections

11.0 AM 4: Presumptive Blood Testing

11.1 Background/References

11.1.1 Most screening tests for blood depend on the catalytic action of the heme group. To minimize false positives, the test is frequently performed as a multi-step test. A good overview is found in the first reference.

11.1.2 References

- 11.1.2.1 Gaensslen, R. Sourcebook in Forensics Serology, Immunology, and Biochemistry. (1983) U.S. Dept. of Justice, Washington, D.C., p. 101-105.
- 11.1.2.2 Burdett, PE (October 1976) "Presumptive Tests for Blood – A Comparative Survey", CRE Report, No. 201.
- 11.1.2.3 Culliford, BJ and Nicholl, LC (1964) "The Benzidine Test: A Critical Review", Journal of Forensic Sciences, 9:175-191.
- 11.1.2.4 Higaki, R.S. and Philip, W.M.S. A Study of the Sensitivity, Stability and Specificity of Phenolphthalein as an Indicator Test for Blood, (1976) Canadian Journal of Forensic Science, Vol 9, No. 3, p. 97-102.

11.2 Scope

11.2.1 To provide a method for the localization and presumptive identification of bloodstains.

11.3 Equipment/Reagents

Cotton swabs or filter paper
Pre-prepared Phenolphthalein Test Kit

11.4 Procedures

11.4.1 Phenolphthalein Procedure

- 11.4.1.1 The kit lot# shall be recorded in the notes. If multiple notes pages are used, the lot# and control information does not have to be filled out for subsequent pages unless new controls are done.
- 11.4.1.2 Cotton swabs or a folded piece of filter paper are used to collect the suspected blood. A swab may be moistened with H₂O if necessary.
- 11.4.1.3 Once a stain is sampled, add 1-2 drops of phenolphthalein working solution to the swab or filter paper. Wait 10-15 seconds to detect potential false positives.
- 11.4.1.4 Add 1-2 drops of 3% H₂O₂ and note appearance or absence of bright pink color. Color reaction should occur rapidly (≤ 1 minute).
- 11.4.1.5 Document result in case notes. Record positive (+), as indicated by the development of the above color change, or negative (-) as indicated by the absence of the color change. The CSI may use other descriptive word(s) as well (e.g. strong, weak, slow, etc.).
- 11.4.1.6 Color changes occurring prior to the addition of 3% H₂O₂ are generally considered inconclusive.
- 11.4.1.7 Color changes occurring after 1 min. are generally considered negative.

11.5 Controls

11.5.1 Testing of Phenolphthalein is performed prior to use and shall only be performed within a 24 hr period.

11.5.2 The control test involves testing a known blood sample using a swab or filter paper. The negative control involves a clean sterile swab. Both the negative and positive control swabs shall be tested with Phenolphthalein. If a swab is moistened with water to collect a positive control sample, then water shall be used for the negative control.

11.5.3 A CSI cannot proceed with processing until control tests bearing positive results (development of pink color) and negative results (no color change) have been carried out and documented in the case notes.

11.6 Additional Information

11.6.1 The manufacturer of a testing kit may include an "Expiration Date" on the kit; the kit may continue to be used as long as both positive and negative controls show that the chemicals are functioning properly.

11.7 Ortho-Tolidine (O-Tolidine, O-Tol)

11.7.1 Procedure

11.7.1.1 The lot number of O-tolidine and hydrogen peroxide shall be recorded in the notes. If multiple notes pages are used, the lot number and control information does not have to be filled out for subsequent pages unless new controls are done.

11.7.1.2 Cotton swabs or a folded piece of filter paper are used to collect the suspected blood. A swab may be moistened with H₂O if necessary.

11.7.1.3 Once a stain is sampled, add 1-2 drops of o-tolidine working solution to the swab or filter paper. Wait 10-15 seconds to detect potential false positives.

11.7.1.4 Add 1-2 drops of 3% H₂O₂ and note appearance or absence of blue-green color. Color reaction should occur rapidly (≤ 1 minute).

11.7.1.5 Color changes occurring prior to the addition of 3% H₂O₂ are generally considered inconclusive.

11.7.1.6 Color changes occurring after 1 min. are generally considered negative.

11.7.1.7 Document result in case notes. Record positive (+) as indicated by the development of the above color change, or negative (-) as indicated by the absence of the color change. The CSI may use other descriptive word(s) as well (e.g. strong, weak, slow, etc.).

11.8 Controls

11.8.1 Testing of O-Tol is performed prior to use and shall only be performed within a 24 hr period.

11.8.2 The control test involves testing a known blood sample using a swab or filter paper. The negative control involves a clean sterile swab. Both the negative and

positive control swabs shall be tested with O-Tol. If a swab is moistened with water to collect a positive control sample, then water shall be used for the negative control.

11.8.3 A CSI cannot proceed with processing until control tests bearing positive results (development of green color) and negative results (no color change) have been carried out and documented in the case notes.

11.9 All bloodstains tested shall be recorded in the notes (either in the narrative notes or on the Presumptive Blood Testing worksheet). There shall be a conclusion for each test (negative, positive, inconclusive).

11.10 All bloodstains that are positive, shall be marked and photographed for collection.

11.11 Safety

11.11.1 Phenolphthalein Safety

11.11.1.1 The test kit is highly flammable and can be harmful if ingested or there is direct contact with the skin.

11.11.2 O-Tol Safety

11.11.2.1 O-tolidine is designated as a potential carcinogen and can be harmful when ingested or there is direct contact with the skin.

11.11.3 Chemicals/reagents shall be labeled using NFPA labels in accordance with the Health and Safety Manual.

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12.0 AM 5: Blood Enhancement Chemicals

12.1 Background

12.1.1 Blood enhancement chemicals may be used for the detection and visualization of blood or suspected blood. Chemical processing may provide contrast between the impression and the underlying substrate. Chemicals are commonly used in scenes that have been altered (e.g. cleaned), scenes that contain impression evidence in blood (e.g. fingerprints, footwear), and/or scenes that have blood stain patterns.

12.2 Scope

12.2.1 This procedure applies to all scenes where blood enhancement could be beneficial to the investigation.

12.3 Procedure

12.3.1 A presumptive blood test should be conducted on suspected blood prior to the application of blood enhancement chemicals.

12.3.2 Consideration for other types of evidence should be considered prior to the application of any blood enhancement chemicals.

12.3.3 If a swab of the blood is to be collected for potential DNA analysis, it should be collected prior to the application of any blood enhancement chemicals.

12.3.4 Surfaces in the crime scene that don't have visible blood stains should be visually examined prior to the application of blood enhancement chemicals in order to determine the most appropriate surfaces/areas to process.

12.3.4.1 A strong white light may be utilized at an oblique angle in order to visualize faint blood deposits. A flashlight or the white light setting on an alternate light source (ALS) are the most common sources for a strong white light.

12.3.4.2 When utilizing an ALS at approximately 415-450nm with an orange or a clear UV filter, blood deposits should appear dark due to light absorption, which may help to visualize areas contaminated with blood.

12.3.4.3 Use of an ALS at other wavelengths may also create a reaction with the surface, thereby creating contrast, visualizing a blood deposit.

12.3.4.3.1 An ALS may only be utilized by CSIs who have received training in the appropriate use of an ALS.

12.3.5 Variables to be considered prior to attempting chemical processing include substrate composition (e.g. texture, porosity), substrate color, orientation of surface (e.g. horizontal or vertical), environmental conditions and/or limitations, and the composition of the substance(s) that make the impression.

12.3.6 Blood stains should be dry prior to the application of any chemicals for enhancement. In general, older stains may be more receptive to chemical processing than fresh stains.

- 12.3.7 Documentation of blood stain patterns for reconstruction shall be conducted as outlined in Section 17, AM 10 of this manual.
- 12.3.8 Impressions in blood can be lifted after chemical enhancement.
Documentation of impression evidence shall be conducted as outlined in Section 14, AM 7 of this manual.
- 12.3.9 Any blood deposits that are developed/visualized shall be properly documented using photography, notes, and sketches/diagrams (as appropriate).
- 12.3.10 Crime scene sketches/diagrams may be used to augment notes by detailing areas containing enhanced blood deposits within a scene.
- 12.3.11 Any lot number and/or date of preparation information shall be recorded in the crime scene notes. A trained analyst may use the chemical processing in this section individually or in sequence, using the ISPPS Latent Print Section Analytical Methods, in order to maximize the recovery of evidence.
- 12.3.12 Background/References
- Leucocrystal Violet
- 12.3.12.1 LCV is a biological stain used to dye blood's hemoglobin components an intense purple color. Due to LCV's toxic nature, it should only be used in small quantities with appropriate safety precautions observed.
- 12.3.12.2 LCV may be used to visualize deposits in blood on non-porous and some porous surfaces.
- 12.3.12.3 Bodziak, William J., "Use of Leucocrystal Violet to Enhance Shoe Prints in Blood", Forensic Science International, Vol. 82, No.1, September 1996.
- 12.3.12.4 Chemical Formulas and Processing Guide for Developing Latent Prints, US Department of Justice, 1994, pp 47-48.
- 12.3.12.5 Fisher, John F., "An Aqueous Leucocrystal Violet Enhancing Reagent for Blood Impressions", Symposium on the Forensic Aspects of Footwear and Tire Impression Evidence, FBI Academy, 1994.
- Amido Black
- 12.3.12.6 Amido Black is also known as Amido Black 10B, Amido Black 12B, Naphthol Blue Black, or Napthalene Black. Amido Black is a dye that stains the protein portion of blood a blue-black color.
- 12.3.12.7 Surfaces may be processed with Amido Black to detect faint deposits. It is generally used on dried blood stains on non-porous surfaces, but has been successful in developing prints on some semi-porous and porous surfaces as well. When used on porous or semi-porous surfaces, consideration should be given for the potential of excessive background staining.

12.3.12.8 Blood should be fixed prior to the application of water based Amido Black to prevent the liquid solutions used in the process from washing away some or all of the blood deposits.

12.3.12.9 Two different formulations of Amido Black are available for use at crime scenes. One is an Amido Black methanol-based formulation that may be used in conjunction with cyanoacrylate ester fuming. The other is a water-based formulation that is not effective when used in conjunction with cyanoacrylate fuming.

12.3.12.10 Fingerprint Source Book v2.0 (second edition), Home Office, 2017.

12.3.12.11 Journal of Forensic Identification, Vol. 45, No. 5 Sept/Oct 1995, "A New Use for an Old Friend", pages 498-503.

12.3.12.12 Fingerprint Visualisation Manual. Home Office; 2022 6.1.3-6.1.10.

12.3.13 Scope

12.3.13.1 This procedure is to be used on any scenes where blood is present and enhancement could further identify evidence to be collected. Limitations to the enhancement chemicals: neither enhancement chemical is a presumptive test for blood and both can potentially destroy DNA.

12.3.14 Equipment/Reagents and Preparation

12.3.14.1 Leucocrystal Violet (LCV)

Balance

Magnetic stirrer/stirring bar

Graduated cylinder

Glass beaker

Glass tray

Storage bottles

Leucocrystal Violet powder

Sodium acetate

5-sulfosalicylic acid

3% hydrogen peroxide

Deionized water

12.3.14.2 Dissolve 10g of 5-sulfosalicylic acid in 100ml distilled water.

12.3.14.3 Add 400ml 3% hydrogen peroxide to sulfosalicylic acid solution. Pour solution into a spray bottle.

12.3.14.4 Repackage 0.75g Leucocrystal Violet in a plastic container and seal.

12.3.14.5 Immediately prior to use, add 0.75g Leucocrystal Violet to the solution in the spray bottle; stir vigorously.

12.3.14.6 Spray the area using a fine mist sprayer. LCV is particularly useful for spray applications over large areas.

12.3.14.7 Development of a dark purple coloration should occur in approximately 30 seconds in the presence of blood deposits.

12.3.14.8 Developed impressions are evaluated to determine their suitability for collection. Impressions deemed to be of value for collection shall be marked, photographed, and/or lifted.

12.3.14.9 Amido Black

Balance
Magnetic stirrer/stirring bar
Pipettes
Beakers
Graduated cylinder
Appropriately sized storage bottles
Spray/squirt bottles
Amido Black
Glacial acetic acid
Methanol
5-Sulfosalicylic acid dihydrate
Deionized (DI) water

12.3.14.10 Methanol-based Amido Black Working Solution

12.3.14.10.1 Weigh out 3-5g of Amido Black and place it in a clean, dry beaker.

12.3.14.10.2 Measure out 100ml of glacial acetic acid and add to the Amido Black.

12.3.14.10.3 Measure out 900ml of methanol and add to the beaker containing the Amido Black and the glacial acetic acid.

12.3.14.10.4 Stir the solution with a magnetic stirrer for 30 minutes and transfer the solution to a clean storage bottle.

12.3.14.11 Methanol-based Amido Black Rinse Solution (de-stain)

12.3.14.11.1 Measure out 100ml of glacial acetic acid and pour into a clean, dry glass beaker.

12.3.14.11.2 Measure out 900ml of methanol and add it to the beaker.

12.3.14.11.3 Stir the solution for two to three minutes and transfer the solution to a clean, dry storage bottle.

12.3.14.12 Water-based Amido Black Fixing Solution

12.3.14.12.1 Add 1 L of DI water to a clean, dry beaker.

12.3.14.12.2 Measure out 23 g of 5-Sulfosalicylic acid and add to the DI water.

12.3.14.12.3 Stir the solution until dissolved (magnetic stirrer recommended) and transfer the solution to a clean storage bottle.

12.3.14.13 Water-based Amido Black Working Solution

- 12.3.14.13.1 Add 1 L of water-based rinse solution to a clean, dry beaker.
- 12.3.14.13.2 Measure out 2 g Amido Black and add to the beaker.
- 12.3.14.13.3 Stir the solution with a magnetic stirrer for 30 minutes and transfer the solution to a clean storage bottle.
- 12.3.14.13.4 Measure out 950 ml of DI water and pour into a clean, dry glass beaker.

12.3.14.14 Water-based Amido Black Rinse Solution (de-stain)

- 12.3.14.14.1 Add 950 ml of DI water to a beaker
- 12.3.14.14.2 Add 50 ml glacial acetic acid
- 12.3.14.14.3 Stir for 2-3 minutes
- 12.3.14.14.4 Transfer the solution to a clean, dry storage bottle.

12.3.14.15 Methanol-based Amido Black Procedure

- 12.3.14.15.1 Blood deposits may be fixed using heat, methanol, or cyanoacrylate. Blood can be fixed to an object by spraying or pipetting methanol over the item; the Amido Black rinse that contains methanol will suffice for fixing the stains. Cyanoacrylate is an effective method for non-porous surfaces, as it will fix all possible latent prints as well as blood deposits. When using a methanol-based solution, the methanol in the solution can act as a fixing agent.
- 12.3.14.15.2 Irrigate the working solution over the surface for approximately three minutes and allow it to sit for an additional two minutes. Amido Black is generally limited to the localized development of impressions.
- 12.3.14.15.3 Irrigate the item with the de-stain rinse solution to remove the excess dye.
- 12.3.14.15.4 Blood deposits should be colored a dark blue-black. The application and rinse process may be repeated to improve contrast.
- 12.3.14.15.5 Allow the surface to dry thoroughly.
- 12.3.14.15.6 Developed stains are evaluated to determine their suitability for collection and/or documentation.

12.3.14.16 Water-based Amido Black Procedure

- 12.3.14.16.1 Fix blood deposits by irrigating the Water-based Fixing Solution over the surface for approximately five minutes and allow the surface to dry.
- 12.3.14.16.2 Irrigate the working solution over the surface for approximately three minutes and allow it to sit for an

additional two minutes. Amido Black is generally limited to the localized development of impressions.

12.3.14.16.3 Irrigate the surface with the de-stain rinse solution to remove the excess dye.

12.3.14.16.4 Blood deposits should be colored a dark blue-black. The application and rinse process may be repeated to improve contrast.

12.3.14.16.5 Allow the surface to dry thoroughly.

12.3.14.16.6 Developed stains are evaluated to determine their suitability for collection and/or documentation.

12.3.14.16.7 The methanol-based solution is preferable when processing horizontal surfaces as the methanol will evaporate quickly.

12.3.15 Procedure

12.3.15.1 LCV should be used prior to Amido Black.

12.3.15.2 A non-evidential area of the substrate may be tested with the reagent to evaluate potential processing limitations such as poor de-staining, degradation of the substrate, or if the substrate also reacts with the reagent.

12.3.15.3 The type of surface should be considered when choosing which formulation to use. Methanol-based Amido Black may be preferable for horizontal surfaces (e.g. floors) as the methanol will evaporate more quickly. For other surfaces (e.g. walls), the water-based Amido Black formulation may be preferable as it has fewer safety considerations.

12.3.15.4 Areas that appear to have been cleaned shall be photographed.

12.3.15.5 Due to staining, approval from the investigating agency shall be obtained and documented, prior to application.

12.3.16 Additional Information

12.3.16.1 Shelf life of the LCV solution is approximately three months.

12.3.16.2 Shelf life of the pre-mixed Amido Black, working solution, and de-stain is indefinite.

12.3.17 Controls

12.3.17.1 Testing of LCV and Amido Black is performed prior to use and shall only be performed within a 24 hr period.

12.3.17.2 The control test involves making a mark in blood on a glass slide. The area surrounding the intentionally deposited mark shall serve as the negative control.

12.3.17.3 A CSI cannot proceed with processing until control tests bearing positive results (development of a purple (LCV) or blue/black (Amido Black)) and negative results (lack of background development) have been carried out and documented in the case notes.

12.3.18 Safety

12.3.18.1 LCV

12.3.18.1.1 LCV may be harmful by inhalation, ingestion, or skin absorption; may cause skin and eye irritation; may cause irritation to mucous membranes and upper respiratory tract.

12.3.18.1.2 LCV should not be used in large amounts.

12.3.18.1.3 A respirator should be used when working with the dry form. LCV should be prepared and used in a well-ventilated area.

12.3.18.1.4 The CSI shall wear proper PPE. This may include: disposable clothing, heavy-duty (non-disposable) gloves, and safety glasses.

12.3.18.2 Amido Black

12.3.18.2.1 When mixing or using Amido Black, gloves, disposable clothing, goggles, and a respirator shall be worn to avoid breathing the vapors.

12.3.18.2.2 The CSI shall wear proper PPE. This may include: disposable clothing, heavy-duty (non-disposable) gloves, and safety glasses. When applying, a respirator shall be worn. Only those CSIs who have been fit tested with a respirator shall use one.

12.3.18.2.3 Glacial acetic acid is corrosive and extremely irritating to the eyes and respiratory system. Glacial acetic acid will cause burns if it comes in contact with skin.

12.3.18.2.4 Methanol is flammable; it shall be handled carefully with gloves during the mixing and use of Amido Black. Methanol is toxic in quantities as small as 30ml and should not be allowed to come in contact with the skin, eyes, or mouth. It is possible for methanol to be absorbed through the skin. If methanol comes into contact with the eyes or mouth, the area should be flushed with generous amounts of water and a doctor may be consulted. Inhalation of methanol vapors should be kept at a minimum and the solution should be used in a well-ventilated area.

13.0 AM 6: Latent Print Development and Preservation

13.1 Background

- 13.1.1 Latent prints are one of the most common types of physical evidence found at crime scenes and are valuable in terms of identifying subjects and associating people with locations and/or objects related to a crime.
- 13.1.2 The term "latent" refers to prints that are not visible prior to utilizing a development method; however, all prints recovered from a crime scene or items of evidence are often referred to as latent prints.
- 13.1.3 Latent prints found at crime scenes are made when the friction ridge skin of the fingers, palms, or soles of the feet come in contact with a surface and leave an impression on that surface.
- 13.1.4 Latent prints may be made from a variety of residues, including sweat, oil, blood, and any other substance that may cover any portion of the fingers/palms/soles prior to coming in contact with a surface.
- 13.1.5 Patent prints are those impressions that are visible prior to any development (e.g. print in blood).
- 13.1.6 Plastic prints (i.e. three-dimensional impressions) may be present if friction ridge skin comes in contact with a soft substance in the scene.
- 13.1.7 CSIs may use light based methods, chemical methods, or physical methods to locate and develop latent prints within a scene.

13.2 Scope

- 13.2.1 This method applies to all scenes where latent print processing is requested by the investigating agency and would be beneficial to the investigation.
- 13.2.2 Only those CSIs who have been trained and competency/proficiency tested to process evidence for latent prints shall conduct latent print processing on crime scenes.

13.3 Equipment

- 13.3.1 Flashlight
- Camera and camera bag
- Scale
- Cyanoacrylate Ester (liquid and gel)
- Powder (standard and magnetic)
- Fiberglass brush and magnetic wand
- Lifting tape
- Latent lift card
- Small Particle Reagent

13.4 Procedure

13.4.1 Items that are thought to contain potential latent print evidence, which are small enough to be collected, shall be collected for processing at the lab. Surfaces in the scene that are not easily removed (e.g. doors, windows, floors, walls, furniture, etc.) should be processed at the scene unless it is a critical piece of evidence that would benefit from lab processing techniques. The determination to collect large items or elements of a building/vehicle (e.g. windows) for submission shall be left to the CSI's discretion and shall be made with the approval of the investigating agency and documented in the notes.

13.4.2 Latent print processing generally starts with methods that would cause the least potential damage to items and proceeds as appropriate.

13.4.3 Prior to processing an item that may have sentimental or inherent value, the CSI shall get authorization from the primary investigator; note who specifically gave authorization for those actions.

13.4.4 Latent print evidence shall be properly documented using photography, notes, and sketches/diagrams (as appropriate) prior to collection.

13.4.4.1 Notes shall reflect the types of latent print processing that were conducted, the areas/items processed, and the results of each type of processing.

13.4.5 Searching

13.4.5.1 Latent prints may be visualized using various angles and wavelengths of light. Visualization of latent prints through the use of forensic lighting methods is non-destructive and should be attempted prior to other processing methods.

13.4.5.1.1 A strong white light may be utilized at an oblique angle in order to visualize latent prints.

13.4.5.1.1.1 A flashlight or the white light setting on an ALS are the most common sources for a strong white light.

13.4.6 Photography

13.4.6.1 It is best practice to photograph all latent prints that are thought to have value prior to any lifts.

13.4.6.2 The CSI should take overall and relationship photos of latents prior to marking.

13.4.6.3 The CSI shall mark all latents that will be preserved.

13.4.6.4 An arc may be used to note the top a finger impression and a bracket may be used to note an area of palm, sole, unknown friction ridge skin, or unknown orientation.

13.4.6.4.1 The marking, when lifted, helps to authenticate the location of the print in the scene.

13.4.6.5 The CSI shall determine which latent prints should be photographed (comparison quality) prior to collection based on their training and experience. Comparison quality photographs shall be taken as outlined in section 10, AM 3 of this manual.

13.4.7 Cyanoacrylate Ester

13.4.7.1 Cyanoacrylate ester (CAE), commonly known as “superglue”, is a chemical used to visualize latent prints on non-porous and some semi-porous objects. CAE processing also prepares the surface for the acceptance of powders that may enable further visualization of the latent prints. CAE can be in the form of a liquid, gel or powder.

13.4.7.2 On scene a vehicle, a room, or a body may be processed using CAE.

13.4.7.2.1 If a body is being CAE processed on scene, the Medicolegal Authority for that county shall be contacted and their express consent shall be granted. Consent shall be documented in the notes.

13.4.7.2.2 In order to facilitate CAE processing, a proper environment shall be established.

13.4.7.2.2.1 The area to be fumed shall be made relatively airtight, and shall be ventilated after processing. The CSI shall add humidity to the environment, and may need to add heat to the CAE in order to expedite the process.

13.4.7.2.2.2 Containers of hot water can be added to the environment in order to increase the humidity.

13.4.7.2.3 The amount of CAE to be used depends on the size of the area being fumed, the fuming rate, and the CSI's preference, based on training and experience.

13.4.7.2.3.1 When utilizing liquid CAE, it can be added to a disposable aluminum dish and placed on a hot plate in order to facilitate the vaporization of the liquid.

13.4.7.2.3.2 When utilizing a CAE gel packet, the gel vaporizes at a controlled rate when exposed to air. Numerous gel packets may have to be used to obtain the desired results.

13.4.7.3 Controls

13.4.7.3.1 Testing of CAE and processing are performed at the same time.

13.4.7.3.2 A quality latent print is applied to a non-porous surface and put in the CAE environment with the evidence, where it can be easily viewed. The area surrounding the intentionally deposited print shall serve as the negative control.

13.4.7.3.3 Positive results (indicated by the development of a white print) and negative results (a lack of background development) shall be documented in the notes.

13.4.7.4 Safety

13.4.7.4.1 Precautions should be taken to avoid inhaling or allowing the vapors to contact the eyes, as the vapors can be irritating to the eyes, nose, and throat. Persons wearing contact lenses should not ventilate areas containing CAE fumes, unless wearing non-vented goggles.

13.4.7.4.2 Gloves should be worn to prevent the CAE from contacting the skin, as adhesion may result.

13.4.8 Powder Processing

13.4.8.1 Powder application will be selected based on CSIs training and experience.

13.4.8.2 When the crime scene is contaminated with blood or other biological contaminants, single use brushes and powder shall be utilized; their use should be noted.

13.4.8.3 When using fluorescent powder, an ALS shall be utilized during processing to avoid over-powdering the surface.

13.4.8.4 Latent prints that are developed and are deemed suitable for collection shall be marked, photographed, and/or lifted. The collection type should be determined based on the CSI's training and experience.

13.4.8.5 If fabric, glove, or other similar impressions are developed while processing a crime scene, they should be documented in notes and possibly with photography, depending on the nature of the impressions and the circumstances at the scene.

13.4.8.6 Safety

13.4.8.6.1 Safety concerns when using commercial fingerprint powders are minimal.

13.4.8.6.2 When fingerprint powders are used for an extended period of time in an enclosed space, a dust mask should be worn to minimize the inhalation of the powder particles.

13.4.8.6.3 CSIs using fingerprint powders should monitor reactions (if any) to the fingerprint powders.

13.4.9 Small Particle Reagent (SPR)

13.4.9.1 SPR is available in either black or white; the solution color should be chosen based on the color of the item/area being examined.

13.4.9.2 SPR can be sprayed onto an item. The bottle of SPR should be shaken often to keep the SPR in suspension. If an area is thought to contain latent prints, SPR should be sprayed above the print so the SPR can flow over the print. Excess SPR can be removed by rinsing the surface with water.

13.4.9.3 Latent prints that are developed and are deemed suitable for collection shall be marked, photographed, and/or lifted. The collection type should be determined based on the CSI's training and experience.

13.4.9.4 Safety

13.4.9.4.1 There does not appear to be any health hazards associated with small particle reagent, but the process should be monitored to see if there are any allergies. When using the powder in the dry form, precautions should be taken to prevent the powder from becoming airborne and possibly inhaled.

13.4.10 Lifting Methods

13.4.10.1 There are a variety of sizes, types, and finishes of lifting tape that can be utilized depending on the surface and/or characteristics of the latent print.

13.4.10.2 Lift tape should be chosen based on the size of the impression.

- 13.4.10.3 Consideration for the size of the lift card should be evaluated. CSIs should avoid unrolling tape to a longer length than the lift card; it is best if the tape does not have to be folded over onto the other side of the lift card.
- 13.4.10.4 Lift tape should be pulled out smoothly, in one motion. CSIs should try to avoid starting and stopping when unrolling the tape.
- 13.4.10.5 Lift tape should be placed on the front side (glossy side) of the latent lift card.
- 13.4.10.6 Latent lift cards should also be chosen based on the size of the impression.
- 13.4.10.7 White latent lift cards shall be utilized when using black powder; black latent lift cards shall be utilized when using white or fluorescent powders.
- 13.4.10.8 All latent lift cards that contain tape lifts shall be retained and turned over to the investigating agency as evidence; no latent lift cards containing tape lifts shall be discarded.
- 13.4.10.9 Latent lift cards should be filled out as completely as possible. Latent lift cards shall contain the following at a minimum: date, initials of the person collecting the lift, location, latent number or marker number. This information should be written on the back side (paper side-not glossy side) of the latent lift card.
- 13.4.10.10 A simple sketch should be made on the latent lift card noting the orientation of the print and the location on the item from which the lift was collection.
- 13.4.10.10.1 If a large area/item is being processed, a larger diagram(s) may be utilized to show the locations of multiple latent prints.
- 13.4.10.11 If latent prints appear to be simultaneous impressions or are in close proximity to one another, they should be lifted together whenever possible.
- 13.4.10.12 Lifts from different areas should be placed on different cards.
- 13.4.10.13 If multiple lifts are taken of the same latent print, they may be placed on the same latent lift card. A notation indicating the order in which they were lifted should be made on the card.
- 13.4.10.14 Casting compounds (e.g. Mikrosil) may be utilized to lift a latent print on a textured or uneven surface.

13.4.10.14.1 See section 14, AM 7 for further instruction.

13.4.10.15 After lifting, casting material can be attached to a latent lift card and the information about the cast can be filled out as detailed in 13.4.10.9.

13.4.10.16 Blood contaminated latent prints may be present in scenes. In order to develop/visualize those latent prints, blood-reactive chemicals may be utilized.

13.4.10.16.1 Prior to the application of any blood enhancement chemicals, consideration should be taken for the collection of any evidence for biological analysis.

13.4.10.16.2 Blood enhancement chemicals should be used as detailed in section 12, AM 5 of this manual.

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14.0 AM 7: Impression Evidence

14.1 Background

14.1.1 Impression evidence is present in crime scenes in the form of shoe and tire marks, bite marks, tool marks, and possibly by marks made from other patterned items.

14.1.2 Impression evidence may be located by utilizing ambient light, ALS lighting, and/or oblique lighting.

14.2 Scope

14.2.1 This method applies to all crime scenes that have impression evidence that could assist in the investigation.

14.3 Procedure

14.3.1 When impression evidence is located outdoors, or could be altered or destroyed, care should be taken to protect the impression.

14.3.2 Impression evidence should be marked using a letter marker.

14.3.2.1 Marker designators should be included in any comparison photography, on any lifts, and on any casts taken of the impression.

14.3.3 Impression evidence shall be properly documented using photography, notes, and sketches/diagrams (as appropriate) prior to collection and/or enhancement attempts.

14.3.3.1 Moveable objects bearing impression evidence should be photographed prior to moving and/or collection. Processing for impression evidence may be best conducted in the laboratory.

14.3.3.1.1 If the item containing the impression can be safely collected, without loss of the impression, then the entire item should be collected.

14.3.3.1.2 If the impression is a two-dimensional impression on a surface, lifting methods should be considered for collection.

14.3.3.1.3 If the impression is a three-dimensional impression, casting should be considered for collection.

14.3.3.2 Impressions on non-movable surfaces shall be documented and processed in place.

14.3.4 The first step in the proper documentation and recovery of impression evidence should be accomplished with photography.

14.3.4.1 Comparison quality photographs shall be taken as outlined in section 10, AM 3 of this manual.

14.3.4.2 Comparison quality photographs should be taken prior to attempting preservation by another means (e.g. casting, lifting).

14.3.5 Some types of impression evidence (e.g. shoe impressions in blood) may be enhanced for photography and collection using chemical and/or powder methods. Less destructive methods should be utilized prior to the use of more destructive methods.

14.3.5.1 Blood enhancement chemicals shall be utilized as outlined in section 12, AM 5 of this manual.

14.3.5.2 Powder processing techniques shall be utilized as outlined in section 13, AM 6 of this manual.

14.3.6 Lifting

14.3.6.1 Lifting should be utilized when there is a risk that the impression may be destroyed if the item is collected.

14.3.6.2 Adhesive lifters work best on non-porous surfaces and can be used after the impression has been processed with fingerprint powder.

14.3.6.2.1 The adhesive lifter should be cut to be slightly larger than the target impression.

14.3.6.2.2 To apply the adhesive lifter, place one edge of the lift on the substrate and slowly smooth down the rest of the lifter over the impression, taking care to press out any air bubbles a roller may assist in this process.

14.3.6.2.3 To remove the lift, carefully lift it by the corners.

14.3.6.2.4 Place the adhesive lift on a latent lift card, piece of paper, transparency sheet, acetate or similar product, depending on which is likely to offer the best contrast for later imaging.

14.3.6.2.5 The adhesive lifter shall be labeled with identifying information which may include, but is not limited to, the following: marker identifier, orientation, position and location of the impression; date; case number; and initials of the person taking the lift.

- 14.3.6.2.6 Gelatin lifters are thicker than adhesive lifters, and may be used on porous or non-porous surfaces. They work well with impressions that have been processed with fingerprint powder, and may work with impressions that have been chemically processed.
- 14.3.6.2.7 Black gelatin lifts work well for impression in drywall dust, while impressions developed with black fingerprint powder will best appear on a white background.
- 14.3.6.2.8 Best practice is to remove the gelatin lift from its package to allow it to come to room temperature for approximately 5-10 minutes prior to lifting an impression.
- 14.3.6.2.9 The gelatin lifter should be cut to be slightly larger than the target impression.
- 14.3.6.2.10 To apply the gelatin lift, first remove the transparent cover. Care should be taken when removing the cover to limit the stretching. Place one edge of the lift on the substrate and slowly smooth down the rest of the lifter over the impression, taking care to press out any air bubbles; a roller may assist in this process.
- 14.3.6.2.11 To remove the lift, carefully lift it by the corners.
- 14.3.6.2.12 Place the lift on a horizontal surface with the gelatin layer up.
- 14.3.6.2.13 The transparent cover is then placed on the impression. The CSI should try to avoid air bubbles as they place this.
- 14.3.6.2.14 Photography of the gelatin lift can be done prior to placing the transparent cover on it. However, previous photography prior to lifting is generally better quality.
- 14.3.6.2.15 The gelatin lifter shall be labeled with identifying information which may include, but is not limited to, the following: marker identifier, orientation, position and location of the impression; date; case number; and initials of the person taking the lift.
- 14.3.6.2.16 Gelatin lifts melt between 104-113 degrees Fahrenheit. Objects that have been exposed to the sun or those temperatures should be cooled before attempting to use a gelatin lifter.

14.3.6.2.17 Gelatin lifts should be stored in individual clean dust free containers.

14.3.6.2.17.1 Adhesive lifts should be placed in a container that is large enough to hold the lifts and protect the lifts from damage. Adhesive and gelatin lifts may be stored at room temperature, though storage in refrigeration is preferable.

14.3.6.2.17.2 If multiple lifts are taken of the same impression, the lifts shall be labeled in order to distinguish which was first, second, etc.

14.3.7 Casting

14.3.7.1 Casting may be utilized in three-dimensional impressions as there is no way to collect the impression without disrupting the substrate.

Dental Stone

14.3.7.2 Equipment

14.3.7.2.1

Dental stone

Water

Bucket or disposable plastic bag

Stir/stick/disposable spoon/tongue depressor

Adjustable metal forms

14.3.7.3 Procedure

14.3.7.3.1 All supplies should be assembled prior to mixing the casting material.

14.3.7.3.2 Metal forms may be placed around the impression to contain the casting material.

14.3.7.3.3 Two pounds of dental stone is placed in a large zip top plastic bag or other similar disposable container.

14.3.7.3.4 Approximately 10 ounces of water is added to the dental stone. The container is closed and the components are thoroughly mixed by

squeezing/manipulating the container until the mixture has the consistency of thin pancake batter. More dental stone or water may be added to reach the desired consistency.

14.3.7.3.5 The ratio listed in the above section is enough to cast an average shoe impression and may be increased for larger impressions.

14.3.7.3.6 Use the casting material quickly after it is mixed or it may harden in the container. Thicker mixtures and warmer temperatures will cause hardening more quickly compared to thinner mixtures and colder temperatures.

14.3.7.3.7 The mixture is gently poured into the impression. A stir stick or similar item may be held at the edge of the impression, with the mixture poured along the stick to direct the flow and reduce damage to the impression.

14.3.7.3.7.1 For fragile and shallow impressions, pour casting material from outside of the perimeter so that it rapidly flows over the impression. A thinner mixture of casting material is necessary for this technique.

14.3.7.3.7.2 Avoid pouring directly onto the impression until a sufficient layer of material has accumulated over the impression.

14.3.7.3.8 At a minimum, the following information shall be written or scratched on the cast: date, initials of CSI, location and marker identifier. This information can also include the agency case number and/or lab case number.

14.3.7.3.8.1 The identifying information can be scratched into the cast when it is firm but still soft. Once completely hardened, the information can be written in permanent marker.

14.3.7.3.9 The cast should be allowed to dry for at least 20 minutes in warm weather and longer in cold, wet conditions.

14.3.7.3.10 The cast should be removed carefully. Any debris should be left in place in the cast.

14.3.7.3.11 The cast should be packaged in a large paper sack or a cardboard box and it should be allowed to dry for an additional 48 hours. The cast should not be packaged in plastic.

14.3.7.4 Safety

14.3.7.4.1 Powder can be an eye irritant.

14.3.7.4.2 As this is an exothermic reaction, burns can result on the skin during hardening.

14.3.7.4.3 Prolonged exposure can irritate pre-existing lung issues. If using in an enclosed space for a long period, a mask should be used.

Underwater Casting

14.3.7.5 Equipment

14.3.7.5.1

Dental Stone

Water

Metal forms

Flour sifter (or similar device)

14.3.7.6 Procedure

14.3.7.6.1 Impressions that are under water may still be cast. Do not attempt to drain away any of the water as it may disturb the impression.

14.3.7.6.2 Place a metal form around the impression to contain the casting mixture.

14.3.7.6.3 Sift or lightly sprinkle dry casting material over the underwater impression until covered by about an inch of casting material. Then mix the casting material to a slightly thicker consistency than typical and carefully scoop the mixture onto the impression.

14.3.7.6.4 Allow to set for at least an hour.

14.3.7.6.5 If the impression is in very shallow water, the casting material may be mixed to a slightly thicker consistency than typical and applied as normal, as the mixture will displace the thin layer of water.

14.3.7.6.6 At a minimum, the following information shall be written or scratched on the cast: date, initials of CSI, location and marker identifier. This information can also include the agency case number and/or lab case number.

15.3.7.6.6.1 The identifying information can be scratched into the cast when it is firm but still soft. Once completely hardened, the information can be written in permanent marker.

14.3.7.6.7 The cast should be removed carefully. Any debris should be left in place to cast.

14.3.7.6.8 The cast should be packaged in a large paper sack or a cardboard box and it should be allowed to dry for an additional 48 hours. The cast should not be packaged in plastic.

14.3.7.7 Safety

14.3.7.7.1 Powder can be an eye irritant.

14.3.7.7.2 As this is an exothermic reaction, burns can result on the skin during hardening.

14.3.7.7.3 Prolonged exposure can irritate pre-existing lung issues. If using in an enclosed space for a long period, a mask should be used.

Casting Impressions in Snow

14.3.7.8 Equipment

14.3.7.8.1

Dental Stone

Water

Flour sifter (or similar device)

Snow print wax

14.3.7.9 Procedure

14.3.7.9.1 Method 1: sift or lightly sprinkle dry casting material over the snow impression until a thin layer is applied. Wait 1-2 minutes for that layer to harden, then sift or sprinkle dry casting material over the impression again. Repeat until there is no more moisture for the casting material to absorb. Mix the remaining casting material with water as typical and apply slowly to the impression.

14.3.7.9.1.1 When casting in snow, use cold water or some snow when making the mixture.

14.3.7.9.2 Method 2: Spray a light coat of Snow Print Wax onto the snow impression. After that coat is dry, apply another coat. Repeat until at least three to four layers of wax have been applied. Allow the wax to set for approximately ten minutes. Mix casting material with water so it is slightly thicker than normal mixture that has been cooled.

14.3.7.9.2.1 When applying Snow Print Wax, be careful not to hold the can so close that the aerosol damages detail in the impression.

14.3.7.9.3 Allow to set for at least an hour.

14.3.7.9.4 At a minimum, the following information shall be written or scratched on the cast: date, initials of CSI, location and marker identifier. This information can also include the agency case number and/or lab case number.

14.3.7.9.5 The identifying information can be scratched into the cast when it is firm but still soft. Once completely hardened, the information can be written in permanent marker.

14.3.7.9.6 The cast should be removed carefully. Any debris should be left in place in the cast.

14.3.7.9.7 The cast should be packaged in a large paper sack or a cardboard box and it should be allowed to dry for an additional 48 hours. The cast should not be packaged in plastic.

Mikrosil

14.3.7.10 Equipment

14.3.7.10.1

Mikrosil base (brown, black, white or grey)

Mikrosil hardener

Mixing cards/latent lift cards

Wooden mixing sticks/stir stick/tongue depressor

14.3.7.11 Procedure

14.3.7.11.1 All supplies should be assembled prior to mixing the casting material.

14.3.7.11.2 Brown colored Mikrosil is preferred for casting tool mark impressions.

14.3.7.11.3 Squeeze out a line of Mikrosil sufficient to cover the impression on the mixing card. Squeeze out a line of hardener next to the line of Mikrosil so that both lines are approximately the same length. Thoroughly mix the two components using a mixing stick for approximately one minute until the mixture is homogeneous.

14.3.7.11.4 Remove the mixed Mikrosil from the card and apply to the surface, taking care to work the casting material into or on the impression, without allowing the mixing stick to come into contact with the impression. Spread more Mikrosil than is needed for the impression, so a small amount of Mikrosil will extend out onto the surface, adjacent to the impression, to create a small flap/strip of material.

14.3.7.11.5 The setting time will be approximately five to eight minutes at 68 degrees Fahrenheit and 12 to 15 minutes at 14 degrees Fahrenheit.

14.3.7.11.6 The cast should be removed carefully to avoid damaging it. The flap/strip portion of the cast can be stapled to the front of a latent lift card or the cast can be placed in a small coin envelope.

14.3.7.11.7 If using a latent lift card, lift cards should be filled out as completely as possible. Latent lift cards shall contain the following at a minimum: date, initials of the person collecting the lift, location, latent number or marker number. This information should be written on the back side (paper side-not glossy side) of the latent lift card.

14.3.7.11.8 Mikrosil casts shall be packaged separately from one another, as they can stick together.

14.3.7.11.9 Multiple casts from the same surface/location (e.g. several pry marks on a window frame) may be packaged in the same outer evidence envelope/bag as long as the casts are contained in separate inner packages.

14.3.7.12 Safety

14.3.7.12.1 Do not allow hardener to contact the eyes or mucous membranes. In case of contact, immediately flush with water.

AccuTrans

14.3.7.13 Equipment

14.3.7.13.1

AccuTrans base (brown, white, transparent)

AccuTrans catalyst (light grey, transparent)

AccuTrans extruder gun

Mixing tip

14.3.7.14 Procedure

14.3.7.14.1 All supplies should be assembled prior to mixing the casting material.

14.3.7.14.2 Remove the syringe plug on the syringe.

14.3.7.14.3 Attach the mixing tip to the syringe by aligning the prongs inside the mixing tip with the syringe orifice. Seat onto the syringe and twist clockwise (90 degrees) to lock in place.

14.3.7.14.4 Apply AccuTrans directly from the syringe.

Dispense casting material over the top of the impression. Ideally, a small amount of AccuTrans will extend out onto the surface, adjacent to the impression, to create a small flap/strip of material.

14.3.7.14.5 The setting time will be approximately four minutes at 68 degrees Fahrenheit and 32 minutes at 14 degrees Fahrenheit.

14.3.7.15 Safety

14.3.7.15.1 No safety concerns exist. If the product contacts your eyes, immediately flush with water.

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15.0 AM 8: Trace Evidence

15.1 Background/References

15.1.1 Trace materials include, but are not limited to, hairs, fibers, glass fragments, metal shavings, wood shavings, paint chips, soil, and vegetation.

15.1.2 Trace materials may be easily dislodged. Care should be taken to avoid loss, contamination, and cross-contamination.

15.2 Scope

15.2.1 This procedure applies to any scene where trace evidence could be beneficial to the investigation and is requested by the investigating agency.

15.2.2 Trace evidence has limitations, one of which is that there are not many labs in the country that can do this type of testing.

15.3 Procedure

15.3.1 A strong white light may be utilized at an oblique angle in order to visualize trace evidence. If a particular type of evidence being searched for would react with a different wavelength of light, an alternate light source (ALS) should be utilized.

15.3.1.1 A flashlight or white light setting on an ALS are the most common sources for a strong white light.

15.3.1.2 No one wavelength will affect every type of fiber. When searching for fibers, a wide range of wavelengths should be utilized.

15.3.2 Trace evidence may be collected using a variety of methods, depending on the type of material and the surface.

15.3.2.1 Individual items of trace material may be picked up using forceps.

15.3.2.2 Smaller/fragile individual items (e.g. hairs, fibers) may be picked up by folding an adhesive note around the item so that it is sandwiched between the two sides of the adhesive paper.

15.3.2.3 Adhesive lifts may be used to collect trace from a large surface area.

15.3.2.3.1 "Lint rollers" and clear adhesive lifts should be utilized to collect possible trace from large areas.

15.3.2.3.1.1 The lint roller or adhesive lift is applied to the surface and light pressure is applied. The lint roller or adhesive lift should be utilized until

its tackiness is reduced or until collection from the surface has been completed.

15.3.2.3.1.2 Each adhesive sheet from a lint roller shall be placed in a plastic pouch/sleeve to prevent adhesion to evidence packaging. Adhesive lifts shall have a clear cover affixed.

15.3.2.3.1.3 Lint rollers shall be new to avoid any potential cross-contamination.

15.3.2.3.1.4 Sheets of trace material shall be labeled based on the area from which it was collected. Each adhesive lift or lint roller sheet shall be placed in its own inner envelope to avoid cross contamination.

15.3.2.4 Adhesive lifters are not always appropriate for items to be tested for wearer DNA as it would remove skin cells from the surface. Adhesive lifters shall not be used to collect paint or polymers as the adhesive can leach into the material and change its chemistry.

15.3.2.4.1 Clear packing tape (or similar tape) shall not be utilized due to the type of adhesive material it has and the damage it may inflict to trace evidence.

15.3.2.5 Trace materials shall be placed in an inner evidence container.

15.3.2.5.1 A druggist's fold (aka bindle), coin envelope, glassine envelope, vial, or similar container may be used as inner packaging for individual trace evidence.

15.3.2.5.2 A large manila envelope may be used as inner packaging for adhesive lifts.

15.3.2.6 Trace material may be packaged in a variety of outer evidence containers, such as evidence envelopes or sacks, depending on the size/type of inner container utilized.

15.3.2.7 Multiple containers of individual items, adhesive lifts and lint roller sheets of trace evidence may be packaged in the same outer evidence container if they were collected from the same area.

15.3.2.7.1 For example, three individual hairs taken from the victim's right hand, each placed in their own glassine envelope, may all be placed in one evidence envelope.

16.0 AM 9: Firearms and Toolmark Evidence

Firearms

16.1 Background

16.1.1 Numerous types of firearm related evidence are commonly encountered in crime scenes. Handguns, long guns, cartridges, cartridge cases, bullet fragments, other fragments of ammunition, and gunshot residue may be encountered when investigating a scene.

16.1.2 All firearms shall be treated as if they are loaded and ready to fire.

16.1.2.1 When handling a firearm, it shall not be pointed at the handler or another person.

16.1.2.2 When handling a firearm, the CSI shall consider the setting (i.e. backdrop) and surroundings in the scene.

16.1.2.3 A CSI's finger should never be placed on the trigger. When moving the firearm, the CSI shall be mindful of anything that could contact the trigger and engage it.

16.2 Scope

16.2.1 This procedure applies to all crime scenes where firearm related evidence may be present.

16.3 Equipment

16.3.1 Note taking supplies

Camera and camera bag

Laser measuring device

Various tools

16.4 Procedure-Firearms

16.4.1 Firearms and related evidence shall be properly documented using photography, notes, and sketches/diagrams (as appropriate) prior to collection.

16.4.1.1 The location of cartridge cases shall be documented.

- 16.4.2 A firearm shall not be altered by a CSI in any way prior to documentation. If it is altered prior to documentation, the person who altered it, and the reason for such alteration, shall be explained in detail in the notes.
- 16.4.3 Documentation of a firearm, prior to altering it, shall include the position of the safety mechanism (if applicable), if a cartridge case is caught in the ejection port (i.e. stove-piped), and any abnormalities to the firearm. Care should be taken to avoid disturbing any evidence (e.g. blood, hairs, fibers, latent prints) on the surface of the firearm.
- 16.3.4 For crime scenes in which a shooting has taken place, all involved firearms, magazines, and any related evidence (e.g. speedloaders) shall be documented.
- 16.3.5 After documentation is completed, the firearm can be rendered safe. If a CSI is not comfortable with, or is not physically capable of clearing a weapon, they may ask for assistance from another CSI or an officer. It shall be noted who rendered the firearm safe.
- 16.3.6 The following information shall be documented for all firearms: make, model, caliber, serial number, color. Any unusual conditions, as well as the absence of identifying information, should be noted.
- 16.3.7 Revolver documentation:
- 16.3.7.1 Using a permanent marker, marks shall be made on the top of the cylinder, on either side of the frame, to show which chamber was positioned under the hammer when the revolver was recovered.
 - 16.3.7.2 When the cylinder is released from the frame, the cylinder rotation, the contents of the chambers (cartridges/cartridge cases) and their relative positions shall be documented.
 - 16.3.7.3 Documentation (notes and/or photography) shall include the headstamp for each cartridge and/or cartridge case.
- 16.3.8 Semi-automatic handgun documentation:
- 16.3.8.1 The magazine is ejected from the magazine well, but not unloaded. Move the slide back so that any round in the chamber is ejected through the ejection port. The contents of the chamber and the magazine well shall be documented, including the magazine capacity.
 - 16.3.8.2 Once documented as a unit, the contents of the magazine should be removed, if feasible. The cartridges should be documented in order as to how the magazine was loaded.

16.3.7.4 Documentation (notes and/or photography) shall include the headstamp for each cartridge and/or cartridge case.

16.3.8.3 An ammunition box may be utilized to maintain control of the cartridges during documentation.

16.3.9 Rifle documentation:

16.3.9.1 The magazine is ejected from the magazine well, but not unloaded. Move the bolt/lever so that any round of the chamber is ejected. The contents of the chamber and the magazine well should be documented.

16.3.9.2 Documentation (notes and/or photography) shall include the headstamp for each cartridge.

16.3.9.3 If the rifle doesn't have a removable magazine, the cartridges should be removed from the magazine, one at a time, if feasible.

16.3.9.4 An ammunition box may be utilized to maintain control of the cartridges during documentation.

16.3.10 Shotgun documentation:

16.3.10.1 Break action shotguns have a hinged opening where the chamber meets the barrel(s); shotguns may have one or more barrels. Open the shotgun so that any shotshell(s) in the barrel(s) can be removed. The contents of each chamber should be documented.

16.3.10.2 Shotshell(s) may project back towards the handler when the shotgun is opened.

16.3.10.3 Most bolt action and pump action shotguns have a magazine tube. Shotshells should be removed from the magazine tube, one at a time.

16.3.10.4 Documentation shall include the headstamp for each shotshell.

16.3.10.5 An ammunition box may be utilized to maintain control of the cartridges during documentation.

16.3.11 Any measurement taken of a firearm at the scene is considered descriptive and general documentation.

16.3.12 When noting the location/position of the firearm, it may be relevant to note which direction the barrel is pointed relative to the grip of the firearm.

16.3.13 It may be difficult to locate cartridge cases, bullet fragments, pellets and/or other small ammunition components.

16.3.13.1 A high intensity white light should be one of the first tools utilized to search for small firearms components.

16.3.14 Cartridge cases may react differently depending on whether they hit against soft surfaces (e.g. carpet, bedding, clothing) or hard surfaces (e.g. wall, floor, table). A cartridge case may bounce against a hard surface and ultimately come to rest in a location that is unexpected.

16.3.15 Bullets may fragment differently based on their construction and based on the types of surfaces they impact. A bullet may be deflected after impacting a surface or perforating an object.

16.3.16 Pellets are spherical and may roll after landing on hard surfaces.

16.3.17 If firearms testing may be requested, relevant ammunition from the scene shall be collected.

16.3.18 All projectile impacts shall be documented to include photography, marking, measurement and location.

16.3.18.1 Surface damage that lacks characteristics to be called projectile impact but is assumed to be from the shooting incident, should still be treated as such.

16.3.18.2 Projectile impacts shall be given a unique identifier that shall be recorded in notes, sketches/diagrams and photography.

16.3.18.3 Photography shall include overall and relationship photos to show the relationship of multiple impacts to one another.

16.3.18.4 Projectiles shall be examined and their characteristics documented. These can include but are not limited to, material, contour, angle, and size.

16.3.19 Projectile impacts may be chemically tested for the presence of copper or lead residues. Only those CSIs who have appropriate training, may perform the chemical tests.

16.3.20 Collection of firearm related evidence may be determined based on the size of the evidence, its condition, and any item it impacted, perforated, or penetrated.

16.3.20.1 If a bullet is lodged in an item that is small enough to be collected, the entire item should be collected.

16.3.20.2 If a bullet has lodged, penetrated, perforated a portion of the structure of the scene (e.g. wall, door, floor), the structure may be cut open to retrieve the bullet.

16.3.20.2.1 Prior to attempting the removal, the area shall be fully documented.

16.3.20.2.2 Authorization from the investigating agency shall be obtained prior to removal; note who specifically gave authorization for those actions.

16.3.20.2.3 If the bullet is lodged in the surface, the area to be removed should extend several inches away from the bullet to avoid impacting it with the cutting tool. The piece that is removed shall be packaged with the bullet left in place in the surface. If the above cannot be accomplished, the notes shall state why. A designation should be made (e.g. north, up) so that the cut out from the surface could be placed back into its original position if needed.

16.3.20.2.4 There should be no attempt to extract the bullet from the surface, as tools used for extraction could impart marks to the bullet surface, which could affect examination/analysis.

16.3.20.2.5 If the bullet has penetrated drywall, but it is uncertain if the bullet has lodged in the wood framing of the wall, or has simply fallen in the void between framing, the drywall should be removed to view the interior of the wall. The drywall should be cut near the bullet defect, and the cut should extend to each side until framing can be found. The drywall can then be cut downward to the floor, parallel to the wood framing. When the drywall is removed, the interior of that section of wall should be visible from the framing on each side, and all the way to the floor.

16.3.20.2.6 If the bullet has penetrated through a fabric covered item (e.g. couch, car seat), cut three sides of a square a sufficient distance away from the hole and then fold the fabric back. This allows the replacement of the

fabric back into its original and proper position for documentation purposes.

16.3.20.2.7 If an area is damaged in the collection of evidence, it shall be documented in the notes and with photos.

16.3.20.3 When collecting projectiles, the CSI should be mindful of the potential for DNA and trace evidence.

16.3.20.4 An accounting of the relative number of projectile impacts, projectiles, and the cartridge cases shall be completed when feasible.

16.3.21.4.1 When a projectile can be associated with an impact, this should be documented in the notes and with photography; markers could be helpful in this situation.

16.3.20.5 If a bullet/projectile cannot be found or physically recovered, the reasons shall be documented.

16.4 Safety

16.4.1 Handling firearms can result in injury or death. As noted above, caution should be exercised when handling. The rules of firearms safety are: always assume the firearm is loaded, never point it at something you do not intend to shoot, never put your finger on the trigger unless you intend to shoot, be aware of your backdrop. If you are unfamiliar with a particular firearm, do not try to render it safe.

16.5 Tool marks

16.5.1 Tool marks are often encountered at the point of entry in crime scenes and may be located throughout the scene, depending on the scene circumstances.

16.5.2 Striated tool marks are caused when the cutting edge of a tool is brought into contact with and slid against a surface (e.g. chisel scarping along door casing).

16.5.3 An impressed mark occurs when a tool is forced into soft material (e.g. side-to-side leverage of a pry bar) or when tools with opposed jaws cut through a surface (e.g. wire cutters).

16.5.4 Saw and drill marks may be present when these tools have been used on a variety of different surfaces, including bone.

16.6 Scope

16.6.1 This procedure applies to all crime scenes where tool mark evidence may be present.

16.7 Equipment

16.7.1 Note taking supplies

Evidence collection

Casting supplies-see Impression Evidence

16.8 Procedure

16.8.1 Tool marks shall be properly documented using photography, notes and sketches/diagrams (as appropriate) prior to collection.

16.8.2 If a tool is recovered, care should be taken to protect it from the creation of any new marks or loss of any unique markings during transport and storage. There shall never be an attempt to "fit" a recovered tool into any tool marks found on scene.

16.8.3 When packaging, the working end of the tool may be covered (e.g. bubble wrap) to prevent any damage that would affect examination/analysis.

16.8.3.1 If the item will also be processed for latent prints or DNA, this should be considered prior to wrapping the tool.

16.8.4 If the item bearing the tool mark cannot be collected, the tool mark may be cast.

16.8.5 CASTING-see Impression Evidence, Section 14

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17.0 AM 10: Biological Evidence

17.1 Background

17.1.1 The type of biological evidence can include blood, semen, saliva, hair, urine, feces, bone, teeth, and other tissues.

17.1.2 Biological evidence should be protected from possible contamination from scene CSIs and possible cross-contamination from other evidence in the crime scene.

17.1.2.1 Gloves should be changed frequently to avoid cross-contamination from items in the scene.

17.1.3 All biological evidence should be treated as infectious. Appropriate personal protective equipment (PPE) should be utilized.

17.2 Scope

17.2.1 This procedure applies to scenes that have biological evidence present.

17.3 Equipment

17.3.1 Alternate Light Sources

Note taking supplies

Cotton tipped swabs

Sterile water

17.4 Procedure

17.4.1 Searching/Documentation

17.4.1.1 Biological evidence shall be properly documented using photography, notes, and sketches/diagrams (as appropriate) prior to collection.

17.4.1.1.1 Relevant biological evidence shall be described in notes and may be included in sketches (if used); descriptions may include color, size, orientation, state (e.g. liquid, dried, flaky), and distribution. If evidence markers were used, the numbers/letters shall be included in the description. The results of any presumptive blood tests shall be included in notes and may be included in sketches (if used).

17.4.1.2 Sketches/diagrams may include preferences to large areas of biological evidence, such as a blood pattern distribution on a wall, or a pool of blood on a floor.

17.4.1.2.1 Colored pens/pencils may be used in sketches/diagrams to more accurately represent the details of biological evidence.

17.4.1.3 Light colored stains can be visualized using blood enhancement chemicals. See section 12, AM 5 of this manual.

17.4.1.4 A high intensity white light should be one of the first tools utilized to search for biological evidence.

17.4.1.5 An alternate light source (ALS) may be utilized when searching for biological fluids such as semen and saliva.

17.4.1.5.1 ISPFS crime scene unit has electrical, tunable ALS, ALS flashlights (PoliLights) and the Crime Lite Auto.

17.4.1.5.2 The most appropriate wavelength to search for bodily fluids is 415-515 nm, utilizing yellow and orange goggles/barriers. Barriers are not applicable when using the Crime Lite Auto.

17.4.1.5.3 Depending on the ALS used, appropriate goggles should be used. See below for the wavelength and corresponding filter.

<400 nm	yellow or clear UV
400-450 nm	yellow
450-540 nm	orange
>540 nm	red

17.4.1.5.4 The use of an ALS, wavelengths/filters and observations, shall be recorded in the case notes.

17.4.1.5.5 For corded ALS', if the ALS malfunctions, it shall be taken out of service. Any maintenance shall be done with the ALS unplugged. Do not use outdoors if wet conditions exist.

17.4.1.5.6 The Crime-lite Auto (CLA) is a compact, portable device that can be used to search and capture images at the same time.

17.4.1.5.6.1 A micro SD card should be used for image storage.

17.4.1.5.6.2 To operate the CLA, power the unit ON.
The user interface (touchscreen)
controls the settings. To change the
settings, select the camera icon and the
settings wheel.

17.4.1.5.6.3 To change light and filter settings, select
the light bulb icon. Once in the light
menu, select the color of dot that
represents the wavelength desired. The
default camera filter will be applied
based on the wavelength selected.

17.4.1.5.6.4 To capture the image, press the camera
icon on the right side of the
touchscreen.

17.4.1.5.6.5 To view any image(s) captured, press
the "stack of photos" icon to view the
gallery.

17.4.1.5.6.6 To make the annotation to an image in
the gallery, press the "freehand" icon.
Once in the annotation tool, various
tools are available including a
rectangular tool, freehand tool, line and
number tool. These tools can be used to
supplement note taking.

17.4.1.5.6.6.1 If the image is annotated,
the CLA saves the
altered image as a new
copy with "-1" at the end
of it.

17.4.1.5.6.6.2 The photo editing
features of the CLA shall
not be utilized to alter
an image.

17.4.1.5.6.7 The CSI should operate the CLA at
approximately 8 inches away from the
surface being searched.

17.4.1.5.6.8 The use of an ALS, wavelengths/filters and observations, shall be recorded in the case notes.

17.4.1.5.6.9 Images should be saved as JPEG for documentation purposes and as TIFF for comparison purposes.

17.4.1.5.6.10 The CLA creates additional files of metadata. To put this data in a format that is readable, download the PDF of this information from the CLA. This document and all the images, shall be uploaded to the digital imaging system.

17.4.1.5.6.11 Do not operate the unit with damaged electrical connection. Do not drop the CLA.

17.4.1.5.6.12 Dust can be removed with a soft dry cloth or tissue. When necessary, a mild cleaning solution can be used.

17.4.1.5.6.12.1 Alcohol-based cleaning solutions may degrade the surface and should be used sparingly.

17.4.1.5.7 The PoliLight Flare Plus 2 (PFP2) is a battery driven, multiple array LED forensic light source with a variety of filtered light outputs.

17.4.1.5.7 To operate the PFP2, turn the unit on by turning the collar left at the base of the head. Turn it left to turn it off.

17.4.1.5.8 To lock the PFP2, turn the collar to the left and release it four times within three seconds; release by repeating the four turns to the left within two seconds.

17.4.1.5.9 The intensity of the light can be changed by turning the control switch to the right and hold to vary the intensity.

17.4.1.5.10 The use of an ALS, wavelengths/filters and observations, shall be recorded in the case notes.

17.4.1.5.11 Do not operate the unit with damaged electrical connection.

17.4.1.5.12 The exterior can be cleaned with a wet soft cloth; dilute mild detergent can be used. The CSI shall not use harsh solvents such as acetone. The CSI shall not use abrasive material on the optics.

17.4.1.5.13 Appropriate goggles should be used by all persons within 45 ft of the PFP2. The CSI shall not look directly in the light or allow beams to bounce off the surface into CSI's eyes.

17.4.1.5.8 An ALS shall only be utilized by those CSIs who have successfully completed the ALS section of the training manual.

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18.0 AM 11: Documentation of Evidence for Reconstruction

18.1 Background

18.1.1 Reconstruction is the use of scientific methods, physical evidence, deductive and inductive reasoning, and their interrelationships to gain explicit knowledge of the series of events that surround the commission of a crime.

18.1.2 Objective data exists in scene context and physical evidence. Crime scene reconstruction works from the evidence backwards; by considering the data, one can determine actions that occurred during an incident, as well as the order of those actions.

18.1.3 Each action has something that precedes it, something that occurs during, and something that follows it; nothing just happens.

18.2 Scope

18.2.1 This procedure relates to any scene where reconstruction is likely needed, or the investigating agency has requested it.

18.3 Equipment

18.3.1 Note taking supplies

Flashlights

Evidence collection supplies

Ruler tape

Camera and camera bag

Measuring sticks/devices

Trajectory rods

Laser

18.4 Procedure

18.4.1 Evidence related to bloodstains and shootings shall be properly documented using photography, notes, and sketches/diagrams (as appropriate) prior to collection of any evidence.

18.4.2 General documentation of biological evidence shall be completed as per this manual.

18.4.3 General documentation of firearms and related evidence shall be completed as per this manual.

18.4.4 Bloodstains

- 18.4.4.1 Recognizing bloodstains in the scene is the first step to fully document them for reconstruction.
- 18.4.4.2 A flashlight may be utilized at an oblique angle to visualize small stains. A flashlight with a yellow cast may be preferable to one with a white light when searching for bloodstains.
- 18.4.4.3 Presumptive tests for the presence of blood shall be conducted as per Section 11, AM 4 of this manual.
- 18.4.4.3.1 When selecting a stain for testing that is part of a pattern on a vertical surface (e.g. wall), any stains whose tail points downward would be ideal as they would not be considered during reconstruction, since they have been affected by gravity. Alternatively, the timing of the blood collection can be coordinated to avoid interfering with bloodstain pattern documentation.
- 18.4.4.4 Bloodstains may be present as individual stains, a group of stains, or a trail of stains, based on the events that created them.
- 18.4.4.5 Groups of bloodstains that were created by the same event should be documented together as a pattern. Patterns may overlap; if possible, each pattern should be documented separately.
- 18.4.4.6 Bloodstains and/or bloodstain patterns may be labeled differently depending on whether the stain is being recorded for reconstruction or whether the stain is being collected as evidence.
- 18.4.4.6.1 For bloodstains that are being documented for reconstruction, letter placards and/or stickers shall be utilized.
- 18.4.4.6.2 For example, if there are three areas of bloodstains in patterns on the north wall, the pattern areas could be labeled as A, B, and C. The bloodstain pattern on the east wall could be labeled D. The bloodstain pattern on the floor in the northeast corner of the room could be labeled E.
- 18.4.4.7 For bloodstains that are being collected as evidence, number placards and/or stickers should be utilized.
- 18.4.4.7.1 For example, a bloodstain on the interior side of the front door handle could be labeled 18, a single drop on the sidewalk south of the front door could be labeled 19.
- 18.4.4.8 For bloodstains that are being documented for reconstruction, but which contain an area to be collected for evidence, both letter and number placards/stickers should be utilized.
- 18.4.4.8.1 For example, swabs of blood are to be collected from area B on the north wall and area D on the east wall. In the area from which the swabs are to be collected, marker 22 would be

added to area B and marker 23 would be added to area D, near the stain that is being swabbed for collection.

- 18.4.4.9 For reconstruction purposes, the dimensions, shape, distribution, and appearance of bloodstains should be documented. These details are important factors in determining the type of event that caused the stains, the location of the blood source, the trajectory of the bloodstains' flight in air, and other scene factors.
- 18.4.4.10 A disturbance or void in the distribution of bloodstains may be important.
- 18.4.4.11 The texture (e.g. smooth, irregular, textured, flexible, rigid), material (e.g. porous, non-porous), surface characteristics (e.g. curved, flat, angled) of the surface bearing bloodstains should be noted, as the surface may affect the appearance of bloodstains. It should also be noted whether the surface is fixed or moveable in the scene.
- 18.4.4.12 The location of blood droplets and bloodstain patterns, as well as the size of bloodstain patterns, should be documented by taking the dimensions of their locations within the crime scene.
- 18.4.4.13 Ruler tape may be used to outline areas of bloodstain patterns so that they may effectively be documented. It may also be used to document the location up from the floor, down from the ceiling, or from any reference point (RP) utilized in the scene.
 - 18.4.4.13.1 Ruler tape should be applied in 1-2 foot sections. However, ruler tape may be cut so that the tape may be applied in a way that does not obscure the bloodstain patterns.
- 18.4.4.14 Other types of measuring devices, such as freestanding measuring tapes, paper/disposable measuring tape, and measuring sticks may also be utilized around areas of bloodstain patterns.
- 18.4.4.15 When outlining areas of bloodstain patterns, the area should ideally be one to two feet in width. If the size of the bloodstain pattern is larger than two feet wide, additional lengths of measuring tape should be utilized.
- 18.4.4.16 Comparison quality photographs shall be taken as outlined in this manual.
 - 18.4.4.16.1 The CSI shall photograph at a maximum of two feet sections.
- 18.4.4.17 Sketches of bloodstain patterns may be completed on the general crime scene sketch, or may be completed as a stand-alone sketch.
- 18.4.4.18 A cross projection sketch may be valuable to show bloodstains and/or evidence in relationship to one another on both the horizontal (e.g. floor) and vertical (e.g. wall) surfaces.
- 18.4.4.19 An elevation sketch may be valuable to show the details of bloodstain patterns on the vertical surfaces (e.g. walls, doors) of a location.

- 18.4.4.20 Blood enhancement chemicals may be used to visualize faint marks thought to be made by a surface bearing blood.
- 18.4.4.21 Blood enhancement chemicals shall be used as outlined in Section 12 of this manual.
- 18.4.4.22 Collection of blood shall be conducted as per this manual.
- 18.4.5 Shooting Incidents
- 18.4.5.1 Recognizing shooting artifacts in the scene is the first step to fully document them for reconstruction.
- 18.4.5.2 A flashlight may be utilized at an oblique angle to visualize small defects.
- 18.4.5.3 Bullet strikes, impacts, penetrations, and perforations may be present as a defect from a single projectile (e.g. bullet fired from handgun) or may be present as a grouping of defects from multiple projectiles (e.g. pellets fired from shotgun).
- 18.4.5.4 Groups of defects that were created by the same event should be documented together as a pattern. Patterns may overlap; if possible, each pattern should be documented separately.
- 18.4.5.5 Bullet impacts and/or impact patterns may be labeled differently depending on whether they're being recorded for reconstruction or whether they're being collected as evidence.
- 18.4.5.6 For bullet impacts that are being documented for reconstruction, letter or number placards and/or stickers shall be utilized.
- 18.4.5.6.1 When a bullet perforates a surface, it is helpful to designate the difference between entrance and exit along the bullet's path. A bullet may enter and exit multiple surfaces along its path. The initial entrance could be labeled with the letter, such as F. Once it is determined that it exited, the exit hole could be labeled F2. If it enters another surface, that could be labeled F3; the next exit could be labeled F4, and so on.
- 18.4.5.7 For cartridge components that are being collected as evidence, number placards and/or stickers shall be utilized.
- 18.4.5.8 For impacts that are being documented for reconstruction, but which contain an item to be collected for evidence, both letter and number placards/stickers shall be utilized.
- 18.4.5.9 For reconstruction purposes, bullet impacts, bullet holes, cartridge/shot components, firearms, ammunition, and other related evidence shall be considered to determine the possible location of a firearm when it was discharged in a scene. Only those CSIs who have completed the shooting reconstruction section of the training manual shall be responsible for the documentation for potential reconstruction.
- 18.4.5.10 The description of the size of a bullet hole should include a measurement of the diameter in mm. Measurements should be rounded down to the nearest mm.

- 18.4.5.10.1 A scale should be used to document bullet hole size.
- 18.4.5.11 The area around the bullet hole should be described including damage to the surface, which may indicate the direction a bullet was traveling at the time of impact.
- 18.4.5.11.1 Bullets that ultimately ricochet off of a surface can leave a lead-in mark that represents the entry side of a ricochet.
- 18.4.5.12 Plugs are often mistaken as a piece of fired bullet. Using a magnet, one can discern a piece of car metal (usually steel, which will adhere to a magnet) from a bullet fragment (usually copper or lead, which will not adhere to a magnet).
- 18.4.5.13 The location of bullet strikes/holes shall be documented by taking the measurements of their locations within the crime scene.
- 18.4.5.14 Ruler tape may be used to outline areas with multiple bullet holes or defects from a grouping of projectiles (e.g. pellets from a shotgun). It may also be used to document the location up from the floor, down from the ceiling, or from any reference point utilized in the scene.
- 18.4.5.15 Other types of measuring devices, such as freestanding measuring tapes, paper/disposable measuring tape, and measuring sticks may also be utilized around areas of bullet holes.
- 18.4.5.16 Measurements made from any RP or designated surface (e.g. floor, northwest corner of room), should start at zero, and should measure to the area of interest. When outlining an area of interest, one measuring tape should be perpendicular to the ceiling or floor, and the second should be level to the ceiling or floor.
- 18.4.5.17 Sketches of areas containing bullet strikes/holes may be completed on the general crime scene sketch, or may be completed as a stand-alone sketch.
- 18.4.5.18 A cross projection sketch may be valuable to show bullet strikes/holes and/or evidence in relationship to one another on both the horizontal (e.g. floor) and vertical (e.g. wall) surfaces.
- 18.4.5.19 An elevation sketch may be valuable to show the details of bullet holes/strikes on the vertical surfaces (e.g. walls, doors) of a location.
- 18.4.5.20 A laser light or a trajectory rod, connecting two impact locations, can provide a visual representation of the bullet path.
- 18.4.5.21 Once two (or more) suitable bullet impacts have been located, photographed, documented, and possibly chemically tested, one can begin to record the angles involved. Every trajectory has a horizontal and a vertical angle.
- 18.4.5.22 When possible, the direction of travel of the bullet shall be documented.
- 18.4.5.23 Angles can be documented using a "zero-edge" 180 degree protractor, an angle finder, and a plumb bob. Angles should be documented

manually, even if measurements are being taken using a total station or similar system.

18.4.5.24 It is often helpful to draw a sketch of the top view (horizontal angle) and the side view (vertical angle) of the trajectory being measured.

18.4.5.25 Angle of impact shall be recorded.

18.4.5.25.1 Horizontal angle is the North, South, East, or West component of the shot. When facing a bullet hole surface (e.g. wall), the position to the left of the bullet defect can be assigned as zero degrees and the position to the right of the defect can be assigned as 180 degrees; this is what a protractor placed against the wall would show. Results are recorded as from left to right, as read from the protractor.

18.4.5.25.2 Zero degrees shall be documented and recorded as a whole number.

18.4.5.26 To measure the horizontal aspect, connect two impact sites with a rod and place the center of a 180-degree protractor at the base of the rod. It is always measured with the protractor parallel to the ground and level. The tip of the rod should be read against the protractor scale. While aligning the center point of the level protractor against the base of the rod, the plumb is held along the edge of the rod and the angle indicated at the intersection of the hanging plumb against the protractor is recorded as the horizontal angle.

18.4.5.26.1 Horizontal angle can also be recorded using a plumb bob to translate the positions of the base and tip of the rod onto the level ground below. Place the plumb bob at the base of the rod and let the weight drop to the ground and mark that position. Next place the plumb out toward the tip of the rod and mark that second position on the ground. Connect the two points translated onto the ground. This angle can be translated onto paper that can be labeled and saved with scene notes.

18.4.5.27 The vertical angle is the up/down component of the trajectory. Vertical angles may simply be described as "x" degrees upward or "x" degrees downward.

18.4.5.27.1 For this measurement, the protractor shall be held straight up and down (aligning with the plumb bob will help) with the zero point of the protractor at the base of the rod. For vertical measure, the protractor should be "rolled" to meet alongside the rod and the angle read directly.

18.4.5.27.2 A second and easier technique for recording the vertical angle is by placing an angle finder along the vertical aspect of

the rod and simply reading the information directly from the device.

18.4.5.28 Logos, hood ornaments, inside rearview mirror, or inside brake light are engineered to be at the centerline of a vehicle. These natural landmarks can be used as a baseline when taking measurements.

18.4.5.29 To provide external reference lines around a vehicle, the CSI should find two relatively parallel positions along one of the sides of the vehicle. A fixed measure can be marked on the ground. Connecting these points constitutes a straight baseline that represents the side of the car. Extend it beyond both ends of the car to make it complete around the car. Hang a plumb from the center of the front or back of the vehicle & mark that position. Connect the plumb position to the side baselines by extending a line all the way across the front or back of the vehicle. Use a carpenter's square to ensure the lines intersect at 90 degrees. Marking these positions on one side and one end of the vehicle can be used to reference all evidence on all sides of the vehicle.

18.4.5.30 Vehicles are mobile and may be hit from any side during the same event, so assignment of angles of trajectory can get confusing. Assign the front center of the car as zero degrees and make all trajectories based on a clockwise assignment of a 360 degree circle.

18.4.5.30.1 When describing these trajectories, it may be described as something like "the bullet that caused trajectory 'A' originated from approximately 228 degrees and was traveling downward at approximately 10 degrees".

18.4.5.31 When photographing horizontal angles, the photographer shall be positioned directly above (or below) the protractor; the camera lens shall be perpendicular to the level protractor.

18.4.5.32 When photographing vertical angles, the image should be recorded with the plumb bob in the picture and the photo taken while the camera is parallel to the rod. If the base of the rod is near the camera lens and the tip of the rod is far from the lens, distortion will result in the incorrect angle being recorded. If the angle finder is utilized, the angle readout from the device should be photographed. For the vertical angle, the photograph should be taken perpendicular to the rod itself.

18.4.5.33 A laser may be used when it's difficult/impossible to insert a rod through two points. It may be photographed by darkening the scene so that the laser light is more easily seen. A white card (e.g. latent lift card) can be held towards the camera so that the laser light hits against it, and with the shutter open, a person can walk quickly through the trajectory, highlighting the laser light.

18.4.5.33.1 In order to photograph the laser light, the camera should be mounted on the tripod.

- 18.4.5.33.2 The camera settings should be adjusted so that the exposure will be appropriate with the shutter open, using the bulb setting, or by locking down the shutter release button on the remote shutter release cord.
- 18.4.5.33.3 Depending on the distance being covered in the trajectory, the depth of field may need to be adjusted by the f-stop setting so that the entire trajectory, and the items around the scene, are all in focus.

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19.0 AM 12: Evidence Collection

19.1 Background/References

19.1.1 Methods of collection and preservation of evidence vary by type of evidence. Proper packaging is critical to preserve the physical integrity as well as to preserve its evidentiary value. Collection and preservation methods are listed in each section of this manual that addresses specific types of evidence. Types of evidence that don't have their own section in this manual shall be addressed in this section.

19.1.2 Evidence shall be maintained and stored in a secure manner that can prevent and detect tampering, alteration, loss or contamination until it is turned over to the investigating agency. Evidence shall be uniquely identified with its documentation (e.g. marker number/letter, unique description).

19.2 Scope

19.2.1 This procedure is to be used on any scenes where evidence is being collected.

19.3 Equipment

19.3.1 Different types of packaging. Equipment from the Documentation section may also be used in this procedure.

19.4 Procedure

19.4.1 Evidence markers may be used to identify items of evidence within a crime scene. The same evidence marker may not be used for multiple items within a scene, unless they are already comingled together.

19.4.1.1 If there are several cartridge cases that are very close to one another (e.g. within one to two inches), such that it would be impractical to use several markers, they may be identified using one marker. If several cartridge cases are in the same area, but are far enough that separate evidence markers can be used, then separate markers should be used.

19.4.2 Items that normally belong in a pair or set should not be packaged together unless they are found together, and even then, may be packaged separately, depending on the scene details.

19.4.3 Evidence shall be packaged in an appropriate evidence container. The container shall be sealed with evidence tape, and the CSI shall date and initial across the tape. The evidence package should be filled out with the agency's case number, a description of the item, the date collected and the evidence marker number, if used (or other marking to uniquely identify the item). Any potential hazards and/or specialized storage considerations (e.g. refrigeration or frozen storage) should be marked on the outer packaging. The chain of custody shall be signed and dated by the CSI.

19.4.3.1 If an item is too large to be placed in available packaging, areas of evidentiary value shall be protected. Non-traditional packaging materials may be utilized for very large or unusually shaped items.

19.4.4 Evidence shall be maintained and stored in a secure manner that can prevent and detect tampering, alteration, loss or contamination until it is turned over to the investigating agency. Evidence shall be uniquely identified with its documentation (e.g. marker number/letter, unique description).

19.4.5 The CSI shall establish a secure area on scene for the temporary storage of evidence following initial collection that maintains its integrity and preserves the chain of custody.

19.4.5.1 If the CSI(s) must leave the scene for a short period of time, and the scene is still under the control of the investigating agency, the evidence may remain in its temporary storage location within the scene. If a scene is being held for multiple days, and the scene is still under the control of the investigating agency, the evidence may remain in the scene.

19.4.6 Wet items/Gasses

19.4.6.1 Any item which may degrade due to prolonged exposure to moisture, such as whole or live plant evidence, clothing, or other organic material, should be dried and packaged in a breathable packaging.

19.4.6.2 Wet items may be temporarily packaged to prevent leakage or seepage until the item can be dried and repackaged for storage.

19.4.6.3 Greasy or oily items should be packaged to prevent leakage or seepage.

19.4.6.4 Gasses or liquids should be packaged in non-porous containers such as glass jars or lined paint cans to prevent evaporation or contamination.

19.4.7 Digital Evidence

19.4.7.1 Digital evidence includes cellular (cell) phones, computers, hard drives, removable drives, computer networks, digital video recorders (DVR), and other similar items containing potential digital information.

19.4.7.2 A Digital Forensic Examiner (DFE) may respond to a scene to capture digital information directly from a device. Items may also be collected for later submission for digital forensic analysis.

19.4.7.3 Cellular phones should be packaged in a signal blocking pouch (e.g. Faraday bag) as internal packaging, depending on case circumstances. If a Faraday bag is not available, the phone may be wrapped in three layers of heavy-duty aluminum foil.

19.4.7.3.1 Collection of cellular phones should include any associated external battery and/or charging cord; these items should also be in the Faraday bag or wrapped in foil.

19.4.7.3.2 Computers, including desktops, laptops, and tablets, should be assessed as to their power status prior to any collection attempt.

19.4.7.3.3 The shift key may be pressed, or the mouse may be moved to determine if the computer is powered on. If the power is on, a DFE should be present to make an assessment. If the computer is powered down, the computer, including any associated power cord, can be collected.

19.4.7.3.4 DVR systems may be powered down and collected. If the investigating agency wants to view and/or acquire video footage while the system is still on-scene, a DFE should respond to the scene.

19.4.7.3.5 Hard drives, Universal Serial Bus (USB) drives, and other memory devices may be collected following general evidence collection procedures.

19.4.7.3.6 External packaging for digital evidence should be based on their size and weight. Paper envelopes, paper bags, and cardboard boxes are most commonly used.

19.4.8 Soil Evidence

19.4.8.1 Soil evidence shall be properly documented. This may include photography, notes, and/or sketches/diagrams (as appropriate) prior to collection.

19.4.8.2 Tools for collection of soil evidence shall either be new, disposable items or non-porous tools, cleaned prior to each use to prevent contamination and/or cross contamination. Tools may include garden trowels, soil corers, pointed trowels, spoons, spades, mining picks, trays, dustpan, cardboard containers, pallet knives (used in painting) and similar tools.

19.4.8.2.1 Tools to be used for soft material (e.g. sand) can be made of plastic. For collection of harder materials, tools made of steel are recommended. Tools may be cleaned by rinsing with clean water (deionized or distilled are recommended) or with a pre-moistened wipe and dried. Alcohol, bleach, or other suitable disinfectant solutions can also be used.

19.4.8.2.2 Soil from the crime scene should be collected from a variety of relevant locations, including, but not limited to, the

surface, burial sites, areas of soil disturbance, footwear or tire impressions, and scene entry and/or exit.

19.4.8.2.2.1 The number of samples to be collected depends on the variability of soil at the scene. For areas with low variability in soil, fewer samples may be collected.

19.4.8.3 Objects that have soil evidence adhering to them (e.g. shoes, clothing, persons) should be documented and then collected intact and submitted to the laboratory.

19.4.8.3.1 If the object cannot be submitted to the laboratory, then documentation of the soil on the object shall be done prior to the soil removal.

19.4.8.3.2 Collection should be done using small tools, such as spoons, pallet knives, or tweezers. When removing soil from porous surfaces, such as upholstery, gentle scraping with a spatula or similar tool should be used.

19.4.8.3.3 The soil should be removed from the item to preserve intact aggregates, which may have layering.

19.4.8.3.4 Soil dried on a large hard surface, such as a vehicle, should be documented in place and then pried or scraped off with a flat tool onto a clean piece of paper or other clean collection package (e.g. cardboard evidence box).

19.4.8.3.5 A deceased person may have soils on or within them (e.g. fingernails, on skin, or within body cavities).

19.4.8.3.5.1 The CSI should coordinate collection of soils with the Medicolegal Death Investigator. If permitted, the soils should be collected prior to the removal of the body.

19.4.8.3.5.2 If the soil evidence cannot be collected from the body prior to its removal, then any visible soil evidence shall be documented photographically. The CSI should communicate appropriate collection and packaging methods to the Medicolegal Death Investigator during autopsy.

19.4.8.3.5.3 Soil from the body recovery location should be collected as elimination samples.

19.4.8.3.6 A living person can have soils on or within them (e.g. under fingernails, on skin or within body cavities).

19.4.8.3.6.1 If the soils are being collected by medical personnel, the CSI should communicate appropriate collection and packaging methods to medical staff. This may include swabs, wipes, tweezers, or tongue depressors to collect soils; soils may be packaged in medical specimen cups.

19.4.8.4 If there is soil at a crime scene, which appears to be foreign to the scene, it shall be documented in place prior to collection. If it is part of a footwear or tire impression, any casts shall be collected prior to collection of foreign soil material.

19.4.8.4.1 When possible, soil collection samples should be approximately 30 mL (2-3 Tbsp) per sample; the number of known soil samples to collect is case and scene dependent.

19.4.8.4.1.1 If the soil contains coarse-grained materials (e.g. gravel, pebbles, botanical content), a larger sample should be collected, approximately 64 mL (one-quarter cup).

19.4.8.4.2 Soil collected from a surface area should extend from the surface down to approximately $\frac{1}{2}$ " to $\frac{3}{4}$ "

19.4.8.4.2.1 In areas of disturbed soil, if the soil horizon in the depression has been compromised, mixed or cannot be observed, an intact depth profile can be observed by excavating a soil pit in close proximity to the original site, or by digging back the side wall to an undisturbed area. Known soil samples should be collected to represent the undisturbed soil throughout the depth of the profile and samples of the disturbed soil.

19.4.8.4.2.2 Soil collected from a sub-surface area should be made to encompass any variability present as the depth increases. Sub-surface soils should

be collected from undisturbed soil layers. The samples from each layer of soil should be collected separately. Samples should be collected at regular intervals of approximately 6"-12".

19.4.8.4.2.3 To collect a specific horizon, either place a clean pan, wide trowel, or cardboard container at the bottom of the horizon and carve the horizon onto the collection material using a rigid tool or take a core from the side wall of the soil pit.

19.4.8.4.2.4 For excavation sites on slopes, samples should be collected from, at a minimum, the upslope and downslope walls of the excavated hole. The locations sampled should be clearly described, noting the orientation of the sampled wall relative to the slope.

19.4.8.5 If a tool is collected that has soil material on it, samples shall be taken from any location associated with the scene or incident.

19.4.8.6 If tool marks are present in the soil, they shall first be documented with photography; other methods regarding tool marks should be performed as per Section 16, AM 9 of this manual. If possible, tool marks should be attempted to be excised from the scene.

19.4.8.7 Areas of disturbed soil should be cleared from top to bottom. Samples collected from soil layers should be sampled from bottom to top to minimize contamination by soil falling from upper levels. A representative sample (e.g. containing characteristics of the mixed soil) should be present; a sample should also be collected from the undisturbed soil at the same depth as the body, but adjacent to it.

19.4.8.8 Soil should be air dried at ambient temperature prior to final packaging to preserve the soil characteristics. If the soil cannot be air dried, it should be refrigerated or frozen; the external packaging should be labeled as "freeze" or "refrigerate".

19.4.8.8.1 Long handle tools may be difficult to package. The working end of the tool may be placed in a cardboard box (e.g. gun box, clean pizza box) and the handle may be wrapped in butcher paper.

19.4.8.9 If a digging tool is recovered for comparison purposes to a burial site, soil samples from the originating location of the tools should be collected as elimination samples.

19.4.8.10 Soil evidence should be packaged in rigid internal containers that can be sealed tightly and which are impervious to corrosion (e.g. screw-top plastic containers, lined paint cans). The internal rigid container should be large enough that the soil aggregate is not bent or crushed when placing it inside and any soil becomes dislodged is retained in the package.

19.4.8.10.1 External packaging may include various sizes of paper envelopes, paper sacks, and cardboard boxes. Inner packaging should be secured inside the external packaging using crushed paper or other appropriate padding material.

19.4.8.10.2 Packages containing soil should be handled minimally to protect the soil from changes or loss.

19.4.8.10.3 Known soil samples shall be packaged separately from evidence soil samples.

19.4.9 Document Evidence

19.4.9.1 Document evidence can be examined for source attribution, the presence of hidden writing, latent indented writing (e.g. blank pages), impressions, fracture matching, or alteration detection.

19.4.9.2 The original document shall be collected if available and if it can be legally seized.

19.4.9.2.1 The CSI should submit high-resolution copies or scans in place of an original document only when prior authorization from a forensic document examiner or other individual with the appropriate expertise has been granted.

19.4.9.2.2 If original writing is on a fixed surface (e.g. wall, floor) and cannot be collected, the questioned writing shall be preserved by comparison quality photography methods as per section 10, AM 3 of this manual.

19.4.9.3 Items from different suspected sources, material types, and locations shall be collected and packaged separately.

- 19.4.9.4 Document evidence shall be protected from alteration. When collecting document evidence, a CSI shall not mark the document itself, or mark the package while it contains the document. Document evidence shall not be unnecessarily folded, torn, marked, soiled, stamped, or written on. Document items shall be collected intact and in their entirety.
- 19.4.9.5 Packaging shall be of the appropriate size to avoid damage or alteration to the document.
- 19.4.9.5.1 Cardboard or a file folder should be inserted into the evidence envelope to maintain the rigidity of the packaging and to prevent any writing on the envelope from transferring to the item of the evidence.
- 19.4.9.5.2 A cardboard box may be used as outer packaging to prevent the damage and/or alteration of the evidence.
- 19.4.9.6 Document evidence can be associated with the materials or equipment used to generate the document. In those cases, it is important to collect possible materials/equipment such as writing instruments, office equipment, or paper for comparison purposes.
- 19.4.9.6.1 Documents containing existing written text may represent an individual's natural handwriting. Existing documents may include checks, business records, correspondence, diaries, etc.
- 19.4.9.7 Ink/toner cartridge evidence for writing instruments, prints, and stamp pads shall be packaged separately from any document. Padding or leak-proof packaging shall be utilized to prevent breakage or leakage. The make, model, and color of the ink/toner cartridge shall be recorded.
- 19.4.9.7.1 Ink/toner cartridges shall not be removed from the machine prior to packaging. Padding or leak-proof packaging shall be utilized to prevent breakage or leakage. Associated computers should be collected as well because of related drivers, software, and/or operating systems.
- 19.4.9.7.2 Typewriter ribbons shall not be removed from the machine.
- 19.4.9.8 Upon collection, the make, model, serial number, and information about any toner supplies and components, and machine repair and service history shall be recorded.
- 19.4.9.9 Any item used to generate or alter the document should be collected, including: paper or other document substrates; stamps, embossing, and

seal devices; document assembly items such as staplers, staples, paper clips, hole punches, envelopes, tape, and glue; documents possibly used as templates for counterfeits such as driver's licenses, social security cards, and passports.

19.4.9.10 Indented writing, typing, or other markings can occur when two or more documents are stacked, leaving indentations on the document(s) beneath. Documents that do not contain visible marks, even when using oblique lighting, can contain valuable indentation evidence and should be collected for additional laboratory processing.

19.4.9.11 Charred documents are particularly fragile and should be protected or immobilized as soon as possible to minimize damage. Charred items shall be photographed prior to movement and/or collection. All pieces of charred documents should be collected.

19.4.9.11.1 Charred items should be packaged in a rigid, flat box padded with cotton in order to immobilize and preserve the document.

19.4.9.11.2 If ignitable liquids are the priority, over the document itself, the document should be packaged in a paint can.

19.4.9.12 Wet documents are fragile and shall be handled delicately.

19.4.9.12.1 Wet documents shall be photographed prior to movement and/or collection.

19.4.9.12.2 If the document is submerged in a liquid, the CSI should contact the forensic document examiner as to how to proceed.

19.4.9.12.2.1 To dry a wet document, place the document on an absorbent surface (e.g. clean paper towel) or a surface that provides for airflow (e.g. a clean, non-metallic window-type screen). When drying documents using airflow (e.g. drying cabinet), clean paper shall be placed underneath the item to catch possible trace evidence. Trace evidence shall be retained.

19.4.9.13 Broken, cut, torn, or otherwise separated pieces (e.g. shredded paper, ripped checks, or torn typewriter ribbons) can undergo physical fit examination to determine if they were at one time a single source.

19.4.9.13.1 Handwriting, printing, surface markings, or visible defects can continue across the separated items and can be useful for association between different fragments.

19.4.9.13.2 All relevant fragments shall be collected.

19.4.9.13.2.1 To avoid further mixing, shredded paper from different locations shall not be packaged together and shall be collected within the item it is found.

19.4.9.13.2.2 When possible, collect the entire shredder.

19.4.9.13.2.2.1 To minimize damaging the fragile ends of the pieces of paper, no attempt shall be made to reassemble on scene.

19.4.10 Gunshot Residue (GSR) Evidence

19.4.10.1 Gunshot residue (GSR) is the name given to particles of barium, antimony and lead that are expelled from the barrel, the cylinder gap of revolvers, and the ejection port of a firearm when discharged.

19.4.10.2 GSR may be collected from people and surfaces using a GSR collection kit. GSR should generally precede collection of other evidence from the same area, unless more probative evidence is likely and requires prioritized collection. GSR is easily lost from hard surfaces such as painted vehicle panels, metal and glass.

19.4.10.2.1 Common areas of collection include: hands, steering wheels, commonly touched items. ISPFS does not currently test GSR.

19.4.10.3 CSIs shall follow the instructions found within the collection packaging.

19.4.10.3.1 When collecting GSR samples from a subject's hand, the samples should be taken from the entire surface, while focusing on the areas that are more likely to contain GSR based on how a firearm is designed to be held (e.g. area around thumb and index fingers). Samples should be taken from each surface until the stub surface is no longer sticky.

19.4.10.3.2 Collection stubs in GSR kits have stock labeling on them. When collecting from different locations than what is listed on the stubs, the CSI shall note the location the GSR was collected from.

19.4.10.4 Adhesive tape lifting can be used to collect samples from many dry surfaces. They can effectively collect organic GSR from skin, clothing and objects. The adhesive surface should be dabbed onto the surface until the tackiness is lost.

19.4.10.5 Swabbing can be used to sample from skin surfaces or inanimate objects. Swabs may be wet or dry. When using a wet swab to collect samples, ethanol and isopropanol are preferred.

19.4.10.6 Samples collected should be placed in an airtight container as internal packaging immediately, to reduce possible loss due to evaporation. External packaging may be an envelope or a paper bag. Samples should be stored frozen to maximize preservation.

19.4.10.7 For all GSR samples collected, the surface from which the sample was collected shall be noted. If the time elapsed between the shooting incident and the sample collection is known, it should be noted.

19.4.11 Firearms, tools, associated evidence

19.4.11.1 Each cartridge case, bullet fragment, shot cup, wad, or pellet should be packaged in its own inner evidence package (e.g. coin envelope, cardboard box). If numerous pellets are collected from the same area, they may be packaged together in the same inner evidence package.

19.4.11.2 All of the cartridges collected from a firearm may be packaged together in one evidence envelope.

19.4.11.3 Any bullet fragment thought to be contaminated with biological fluids shall be packaged in paper to facilitate drying.

19.4.11.4 Each item of firearm related evidence may be packaged individually in an evidence envelope or sack (outer packaging). The weight of the items should be considered; a cardboard box may be more appropriate to maintain the integrity of the packaging.

19.4.11.5 Firearms and tools should be secured in a cardboard box using cable ties to minimize movement in the box.

19.4.11.5.1 Cable ties should never be inserted into the barrel of a firearm.

19.4.11.5.2 If a cardboard gun box does not have labeling fields, an evidence label shall be affixed to the exterior.

19.4.11.6 If a firearm was recovered in water, it should be placed in a container of the same water from which it was recovered such that it is completely covered.

19.4.12 Biological Collection

19.4.12.1 Collection of biological evidence is often determined based on the size of the item containing the evidence.

19.4.12.1.1 If an item is small enough to be collected, the entire item should be collected.

19.4.12.1.2 If an item is large, a piece of the item may be taken (e.g. seat cushion of a chair) or an area may be removed from the item (e.g. cutting fabric from a mattress, cutting out a piece of drywall from a residence, etc.).

19.4.12.1.3 If an item or area is damaged in the collection of evidence (e.g. cutting a piece of drywall from a residence), it shall be documented in notes and with photos.

19.4.12.1.3.1 Authorization from the primary detective or investigating agency shall be obtained prior to removal; note who specifically gave authorization for those actions.

19.4.12.1.4 If collection of the item is not possible or appropriate, the item may be swabbed in order to collect the biological evidence.

19.4.12.1.5 When swabbing an item/area, appropriate water sources and swabs shall be used.

19.4.12.1.5.1 If a swab is moistened to collect a sample, water from a sterile water ampule/bottle shall be utilized.

19.4.12.1.5.2 Standard wood/plastic shaft sterile swabs shall be utilized to collect a variety of types of biological evidence.

19.4.12.1.6 After collection, standard swabs should be placed in a small coin type envelope or evidence envelope. Time should be allowed for the swab to dry. It is effective to tent the envelope to keep it somewhat open in order to facilitate swab drying.

19.4.12.1.7 When collecting a stain that is liquid, the following guidelines should be followed.

19.4.12.1.7.1 To concentrate the stain, one swab should be used for small areas and two swabs should be used for larger areas.

19.4.12.1.7.1.1 When using two swabs, they shall be collected simultaneously.

19.4.12.1.7.2 The cotton end of the swab should be placed into the liquid in order to absorb the liquid into the swab. Collect until the swab is saturated.

19.4.12.1.7.3 The swab should be dried prior to sealing.

19.4.12.1.8 When collecting a stain that is dried, the following guidelines should be followed.

19.4.12.1.8.1 The cotton end of the swab should be slightly moistened with sterile water (approximately one drop).

19.4.12.1.8.2 Do not saturate the swab. If a swab is inadvertently over-saturated, it should be discarded.

19.4.12.1.8.3 Do not touch the tip of the water ampule to the swab.

19.4.12.1.8.4 To concentrate the stain, one swab should be used for small areas and two swabs should be used for larger areas.

19.4.12.1.8.5 The swab should be held at approximately 90 degrees to the stain in order to concentrate the material onto the end/tip of the swab.

19.4.12.1.8.6 The swab should be rubbed against the stain until the stain is transferred to the swab

19.4.12.1.8.7 The swab should be dried prior to sealing.

19.4.12.1.9 Possible or potential DNA evidence refers to a likely, but not necessarily visible, deposition of DNA. This can be based on how something/someone may have touched or handled a surface.

19.4.12.1.10 When collecting potential DNA material from a person (e.g. finger swabs, penile swabs) or surface, the following guidelines should be followed.

19.4.12.1.10.1 The cotton end of the swab should be slightly moistened with sterile water (approximately one drop).

19.4.12.1.10.2 Do not saturate the swab. If a swab is inadvertently over-saturated, it should be discarded. If water is visible on the person or surface, discard.

19.4.12.1.10.2.1 Do not touch the tip of the water ampule to the swab.

19.4.12.1.10.3 To concentrate the stain, one swab should be used for small areas and two swabs should be used for larger areas. For example, a radio dial would need one swab and a steering wheel would need two swabs. When using two swabs, they shall be used simultaneously.

19.4.12.1.10.3.1 The swab should be held at approximately 90 degrees to the surface in order to concentrate the material onto the end/tip of the swab.

19.4.12.1.10.3.2 The swab should be rubbed against the surface. The swab is sufficient when the following are observed: color transfer, flattening of the cotton tip, breaking of the swab shaft.

19.4.12.1.11 When swabbing fingers, two swabs should be used for one entire hand (e.g. one set of swabs for the left hand, one set of swabs for the right hand).

19.4.12.1.11.1 Do not separate the hand into sections for collection (e.g. swabs from right index finger, swabs from right middle finger, etc.)

19.4.12.1.11.2 Extra attention should be paid when swabbing areas where potential DNA material may collect, such as under the edge of the fingernails and around the nail bed.

19.4.12.1.11.3 When collecting penile swabs, two swabs should be used for the entire genital area. Do not separate the

genitals into sections for collection (e.g. base, shaft, scrotum, etc.).

19.4.12.1.11.4 The swab should be dried prior to sealing.

19.4.12.1.12 Menstrual products may contain blood and semen. When collecting these products, the following guidelines should be followed.

19.4.12.1.12.1 If the adhesive surface of the sanitary pad is exposed, it should be affixed to a paper envelope to keep the adhesive portion from adhering to other areas of the pad.

19.4.12.1.12.2 A menstrual cup containing liquid should be absorbed with a sterile piece of gauze or sterile swabs. As a last resort, poured into a sterile sanitary pad.

19.4.12.1.12.3 All menstrual products should be dried prior to packaging.

19.4.12.1.12.4 All menstrual products should be placed in a paper envelope (inner packaging). This paper envelope should then be placed in an evidence envelope or sack (outer packaging).

19.4.12.1.13 Condoms may contain biological fluid from multiple people. When collecting condoms, the following guidelines should be followed.

19.4.12.1.13.1 The condom should be handled as minimally as possible to prevent transfer of DNA between the interior and exterior surfaces. The condom should not be turned inside out; the surfaces should remain the way they were found.

19.4.12.1.13.2 Condoms often have lubricant on their surfaces. While the biological materials may dry on the interior and exterior surfaces, the lubricant may not fully dry and can be absorbed into paper packaging.

19.4.12.1.13.3 The best practice is to store condoms frozen. If a condom cannot be frozen, it should be refrigerated. Condoms should be put into cold storage as soon as possible.

19.4.12.1.13.3.1 If cold storage is available in a reasonable time frame, the

condom may be packaged in plastic.

19.4.12.1.13.3.2 If the condom is pliable, it can be placed into a screw top plastic vial. The plastic vial should then be placed in an evidence sack.

19.4.12.1.13.3.3 A notation should be made on the exterior evidence packaging indicating the need to freeze/refrigerate the evidence.

19.4.12.1.13.4 If a condom cannot be stored in a cold environment, it should be packaged in paper.

19.4.12.1.13.4.1 The condom should be placed in a paper envelope (inner packaging). This paper envelope should then be placed in an evidence envelope or sack (outer packaging).

19.4.12.1.13.4.2 If there is concern that the liquid contents of the condom may leak out, sterile gauze or paper towels should be placed inside the condom to absorb any liquid.

20.0 AM 13: Evidence Collection from Known Sources

20.1 Background

20.1 A variety of different people may interact with the victim, suspect, or crime scene. Documentation of their condition and/or collection of evidence from their person may be critical.

19.1.2 In some cases, domestic animals may be involved in the crime. Collection of evidence from animals for genetic analysis may be necessary.

20.2 Scope

20.2.1 This procedure applies to any scene where samples from an involved person need to be obtained.

20.3 Procedure

20.3.1 A person shall be properly documented using photography and notes prior to the collection of any evidence.

20.3.1.1 Consideration for the different types of evidence that may be present should be considered prior to beginning the collection process.

20.3.1.2 Ideally, the person should be prohibited from changing their clothes or washing their body prior to evidence collection. If the person altered their clothing and/or condition, it should be noted.

20.3.1.3 When photographing a living person, identification and condition photographs should be taken.

20.3.1.3.1 Photography of living persons shall be followed per this manual.

20.3.2 Hands are often the location of different types of evidence.

20.3.2.1 If it is thought that a person may have had considerable interaction with a suspect or victim (e.g. fist fight, defensive movements), further documentation shall be made. The different type of evidence that may be present should be considered.

20.3.3 A known DNA sample aka reference sample, may be collected from a person to facilitate future DNA analysis.

20.3.3.1 Buccal swabs are collected from the inside of the mouth to obtain DNA.

20.3.3.1.1 Standard wood/plastic shaft sterile swabs shall be utilized to collect a known DNA sample.

20.3.3.1.2 The swab(s) should be allowed to dry prior to packaging.

20.3.3.1.3 If taking buccal swabs from more than one subject, gloves should be changed between collections.

20.3.3.2 Buccal swabs should be packaged in paper, both for internal and external packaging. The external packaging shall have the name of the subject from whom the buccal swabs were collected.

20.3.3.2.1 In some situations, hair needs to be obtained.

20.3.3.2.1.1 If hairs from more than one subject are being collected, gloves should be changed between collections.

20.3.3.2.1.2 Use fingers or pliers to grasp hair close to the skin and pull several hairs at once.

20.3.3.2.1.3 Package loose hairs in a paper fold or adhere to an adhesive note and then place in a paper envelope.

20.3.4 Buccal swabs and hair may be collected from domestic animals (cats and dogs) to determine their DNA profiles.

20.3.4.1 Prior to collecting, the collector shall isolate any animal(s) to be tested from other individuals and remove food and water at least 30 minutes prior to sample collection.

20.3.4.2 Buccal swabs are collected from the inside of the mouth to obtain DNA.

20.3.4.2.1 Standard wood/plastic shaft sterile swabs shall be utilized to collect a known DNA sample.

20.3.4.2.2 The swab(s) should be allowed to dry prior to packaging.

20.3.4.2.3 If taking buccal swabs from more than one subject, gloves should be changed between collections.

20.3.4.3 Buccal swabs should be packaged in paper, both for internal and external packaging. The external packaging shall have the name of the subject from whom the buccal swabs were collected.

20.3.4.4 Pulled hair with roots are the preferred DNA source for domestic mammals other than cats and dogs; cut hairs are not acceptable.

20.3.4.4.1 If hairs from more than one animal are being collected, gloves should be changed between collections.

20.3.4.4.2 Collect thick hairs such as those from the mane, tail, or fetlock (base of leg just above the hoof). The area on the animal from which the hairs are collected should be dry. If dirt or debris is present, brush the area to remove it.

20.3.4.4.3 Use fingers or pliers to grasp hair close to the skin and pull approximately ten hairs at once. Repeat this until 20-30 hairs with roots have been obtained. For pigs, five to ten hairs with roots are sufficient.

20.3.4.4.4 Package loose hairs in a paper fold or adhere to an adhesive note and then place in a paper envelope.

20.3.4.4.5 The external packaging should include identifying information from the animal from which the hairs were collected.

20.3.5 Some types of bodily fluids have very limited forensic value; vomit, urine and feces may be collected if determined to be probative.

20.3.5.1 Vomit may be collected if poisoning, ingested drug use, or an oral sexual assault is suspected.

20.3.5.1.1 Dried vomit may be collected on the source (e.g. clothing, bedding, etc), or a large sample may be swabbed or collected and placed in a plastic screw top container.

20.3.5.1.2 Wet vomit should be collected in a plastic screw top container.

20.3.5.1.3 Vomit should be stored frozen.

20.3.5.2 Fecal material generally has limited forensic biology value.

20.3.5.2.1 If DNA analysis is needed on fecal matter, then the exterior of the feces, near the "pinch" point, should be swabbed. The feces as a whole should not be collected. Swabs should be dried prior to packaging and stored frozen.

20.3.5.3 If a diaper appears to contain potentially probative blood or semen, a sample should be collected. If there is an isolated stain that may be cut or swabbed from the diaper, it may be removed to avoid contamination

and air dried. If the sample is mixed with fecal material, the diaper should be collected and dried, then stored frozen.

20.3.5.3.1 The diaper should not be rolled or folded tightly in a way that would trap moisture inside. The open diaper should be placed into a paper evidence sack; the interior sides of the front and back panels of the diaper may be in loose contact with one another.

20.3.5.4 Sexual Assault Kits shall not be collected by CSIs.

20.3.5.4.1 Sexual Assault Kits shall be collected in accordance with the "Idaho Sexual Assault Response Guidelines, Best Practices"

20.3.5.5 Fingerprint Exemplars

20.3.5.5.1 Known exemplars is a term used to describe the intentional recording of an individual's friction ridge impressions that are made for comparison purposes. Impressions may be made using a number of techniques, including, but not limited to, photography, traditional ink/cards and powder/adhesive lift methods.

20.3.5.5.2 "Major Case Prints" or "Complete Friction Ridge Exemplars" are known exemplars that generally include areas of friction ridge skin that are not represented on a standard 10-print fingerprint card.

20.3.5.5.2.1 The areas of friction ridge skin that are often recorded are: sides of fingers, sides of palms and fingertips. It may also include foot exemplars, depending on the case circumstances.

20.3.5.5.3 Only those CSIs who have completed the Friction Ridge Exemplars section of the training manual shall collect exemplars.

20.3.5.5.4 If a subject's hands are overly sweaty/dirty, they should be cleaned and dried prior to attempting to record their prints.

20.3.5.5.5 All recordings of fingerprints shall be retained.

20.3.5.5.6 Ink

20.3.5.5.6.1 If a subject's hands are dry, a small amount of lotion may be rubbed into their hands prior to attempting to record their prints.

20.3.5.5.6.2 Pre-printed cards (aka 10-print or fingerprint cards) for fingers and palms may be utilized for recording. In the absence of pre-printed cards, plain white paper may be utilized. A cylindrical object, such as a piece of pipe or cardboard tube (approximately 3" or bigger in diameter) should be utilized to obtain complete palm exemplars.

20.3.5.5.6.2.1 The fingerprint card should be placed on a flat surface when collecting fingerprints. A card stand can be used to assist with this process.

20.3.5.5.6.3 An ink pad can be used for fingers and slab ink can be used for palms.

20.3.5.5.6.3.1 When using an ink pad, the fingers should be rolled ONCE nailbed to nailbed, inking all of the friction ridge detail on the finger.

20.3.5.5.6.3.2 The CSI should not roll back and forth in the ink as this will smear the recording.

20.3.5.5.6.3.3 The CSI should roll with even pressure to avoid smearing.

20.3.5.5.6.4 Slab ink should be applied to a piece of glass using a brayer. The brayer (now with ink) should be rolled onto the hand with even pressure.

20.3.5.5.6.4.1 To apply the slab ink to glass, the CSI should squeeze out a pea sized amount onto the glass. Then roll the brayer over the ink

until it has evenly covered the glass.

20.3.5.5.6.5 Once the fingers are inked, the CSI should roll the fingers in the same way as indicated above (nailbed to nailbed), recording the fingers in the corresponding boxes on the fingerprint card.

20.3.5.5.6.5.1 The thumb impressions on the bottom of the card are intended to be fingertips. The CSI should roll the finger starting at the joint and move the finger vertically, to obtain the fingertip. Both thumbs should be recorded in their corresponding boxes.

20.3.5.5.6.5.2 The bottom left and bottom right of the fingerprint card are intended for simultaneous impressions that are not rolled but slapped. The CSI should record all four fingers together, placing them on the ink instead of rolling them. They should be recorded in their corresponding boxes.

20.3.5.5.6.6 If an amputation, deformity, or injury makes it impossible to print a finger, a notation shall be made to that effect in the individual finger block. For example, "AMP" or "TIP AMP". If a portion of the finger is not covered with a bandage, rolling the finger should be attempted.

20.3.5.5.6.7 Fingerprint cards should be packaged in an evidence envelope but can be packaged in any packaging. All fingerprint cards taken from one individual should be placed in the same exterior packaging.

20.3.5.5.6.7.1 If multiple subjects are recorded, they should be packaged in separate exterior packaging.

20.3.5.5.6.8 All exemplars shall be marked with the date, CSI's name, CSI's signature/initials and the subject's name.

20.3.5.5.6.8.1 If the subject's name is not known, it shall be noted.

20.3.5.5.6.8.2 If known, the case number should be noted.

20.3.5.5.6.8.3 It is best practice to have the subject sign the fingerprint card. If they are not able, or they refuse, it should be noted.

20.3.5.5.7 HandiPrint

20.3.5.5.7.1 "Handiprint" is a powder/adhesive lift method for recording fingerprints. This is the preferred method by ISPFS when recording fingerprints.

20.3.5.5.7.2 Adhesive lifts may be cut to size based on the area of skin being recorded. If an individual finger/area is being recorded, that finger/area shall be noted on the exemplar.

20.3.5.5.7.2.1 When adhesive lifts are cut to size, they should be placed on a clear acetate sheet no larger than 8.5 x 11 inches. If the adhesive lift is smaller, the cover may be trimmed.

20.3.5.5.7.3 Once the adhesive lifts are trimmed and ready, the hand being recorded should be brushed with black fingerprint powder.

20.3.5.5.7.3.1 The powder should be applied evenly and consistently across the area of skin, using a fiberglass brush.

20.3.5.5.7.4 The adhesive lift should then be placed carefully against the skin, avoiding any folds.

20.3.5.5.7.4.1 Once in place, even pressure should be applied to the adhesive lift in

order to ensure good contact
against all areas of the skin.

20.3.5.5.7.5 The adhesive lift should be removed in one swift motion, avoiding adhesion to itself.

20.3.5.5.7.6 A clear acetate cover shall be placed against the adhesive lift prior to packaging.

20.3.5.5.7.6.1 Once adhered to the cover, the lift/cover can be rubbed, to push out any bubbles.

20.3.5.5.7.7 Fingerprint cards should be packaged in an evidence envelope but can be packaged in any packaging. All fingerprint cards taken from one individual should be placed in the same exterior packaging.

20.3.5.5.7.7.1 If multiple subjects are recorded, they should be packaged in separate exterior packaging.

20.3.5.5.7.8 All exemplars shall be marked with the date, CSI's name, CSI's signature/initials and the subject's name.

20.3.5.5.7.8.1 If the subject's name is not known, it shall be noted.

20.3.5.5.7.8.2 If known, the case number should be noted.

20.3.5.5.7.9 It is best practice to have the subject sign the fingerprint card. If they are not able, or they refuse, it should be noted.

20.3.5.5.8 Post-Mortem Exemplars

20.3.5.5.8.1 Post-mortem exemplars may be recovered from the deceased at autopsy in the same manner as described above. However, due to injury and decomposition, traditional methods may not yield satisfactory results; casting and/or photography may be more effective.

20.3.5.5.8.1.1 Only those CSIs who are in the Latent Print Section of ISPFS shall record fingerprints via photography.

20.3.5.5.8.2 Exemplar recording shall be done with the approval of the Medicolegal Authority

20.3.5.5.8.2.1 Biometric scanning devices frequently utilized by the Medicolegal Authority for their identification purposes are not of sufficient quality to utilize for potential comparison purposes.

20.3.5.5.8.2.2 Any methodology not included in this section shall be approved by and supervised by the Medicolegal Authority. These methods include but are not limited to, severing flexor tendons and rehydration (ammonium hydroxide, sodium hydroxide and detergent).

20.3.5.5.8.3 If the body has been refrigerated, it is helpful to allow it to warm to near room temperature prior to recording exemplars as condensation may interfere.

20.3.5.5.8.4 If rigor mortis has set in, attempt to "break the rigor" by forcefully bending the joints back and forth.

20.3.5.5.8.5 Before undertaking any method of exemplar collection, the friction ridge skin shall be inspected in order to determine the best methodology to utilize. The CSI shall attempt to locate all portions of the friction ridge skin if pieces have been separated from the hands and/or feet.

20.3.5.5.8.5.1 If the fingers have begun to wrinkle due to decomposition, the CSI shall attempt to pull the skin taut while taking the recording.

20.3.5.5.8.5.2 If the skin is still too wrinkled, a plumping agent can be used. This is a commercially available post mortem injection solution.

20.3.5.5.8.5.2.1 Fill a syringe with the solution. Insert the needle just below the skin at the distal joint of the finger and into the fingerprint pattern area.

20.3.5.5.8.5.2.2 Inject the solution until the pattern is rounded out. After initial insertion, the needle should not puncture the skin. A string can be tied just above the site to prevent the solution from leaking out.

20.3.5.5.8.5.3 If the friction ridge skin has separated and is too fragile to work with, it may be cleaned, flattened under a piece of glass, and photographed.

20.3.5.5.8.5.4 Occasionally, a large portion of the outer layer of skin (i.e. epidermis) separates in the form of an "epidermal glove". If this occurs, the skin should be placed on the CSI's gloved hand and recorded in the traditional methods listed above.

20.3.5.5.8.5.4.1 It may be necessary to excise the skin from the

underlying
tissue if it is still
partially
attached.

20.3.5.5.8.5.4.2 If the epidermal
layer is no
longer available,
it may still be
possible to
obtain useable
prints by
photographing
the dermis
and/or using the
HandiPrint
method.

20.3.5.6 Tire Exemplars

20.3.5.6.1 The tire exemplar provides a record of the characteristics
present on the tire at a given time.

20.3.5.6.2 Tire impressions should record fine detail with appropriate
contrast and/or three-dimensional features of accurate size,
shape, and clarity.

20.3.5.6.3 The impression a tire leaves will be slightly different
depending on whether or not it is under load. If exemplars
are being made for purposes other than elimination, they
should include the full circumference of the tire when under
load; typically this is between six and eight feet in length.

20.3.5.6.3.1 Partial exemplars may be collected for purposes
of elimination; the CSI shall choose one of the
options below.

20.3.5.6.3.2 A photograph of the tire tread is a sufficient
elimination exemplar; a scale shall be included
in the photograph. Make and model information
about the tire and the vehicle shall be recorded.

20.3.5.6.3.3 A white adhesive lift can be used to take a tire
elimination exemplar. A large adhesive lift can
pick up residual material from a tire, providing

a good representation of a section of the tread design. Information about the tire and the vehicle shall be recorded.

20.3.5.6.4 When it is determined that the collection of tire exemplars is to be performed while processing a vehicle, the CSI should ideally seek assistance from a footwear/tire tread examiner.

20.3.5.6.4.1 It may be beneficial to provide the footwear/tire tread examiner with images of the impression and/or vehicle tires ahead of time. In some cases, the collection of full exemplars may not be necessary. This decision shall only be made by someone trained in footwear/tire tread analysis. This consultation shall be documented in the notes.

20.3.5.6.4.2 If comparison of individual characteristics is to be requested, the collection of tires is required even when tire exemplars have been collected. The conclusions of a subsequent comparison may be limited if the tires are not available for examination.

20.3.5.6.5 Equipment

20.3.5.6.5.1

Broom

Kraft paper

Duct tape

Work gloves

Scissors/utility knife

Chart board

Wet media film

Tape or chalk (for marking sidewalls)

Permanent markers

Cloth measuring tape

Method 1 equipment:

Black Printer's Ink

Clear plastic sheeting

Method 2 equipment:

Petroleum Jelly or Silicone Oil

Magnetic fingerprint powder

Magnetic fingerprint brush

Clear lacquer spray

20.3.5.6.6 Procedure

20.3.5.6.6.1 An appropriate facility/surface and several preparatory steps should be completed prior to beginning the collection of tire exemplars.

20.3.5.6.6.2 A smooth area of asphalt or concrete is sufficient and should be swept clean. The size of the area needed depends upon the vehicle and tires, but should be at least long enough to permit one full tire rotation with enough extra room to bring the vehicle to rest off of the exemplar.

20.3.5.6.6.3 Roll out enough paper to keep the tires from collecting debris while moving. Secure the paper with tape.

20.3.5.6.6.4 Clean the tires by rubbing them lightly while wearing work gloves. Cleaning should remove surface debris only. Rocks in the tread or other similar items shall be left in place.

20.3.5.6.6.5 Measure the circumference of the tire(s) of interest using a cloth measuring tape.

20.3.5.6.6.6 Measure the wheel base of the vehicle.

20.3.5.6.6.7 Mark the tire at five to six points equal distance around the tire and label them alphabetically; the tread wear indicators are ideal for creating these points. If consulting a tire tread examiner, the number of points may vary at their discretion, depending on the size and design of the tire. Document the location of the labels on the tire with enough detail (e.g. close photography) that the labels can be recreated and/or replaced at a later date. This consultation with the tire tread examiner shall be documented in the notes.

20.3.5.6.6.8 Record the information from the vehicle and tire side wall:

Make/model/year of the vehicle

Make/model of the tire

DOT number of the tire

P-metric tire size designation

Mold numbers (when possible)

20.3.5.6.6.9 Method 1-Slab Ink-Preferred Method

20.3.5.6.6.9.1 Tape sections of chart board together to achieve a length slightly longer than the tire circumference, typically four to six extra inches. If using wet media film, secure a length of film on top of one of the lengths of chart board. Repeat this step.

20.3.5.6.6.9.2 Apply a thin layer of slab ink to one set of chart board; this will act as an inking pad.

20.3.5.6.6.9.3 Tape clear plastic sheeting to the other set of chart board.

20.3.5.6.6.9.4 Line the chart boards up so that the tire is inked and then rolls over the plastic sheeting.

20.3.5.6.6.9.5 Move the vehicle in a continuous motion over the chart board, depositing an impression on the film; pushing the vehicle is preferable to driving the vehicle. As the tire rolls, mark the locations on the exemplar where the A-F labels on the tire correspond. If the tire tread indicators were not used as labels, the tire tread indicators should also be marked on the film.

20.3.5.6.6.10 Method 2-Petroleum Jelly/Silicone Oil, fingerprint powder on wet media film

20.3.5.6.6.10.1 Tape sections of chart board together to achieve a length slightly longer than the tire circumference, typically four to six extra inches. If using wet media film, secure a length of film on top of one of the lengths of chart board.

20.3.5.6.6.10.2 Using gloved hands, rub a very small amount of petroleum jelly or silicone oil to coat one or both of your hands.

20.3.5.6.6.10.3 Thoroughly rub the tread surface of the tire so that an even, thin coating is applied to the full circumference.

20.3.5.6.6.10.3.1 It is important to use only a small amount of petroleum jelly/silicone oil so that good details can be visualized.

20.3.5.6.6.10.4 Place an end of chart board (with film) just in front of the tire.

20.3.5.6.6.10.5 Drive the vehicle in a continuous motion over the chart board, depositing an impression on the film. As the tire rolls, mark the locations on the exemplar where the labels A-F correspond on the tire.

20.3.5.6.6.10.6 Develop the impression by powdering it with magnetic fingerprint powder.

20.3.5.6.6.10.7 Spray three to four coats of a fixative, such as a clear lacquer, to preserve the exemplar and allow it to dry as per the manufacturer's instructions

prior to handling or packaging. The impression can be damaged if it is touched before it is dry.

20.3.5.6.6.10.8 Mark the exemplar with pertinent case information that includes the location and orientation of the tire.

20.3.5.6.6.10.9 Repeat the process for each tire as necessary.

20.3.5.6.6.10.10 Allow the ink to dry prior to packaging; this may take overnight or longer.

20.3.5.6.6.11 Two exemplars from each tire are recommended. The exemplars should be off-set so that they do not end in the same location.

20.3.5.6.6.12 Mark the exemplars with case information that includes the location and orientation of each tire.

20.3.5.6.6.13 The following information shall be recorded on each exemplar: Case number/lab number (as applicable), date of collection, name and initials of the person collecting, location of the tire on the vehicle (e.g. driver side front, passenger rear, etc), direction of travel, where on the exemplar specific tire locations (e.g. A-F) are, direction toward the front of the vehicle, indication of the outside and inside edge of the impression (as the tire is mounted on the vehicle).

20.3.5.6.6.14 Exemplars may be rolled for packaging. They should be packaged in an evidence sack, cardboard box, or other similar packaging.

21.0 AM 14: Vehicle Processing

21.1 Background/References

21.1.1 Vehicles may hold an abundance of evidence, depending on the amount of contact the suspect and/or victim may have had with the vehicle. A vehicle should be examined thoroughly and should be treated in all aspects like a stand-alone crime scene.

21.2 Scope

21.2.1 This procedure applies to processing vehicles.

21.3 Equipment

21.3.1 Camera and camera bag

Note taking supplies

Evidence collection supplies

21.4 Procedure

21.4.1 A vehicle shall be properly documented using photography, notes, and sketches/diagrams (as appropriate) prior to searching the vehicle and collection of any evidence.

21.4.1.1 A vehicle should be photographed as outlined in the Photography section of this manual.

21.4.2 Notes should include the location and condition of seals, including the time they were broken. Vehicle descriptions shall include the year, color, make, model, license plate number, and Vehicle Identification Number (VIN); note if the VIN plate/sticker and/or license plate(s) are missing. The general condition of the vehicle and its contents should be noted.

21.4.3 Sketches/diagrams may be utilized as appropriate, depending on case circumstances. Diagrams of a variety of styles of cars, trucks, vans and sport utility vehicles are available and may be printed out and used for efficiency. Sketches may be utilized to supplement notes as appropriate.

21.4.4 Consideration should be made to document the location/position of vehicle components (e.g. driver's seat) in case its location/position is relevant to the investigation. During processing, components may be moved/altered.

21.4.5 The Vehicle Identification Number (VIN) is available on a plate affixed to the driver's side of the dashboard (near the windshield), on the edge of the driver's door, and in the engine compartment.

21.4.5.1 The VIN may also be present on vehicle registration, insurance, or other documents.

21.4.5.2 Current models of vehicles have a standard VIN of 17 characters. Vehicles manufactured prior to 1981 might have fewer characters.

21.4.5.3 The 10th character of the VIN indicates its model year.

21.4.6 A systematic approach to searching a vehicle may be accomplished by dividing the vehicle into areas based on the occupants/areas (driver, front passenger, etc).

21.4.6.1 Areas associated with the driver should be labeled as “driver”, rather than as “driver’s side” (e.g. driver’s door rather than driver side front door).

21.4.7 A strong white light may be utilized at an oblique angle in order to visualize small evidence. If a particular type of evidence being searched for would react with a different wavelength of light, an ALS may be utilized.

21.4.7.1 See the ALS section located in Section 17, AM 10 of this manual for further procedures.

21.4.8 Trace, biological stains, latent prints and GSR evidence may be present on the interior surfaces of the vehicle and/or on items found in the vehicle.

21.4.8.1 See the applicable sections in this manual for further procedures.

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22.0 AM 15: Buried Body Excavations and Scattered Human Remains

22.1 Background

- 22.1.1 Bodies that have either been buried or exposed to the environment for an extended period of time present challenges to crime scene investigation. The greater the amount of time that has elapsed since the body has been in an area, the greater the likelihood that evidence and items associated with the crime may have been dispersed. Evidence items associated with buried bodies or bodies that decompose on the surface over an extended period tend to be widely dispersed in the surrounding soil and vegetation. This demands the application of archeological techniques to locate, document, and collect the evidence and its scene context.
- 22.1.2 Care should be taken to examine the area for evidence that may help determine whether the death took place in the area, or if the death may have taken place at another location, and the body was taken to the area for disposal.
- 22.1.3 The examination of a scene containing a buried body or an outdoor skeletal recovery shall include consultation with the local Medicolegal Authority's office and should include consultation with a forensic anthropologist, anthropologist, or similarly trained expert.
- 22.1.4 At least one CSI or the Lead CSI processing a scene involving buried body excavations or scattered remains should have training in archeological techniques and methods to facilitate the thorough recovery of human remains and associated evidence, enable complete documentation, and maintain the chain of custody of evidence.
- 22.1.5 Anthropologists may be able to attend a scene or consult, give instructions for scene methodology, and/or differentiate between human and non-human bones.
- 22.1.6 Based on the scene information, the CSI should consider the possibility of a burial related to the recovery of a Native American person and burial sites of possible historical significance. Processing shall be ceased until authorization is provided.
- 22.1.7 Clandestine graves may be discovered by chance or by searching an area based on information provided by a subject. There are a number of different methodologies and tools that may be employed to attempt to detect a clandestine grave in an area.
- 22.1.8 Non-invasive techniques used to search for graves include the use of aerial/drone photography, cadaver dogs, magnetometers, ground-penetrating radar, and infrared thermography. Intrusive techniques for locating graves include the use of probes and vapor monitors. These techniques may only be utilized by trained experts.

22.2 Scope

- 22.2.1 This procedure applies to any crime scene where remains may be present.

22.3 Equipment

22.3.1 Excavation supplies (shovel, trowel)

Sifter

Note taking supplies

String

Level

Measuring tape

Collection supplies

22.4 Procedure

22.4.1 The area of a potential gravesite shall be properly documented using photography, notes, and sketches/diagrams (as appropriate) prior to searching the area and collection of any evidence.

22.4.2 Aerial photography can be done in addition to traditional crime scene photography.

22.4.3 The path in/out of the area, and the possibility of any discarded evidence along that path, shall be considered and those areas preserved.

22.4.4 The surface of the area shall be examined first. Any visible items of potential evidence shall be documented prior to excavation.

22.4.5 A grid search is often the most appropriate method to search an area involved in an excavation. A reference point (RP), or several reference points (RP's), may be established, depending on the size and elements involved in the terrain. Flags, evidence markers, or other means should be used to identify items of potential evidentiary value. If there is the possibility of more than one decedent in the grave, a numbering/labeling system should be used with unique identifiers for each element or groupings of elements within the grave.

22.4.6 A physical grid may be established over the area to be excavated. All measurements can be made to the RP's established within the grid itself. Since the grave is a three-dimensional artifact, depth shall also be documented for each discovery.

22.4.6.1 The grid should be oriented north/south and east/west as much as practical, given the scene circumstances. Stakes should be driven into the ground at the four corners of the grid.

22.4.6.2 String or flagging tape should be used to connect the four stakes and establish the outer perimeter of the grid. At least one string line shall be checked to ensure it is level; it may then be used for depth measurements to items of evidence.

- 22.4.7 Once surface finds are properly documented and collected, the site should be examined with a metal detector; any hits should be marked for further documentation and excavation; surveyor flags work well for this.
- 22.4.8 Loose debris (e.g. leaves, twigs, etc.) should be removed by hand and examined for any potential evidentiary value. Items that have scene context (e.g. sticks fashioned in a cross formation) shall be documented and preserved.
- 22.4.9 Once loose debris is removed, the ground should be reexamined for any objects or items of evidence. Ground plants should be removed by cutting them at ground level, unless a forensic botanist requests the root system to be retained.
- 22.4.10 Shovels may be used to remove topsoil in an area. Remove the soil in a shallow, horizontal motion to avoid having the end of the shovel impact anything in the grave. If any item in the grave is inadvertently struck by a shovel, it shall be documented in the notes.
- 22.4.11 The use of heavy machinery in an attempt to locate a grave should be the last option undertaken, when all other attempts to locate a grave have failed.
- 22.4.12 Heavy machinery, such as a backhoe, may be utilized to slowly scrape topsoil in layers from the area in question. If any artifact is discovered, the process shall be halted, and standard excavation techniques are utilized.
- 22.4.13 Actual excavation of the site should be undertaken in levels. General archeological protocol dictates that excavations proceed in arbitrary levels following the surface contour until an evident stratum (i.e. layer) is located (man-made or natural).
- 22.4.13.1 A stratum may be a layer of some specific type of soil, a layer with some form of particular debris, or any level in which an artifact or artifacts become exposed.
- 22.4.13.2 Once excavated and mapped, the process continues for each newly discovered stratum.
- 22.4.14 The primary tools required for excavation include trowels and brushes. Small tools are used to prevent damage to the sides of the grave and the evidence contained in the grave.
- 22.4.15 The sequence of artifacts uncovered is important, dirt should be removed in no more than 2-to-4-inch layers. If a layer of a material is less than 2 inches (e.g. 1 inch layer of gravel), then less material should be removed when excavating that stratum.
- 22.4.16 Vegetation growing through the remains should be left intact as much as possible and collected with the remains.
- 22.4.17 As the grave sides are exposed, they should be examined for evidence of tool or footwear marks.
- 22.4.18 As each artifact is discovered, it shall be properly documented using photography, notes, sketches/diagrams, and location from RP's.

- 22.4.18.1 Each object's elevation should be measured in relation to the grid RP. Elevation can be measured using a string, string level, and plumb bob.
- 22.4.18.2 A north indicator may be utilized as a reference for photography inside the grave as landmarks aren't present in the grave as they are on the surface.
- 22.4.19 Screens shall be used to examine all litter, debris, or soil removed from the excavation site. A methodology shall be established prior to excavation so that the location from which soil was taken is not lost as screen sifting is undertaken.
- 22.4.19.1 A two-level screening effort is recommended. The first screen is usually made up of 1/4 inch mesh, while the second is made up of 1/16 inch mesh. Double screening will make it more likely that small objects such as hairs, fibers, or shot pellets are located and recovered.
- 22.4.20 It is important to maintain elevation control, slowly exposing the body and collecting any artifacts.
- 22.4.20.1 Photography should be done as the body is exposed, documenting each step and the condition of the body.
- 22.4.20.2 Once the body is completely exposed, its position is documented in relation to the grid, and any associated articles found on or beside it shall be documented prior to collection. Tool and footwear impressions may be present under the body; prevent the soil from filling in the impressions or compacting any impressions.
- 22.4.20.3 Once the body is removed, excavation continues until the base of the grave is reached; at least 2 to 4 inches below the body should be excavated. The total depth of the grave shall be measured and documented.
- 22.4.21 Scattered or skeletonized remains may appear in two different ways; relatively complete in a single location or widely dispersed over a large area. Dispersal may vary greatly depending on animal activity, erosion, or flooding. Additionally, the body may have been dismembered and scattered intentionally.
- 22.4.21.1 Widely dispersed remains can be more difficult to map and document, compared to other scenes.
- 22.4.21.2 Bones found in a remote setting should first be determined to be human before beginning full scene processing; a forensic anthropologist or other appropriately trained person should make that determination. If consulting with the above personnel, it shall be documented.
- 22.4.22 A grid should be established over the primary location of remains as instructed in this procedure. The size and scope of the grid is determined by the amount of scatter.
- 22.4.23 A line search is effective when dealing with remains scattered over a large area. When searching, any obvious remains should be marked with a flag until they can be documented and collected. Once the search is done, the area should be checked with a metal detector.

22.4.24 After documenting the surface and all obvious remains, the area immediately surrounding the remains should be processed in the same way as a grave. Surface debris and plants should be removed. Document plants growing in and around the body as plant growth may help establish timelines. All items of evidence shall be documented, mapped, and collected. Once surface evidence is collected, the area beneath the remains should be troweled to a depth of at least 2 inches and the soil should be searched for artifacts.

22.4.24.1 When dealing with scattered remains, a human skeleton diagram/bone list may be utilized to keep track of which bones have been found and as a reference for the basic anatomy of human bones. Additionally, by keeping track of which bones have been found, the presence of too many bones of one type (e.g. three right femurs) immediately demonstrates the presence of more than one victim.

22.4.25 When collecting soil in the excavation process, follow the methods in Evidence Collection section of this manual.

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23.0 AM 16: Entomology

23.1 Background

23.1.1 Insect activity that takes places in, on, and around a dead body may assist a forensic entomologist in determining time since death.

23.2 Scope

23.2.1 This procedure applies to any scene where time of death is unknown and could be helpful to the investigation; or the investigating agency has requested entomology.

23.3 Equipment

23.3.1 Note taking supplies

Camera and camera bag

Collection supplies

Sticky traps

Pet food

Paper towels

23.4 Procedure

23.4.1 In the absence of a forensic entomologist on scene, CSIs can collect specimens to be sent for later analysis.

23.4.2 Each life stage should be collected for each type of insect present on and around the body.

23.4.2.1 Some life stages may not be present. Early stages may be small, later stages can be dispersed to around ten feet from the body, and, depending on the environment, may have become hidden (e.g. burrowed into soil and under carpet); this may require more extensive search.

23.4.3 Stages of specimens include: eggs, larvae, pupae, adults, empty puparia and larval skins.

23.4.4 Labels should be done in tandem; that is, one label in the container (using a pencil) and a duplicate label on the outside of the container. Labels should include case number, item number, collector name, time, date, geographical location, site of collection; and ethanol concentration for relevant samples.

23.4.5 Temperature is vital to the calculation of the time since colonization as insect development is temperature dependent.

- 23.4.5.1 To measure the temperature in a scene, CSIs have access to an infrared thermometer. This gun-style thermometer can be used to measure the surface temperature of objects or fluids.
- 23.4.5.2 For greatest accuracy, the “measurement spot” on the area being measured should be measured at an 8 to 1 ratio (at 8” from the target, the “measurement spot” would be 1” diameter).
- 23.4.5.3 For safety, the infrared thermometer should not be pointed at any person. Personnel should avoid looking at the light.
- 23.4.6 In indoor scenes, note when the first responders entered and whether they left doors open or opened windows to ventilate the scene, which can allow ingress and egress of adult insects. This may also affect the temperature in the scene.
- 23.4.7 Insect activity shall be properly documented using photography, notes, and sketches/diagrams (as appropriate) prior to searching the area and collection of any evidence specimens.
- 23.4.7.1 Photographs of insect activity should be taken, both with and without a scale, from the following areas: on the body, prior to any alteration; the surface where the body rested, after its removal; close-up images of the body and wounds; insects on and off the body.
- 23.4.7.2 Time and date the body was discovered should be noted.
- 23.4.7.3 A diagram should be made to indicate location of insect colonization.
- 23.4.8 Flies may begin laying eggs on the body within 20 minutes of death. Flies target any warm, moist areas of the body.
- 23.4.8.1 Flies lay eggs in the nostrils, eyes, mouth, or any opening that is available on the body. If eggs are present in an area that is not a natural opening to the body, it is likely the site of an injury.
- 23.4.9 Eggs develop into larvae (i.e. maggots). The maggots will be present together in a mass. When the maggots mature, they leave the body.
- 23.4.10 When the maggots leave the body, they enter the soil or other surrounding areas where they pupate, forming a hard casing from which a fly later emerges.
- 23.4.11 Pupae are usually found in drier environments, away from the maggot mass; they may be found in clothing and surrounding soil.
- 23.4.11.1 Live specimens require moisture and air, but also demand careful sealing, as adult flies can emerge from the pupae at any time.
- 23.4.11.2 Samples collected for preservation should be placed in vials of ethyl or isopropyl alcohol (70%).

23.4.12 With careful collection of both living and preserved maggots, pupae casings, and adult flies, a time of death may be determined.

23.4.13 Collection of specimens of flies should occur immediately upon discovery, as adult flies relocate quickly once the body is disturbed. Different locations on a body could be colonized at different times and by different species. Live samples collected for rearing shall not be commingled (e.g. from different life stages or collected from different locations on the body).

23.4.13.1 Half of the specimens should be preserved and the other half kept alive in order to allow them to mature.

23.4.13.2 An attempt to use the temperature gun should be exercised, to obtain a temperature of the larval mass. If this is accomplished, it shall be noted. Larvae can be collected with forceps or by using a moistened paint brush.

23.4.13.3 Live samples (approximately 20-30) should be placed in a container with moisture and a food source (e.g. dry or wet pet food and a moistened paper towel).

23.4.13.4 The same approximate number of larvae (approximately 20-30) should be collected for preservation. They should be placed in vials of ethyl or isopropyl alcohol (70%).

23.4.14 A sticky trap can be utilized to catch adult flies. Sticky traps should be labeled, inverted into a cylinder with the sticky side on the inside, ensuring not to overlap the sticky section, and placed in a sealable plastic bag. The sticky trap should be stored in a dry place or freezer.

23.4.15 Soil samples from a variety of areas, including beneath the body and at distances of approximately three to ten feet around the body, should be collected and placed in small containers. The location of collection should be noted on the container. Depending on soil compaction, the search can be as deep as 10 cm.

23.4.15.1 Notes should be taken to document the environment (indoors or outdoors) in which the insects have been living.

23.4.15.2 Note if the area is shaded or sunlit, the nature of the foliage (e.g. wooded, grassy), the weather conditions (including soil and air temperature), the thermostat setting, broken windows, open windows without screens, and the condition of the body (e.g. buried, partially buried, clothed).

23.4.15.3 Each specimen shall have a notation as to the date and time collected, the stage of development, and the specific location on the body.

23.4.15.4 Note other potential sources of insects near the decedent, as they might be either a source of the colonizing insects or a source of unrelated but confounding insects. Sources may include other carrion, decomposing food, garbage, or dirty diapers.

23.4.16 In some cases insects may not be noticed until autopsy.

23.4.16.1 If collection takes place at autopsy, determine the amount of time that the remains were refrigerated and how long the remains were at room temperature.

23.4.16.2 The temperature of the refrigerator and the examination room should be determined and the amount of time between removal from refrigeration and the sample collection should be noted.

23.4.16.3 Any ticks, lice, or fleas present on the body should be collected and placed in 70% ethanol; note whether they were alive or dead upon collection.

23.4.16.4 Note if any insect artifacts (e.g. sting or bite locations) are present on the body.

23.4.17 Entomology samples may be packaged in a variety of outer evidence containers, such as evidence sacks or boxes, depending on the size/type of vial or collection container used.

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24.0 AM 17: Fire Scenes

24.1 Background

24.1.1 Fire scenes are one of the most complex and difficult scenes to work.

Conditions of fire scenes that create difficulties include the fire damage itself, the damage to the stability of the structure, the presence of debris covering items, the addition of water and/or fire retardant, the destruction of the scene/evidence during firefighting efforts, and the fact that dark surfaces do not reflect light well.

24.2 Scope

24.2.1 This procedure applies to fire scenes.

24.3 Procedure

24.3.1 Safety should be the first concern prior to entering a fire crime scene.

24.3.1.1 Structural concerns may affect the way a CSI can move safely through the scene. Prior to entry, the scene shall be determined to be safe by the Fire Marshal or investigating fire department; a note shall be made as to who made the authorization to enter.

24.3.2 The CSI should ask the authority if the power is off prior to entering.

24.3.2.1 Inhalation of dusts and gases are a health concern on scene. In order to prevent exposure, a full face respirator with P-100 cartridges should be utilized.

24.3.2.2 If more than 72 hours has lapsed since the fire, an N95 can be used.

24.3.3 The effects of fire and of firefighting may damage the structure and items in the scene. Use caution when moving through the scene and moving items to search, as sharp objects may be present.

24.3.4 Investigations of fire crime scenes involve coordination with the fire department and/or fire investigator.

24.3.4.1 Origin and cause determinations are made by the fire investigator. They can be helpful in determining areas of focus for documentation and evidence collection.

24.3.4.2 The fire department should be consulted in order to determine how they altered the scene during their response. Their alterations shall be documented.

24.3.4.2.1 Potential alterations include: forced entry, window and wall manipulation, movement of objects such as furniture and debris.

24.3.5 Fire scenes shall be properly documented using photography, notes, and sketches/diagrams (as appropriate) prior to searching the scene and collection of any evidence.

24.3.5.1 Camera settings and/or photographic techniques should be altered to adequately photograph a scene blackened by the action of fire.

Adjustments should be made to increase the amount of light gathered while the shutter is open, which can be accomplished through changes to the ISO, shutter speed, and f-stop in the camera, or by the use of additional lighting techniques.

24.3.6 Fire patterns leave effects in the scene which may be crucial to origin and cause analysis. While CSIs may not be familiar with fire patterns, depending on their training and experience, they should document any patterns relevant to the investigation of the scene.

24.3.6.1 Fire patterns include char patterns, smoke and soot patterns, and damage patterns.

24.3.7 Fire signs may present themselves as a surface effect, such as bubbling of paint on a wall or the directional melting of glass in a light bulb.

24.3.8 When working in a fire scene, it may be helpful to begin working in areas with the least amount of damage and move toward areas with greater amounts of damage. This can give the CSI a better understanding of the condition of the scene prior to the fire.

24.3.9 The evidentiary value of physical evidence in the fire scene may not be known until at or near the end of the fire scene examination. As such, the entire fire scene should be considered potential physical evidence and should be protected and preserved.

24.3.10 Evidence from fire scenes often include burnt fire debris and liquids. Other items to consider: clothing, containers or items of ignitable liquids.

24.3.11 The position of knobs and switches on any equipment, appliances, or utility services may be an important element in the investigation. It is also important to note ventilation (windows/ doors). These shall be documented in notes and via photography.

24.3.12 For scenes in which an accelerant is thought to have been used, an area of substrate that was not affected by the accelerant should be collected separately as a control.

24.3.12.1 When collecting evidence from a fire scene, any tools that are used should be cleaned with water between collecting items. The use of an alcohol based cleaner could affect the analysis of the item.

24.3.12.2 To help decrease contamination, the lid of a friction lid can could be used to help scoop/collect the evidence into the can.

24.3.13 Fire scene evidence shall be packaged in clean, airtight containers.

24.3.13.1 Debris samples and clothing should be packaged in either a lined friction lid can, a glass jar, or a heat-sealable polyethylene or nylon bag that is designed for use with fire evidence.

24.3.13.2 Friction lid cans should not be filled more than 2/3 full.

24.3.13.3 The groove at the top of the can should be free of debris prior to attaching the lid.

24.3.13.4 The lids of friction lid cans shall be hammered down tightly, but not with such force as to damage/buckle the can itself.

24.3.13.5 If packing materials are to be used inside the can, the evidentiary item should first be placed in a paper sack before being placed inside the can. Alternatively, the packing materials could be placed inside a paper sack, then placed around the item of evidence. By doing this, small items or fragments of items won't get lost amongst the packing materials.

24.3.14 Glass vials shall be used for liquids suspected of being or containing an ignitable liquid. The glass vial should be packaged in a friction lid can with adsorbent material to prevent the contents of the vial from contaminating adjacent samples and to protect the vial from damage/preserve the sample in case of breakage.

24.3.14.1 Glass vials should not be filled more than 2/3 full.

24.3.14.2 External packaging may include paper sacks and cardboard boxes.

24.3.14.2.1 Friction lid cans may be sealed, labeled, and submitted without placing the can inside additional packaging.

24.3.15 For all evidence that requires special storage considerations, the external packaging should have the storage medium noticeably written (e.g. "freeze", "refrigerate") in bold print.

24.3.15.1 Fire evidence should be stored under refrigeration until analysis.

24.3.15.1.1 Fire evidence thought to contain substrate materials likely to contribute to the degradation of petroleum products such as manure, vegetation, and/or soil, should be frozen until analysis.

24.3.16 Once cleared and scene processing is done, the CSI should shower within one hour.

25.0 AM 18: Field Services requests in the laboratory

- 25.1 There may be instances in which a field services action would be better accomplished in the laboratory. This most likely would take place when an action could be taken on scene, but is elected to be done in a laboratory setting to minimize loss or contamination to item(s) of evidence. These types of actions would be outside the scope of an already existing discipline in ISPFS.
- 25.2 Any item to be submitted for a field services request shall be submitted by the agency to ISPFS in the same manner as any other item of evidence for processing.
- 25.3 All of the methods outlined in this manual shall be followed, regardless of the processing taking place in the laboratory.

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26.0 AM 19: Report Writing

26.1 Background

26.1.1 Crime scene documentation and report writing shall be according to the ISPFS Quality Manual.

26.2 Scope

26.2.1 This procedure applies to all reports written in ILIMS as a Field Services assignment.

26.3 Equipment

26.3 N/A

26.3 Procedure

26.3.1 Reports shall be entered in the Field Services matrix of the case assignment in the ILIMS system.

26.3.1.1 An assignment shall be created with the "Section" selected as "Field Services"; the "Task Type" shall be selected as "Field Services". The Case File should be assigned to the CSI who will be writing the report, unless there is associated evidence (e.g. Digital Media) associated with the Field Services response.

26.3.1.2 In the "Scene Personnel" panel, a separate entry shall be made for each CSI, for each response date. In each entry, the total travel time, total time on scene, and number of locations shall be entered.

26.3.1.3 In the "General Crime Scene" panel, a separate entry may be made for each response event or location. Only the pertinent fields shall be entered in this panel, based on the processing conducted. If three vehicles were processed at a department's garage, it may make sense to create an entry for each vehicle. If the information can be sufficiently conveyed in one entry, without confusion, then only one entry may suffice.

26.3.1.4 In the "Autopsy Services" panel, a separate entry shall be made for each decedent. Enter the pertinent fields based on the quantity of each item that was collected at autopsy.

26.3.1.5 In the "Subject Exemplars" panel, list the quantity for each type of exemplar collected from a person.

26.3.1.6 In the "General Notes" panel, additional information may be added to the notes for the case.

26.3.1.7 In the "Report" panel, the case narrative is entered. There is a limit on the number of available characters per entry, so multiple entries may have to be made in order to write a long report.

26.3.1.8 In the "Verification of Accompanying Personnel" panel, there are three entries to be made. Each accompanying CSI shall fill out a verification panel. After reviewing the content of the notes and report, any suggested changes or corrections should be entered in the "Notes from Accompanying Responder" field. Once the corrections have been

completed, the accompanying CSI shall fill in the "Information Verified" field (password entry required) and the date field.

26.3.1.9 Once all accompanying personnel have verified the content of the report, it can be sent for technical review.

26.3.1.10 Reports should be as clear and concise as possible, but shall include enough detail to adequately describe the scene, evidence, and activities performed. The reader should be able to clearly understand the scene from the report, without having to reference photographs or sketches.

26.3.1.11 Reports shall be written in the first person and shall be in an active voice. If multiple people performed tasks, the report shall indicate which people performed which tasks. Only the tasks performed by ISPFs personnel shall be included in the report.

26.3.1.12 All time notations shall be in military time and shall include the time zone abbreviation (e.g. MT, PT). If the time changes between standard and daylight savings time while out on a crime scene, make note of the time change and add a notation for which times fall into which time designation (e.g. MST/MDT, PST/PDT).

26.3.1.13 Reports shall not contain any information that is not represented in the crime scene notes, which includes the crime scene sketch.

26.3.1.14 Reports do not need to be broken down into sections with headings, unless the report is so complicated that the additions of section headings would help the reader to better understand the report.

26.3.1.14.1 If headings are used, recommended headings would be "Scene Description", "Victim(s)", "Evidence", and "Scene Activities".

26.3.1.15 Reports should be organized in the following order, including only those sections and information relevant to the activities performed:

26.3.1.15.1 Basic scene and response information, including date, time, names of CSIs responding to the scene, location, type of investigation, personnel who were present at the scene, how the scene was secured, and/or environmental conditions.

26.3.1.15.2 Description of vehicles, buildings, and other scenes

26.3.1.15.2.1 Vehicle descriptions should include the year, color, make, model, license plate number, and Vehicle Identification Number (VIN). The vehicle's location and the condition of any seals shall be reported, including the time the seals were broken. The general condition of the vehicle and its contents shall be reported.

26.3.1.15.2.2 Building descriptions shall include the type of building, the number of stories, the direction it faces, the type of location, and

the number and types of rooms contained therein. The general condition of the building and rooms of importance shall be reported. Specifically report any damage that may be pertinent to point of entry or exit.

26.3.1.15.2.3 Other types of scenes shall be described using cardinal directions referenced from a landmark or location or described generally, including GPS coordinates.

26.3.1.15.3 Description of rooms of importance

26.3.1.15.4 Starting with the doorway to the room, moving around the room (either clockwise or counterclockwise), describe the furniture and items in the room, including structures. For fixed items, like doors and windows, use *present tense* to describe. For items that are moveable, use *past tense* to describe, as the report only indicates their location at the time you were on scene.

26.3.1.15.4 Description of Victim(s)

26.3.1.15.4.1 Describe the body's position in the scene. Describe all clothing, visible jewelry, and accessories. Report the location of any visible injuries and the presence of apparent blood or other fluids, if present.

26.3.1.15.5 Description of items of evidence in the scene

26.3.1.15.5.1 Describe the item of evidence sufficiently that it can be distinguished from other similar items of evidence. Use serial numbers or identifying numbers, brands, or labels, as applicable. Include evidence markers with descriptions.

26.3.1.15.5.2 If the investigating agency assigns their own item number to an item of evidence, that number may be included so that the items can be easily correlated with that agency's reports.

26.3.1.15.6 Scene Activities

26.3.1.15.6.1 Photography

26.3.1.15.6.1.1 Include a general statement that the scene or vehicle was photographed for overall location,

identification, and condition, including who captured the photos.

26.3.1.15.6.1.2 If any persons were photographed, report that they were photographed for overall identification and condition. If there is something specifically photographed that is pertinent to the investigation, it should be specifically included in the report.

26.3.1.15.6.1.3 If any photographs are taken of fingerprints, footwear, tire tracks, or tool marks, include that comparison quality photographs were taken of that evidence, and from what location(s) in the scene.

26.3.1.15.7 Presumptive Test for Blood

26.3.1.15.7.1 All items and areas that were tested shall be reported. If there are a small number of items, they may be listed individually. If there are a large number of items, they may be grouped to indicate a number of items from a particular location within the scene.

26.3.1.15.7.2 Positive results shall be reported by individual items, if there were few items, or by quantity and location, if there were numerous items.

26.3.1.15.7.2.1 Positive results shall use the term “indicating” in regards to the presence of blood.

26.3.1.15.7.3 Negative results shall either be reported indicating that for all

other items tested, blood was not detected, or that for specific items/areas, blood was not detected.

26.3.1.15.7.4 The name of the CSI(s) who conducted the testing shall be included in the report.

26.3.1.15.8 ALS

26.3.1.15.8.1 The CSI should describe in the report the item/location the ALS was used. This shall include who operated the ALS and the results of this examination.

26.3.1.15.9 Latent Print Processing

26.3.1.15.9.1 The CSI should describe in the report the item/location latent print processing was done, which process was done, the results of this process and who did the processing.

26.3.1.15.9.2 If comparison quality photographs were taken, a statement indicating that this was done and that comparisons need to be requested, shall be included in the report.

26.3.1.15.10 Evidence Collection

26.3.1.15.10.1 Each item of evidence that is collected from the scene shall be listed in the report.

26.3.1.15.10.2 If multiples of the same type of evidence were collected (e.g. swabs, adhesive lifts, latent lift cards, etc.), they may be grouped to indicate the number of items from a particular location within the scene.

26.3.1.15.10.3 If the location of a particular piece of evidence is significant, its

measurement to a reference point shall be included in the report.

26.3.1.15.10.4 The report shall include to whom the evidence was turned over, their agency, the time and the date.

26.3.1.15.11 Final Notes

26.3.1.15.11.1 Report the time that you cleared the scene.

26.3.1.15.11.2 If digital images were transferred to the investigating agency, report to whom the images were transferred to, their agency, the time and the date.

26.3.1.15.9.11.1 If a CD/DVD/thumb drive of images was made for the agency, indicate which type of media was used, to whom it was delivered/sent/left for, and on what date.

26.3.1.15.11.3 Note that all digital images were uploaded to the digital imaging system.

26.3.1.16 The following are basic report writing examples; actual reports may vary based on case circumstances and/or situations. There may be situations that do not fit the examples given and wording shall be developed as the need arises. (Blanks and items in parentheses indicate a choice or description should be entered).

Basic Scene Information

On (date), (other CSI title/name and) I responded to (location – address, city, county, Idaho) to assist with a (type) investigation. (People/agency) were present upon my arrival and the scene was (cordoned off with crime scene tape/secure). The weather was _____ and the temperature was approximately _____ degrees F.

Description of Scene- Vehicle

Vehicle 1 (V1) is a (year) (color) (make) (model), (license plate state/number), VIN: (17 characters, tenth character is vehicle year). V1 was located at (location) and (each door/trunk/hood) was sealed upon my arrival; I broke the seals at (time).

Description of Scene- Building

(Location) is (single/two/three) story home that faces (direction) in a residential neighborhood. The house consists of (number and type of rooms).

(Location) is a(n) (apartment/condominium) that faces (direction) in a multi-unit complex.

(Location) is a commercial building that faces (direction). The building consists of (number and type of rooms).

Description of Scene- Other

...an undeveloped area (direction) of (landmark, location).

...a (desert/wooded/etc.) area at (GPS coordinates).

Description of Rooms of Importance

The door to the master/primary/main bedroom is in the northeast corner of the room. South of the doorway, on the east wall, there is a closet door and the door to the master bathroom. There are two windows on the south wall. A freestanding mirror was in the southeast corner of the room, south of the bathroom door. A bed was against the west wall, extending eastward into the room. A nightstand with a lamp (powered on) was against the west wall, north of the bed.

Description of Body

The victim, tentatively identified as (First Last) was lying on the floor, north of the bed, with his head to the west and his feet to the east. His head was turned so that the right side of his face was against the floor. His right arm was bent at the elbow, his right hand resting palm side up, next to his right hip. His left arm was straight at his left side. His right leg was straight, and his left leg was bent slightly at the hip and the knee. The victim was wearing a dark blue hooded sweatshirt, blue jeans with a black belt, gray socks, and gray athletic shoes. A gold-colored chain was visible around his neck. There was an area of apparent blood on the left side of his mouth and on his right hand, at the base of his thumb.

The victim, an unidentified (female/male)...

Description of Items of Evidence in the Scene

In the master/primary/main bedroom, there was a Glock G43 semi-automatic handgun (SN ABC123) on the nightstand (Marker 4/ PPD Item 2), a box of ammunition on the floor (Marker 5), and one cartridge case on the floor (Marker 6). Swabs of apparent blood were collected from the closet door exterior handle (Marker 12), closet door frame (Marker 13), and baseboard south of closet (Marker 14).

Photography

I photographed the (scene/vehicle) for overall location, identification, and condition.

I photographed the (victim/suspect) for overall identification and condition.

I took comparison quality photographs of (footwear/tire track/fingerprints) from (location in scene)

FS _____ photographed the (exterior, interior) of the scene using the LizQ imaging system.

Presumptive Test for Blood

I/CSI name performed a presumptive test for the presence of blood on (number) items from (locations). Positive results, indicating the presence of blood, were obtained on (number) stains from (locations). Blood was not detected on the other items tested. Swabs were collected from (locations).

Results from presumptive chemicals tests for the presence of blood were (negative/inconclusive) for (locations).

ALS examination

I/CSI name performed an ALS examination using (list ALS used) on (item/location). I observed (fluorescence or absorbance), indicating (possible body fluids or blood).

Latent Print Processing

(Items/Areas) were processed for latent prints.

Comparison quality photographs were taken of latent prints (labels) by (CSI name).

Latent prints (labels) were developed on (items/areas); all other areas processed either contained insufficient ridge detail or had no ridge detail developed.

Evidence Collection

I collected twelve latent lifts: four from exterior of the window east of the front door, six from the master bedroom, and two from the kitchen. I collected three (gel lifts) of footwear impressions (Markers A-C) from the floor east of the front door of the residence.

Evidence (items) was/were collected by (CSI).

All evidence collected was turned over to (person/agency) at (date/time).

Final Notes

I cleared the scene at (time).

I transferred digital images to (person/agency) on (date).

I uploaded all digital images to the digital imaging system and provided a (CD/DVD) of the images to (person/agency) on (date).

27.0 AM 20: Review

27.1 Background

27.1.1 Technical and Administrative reviews shall be conducted in accordance with the ISPFS Quality/Procedure Manual.

27.2 Scope

27.2.1 This applies to any report written for the Field Services section.

27.3 Equipment

27.3.1 N/A

27.4 Procedure

27.4.1 Reports shall be written as outlined in Section 26, AM 19 of this manual.

27.4.1.1 One report should be written that represents the work of all the CSIs who responded to a scene or series of scenes.

27.4.1.2 If CSIs respond to multiple locations, process multiple vehicles, and/or document multiple people in the course of one crime scene response, all of the responses may be included in one report.

27.4.1.3 If the crime scene response is conducted over several consecutive days, one report may be written.

27.4.1.4 If additional requests for further crime scene assistance are received at a later date, a separate report should be written for each subsequent response.

27.4.2 Each CSI shall review the content of the notes and the report prior to the report being considered for review.

27.4.2.1 Each CSI shall initial each page of the physical notes packet. Notes pages generated in ILIMS will only bear the initials of the CSI writing the report.

27.4.2.2 Each CSI shall verify the content of the report, indicate the need for any corrections and/or changes, and sign and date the Verification of Accompanying Personnel panel in the ILIMS matrix.

27.4.2.3 Only those CSIs who attended the scene and contributed should verify the content and initial the notes. CSIs that attended the scene for training do not need to verify and initial.

27.4.3 Review shall not be completed by one of the CSIs who responded to the scene.

Only those CSIs who have completed the Review section of the training manual can complete report reviews.

27.4.4 The information in the matrix regarding scene personnel, actions taken, tests performed, etc. shall be consistent with the information contained in the field notes.

27.4.5 Any information present in the report shall be contained in the notes, including sketches.

27.4.5.1 Identifying numbers, including marker numbers, serial numbers, license plate numbers, etc. should be checked for omissions and/or transpositions.

27.4.5.2 Any direction indications should be checked against sketches.

27.4.5.3 For any presumptive tests that were conducted, results should be clearly indicated in the report. The report shall also clearly state who performed the presumptive test(s).

27.4.6 Administrative documentation for the case should be attached in the Case info tab in ILIMS.

27.4.6.1 Copies of search warrants and/or consent forms shall be attached in the Case Info tab in ILIMS.

27.4.6.2 During review, entries made in the notes, the matrix, and the report shall be checked by the reviewer for spelling, grammar, and content. Any corrections shall be sent back to the reporting analyst and shall be changed to be in compliance with this manual.

27.4.6.2.1 If unable to review in the ILIMS rejection field, any documentation made in regards to the review, shall be placed in the Case Info tab of ILIMS.

27.4.7 All photographs taken at the crime scene (excluding LizQ) shall be uploaded to the digital imaging system.

27.4.8 Information may be entered in the description field; it may contain date, location, or other pertinent information related to the images.

27.4.9 A disposition statement shall be included in the report that digital images are being retained by ISPFS.