DRUG ENFORCEMENT ADMINISTRATION

LABORATORY OPERATIONS MANUAL
EXAMINATION OF FRICTION RIDGE EVIDENCE
7700

Contents

“7701 QUALITY ASSURANCE

7701.1 Scope

The quality assurance program for the friction ridge program includes**:**

A. Testing proficiency

B. Peer review

C. Validating techniques and procedures

D. Maintaining equipment

7701.2 Definitions

A. Terminology used in 7700 is defined in Exhibit 1/7701 Examination Friction Ridge Definitions.

B. Symbols, acronyms, and abbreviations within 7700 are defined in Exhibit 2/7701 Symbols, Acronyms, and Abbreviations.

C. Policy statements within 7700 are mandatory requirements, and the word “must” is to be presumed, except as noted below:

1. The word “should” within a statement signifies a best-practice or recommendation.
2. The word “may” in a statement provides permission that does not require additional authorization.
3. The phrase “may not” and the word “cannot” are prohibitive language intended to clarify that an action is impermissible.

NOTE: Unless expressly prohibited elsewhere in 7700, the Laboratory Director (LD) may request exemptions to policies and procedures from Office of Forensic Sciences (SF).

7702 PERFORMANCE MONITORING

The Proficiency Testing Program (PTP) is comprised of two components:

A. Friction Ridge Comparison (See 7702.1)

B. Friction Ridge Processing (See 7702.2)

7702.1 Friction Ridge Comparison Proficiency Test

7702.1.1 Responsibilities

The LD or designee:

A. Ensures each Friction Ridge Examiner (FRE) and Friction Ridge Supervisor (FRS) completes at least one friction ridge comparison proficiency test each fiscal year.

B. Orders one Friction Ridge Comparison Examination test for each FRE and FRS.

NOTE 1: One Friction Ridge Comparison Examination test is assigned to satisfy the external proficiency test program (EPTP) requirement per laboratory.

NOTE 2: Remaining Friction Ridge Comparison Examination tests are assigned to all FREs for examination and internal review.

C. Ensures the Friction Ridge Comparison Examination tests are to be returned within the established time limits to satisfy EPTP requirements.

7702.1.2 Procedures

A. The Laboratory Quality Assurance Manager (LQAM) in coordination with the Friction Ridge Associate Laboratory Director (ALD):

1. Assigns the comparison proficiency test to FREs and FRSs on a rotating basis to meet Drug Enforcement Administrative (DEA) and test provider requirements.
2. Downloads all test materials from the external provider website.
3. Prepares one Digital Versatile Disc (DVD) per FRE and FRS containing the images from the external provider website.
4. Seals each DVD into a labeled Plastic Sealed Evidence Envelope (PSEE).
5. Distributes the comparison proficiency tests.
6. Prepares a Receipt for Cash or Other Items (DEA-12) form for each comparison proficiency test to be forwarded to the receiving laboratories.
7. Submits the DEA-12, external provider data sheets, and PSEE to the evidence vault or uses registered mail (return receipt requested), or an approved commercial carrier to transfer the exhibit to the receiving laboratories.
8. Informs the FRSs that the comparison proficiency tests have been distributed to FREs.

B. The FRS or Friction Ridge ALD:

1. Assigns the comparison proficiency test to the FRE and FRS in Laboratory Information Management System (LIMS).

C. The FRE or FRS:

1. Retrieves the comparison proficiency test from the evidence vault.
2. Saves all images from the external comparison proficiency test and notes (e.g. handwritten notes and fingerprint charts) into the digital imaging system under the assigned LIMS number.
3. Completes Friction Ridge Details Report (FRDR) DEA-466, Friction Ridge Matrix Report (FRMR) (DEA-466b), and Friction Ridge Examination Report (FRER) (DEA-111) in LIMS.
4. Attaches the completed external provider data sheets in LIMS Case Management, Case Attachments –Friction Ridge Attachments.
5. Returns the external comparison proficiency test back to the evidence vault.

D. The FRS or Proficiency Tested FRE:

1. Conducts all verifications, technical and administrative reviews on all comparison proficiency tests.
2. Reviews the external provider data sheets and documentation associated with the comparison proficiency test for any discrepancies.
3. Brings any discrepancies to the attention of the LQAM and Friction Ridge ALD.
4. Discusses any difference of opinion with the FRE or FRS if an agreement 'cannot" be reached, refers to Conflict Resolution. (See 7717.4)
5. Submits all completed external provider data sheets to the LQAM or designee.

E. The LQAM or designee:

1. Returns the selected external provider data sheets within the established time limits to satisfy EPTP requirements.
2. Authorizes the test provider to release the results for the selected FRE or FRS to the accrediting body.
3. Forwards a complete report of examination for each exhibit to SF once results are returned to the test provider.
4. Maintains all completed comparison proficiency data sheets and documentation at the laboratory for an accreditation cycle.

F. The SF Quality Assurance Manager (SFQAM) or designee:

1. Authorizes the destruction of external and internal comparison proficiency tests through the quarterly PTP report.
2. Monitors the results of analysis and notifies the Friction Ridge ALD and LQAMs of potential inconsistencies. (See Laboratory Operations Manual (LOM 7100)

7702.2 Friction Ridge Processing Proficiency Test

7702.2.1 Procedures

A. The LD or designee:

1. Ensures each FRE completes at least one friction ridge processing test during each accreditation cycle.
2. Orders one Friction Ridge Processing Examination test for each FRE.

NOTE 1: One Friction Ridge Processing Examination test is assigned to satisfy the external proficiency test program (EPTP) requirement per laboratory.

NOTE 2: Remaining Friction Ridge Processing Examination tests are assigned to all FREs for examination and internal review.

B. The LQAM or Friction Ridge ALD:

1. Assigns the processing proficiency test to FREs on a rotating basis to meet Drug Enforcement Administrative (DEA) and test provider requirements.

C. The FRE:

1. Receives the assigned processing proficiency test from the evidence vault and completes the LIMS tests listed below:
    a. Description of Evidence
    b. Fingerprint Examination
    c. Evidence Disposition
2. Prints out or creates a .pdf of the FRDR.
3. Selects "Examiner Report Not Needed" in LIMS Examiner Report.
4. Returns the evidence container to the evidence vault.
5. Submits the completed external provider data sheets and the FRDR to the FRS.

D. The FRS:

1. Reviews the external provider data sheets and FRDR associated with the proficiency test for any discrepancies.
2. Brings any discrepancies to the attention of the LQAM or designee.
3. Submits all completed external provider data sheets and FRDR to the LQAM or designee.

E. The LQAM or designee:

1. Returns the selected external provider data sheets within the established time limits to satisfy EPTP requirements.
2. Authorizes the test provider to release the results to the accrediting body.
3. Forwards a complete report of examination to SF once results are returned to the test provider.
4. Maintains all completed processing proficiency data sheets and documentation at the laboratory for an accreditation cycle.

F. The SFQAM or designee:

1. Authorizes the destruction of external, internal comparison, and processing proficiency tests through the quarterly PTP report.
2. Monitors the results of analysis and notifies the LQAMs of potential inconsistencies. (See LOM 7100).

7702.3 Individual Characteristic Database AFIS Monitoring

A. Reviewing FRE/FRS performing observations must have been competency tested to perform the work being reviewed and qualified to conduct audits. (See LOM 7105.1)

B. One observation of an AFIS search per laboratory per accreditation cycle.

C. The Reviewing FRE/FRS:

1. Completes the Individual Characteristics Database (ICD) Performance Monitoring Form. (See Office of Forensic Sciences Document Control Center (SFDCC))
2. Submits completed ICD Performance Monitoring Form to the LQAM or designee.

D. The FRE signs the ICD Performance Monitoring Form acknowledging the observation review.

E. The LQAM or designee signs the ICD Performance Monitoring Form and maintains it with the proficiency test records.

7703 PEER REVIEW OF FRICTION RIDGE EXAMINER EXAMINATIONS

7703.1 General Requirements

A. A minimum of six peer reviews for each FRE and FRS per fiscal year will be conducted from each of the following categories:

1. Processing
2. Analysis/Comparison

B. A minimum of two peer reviews for each FRE and FRS per fiscal year will be conducted on Automated Fingerprint Identification System (AFIS).

C. A minimum of six additional FRS processing reviews will be conducted for each FRE per fiscal year.

D. One performance monitoring review to be conducted by a qualified FRE or FRS on conducting an AFIS search and the results per laboratory per accreditation cycle.

NOTE 1: FRSs not conducting routine friction ridge examinations will not be held to minimum requirements from each of the categories.

NOTE 2: Peer reviews will be conducted on all FRS exhibits if the minimum requirements cannot be met in the fiscal year.

7703.2 Responsibilities

A. The FRS:

1. Assigns peer reviews to each FRE.
2. Processing Peer Reviews are to be assigned at the time the exhibit is assigned to the FRE for processing.
3. Comparison and AFIS Peer Reviews are to be assigned after the technical review and before the administrative review is conducted on the FRER.
4. Conducts peer review examinations (processing, comparison, and AFIS) when there are no FREs available.

5. Conducts six (at a minimum) processing reviews for each FRE per fiscal year.
6. Conducts peer reviews in accordance with 7703.3.
7. Refers to Conflict Resolution if a difference of opinion cannot be resolved. (See 7717.4)
8. Forwards the completed Friction Ridge Peer Review Form to the Quality Assurance Specialist (QAS).

B. The reviewing FRE:

1. Conducts peer reviews in accordance with 7703.3.
2. Refers to Conflict Resolution if a difference of opinion cannot be resolved. (See 7717.4)
3. Forwards the completed Friction Ridge Peer Review Form to the FRS. (See SFDCC)

C. The QAS maintains the Friction Ridge Peer Review Form files for an accreditation cycle

7703.3 Conducting Peer Reviews

7703.3.1 Processing Reviews

The reviewing FRE/FRS:

A. Verifies proper processing techniques were applied.

B. Examines the evidence after each processing step.

C. Examines the test print after each step to confirm reagent and equipment are working properly.

D. Reviews the FRDR.

E. Verifies all potential comparable friction ridge prints developed on the evidence were preserved.

F. Completes the LIMS Friction Ridge Case Peer Review – Processing form. (See SFDCC)

7703.3.2 Analysis/Comparison Reviews

The reviewing FRE/FRS:

A. Re-evaluates suitability for all comparable friction ridge prints that were preserved.

B. Evaluates and verifies all comparisons (source exclusions and inconclusive).

C. Reviews the DEA-466 for documentation of impression type, comparison result(s), identification(s), verification(s), identifier initials, verifier name, and dates.

D. Completes the LIMS Friction Ridge Case Peer Review – Comparison form. (See SFDCC)

7703.3.3 Automated Fingerprint Identification Systems Reviews

The reviewing FRE/FRS:

A. Reviews all AFIS search documentation.

B. Conducts a re-comparison of all images from the candidate list.

C. Reviews the DEA-466b for documentation of AFIS searches and results.

D. Reviews AFIS generated documentation. (See 7716)

E. Completes the LIMS Friction Ridge Case Peer Review – AFIS form. (See SFDCC)

7703.3.4 Single Image Review

If only one area of friction ridge detail has been captured (preserved) and not identified in the exhibit, it will be reviewed by the technical reviewer. The Technical Reviewer:

A. Completes the Single Image Review Form. (See SFDCC)

B. Attaches the Single Image Review Form (PDF format) into LIMS Case Management, Case Attachments - Fingerprint Attachments.

C. Resolves differences in technical opinions through the Conflict Resolution process. (See 7717.4)

7704 VALIDATING AND VERIFYING FRICTION RIDGE DEVELOPMENT TECHNIQUES AND PROCEDURES

A. Method validation is required for the following:

1. Implementation of a newly developed or externally published, but non-validated development technique or procedure.
2. After modification of a technique or procedure that results in a new procedure.

B. Method verification is required for the following:

1. Implementation of externally published and validated chemical reagent development techniques or procedures.

7704.1 Responsibilities

The LD or designee:

A. Requests approval for the development of new techniques or procedures in accordance with LOM 7200.

B. Submits proposed standard operating procedure and supporting publications to SFQ/SFM prior to the implementation of additional externally published and validated development techniques or procedures.

C. Ensures that friction ridge development techniques or procedures are fit for their intended purpose and validated before use in casework.

D. Maintains validation documentation in the format posted on the SFDCC.

E. Forwards a copy of the validation documentation to the SF for posting on the SFDCC.

7704.2 Validation of Techniques or Procedures for Developing Friction Ridge Detail

The FRE:

A. Performs a thorough review of publications, academic materials, safety procedures and protocols, etc., involving the technique or procedure.

B. Uses the Friction Ridge Development Technique Validation Final Report form to document the validation. (See SFDCC)

7704.2.1 Standard Samples

The FRE selects samples representative of the type of specimens routinely analyzed by the technique or procedure.

7704.2.2 Reproducibility

The FRE performs the technique or procedure on each test sample to demonstrate consistent results.

7704.2.3 Ruggedness

A FRE who did not perform the reproducibility must be able to reproduce the test results using the same technique or procedure.

7704.2.4 Environmental Studies

The FRE evaluates the effect of environmental conditions on a technique or procedure by exposing known samples to a variety of conditions prior to development.

7704.2.5 Accuracy

The FRE determines that the technique or procedure develops sufficient friction ridge detail to allow another qualified FRE to evaluate the results and conduct a comparison

7704.3 Verification of Techniques or Procedures for Developing Friction Ridge Detail

The FRE verifies the chemical reagent development by performing and documenting the results of a test print during each step of the processing procedures.

7705 FRICTION RIDGE EQUIPMENT

7705.1 Equipment

The FRE examines the following friction ridge equipment upon receipt/installation in the laboratory to determine if it is functioning according to manufacturer's specifications:

A. Laser

B. Alternate Light Source

C. Reflective Ultraviolet Imaging System (RUVIS)

D. Environmental Chamber

E. Cyanoacrylate Chamber

F. Digital Imaging System and Workstation

G. Photography Print Processor

H. AFIS Workstations

I. Full Spectrum Imaging System

7705.2 Documentation Requirements

A. The LD or designee:

1. Specifies the format of the equipment logbook.
2. Archives the equipment logbook in the laboratory for 75 years.

B. The FRE:

1. Keeps an equipment logbook for each piece of equipment listed. (See 7705.1)
2. Includes in the logbook, at a minimum, the following:
    a. The identity of the item of equipment and its software.
    b. The manufacturer's name, type identification, and serial number or other unique identification.
    c. The current location.
    d. The manufacturer's instructions, if available, or reference to their location.
    e. Dates, results, and copies of reports and certifications of all adjustments, acceptance criteria, and the due date of next service.
    f. The maintenance plan and maintenance carried out to date.
    g. Any damage, malfunction, modification, or repair of the equipment.
3. Verifies operation of environmental (humidity and temperature) chambers, fuming chambers, and forensic light sources when used in conjunction with a chemical reagent by performing a test print and recording the results in LIMS.
4. Removes equipment from service when not operational and documents it in the equipment logbook.
5. Places a "Not in Service" sign on the affected equipment to notify potential users of its status.
6. Documents all steps to resolve the equipment problems in the logbook.
7. Documents the date when equipment is repaired and placed back into service.

7706 REAGENT RELIABILITY

7706.1 Documenting Reagents

7706.1.1 Stock Reagents

The FRE records the following information on the Reagent Reliability – Stock/Working Solution form for each stock (primary) reagent prepared: (See SFDCC)

A. Reagent Name

B. Prepared Date

C. Laboratory Traceable Number (reagent-sequence number-date prepared including month, day, and year (e.g., R6G-1-9/1/2015))

D. Preparer Initials

E. Amount Prepared

F. Test Print Result (Positive/Negative)

G. Expiration Date (if applicable)

H. Date Stock Depleted

I. FRE Initials (upon disposal)

7706.1.2 Secondary Container

The FRE records the following information on the Reagent Reliability – Stock/Working Solution Form for each secondary container prepared from a verified stock reagent. (See SFDCC)

A. Reagent Name

B. Laboratory Traceable Number (See 7706.1.1(2))

C. Prepared Date

7706.1.3 Commercial (Purchased) Reagent

The FRE records the following information on the Reagent Reliability – Commercial Reagents Form once the manufacturer's seals are broken on a commercial reagent. (See SFDCC)

A. Reagent Name

B. Laboratory Traceable Number (See 7706.1.1(2))

C. Date Opened

D. FRE Initials (upon opening)

E. Manufacturers Reported Reagent Volume

F. Test Print Result (positive/negative)

G. Expiration Date (if manufacturer provided)

H. Date Depleted

I. Final Disposition

J. FRE Initials (upon disposal)

7706.2 Label Containers

Table 1 Label Containers

The FRE labels the reagent containers as follows:

	Reagent Name	FRE Initials	Prepared Date	Lab Traceable Number	Date Opened
Stock Container	X	X	X	X	
Secondary Containers	X		X	X	
Commercially Prepared Containers	X	X		X	X

7706.3 Disposing Reagents

The FRE:

A. Disposes a reagent as hazardous waste when it meets any of the following criteria (See LOM 7800):

   1. Does not produce expected results during verification.

B. Changes drastically in appearance or composition.

C. Disposes a reagent when no longer needed.

D. Maintains reagents that have reached their expiration date, if able to demonstrate that the reagent continues to work as expected and ensure compliance with LOM 7800.

7710 EVIDENCE EXAMINATION

7710.1 Scope

A. This chapter contains the policy and procedures for developing friction ridge detail on evidence, friction ridge examination, digital imaging system, and AFIS searches.

B. Laboratory management must approve all deviations that do not meet minimum requirements.

C. Laboratory management, Special Agent (SA), Diversion Investigator (DI), or Task Force Officer (TFO) must authorize all deferred examinations.

D. Deviations and deferred examinations require documentation in LIMS Case Management, Case Attachments - Friction Ridge Attachments.

E. The FRE:

1. Uses standard reporting language (SRL) in Examination Results and Conclusion section of the DEA-111 as shown in Exhibit 3/7710 Standard Reporting Language.
2. Uses standard operating procedures (SOPs) for friction ridge detail processing as defined in Exhibit 7/7710 Standard Operating Procedures for Friction Ridge Processing.
3. Examines friction ridge detail as described in Exhibit 4/7710 Analysis of Friction Ridge Detail.
4. Follows Department of Homeland Security (DHS) Guidelines on AFIS submissions for AFIS requests to DHS in Exhibit 5/7710 Department of Homeland Security AFIS Guidelines.
5. Follows Department of Justice (DOJ) Approved Uniform Language for Testimony and Reports (ULTR) in Exhibit 6/7710 Department of Justice (DOJ) Approved Uniform Language for Testimony and Reports.

7711 EVIDENCE HANDLING

7711.1 Determining Gross Weight of Evidence

The FRE:

A. Ensures all labels on the evidence are consistent with the associated paperwork.

B. Determines the gross weight of drug evidence if received prior to the Forensic Chemist's (FC) analysis.

F. Weighs the properly sealed evidence to determine the gross weight.

NOTE: Evidence packaged in accordance with the REDACTED (i.e., intact seals and complete labels) is considered properly sealed.

6. Compares the obtained gross weight with the submitted gross weight. A witness is required if the weight differs by more than two grams or 0.2% of the gross weight of the evidence package, whichever is greater, from the reported weight of the submitting SA, TFO, or DI, or if there is no gross weight recorded either on the evidence package or on the Report of Drug Property Collected, Purchased, or Seized (DEA-7).
7. Reports the gross weight in the LIMS Gross Weight test.
8. Another LIMS user witnesses the evidence gross weight, prior to breaking the seal, by entering one's username and password in the Gross Weight LP test - Weight Discrepancy field.

9. Takes appropriate follow up action, which may include referral to the Office of Professional Responsibility (OPR).

C. Does not determine the gross weight of evidence received from the vault after separation by the FC.

D. Does not determine the gross weight for bench transfers.

E. Does not determine the gross weight for non-drug evidence.

7711.2 Photographing Evidence

The FRE:

A. Photographs evidence when drug evidence is received from the vault before separation by a FC or when necessary to document any unusual physical feature(s) prior to processing.

B. Photographs the entire evidence, and, if the evidence is in closed containers (e.g. evidence boxes), opens containers to display evidence.

C. Uses a digital camera.

D. Creates a placard containing the LIMS Number, FRE's initials, and date.

E. Positions the placard so the information appears in the photograph.

F. Positions a measuring device such as a ruler or yardstick in all photographs.

G. Arranges or stacks the evidence so that it makes a clear, visual display of the evidence.

H. Attaches photographs in LIMS Case Management, Case Attachments – Friction Ridge Attachments.

7711.3 Opening and Resealing Evidence

The FRE:

A. Opens the plastic sealed evidence envelopes (PSEE) by cutting along the edge opposite the SA's, TFO's, DI's, or FC's evidence seal to create a separate strip.

1. Annotates FREs initials, date opened, and unique identifier (LIMS case number) on this strip.

B. Places the strip cut from the PSEE inside the original PSEE.

C. Annotates the affixed evidence label with the date opened and any other applicable information.

D. Records the date opened in the LIMS Description of Evidence – Friction Ridge Test and completes the "Opened By" and "Date Opened" fields on the affixed evidence label. Marks secondary container(s) inside original packaging containing specimens for processing with FRE initials, date opened, and unique identifier.

E. Adds additional container(s) in LIMS Description of Packaging – Friction Ridge Test.

F. Properly marks specimens after examination with the FREs initials, date, and a unique identifier.

   1. Alternately, places multiple specimens into a secondary container(s) marked with the FREs initials, date, and a unique identifier.

G. Places friction ridge evidence (lifts, non-rewriteable optical media, cut outs, photographs that are developed or preserved) in a new secondary container(s) marked with the FREs initials, date, and a unique identifier.

   1. Adds the additional container(s) in LIMS Evidence Disposition - Friction Ridge Test – Remarks when added by the FRE.

H. Places the specimens and/or secondary container(s) into the original PSEE.

I. Places an evidence seal bearing the FREs signature, the date of sealing, the Investigating Agency (IA) Case Number, the IA Exhibit Number, and unique identifier on the outside of the PSEE, at the bottom, center edge, parallel with the opening.

J. Heat-seals the open end of the PSEE, and inspects the integrity of the seal or reseals the original package(s) with fiber-reinforced tape.

   NOTE 1: Completely encircles the box or package(s) with the fiber-reinforced tape in two opposing directions that cross each other and places an evidence seal bearing the FREs signature, the date of sealing, IA Case Number, IA Exhibit Number, and unique identifier at the junction where the tape ends meet.

   NOTE 2: Ensures that part of the evidence seal adheres to the box or package and covers the fiber-tape junction.

K. Records the date sealed in LIMS Evidence Disposition - Friction Ridge Test, and completes the “Resealed By” and “Date Resealed” fields on the affixed evidence label.

L. Records a description of the evidence disposition in the LIMS Evidence Disposition – Friction Ridge Test finding.

M. Records the weight after completion of the evidence processing, if the exhibit contains a suspected controlled substance.

N. Weighs the properly resealed evidence container to determine the gross weight.

O. Records the weight on the affixed evidence label and in the LIMS Gross Weight after Analysis – Friction Ridge Test.

7711.4 Improperly Sealed Evidence

A. The FRE notifies a laboratory manager when evidence is not packaged in accordance with REDACTED (e.g., the SA’s seals are not intact).

B. The FRS or designee decides if the evidence will be returned to the vault or be examined.

7711.5 Describing the Evidence

The FRE:

A. Compares the physical evidence with the description from the DEA-7 or Non-Drug Evidence Laboratory Analysis Report (DEA-7b) and, if it differs significantly from the description reported, selects "No" in the Consistent with Paperwork finding in the Description of Evidence - Friction Ridge Test. Completes the Paperwork Inconsistency Description – LP Test.

   1. A FRE or another LIMS user witnesses the FRE description.

B. In the Description of Evidence – Friction Ridge Test, the witness enters their username and password to document the witnessing of the description discrepancy.

C. Contacts the SA, TFO, or DI in an attempt to resolve any significant differences.

   EXCEPTION: The FRE is not required to report significant differences from the DEA-7 for evidence previously separated by the FC.

D. Records communication in LIMS in the Case Communications Log, Friction Ridge Case Activity Communication Log (DEA-466c), or email attachment(s).

E. Attaches DEA-466c forms or email attachments into LIMS Case Management, Case Attachments - Friction Ridge Attachments.

7711.6 Creating Evidence Containers

7711.6.1 Fingerprint Unit – Additional FIN Unit

The FRE:

A. Creates a FIN unit when evidence is received from the FC (bench transfer) or when drug evidence is received from the vault before analysis by the FC.

   1. When no friction ridge detail was developed or observed, inserts a piece of paper with the appropriate SRL used on the final report or inserts an overall photograph of the evidence into a new PSEE. (See Exhibit 3/7710)

   2. When friction ridge detail was developed or observed, inserts digital workplace printouts, DVD, DVD-R, Compact Disc/Record (CD-R), cutouts, latent lift cards, or fingerprint evidence (separated) in a new PSEE.

B. Properly seals the new PSEE and places an evidence seal on the package bearing the FREs signature, the date of sealing, the IA Case Number, the IA Exhibit Number, and the LIMS Case Number.

C. Selects "Add" through Organize My Work (LIMS), creates Lab Exhibit, and places in new container.

D. Uses the Container Code "Fingerprint."

E. Prints a FIN container label(s) for newly created container(s) and affixes the container label(s) to the new container(s).

7711.6.2 Repackaging Evidence in New Container

The FRE:

A. Creates a new container(s) when the original evidence cannot be repackaged into the original container(s) and places the original container within the new container.

B. Selects the correct Container Type, Container Code, and the number of new containers.

C. Properly seals the evidence packaging, and places an evidence seal on the package bearing the FREs signature, the date of sealing, the IA Case Number, the IA Exhibit Number, and the LIMS Case Number.

D. Selects "Add" through Organize My Work (LIMS), Evidence Containers.

E. Uses the Container Code "Fingerprint."

F. Prints a FIN container label(s) for the newly created container(s) and affixes the label to the new container(s).

7711.7 Returning Completed Evidence to the Vault

The FRE returns the completed evidence to the vault in accordance with LOM 7300.

7711.8 Assessing Evidence Returned from Court

Evidence returned from court shall be processed in accordance with LOM 7300.

7712 CONDUCTING FRICTION RIDGE EXAMINATIONS

7712.1 Selecting Techniques and Procedures Used to Develop Friction Ridge Prints

The FRE:

A. Uses validated techniques and procedures selected to minimize the destruction and increase the possible enhancement of friction ridge detail.

B. Visually examines all specimens for friction ridge detail, using ample lighting, before subjecting them to any friction ridge development technique.

7712.2 General Requirements

The FRE:

A. Conducts an examination on an exhibit and is responsible for correctly processing, preserving, describing, and reporting all comparable friction ridge prints.

B. Documents a test print each time a reagent is used in casework and includes the results of the test print in LIMS Exhibit Analysis – Step Entries.

C. Uses LIMS tests to record all observations, examinations, and results at the time they are made.

D. Documents results so that they are identifiable to a specific task and in a manner that permits adequate reconstruction of the analysis or examination performed.

E. Completes comparisons of all unidentified comparable friction ridge print, unless a deferred comparison has been documented. (See Exhibit 3/7710)

7712.3 Documentation Preserved Friction Ridge Prints

The FRE:

A. Shows the location of the preserved friction ridge print on the specimen by placing a scale (adhesive or non-adhesive) next to the developed or observed friction ridge print.

B. Adds the laboratory depiction identifier to the scale or depiction label.

C. Marks the depiction identifier (e.g., 1-1-1) assigned to a preserved friction ridge print with the following:

1. Exhibit Number
2. Specimen Designation Number
3. Friction Ridge Print Number

D. Uses a non-adhesive scale next to the developed or observed ridge detail in circumstances where there is insufficient space to place an adhesive scale next to the friction ridge print.

E. Writes (at a minimum) the friction ridge print number near the developed print or observed ridge detail.

F. Places a placard containing the LIMS Number, FREs initials, and date in the overall photograph documenting the location of the preserved friction ridge print.

NOTE: A reviewer must be able to read the laboratory depiction identifier for each preserved friction ridge print developed or observed in the overall photograph(s).

G. Attaches overall photographs in LIMS Case Management, Case Attachments – Friction Ridge Attachments.

7712.4 Unrecoverable Ridge Detail

When the friction ridge print evidence on the specimen is:

A. Capable of being obliterated during subsequent processing;

B. Developed with a chemical known to fade over time; or susceptible to loss or destruction.

C. The FRE:

1. Places non-rewriteable media, lift cards, or photographs of the friction ridge detail into the corresponding FIN or Non Drug Evidence (NDE) container.
2. Marks CD, DVD, lift cards, and/or photographs with FRE initials, date, and unique identifier.
3. Places CD, DVD, lift cards, and/or photographs into a new secondary container.
4. Annotates in the remarks section of Evidence Disposition Secondary container with _____ (CD, DVD, lifts, and photographs) was added.
5. Places secondary container inside original container.

7713 LABORATORY LIMS FILE DOCUMENTATION

7713.1 Friction Ridge Print Details Report

The FRE:

A. Generates a FRDR from the information that has been entered into My Work Assignments and Pending Results Entry – Friction Ridge Tests.

B. Begins the description of evidence with the number and detailed description of the physical evidence (e.g., one white envelope, four clear plastic zip lock type bags).

NOTE 1: Exhibits containing numerous quantities that are impractical to count can be generalized (e.g., multiple layers of plastic).

NOTE 2: Abbreviations are not used in the Description of Evidence test.

C. Annotates all blank spaces with "Not Applicable (N/A)."

EXCEPTIONS: Remarks, Comments, and Notes sections.

7713.2 Friction Ridge Print Matrix Report

The FRE:

A. Generates a DEA-466b from the information that has been entered into LIMS Results Entry My Assignments – LP Tests.

B. Documents all friction ridge prints preserved.

C. Documents the following on the DEA-466b:

1. Depiction ID
2. Impression Type
3. Processing Technique
4. Subject Comparison
5. Identification
6. Verification
7. AFIS

D. Annotates all blank spaces with "N/A."

EXCEPTIONS: Remarks, Comments, and Notes sections.

7713.3 Friction RidgeExamination Report

The FRE:

A. Generates a DEA-111 from the information that was entered in LIMS.

B. Removes Comparison Information section from the DEA-111 for the following processing examination results (See Exhibit 3/7710):

1. No Friction Ridge Detail Developed or Observed
2. No Friction Ridge Prints Suitable for Comparison
3. Visual Examination Only
4. Not Suitable for Friction Ridge Examination
5. Contaminated Material

C. Does not use abbreviations in the Examination, Results, and Conclusions sections of the DEA-111.

EXCEPTION: When the submitted subject name on the DEA-7 or DEA-7b is significantly different from the known print card used in a comparison, the abbreviation "aka" (also known as) can be used.

D. Does not list the name (e.g., right index finger) or the number (e.g., #2) of the finger in the DEA-111 when reporting an identification. Instead, delineates this information on DEA-466b.

E. Reports only the name as it appears on the known print card and federal Universal Control Number (UCN) or local numbering system when reporting an identification. Does not include titles, other numbers, or other descriptive information.

F. Uses SRL statements on the DEA-111. (See Exhibit 3/7710)

G. Lists SRL statements on the DEA-111 in the following sequence:

1. Transfer Friction Ridge Evidence Statement
2. Processing Examination
3. Comparison Examination
4. AFIS Examination
5. Identification of the Methods Used
6. Qualify Significance of Association for Conclusions
7. DOJ ULTR Reference Statement

NOTE 1: Processing Examination, Comparison Examination, and AFIS Examination (G2-4) SRL statements can be listed in the order of occurrence.

NOTE2: Changes to the SRL regarding subject and verb agreement (i.e., singular to plural) are not deviations. (See Exhibit 3/7710)

H. Reports the identification of the methods used as follows:

I. Adds "Summary of Test(s)" followed by the list of methods used for examination.

NOTE: Methods only need to be listed one time per exhibit.

J. Adds identification of the method used for examination from the list below (no abbreviations).

1. 1,2-Indanedione-Zinc Chloride HFE-7100

2. 1,2-Indanedione-Zinc Chloride Ether
3. Cyanoacrylate Fuming
4. Digital Imaging System
5. Forensic Powder
6. Fluorescent Dye Stain
7. Gentian Violet
8. Gun Bluing Solution
9. Iodine Fuming
10. Ninhydrin
11. Physical Developer
12. Reflective Ultraviolet Imaging System
13. Silver Nitrate
14. Titanium Dioxide
15. Visual Examination
16. Example: Summary of Test(s)
    a. Visual Examination
    b. Cyanoacrylate Fuming
    c. Fluorescent Dye Stain
    d. Digital Imaging System

K. Obtains approval from FRS for any deviations to the SRL and attaches into LIMS Case Management, Case Attachment – Friction Ridge Attachments.

7713.4 LIMS Documentation – Other Exhibit Documentation

The FRE includes the following in the LIMS Case File, if available:

A. Hand-written notes that relate to the examination

B. Digital Imaging System printouts with documentation that relate to the analysis of the friction ridge print, including complex friction ridge detail (CFRD) documentation when applicable.

C. Overall Photographs (JPG, XPS, and PDF files)

D. Fingerprint/Palm Print cards/Other Known Standard Cards (e.g., major case prints, joints of fingers, tips of fingers, etc.)

E. Deferred Examination Approval (Processing, Comparison, and AFIS Documentation)

F. AFIS Generated Documentation

G. DEA-466b (Completed outside of LIMS/e.g., Known to Known print card comparison)

H. Friction Ridge Case Activity & Communication Log DEA-466c

I. Single Image Review Form

7713.5 Friction Ridge Case Activity and Communication Documentation

The FRS and FRE:

A. Documents all activity and/or communication that occurred during the course of casework (e.g., contact with case agents or activity involving acquisition of fingerprint cards from state record bureaus).

B. Uses emails, DEA-466c, and/or LIMS Communication Log Form to document activity and communication.

C. Attaches emails and DEA-466c into LIMS Case Management, Case Attachments - Friction Ridge Attachments.

7714 FRICTION RIDGE EXAMINATION METHODOLOGY

7714.1 Friction Ridge Examination

The FRE utilizes the process of Analysis, Comparison, Evaluation, and Verification (ACE-V) for all preserved friction ridge detail.

7714.1.1 Analysis of Friction Ridge Detail

The FRE:

A. Assesses friction ridge prints to determine suitability for comparison.

B. Considers the following factors in the assessment of friction ridge detail: quality (clarity) and quantity of first, second, and third level detail. (See Exhibit 4/7710)

C. Documents that the friction ridge print is not suitable for comparison if a print lacks sufficient reliable information such that an identification decision to any source would not be considered possible.

7714.1.2 Documentation of Friction Ridge Detail Observed

The FRE:

A. Documents analysis results and observations for each individual friction ridge print preserved.

B. Documents analysis results and observations within the description box of the digital imaging system.

C. Documents results and observations for each of the following:

1. First Level Detail
2. Second Level Detail
3. Third Level Detail
4. Complex Friction Ridge Print Factors

D. Documents a result of "Present/Not Present" for each examination followed by observation when "Present" is the result.

1. Example 1:
    a. Level 1 - Present – Whorl
    b. Level 2 - Present – Ridge Endings – Bifurcations
    c. Level 3 - Present – Ridge Structure – Flow
    d. Complex – Not Present
2. Example 2:
    a. Level 1 - Present – Loop
    b. Level 2 - Present – Ridge Endings – Bifurcations
    c. Level 3 - Present – Ridge Structure – Flow
    d. Complex – Present – Double Tap

7714.2 Comparison of Friction Ridge Detail

A. Comparison is the direct or side-by-side observation of friction ridge detail to determine whether the detail in two impressions are in agreement, based upon similarity, sequence, and spatial relationship.

B. No absolute number of characteristics is required to establish a source identification.

C. The FRE:

1. Determines if one or more CFRD factors are found to be challenging to the comparison.
2. Attaches any additional CFRD documentation (e.g., charts, written notes, notations) into LIMS Case Management, Case Attachments, Friction Ridge Attachments.
3. Enters "Additional CFRD Documentation" in the description box.

7714.3 Evaluation of Friction Ridge Detail

The FRE:

A. Evaluates friction ridge detail based upon analysis and comparison of friction ridge impressions.

B. Reaches one of the following conclusions for each comparison: (See Exhibit 6/7710)

1. Source Identification (i.e., came from the same source)
2. Inconclusive
3. Source Exclusion (i.e., came from a different source)

7714.3.1 Evaluation Documentation

The FRE:

A. Documents the results of the comparison and evaluation of the friction ridge print preserved on the DEA-466b, including:

1. Source Identification
2. Source Exclusion
3. Inconclusive
4. Not compared
5. Not suitable for comparison
6. Exemplar(s) used to reach the conclusions
7. Identified specific anatomic source (e.g., #1 or RT=Right Thumb, RP=Right Palm)
8. FRE initials and date of each identification

B. Documents conclusions prior to verification.

7714.4 Verification of Friction Ridge Detail

The International Association for Identification (IAI) certified FRE:

A. Performs an independent verification on all identifications, using the ACE process, to either support or refute the conclusions of the original FRE.

B. Reviews the correct spelling of the name and result (key) of the person identified.

C. Enters their username and password to document the verification in LIMS Exhibit Analysis Test/Depictions and Friction Ridge Matrix/Verify.

D. Confirms that their name and date appears in LIMS Depictions and Friction Ridge Matrix – Friction Ridge Test within the Verification By (Date) to indicate the verification has been completed.

E. Resolves differences in technical opinions through the Conflict Resolution process. (See 7717.4)

7715 DIGITAL IMAGING

7715.1 Digital Image Capture

The FRE:

A. Uses digital imaging capture software to preserve the image once friction ridge print has been developed and is determined to be suitable for comparison.
NOTE: The entire friction ridge detail in the image must be captured in at least one complete unedited depiction.

B. Places a scale next to the preserved friction ridge print.

C. Writes the laboratory depiction designation on the scale or adds a depiction label next to the preserved friction ridge print. (See 7712.3 (C))

D. Captures a digital image at a minimum of 1000 pixels per inch when possible.

7715.2 Digital Imaging Processing

The FRE:

A. Acquires the captured digital image from the capture device using the Image Management System.

B. Enters LIMS Case Number, Crime Type, and Description, as required by the Image Management System.

C. Enters the following in the Description field:

   1. Friction Ridge Print Depiction Identifier

   2. Description of the Specimen

   3. Documentation of First Level Detail, Second Level Detail, Third Level Detail, and Complex Friction Ridge Detail Factor(s) (See 7714.1.2)

D. Verifies that the original image was saved in the database.

E. Completes the enhancements of the images using the approved image editing software accessed through the Image Management System.

7715.3 Archiving and Backing Up Images

A. The FRS assigns a FRE at each of the laboratories to verify the system back-up.

B. The FRE refers to the Digital Imaging System's user manual for specific instructions for archiving and system back-ups.

7715.3.1 System Back-up

The assigned FRE:

A. Logs (electronic or written) the results performed on each work day.

B. Performs annual archiving by the end of the fiscal year.

C. Purges the Digital Imaging System of images older than two years from date of archive (e.g., if an archive is performed on September 1, 2017, then all images from September 1, 2015 and prior will be archived).

D. Writes images to a non-rewritable optical media, either DVD or DVD/Record (DVD-R) or Compact Disc/Record (CD-R).

E. Archives images to two non-rewritable optical media.

F. Chooses "read only" option to prevent any alterations to the non-rewritable optical media when archiving.

G. Verifies that the images were successfully written to each non-rewritable optical media before deleting the images from the digital imaging server.

H. Stores the non-rewritable optical media in two separate secured locations, one of which is readily accessible to the FREs.

7716 CONDUCTING AFIS SEARCHES

7716.1 Requirements

The FRE:

A. Conducts an AFIS evaluation and search on any friction ridge prints that remains unidentified in the exhibit.

EXCEPTION 1: When the unidentified friction ridge print is found not suitable for an AFIS search.

EXCEPTION 2: When the unidentified friction ridge print was developed on evidence seized from a location believed to be outside of the United States (e.g., off-shore boat or aircraft).

EXCEPTION 3: When a subject in the exhibit has already been identified and deferred AFIS approval was obtained.

EXCEPTION 4: When a determination that unidentified friction ridge print is made by the same finger/palm.

EXCEPTION 5: Completes evaluation of all unidentified friction ridge prints, unless a deferred AFIS evaluation has been documented. (See Exhibit 3/7710)

B. Follows Department of Homeland Security AFIS guidelines. (See Exhibit 5/7710)

7716.2 Universal Latent Workstations

The FRE:

A. Uses the Federal Bureau of Investigation (FBI) Universal Latent Workstation (ULW) software to search and compare unidentified latent prints.

B. Searches friction ridge print(s)as Latent Friction Feature Search (LFFS) and/or Latent Friction Image Search (LFIS).

1. Enters the Case Prefix and Case ID for each friction ridge printsearched.
2. Case Prefix: FRE Initials, Laboratory Depiction Number (e.g., BCL_1-1-1-A)
3. Case ID: LIMS Case Number (e.g., 2016-SFLX-XXXXX)

C. Is not required to register an unidentified friction ridge printin the ULW.

7716.3 Regional Automated Fingerprint Identification System

The FRE may use the regional AFIS database for searching unidentified friction ridge prints.

7716.4 Department of Homeland Security AFIS System

The FRE:

A. May use the DHS database for searching unidentified friction ridge print(s).

B. Follows the requested procedures when submitting an AFIS search request to DHS. (See Exhibit 5/7710)

C. Requests a candidate list and/or subject's known fingerprints with the accompanying biographic data from DHS, when necessary.

NOTE: Privacy requirements may restrict the dissemination of the candidate list in some instances.

D. Attaches the electronic mail message sent to DHS into LIMS Case Management, Case Attachments - Friction Ridge Attachments.

E. Attaches the report from DHS into LIMS Case Management, Case Attachments - Friction Ridge Attachments.

7716.5 Additional Reporting and Documentation Requirements

The FRE:

A. Documents AFIS submissions in the LIMS Result Entry – Depictions tab.

B. Does not report negative search results of candidates produced via a search.

C. Attaches all AFIS-generated documentation into LIMS Case Management, Case Attachments-Fingerprint Attachments including:

1. List of candidates generated for each search.
2. Printout of encoded image for local AFIS search.
3. Print for Records Report (LFFS and/or LFIS)

D. Verifies above documentation is saved in LIMS prior to removing it from the workstation.

7717 CONDUCTING REVIEWS

7717.1 Requirements

A. Technical and administrative reviews will be performed on all casework.

B. Technical reviews are performed by a FRE or FRS.

C. Administrative reviews are performed by FRS or designee.

D. Resolves differences in technical opinions through the Conflict Resolution process. (See 7717.4)

7717.2 Technical Reviews

A. The technical reviewer verifies**:**

1. Conclusions and supporting case documentation are present and complete.

2. Conclusions are consistent with the documented data and are within the limitations of the discipline.
3. All supporting documentation is included in the case file.
4. Unique identifier and exhibit are properly documented on all reports.
5. Evidence description is complete and consistent with the DEA-7 or DEA-7b.
6. Observations and analyses are clearly and completely documented, in accordance with policy.
7. Appropriate examinations have been performed.
8. Identifications have been verified and documented.
9. Single Image Review Form has been attached into LIMS Case Management, Case Attachments - Friction Ridge Attachments. (See 7703.2.4)
10. Reports and results are clear, concise, accurate, complete and addresses the requested examination.

B. The name of the technical reviewer and date of the review will be documented in LIMS.

NOTE 1: The technical reviewer's name and date reviewed appear on the FRDR – Review Information.

NOTE 2: The technical reviewer is not responsible for conducting a physical examination of the evidence.

7717.3 Administrative Reviews

The administrative reviewer verifies:

A. Compliance with procedures for documenting friction ridge print examinations.

B. Necessary technical review has been conducted and documented.

C. Documentation is free of administrative or transfer errors and the improper use of abbreviations.

NOTE 1: The administrative reviewer's name and date reviewed appear on the FRDR – Review Information.

NOTE 2: The administrative reviewer's name and date reviewed appear on the DEA-111.

7717.4 Conflict Resolution

A. Conflict resolution is the process used to settle differences in technical opinion between the examiner and reviewer.

NOTE: The conflict resolution process may include reviewing examination notes and discussing and potentially re-examining the evidence.

B. The process resolves differences in technical opinion through the following incremental steps:

1. Discussion between examiner and reviewer
2. Independent review
3. Consensus panel

NOTE: FREs documents the basis for their opinions at steps 2 and 3 in the process.

C. The FRE:

1. Includes memoranda explaining the basis of opinions.
2. Includes supporting documentation (e.g., charts, photos, etc.).
3. Attaches notations, images, and documentation generated during the conflict resolution process into the case file.

7717.4.1 Discussion between Examiner and Reviewer

A. The examiner and reviewer:

1. Discusses their respective opinions and review case documentation and any relevant materials.

B. The FRE and reviewer:

1. Either resolves their differences in opinion or notify the FRS if resolution cannot be reached.

   NOTE: No approval or additional documentation is required if the issue is resolved between examiner and reviewer.

2. Submits all notations, images, and documentation generated during the discussion to the FRS when resolution cannot be reached.

7717.4.2 Independent Review

An independent review is conducted after the examiner and reviewer fail to resolve their differences in opinion.

A. The FRS:

1. Appoints an IAI certified FRE from a different laboratory to perform an independent review.
2. Provides unannotated images/photographs and any relevant documentation to the independent reviewer.
3. Provides guidance on refraining from any technical discussion of the examination or their conclusions with others.
4. Does not provide IA Case Number, LIMS #, Exhibit #, or identity of the Original / Reviewing FRE to the independent reviewer.

   NOTE: The LQAM performs the duties of the FRS when the FRS is the original or reviewing FRE.

B. The Independent Reviewer:

1. Conducts a blind and independent examination using the provided unannotated images/photographs and any relevant documentation.
2. Reports their conclusions to the FRS.
3. Submits notations, images, and documentation generated during their review to the FRS.

C. The FRS:

1. Notifies the examiner and reviewing FREs of the independent reviewer conclusion and discusses the findings with both FREs to try to resolve the conflict.
2. Protects the identity of the independent reviewer.
3. Documents the resolution of the disagreement in LIMS Case Management – Friction Ridge Attachments.
4. Notifies the LQAM and SF Program Manager (PM), if consensus cannot be reached.

7717.4.3 Consensus Panel

A consensus panel is convened after an independent review fails to resolve differences in technical opinion.

A. The FRS:

1. Requests SF PM to convene a consensus panel.
2. Provides IA Case Number, LIMS #, Exhibit #, and Original and Reviewing FRE names to the LQAM and SF PM.
3. Provides unannotated images/photographs and any relevant documentation to SF PM.
4. Provides name of Independent Reviewer to SF PM.

B. The SF PM:

1. Convenes a consensus panel consisting of three IAI certified FREs.
2. Selects consensus panel participants (CPPs) from three laboratories with a friction ridge program.
3. Avoids selecting a CPP from the originating laboratory.
4. Provides unannotated images/photographs and any relevant documentation.
5. Does not provide IA Case Number, LIMS #, Exhibit #, and identities of the Original / Reviewing / Independent Reviewer FRE.

C. The CPPs:

1. Conduct a blind, independent examination.
2. Convene after the independent examinations to discuss findings.
3. Issue a consensus conclusion statement(s) to the SF PM.

D. The SF PM:

1. Provides a summary of the consensus panel conclusion(s) to the FRS, LQAM, and SFQAM.

E. The FRS:

1. Informs Original / Reviewing FREs of the consensus panel conclusion.
2. Ensures a final report, consistent with the consensus panel conclusion(s), is issued by the original FRE, reviewing FRE, or FRS.

F. The SFQAM:

1. Reviews the conflict resolution documentation and determines if additional action is necessary (e.g., preventative action or policy change).

7717.4.4 Reporting Conclusions

A. Reported conclusion(s) support the conclusion(s) reached as a result of the consensus panel.

B. The individual issuing the reported conclusion(s) must support the conclusion(s) reached as a result of the consensus panel.

NOTE: Uses SRL in the Examination, Results, and Conclusions section of the DEA-111. (See Exhibit 3/7710)

C. The original FRE issues the report when consensus panel conclusion(s) supports the original examination.

D. The reviewing FRE issues the report when consensus panel conclusion(s) supports the conclusion(s) of the reviewing FRE.

E. The FRS issues an inconclusive report when the consensus panel cannot reach agreement.

7718 PRELIMINARY RESULTS

The FRE:

A. Is authorized to provide preliminary negative results prior to a final report.

B. Reports one of the following preliminary negative results:

1. No friction ridge prints developed.
2. No friction ridge prints suitable for identification.
3. Exclusions effected to date.

C. Will not offer preliminary positive results until after a verification of identification or a technical review has been conducted.

D. Conveys that a comprehensive review has not yet been completed and the final results may be subject to change.

E. Documents communication of preliminary positive or negative results by LIMS-Activity and Communication Log, DEA-466c, or email.

F. Attaches documentation into LIMS Case Management, Case Attachments - Friction Ridge Attachments.

7720 FIELD ASSISTANCE

7720.1 Scope

A. Forensic support for field assistance can range from support of clandestine laboratory investigations to the processing of bulk evidence in the field.

B. Laboratory personnel use the procedures described in this chapter, in conjunction with REDACTED.

7721 FRICTION RIDGE PRINT FIELD PROCESSING

A. The LD or designee:

1. Coordinates field processing response within the laboratory's area of responsibility in which DEA asserts primary authority.
2. Ensures that only clandestine laboratory certified FREs respond to field investigations.
3. Ensures that all clandestine laboratory certified FREs have a working knowledge of the evidence procedures in REDACTED.
4. Ensures that all participating FREs have a working knowledge of friction ridge detail processing used in the field.

F. The FRS:

1. Assigns the exhibit(s) seized during a field investigation to the FRE(s) who participated in the operation, when practical.

7721.1 Preparing for Field Processing

The FRE:

A. Communicates, plans, and organizes with the SA, DI, or TFO on technical and logistical matters pertinent to the investigation.

B. Responds to requests for field assistance with proper personal protective equipment (PPE) (e.g., respirators, goggles, etc.).

C. Ensures that all participating laboratory personnel are familiar with all the information supplied to the field laboratory by the SA, DI, or TFO regarding the investigation.

D. Determines:

1. What type and amount of evidence to be processed.
2. Number of FREs needed for processing of scene.
3. Equipment needed for friction ridge detail processing.

4. Chemicals and material required for friction ridge detail processing.

7721.2 On Site Activities

The FRE:

A. Enters the laboratory only after the premises are secured by the SAs, DIs, or TFOs.

B. Conducts an assessment of the site to identify potential hazards and conditions that might affect friction ridge detail processing.

C. Obtains approval from the SA, DI, or TFO prior to moving items that require relocation for safety reasons and for friction ridge detail processing.

D. Assists the SAs, DIs, or TFOs in preparing a complete inventory of the site and in determining what evidence can be processed for friction ridge detail.

E. Assists the SAs, DIs or TFOs in the handling and preparation of friction ridge evidence for submission to the laboratory.

F. Coordinates with FCs to determine best protocol for friction ridge detail processing before a chemical sampling.

G. Photographs all essential areas of the site, as well as the evidence selected for friction ridge detail processing.

H. Documents friction ridge evidence with generic identifier, initials, and case identifier (IA Case #).

I. Ensures recognition of friction ridge evidence in photographs.

J. Determines the correct processes in developing friction ridge detail.

K. Documents deviations of processing of specimens on the DEA-466.

NOTE: Discusses deviations with the FRS beforehand, if possible.

L. Records any maintenance conducted on friction ridge equipment in the maintenance logbook.

7721.3 Upon Return to Laboratory

The FRE:

A. Restocks supplies and cleans friction ridge and reusable PPE equipment.

B. Transfers all digital images from the camera memory card to the digital imaging system under the IA Case #, Date, and FRE Initials. (e.g., XX-21-01234_01-01-2021_XXX)

C. Scans documentation (e.g. handwritten notes, sketches or diagrams, DEA-466, DEA-466c, and DEA-12) into digital imaging system under the IA Case #, Date, and FRE Initials. (e.g., XX-21-01234_01-01-2021_XXX)

D. Refers to the REDACTED for creating and managing digitized/scanned records.

E. Transfers the digitized/scanned records (e.g. handwritten notes, sketches or diagrams, DEA-466c, DEA-12 and DEA-466) into LIMS under the LIMS # when evidence is received in the laboratory.

NOTE: Document on the DEA-466 the transfer of digital images from the camera memory card to the digital imaging system (i.e. Images transferred to digital imaging system, IA Case #, Date, and FRE Initials).

7721.4 Field Processing Documentation

The FRE prepares a DEA-466 (DEA-466a, when applicable), the report will contain the following:

A. IA Case Number

B. Description of Evidence

C. Friction Ridge Development Processing

D. Documentation of Evidence Transfer (if needed)

E. Documentation of transfer of digital images from the camera memory card to the digital imaging system (if applicable).

7721.5 Reporting

A. The FRE:

1. Prepares a DEA-111 after the field investigation has been completed. (See SFDCC)
2. Uses SRL for Field Investigation Results. (See Exhibit 3/7710)
3. Sends completed DEA-111 and DEA-466 for approval.
4. Attaches the approved DEA-111 and DEA-466 into the digital imaging system under IA Case Number, Date, and FRE initials.

B. The FRS or Designee:

1. Returns approved DEA-111 to FRE for submission into the digital imaging system.
2. Sends approved DEA-111 to requesting agent.

7721.5.1 Supplemental Reporting

The FRE:

A. Attaches the approved DEA-111 and DEA-466 report from the digital imaging system into LIMS Case Management, Case Attachments - Friction Ridge Attachments when friction ridge evidence is received into the laboratory.

B. Generates a supplemental DEA-111 when friction ridge evidence is received into the laboratory to report the subsequent examination conclusions.

7730 ORIENTATION AND TRAINING

7730.1 Scope

A. This chapter applies to all newly-hired and rehired FREs.

B. FREs must successfully complete required content and pass a competency comparison examination before examining casework.

7730.2 Responsibilities

A. The LD:

1. Determines competency. (See LOM 7000)
2. Designates the Friction Ridge Training Officer (FRTO).

B. The FRS:

1. Assigns duties to the FRTO.
2. Creates or delegates the creation of the practical skills assessments and training exercises, in accordance with policy.
3. Communicates with all affected LQAMs and LDs regarding performance.
4. Recommends remedial training and counseling during the probationary period.
5. Reviews the training program to identify gaps in instruction, materials, and propose changes to improve program delivery.
6. Maintains training records.
7. Assigns the competency and comparison examination.
8. Provides appropriate training and competency documentation to the LQAM.
9. Provides necessary outside training.

C. The FRTO:

1. Administers training exercises and practical skills assessments.
2. Provides additional training, as needed.
3. Provides written weekly progress updates to the FRS.
4. Meets with the FRS to discuss overall progress on a bi-weekly basis.
5. Documents the completion of tasks.

D. The FRE:

1. Completes required training exercises.
2. Completes external training or additional training exercises as necessary.
3. Completes a competency comparison examination.

7731 TRAINING CONTENT

7731.1 Required Content

A. The FRE:

1. Demonstrates competency by the following training exercises:
    a. Established Policies, Procedures, and Guidelines
    b. Evidence Handling
    c. Methods
    d. Equipment
    e. Friction Ridge Print Comparison
    f. Forms, Reports, and Documentation
    g. AFIS
    h. Procedures of Law, Law, and Regulations
    i. Moot Court

    NOTE: The FRS will determine training exercise requirements for a rehired FRE.

7731.2 External Training

The FRE receives external training as determined by the FRS.

7731.3 Clandestine Laboratory Training

The FRE receives clandestine laboratory training before participating in field work.

7731.4 Competency Examination

The FRE successfully completes a competency comparison examination administered by the FRS.

7731.5 Additional Training

Additional training may be provided by the FRTO until the FRE demonstrates competency.

NOTE: In some cases, training may require FRE to successfully complete additional competency examinations.

Exhibit 1/7701 FRICTION RIDGE EXAMINATION DEFINITIONS

Table 2 Friction Ridge Examination Definitions

Term	Definition	Reference
Accreditation Cycle	The period of time (generally four years) between the date that accreditation is granted and the date accreditation expires.	3
AFIS	Acronym for Automated Fingerprint Identification System. A generic term for a friction ridge print matching, storage, and retrieval system.	2
ACE-V	Acronym for a scientific method: Analysis, Comparison, Evaluation, and Verification (see individual terms).	1
Analysis	The first step of the ACE-V method. The assessment of an impression to determine suitability for comparison.	1
Candidate List	Compiled ranking of images generated from an NGI search. Rankings are arranged from highest to lowest score based on the information entered.	5
Capture Device	A device, such as a digital camera, flatbed scanner, or film scanner, used to record a digital image of an object.	5
Case Number	Contains the office designators and the case number. See IA	5
CD-R	Acronym for Compact Disc-Recordable. Optical disc format designed to function as data storage media.	5
Characteristic	Feature of friction ridges. Commonly referred to as a minutiae, Galton detail, point, feature, ridge formation, or ridge morphology.	5
Comparison	The second step of the ACE-V method. The observation of two or more impressions to determine the existence of discrepancies, dissimilarities, or similarities.	1
Competency	Possessing and demonstrating the requisite knowledge, skills, and abilities to successfully perform a specific task.	1
Complex Analysis	The advanced examination of friction ridge skin due to dissimilarities or factors influencing the quality of the friction ridge print that could interfere with the proper interpretation of the print.	5
Complex Friction Ridge Detail	Friction ridge print is considered complex when one or more factors are observed which affect the quality or quantity of ridge detail.	4
Cyanoacrylate Ester (CAE)	An adhesive used in a fuming method to develop friction ridge detail.	5
Depiction/Original Image	An accurate replica (pixel for pixel) of the primary image.	1

Digital Capture	The process of recording an image of an object onto any digital media.	5
Digital Image	A numerical representation recorded as a series of binary digits (bits) either as 1 or 0 with no values in between. See Depiction.	5
Digital Media	Any object on which a digital image is preserved.	5
Depiction	See Latent Print.	4
Distortion	Variances in the reproduction of friction skin caused by factors such as pressure, movement, force, and contact surface.	1
DVD-R	Acronym for Digital Versatile Disc or Digital Video Disc/Record. Optical disc format designed to function as data storage media.	5
Evaluation	The third step of the ACE-V method wherein an examiner assesses the value of the details observed during the analysis and the comparison steps and reaches a conclusion.	1
Evidence	Equivalent to test items material, regardless of form, which is received by a laboratory for the purpose of gleaning information relevant to a criminal investigation through examination/analysis by one or more of the laboratory's testing procedures.	3
Examination	The procedure utilized by the laboratory friction ridge examiner to obtain information from evidence in order to reach conclusions concerning the nature of and/or associations related to evidence received by the laboratory.	3
External Proficiency Test	A test prepared, provided by, and reported to a source external to the laboratory, laboratory system, or the laboratory parent organization.	3
Fingerprint	An impression of the friction ridges of all or any part of the finger.	1
Friction Ridge	A raised portion of the epidermis on the palmar or plantar skin, consisting of one or more connected ridge units.	1
Friction Ridge Detail (Morphology)	An area comprised of the combination of ridge flow, ridge characteristics, and ridge structure.	1
FUR	Acronym for friction ridge unrecoverable. Friction ridge detail not able to be retained on the evidence on which it was developed on; is considered the "best evidence" in the exhibit.	4
IA	Acronym for Investigating Agency. See Case Number.	5
IAFIS	Acronym for Integrated Automated Fingerprint Identification System.	5
ICD	Individual Characteristics Database	4

Inconclusive	See Exhibit 6/7710 DOJ ULTR Comparison Conclusions	10
Known Prints	The prints of an individual, associated with a known or claimed identity, and deliberately recorded electronically, by ink, or by another medium. (Finger, Palm, and Foot Prints)	1
Known to Known Comparison	Comparison of a known print (either ten print or single print) with another known print.	5
LASER	Acronym for Light Amplification by Stimulated Emission of Radiation. The device produces coherent wavelengths of light.	5
Latent Print	Transferred impression of friction ridge detail not readily visible. Generic term used for unintentionally deposited friction ridge detail.	1
Level One Detail	Friction ridge flow, pattern type, and general morphological information.	1
Level Two Detail	Individual friction ridge paths and associated events, including minutiae.	1
Level Three Detail	Friction ridge dimensional attributes, such as: width, edge shapes, pores, and the shapes of the ridge structures.	1
Lift	An adhesive or other medium used to transfer a friction ridge impression from a substrate.	1
LIMS	Acronym for Laboratory Information Management System. A computerized case tracking system.	8
Matrix	The substance that is deposited or removed by the friction ridge skin when making an impression.	1
Method Validation	The process by which it is established, through laboratory studies, that the performance characteristics of a procedure meet the requirements for the intended analytical applications.	11
Method Verification	The process by which it is established, through laboratory studies, that the performance characteristics of a procedure meet the requirements for the intended analytical applications.	11
Minutiae	Events along a ridge path, including bifurcations, ending ridges, and dots (also known as Galton details or characteristics).	1
NGI	Acronym for Next Generation Identification. The updated version of IAFIS	1
Not Suitable for Comparison	A print is not suitable for comparison when there is insufficient reliable information and an identification decision cannot be reached.	4

Quality	The clarity of the information contained within a friction ridge impression.	1
Quantity	The amount of information contained within a friction ridge impression.	1
Quality Assurance	Those planned and systematic actions necessary to provide sufficient confidence that a laboratory's product or service will satisfy given requirements for quality.	3
Palm Print	An impression of the friction ridges of all or any part of the palmar surface of the hand.	1
Proficiency	The ongoing demonstration of competency.	1
Proficiency Test	A test to evaluate the capability and performance of friction ridge examiner, technical support personnel, and the laboratory; in open tests, the analysts and technical support personnel are aware that they are being tested; in blind tests, they are not aware.	3
Proper Seal	A seal that prevents loss, cross transfer, or contamination while ensuring that attempted entry into the container is detectable. A proper seal may include a heat seal, tape seal, or a lock. The initials or other identification of the person creating the seal will be placed on the seal or across the seal onto the container when possible.	3
RAW	Image file that contains the unprocessed data from the image sensor of a digital camera.	5
Reagent	Substance used in a chemical reaction to detect, examine, measure, or produce other substances.	5
Ridge Flow	The direction of one or more friction ridges. A component of Level 1 detail.	1
Ridge Path	The course of single friction ridge. A component of Level 2 detail.	1
Secondary Container	As any container being used beyond the original manufacturer's bottle that the chemical was shipped in. This may include, but is not limited to: Portable or working containers, such as flasks, beakers, or small storage bottles in "immediate use".	9
Source Exclusion	See Exhibit 6/7710 DOJ ULTR Comparison Conclusions	10
Source Identification	See Exhibit 6/7710 DOJ ULTR Comparison Conclusions	10
Suitable for Comparison	A friction ridge print is suitable for comparison when sufficient reliable information is present such that an identification decision can be reached.	4
TIF / TIFF	The acronym Tagged Image File Format.	5

Tonal Reversal	A transferred impression representing the furrows of a friction ridge impression rather than the ridges. Tonal reversals result in the reverse effect than expected (i.e. with ink or black powder, the dark lines represent the furrows instead of the friction ridges).	6
Verification	Independent application of the ACE process as utilized by a subsequent examiner to either support or refute the conclusions of the original examiner.	1
UCN	Acronym for Universal Control Number. A unique number within the Criminal Justice Information Services (CJIS) Division files assigned to an individual.	7
Working Solution	Solution at the proper dilution for processing.	5

Reference #	Location
1	NIJ The Fingerprint Sourcebook
2	SWGFAST Standard Terminology of Friction Ridge Examination
3	2011 Supplemental Requirements for Accreditation of Forensic Science Testing Laboratories – Appendix A - Glossary
4	LOM 7700 Laboratory Operations Manual Examination of Friction Ridge Evidence 7700
5	FBI Latent Print Operations Manual Integrated Automated Fingerprint Identification System, Glossary 2008 Examining Friction Ridge Impressions, Glossary 2010 Processing Used to Develop Latent Prints, Glossary 2006 Digital Images, Glossary 2008 Definitions and Abbreviations, 2017
6	Michele Triplett Fingerprint Terms/www.fprints.nwlean.net/d.htm
7	FBI Universal Latent Workstation Version 6.4.1 Supplemental Instructions
8	LIMS LP Quick Reference Guide (QRG) Version 1.6
9	www.marquette.edu.orc.documents
10	DOJ ULTR

Exhibit 2/7701 SYMBOLS, ACRONYMS, AND ABBREVIATIONS

Table 3 Symbols, Acronyms, and Abbreviations

⦸	Identified Friction Ridge Print (Symbol)
/	Symbol for Left Slant Loop
\	Symbol for Right Slant Loop
A	Arch
AB	Amido Black
ACE-V	Analysis, Comparison, Evaluation, and Verification Methodology
ADAMS	Authenticated Digital Asset Management System
ADM	Analysis of Drug Manual
ADX	Ardrox
AFIS	Automated Fingerprint Identification System
AFIX	AFIX Tracker System
AKA	Also Known As
ALD	Associate Laboratory Director
ALS	Alternate Light Source
ALT BP	Alternate Black powder
REDACTED	REDACTED
AQ	AFIS Quality
ASP	Adhesive Side Powder
BET	Black Electrical Tape
BMP	Black Magnetic Powder
BP	Black Powder
BT	Black Tape
BW	Bubble Wrap
C	Compared, No ID (DEA-466b only)
CAE	Cyanoacrylate Ester (chamber/glue fuming)
CAFIS	Cogent Automated Fingerprint Identification System

CAL	Caliber (weapon)
CAL-DOJ	California – Department of Justice
CBB	Coomassie Brilliant Blue R250
CDO	Crowle's Double Stain
CD-R	Compact Disc/Recordable
CJIS	Criminal Justice Information Services
CFRD	Complex Friction Ridge Detail
CP	Clear Plastic
CPA	Convenience Packaging
CPB	Clear Plastic Bag
CPLSB	Clear Plastic Lock Seal Bag
CPP	Consensus Panel Participants
CPSB	Clear Plastic Sandwich Bag
CPW	Clear Plastic Wrap
CRT	Clear Reinforced Tape
CT	Clear Tape
CYVAC	Cyanoacrylate Vacuum Chamber
DEA	Drug Enforcement Administration
DEA-111	Friction Ridge Examination Report
DEA-12	Receipt For Cash or Other Items
DEA-466	Friction Ridge Examination Worksheet
DEA-466a	DEA-466 Continuation Sheet
DEA-466b	Friction Ridge Matrix Report
DEA-466c	Friction Ridge Case Activity & Communication Log
DEA-466f	Friction Ridge Statistics Form
DEA-7	Report of Drug Property Collected, Purchased, or Seized
DEA-7a	Acquisition of Non-Drug Property Seizures
DEA-7b	Non-Drug Evidence Laboratory Analysis Report

DFO	1,8-diazafluoren-9-one
DHS	Department of Homeland Security
DI	Diversion Investigator
DOJ	Department of Justice
DVD	Digital Versatile Disc or Digital Video Disc
DVD-R	Digital Versatile Disc or Digital Video Disc-Record
E.G.	For Example
ENV	Environmental Humidity Chamber
EPTP	External Proficiency Testing Program
ES	Evidence Specialist
EX	Exhibit
EXT	External
F	Fingerprint (DEA-466b only)
FBI	Federal Bureau of Investigation
FBS	Firebird Booking Station
FC	Forensic Chemist
FIN	Fingerprint Unit
FLP	Fluorescent Powder
FLS	Forensic Light Source
FP	Fingerprint
FR	Fragment (DEA-466b only)
FRDR	Friction Ridge Details Report (Generated by LIMS)
FRE	Friction Ridge Examiner
FRER	Friction Ridge Examination Report (Generated by LIMS)
FRS	Friction Ridge Supervisor
FRTO	Friction Ridge Training Officer
FSIS	Full Spectrum Imaging System
FUR	Friction Ridge Unrecoverable

GB	Glassine Bag
GE	Glassine Envelope
GP	Gray Powder
GS	Group Supervisor
GV	Gentian Violet
HSEE	Heat Seal Evidence Envelope
I	Impression
I.E.	That Is
IA	Investigative Agency
IAFIS	Integrated Automated Fingerprint Identification System (FBI)
IAI	International Association for Identification
ICD	Individual Characteristics Database
ID	Identification
IF	Inherent Fluorescence
INT	Internal
IRR	Image Request Response
J	Lower Joint (DEA-466b only)
JABS	Joint Automated Booking Service
.jpg	Joint Photographic Experts Group
L	Loop
LASER	Light Amplification by Stimulated Emission of Radiation
LD	Laboratory Director
LF	Left Footprint (DEA-466b only)
LFFS	Latent Fingerprint Feature Search
LFIS	Latent Fingerprint Image Search
LI/7	Left Index Finger (#7) (DEA-466b only)
LIMS	Laboratory Information Management System
LL/10	Left Little Finger (#10) (DEA-466b only)

LM/8	Left Middle Finger (#8) (DEA-466b only)
LOM	Laboratory Operations Manual
LP	Latent Print
LPP/L	Left Palm Print (L) (DEA-466b only)
LQAM	Laboratory Quality Assurance Manager
LR/9	Left Ring Finger (#9) (DEA-466b only)
LSB	Lock Seal Bag
LT/6	Left Thumb (#6) (DEA-466b only)
M	Major Case (DEA-466b only)
MBD	7-P-methoxybenzlamino- 4notrobenz-2-oxa-1,3-diazile
MCP	Major Case Prints
MGP	Magnetic powder
MSDPS	Maryland State Department of Public Safety
MT	Masking Tape
N	Not Compared (DEA-466b only)
N/A	Not Applicable
NAQ	Not AFIS Quality
NARD	No Additional Ridge Detail
NE	Not Evaluated (DEA-466b only)
NEG	Negative
NGI	Next Generation Identification
NI	Not Identifiable
NIN	Ninhydrin
NFRP	No Friction Ridge Prints
NV	No Value
NVRD	No Visible Ridge Detail
NYDPS	New York Department of Public Safety
O	Compared, No ID, Need Additional Known Prints (DEA-466b only)

OPR	Office of Professional Responsibility
ORG	Original
OV	Of Value
P	Palm print (DEA-466b only)
PAB	Paper Bag
PB	Plastic Bag
PD	Physical Developer
.pdf	Portable Document Format
PH	Photograph(s)
PKG	Package
PM	Program Manager
POS	Positive
PP	Palm Print
PPE	Personal Protective Equipment
PPI	Pixels Per Inch
PSEE	Plastic Sealed Evidence Envelope [Heat Sealed Evidence Envelope (HSEE) or Self Sealing Evidence Envelope (SSEE)]
PTP	Proficiency Testing Program
PW	Plastic Wrap
QA	Quality Assurance
QAM	Quality Assurance Manager
QAS	Quality Assurance Specialist
QRG	Quick Reference Guide
R6G	Rhodamine 6G
RAM	Rhodamine 6G, Ardrox, MBD dye stain
RF	Right Footprint (DEA-466b only)
RI/2	Right Index Finger (#2) (DEA-466b only)
RL/5	Right Little Finger (#5) (DEA-466b only)

RM/3	Right Middle Finger (#3) (DEA-466b only)
RR/4	Right Ring Finger (#4) (DEA-466b only)
RPP/R	Right Palm Print (R) (DEA-466b only)
RSLD	Resealed
RT/1	Right Thumb (#1) (DEA-466b only)
RTV	Returned to Vault
RUVIS	Reflective Ultraviolet Imaging System
SA	Special Agent
SABIS	Statewide Automated Biometrics Identification System (New York)
SAC	Special Agent in Charge
SBX	Sealed Box
SC	Supervisory Chemist
SF	Office of Forensic Sciences
SFC	Senior Forensic Chemist
SFDCC	Office of Forensic Sciences Document Control Center
SFM	Laboratory Management & Operations
SFPS	Senior Fingerprint Specialist
SFQ	Quality Assurance Section
SID	State Identification Number
SN	Silver Nitrate
SOP	Standard Operating Procedures
SRL	Standard Reporting Language
SSEE	Self-Sealing Evidence Envelope
SSET	Safety Seal Evidence Tape
SSP	Sticky Side Powder
ST	Scotch Tape
SWGFAST	Scientific Working Group on Friction Ridge Analysis, Study and Technology

T	Tip of Finger (DEA-466b only)
TD	Titanium Dioxide (Ti02)
TFO	Task Force Officer
TIF / TIFF	Tagged Image Format File
TOT	Turned over To
TP	Toe Print (DEA-466b only)
TR	Technical Reviewer
TXDPS	Texas Department of Public Safety
UCN	Universal Control Number
UF	Unknown Footprint (DEA-466b only)
ULF	Unsolved Latent File
ULM	Universal Latent Match
ULW	Universal Latent Workstation (software)
UV	Ultra-Violet Light
VIN	Vehicle Identification Number
VIS	Visual
VSB	Vacuum Seal Bag
W	Whorl
WIN	Western Identification Network
X	Not Identifiable (DEA-466b only)
.xps	Open XML Paper Specification
ZLPB	Zip Lock Plastic Bag

Exhibit 3/7710 STANDARD REPORTING LANGUAGE

Table 4 Standard Reporting Language

Exhibit 3-1 Transfer of Friction Ridge Evidence	
Criteria:	Friction ridge evidence transferred to another laboratory for processing.
SRL:	**All examinations were completed at the (Receiving Laboratory, City and State)**
Example:	All examinations were completed at the Southeast Laboratory, Miami, FL.

Exhibit 3-2 Processing Examination Results

Exhibit 3-2.1 No Friction Ridge Detail Developed or Observed	
Criteria:	No friction ridge detail was developed or observed on all specimens within the exhibit.
SRL:	**No friction ridge detail were developed or observed.**
Example:	No friction ridge detail were developed.

Exhibit 3-2.2 No Friction Ridge Prints Suitable for Comparison	
Criteria:	The exhibit contains specimens that have friction ridge detail developed or observed that contain no friction ridge prints suitable for comparison. In addition, the exhibit may also contain specimens that have no friction ridge detail developed or observed.
SRL:	**No friction ridge prints suitable for comparison was developed or observed.**
Example:	No friction ridge prints suitable for comparison was developed.

Exhibit 3-2.3 Friction Ridge (Latent) Prints Suitable for Comparison	
Criteria:	Friction ridge prints suitable for comparison was developed or observed on the specimens that were examined.
SRL:	**(Indicate #) latent (fingerprint/palm) print(s) suitable for comparison were (developed or observed) on (# and indicate specific specimen(s)).**
Example:	Five latent prints suitable for comparison were developed on one clear plastic baggie.

Exhibit 3-2.4 Remaining Specimens – Additional Reporting Statement	
Criteria:	Friction ridge prints suitable for comparison were not (developed or observed) on the remaining specimens in the exhibit that was examined.
SRL:	**No friction ridge prints suitable for comparison were (developed or observed) on the remaining specimen(s).**
Example:	No friction ridge prints suitable for comparison were developed on the remaining specimens.

Exhibit 3-2.5 Visual Examination Only	
Criteria:	When the FRE only conducts a visual examination on the specimen or entire exhibit.
SRL:	**A visual examination for friction ridge detail was conducted and no friction ridge detail was observed on (specimen(s) or exhibit #). The (specimen(s) or exhibit #) is not suitable for further friction ridge processing.**
Example:	A visual examination for friction ridge detail was conducted and no friction ridge detail was observed on the dryer sheets. The dryer sheets are not suitable for further friction ridge processing.

Exhibit 3-2.6 Not Suitable for Friction Ridge Examination	
Criteria:	When the specimen is not suitable for examination.
SRL:	**The (specimen(s) or exhibit #) is not suitable for friction ridge examination.**
Example:	The rubber bands are not suitable for friction ridge examination.

Exhibit 3-2.7 Contaminated Material	
Criteria:	When the FRE conducts a visual examination only of the (specimen or exhibit #) and, due to the presence of contaminants, is unable to conduct further latent print processing.
SRL:	**A visual examination for friction ridge prints was conducted and no friction ridge prints suitable for comparison were observed on (specimen(s) or exhibit #). The presence of contaminant material on (specimen(s) or exhibit #) precluded any further friction ridge print processing.**

Example:	A visual examination for friction ridge prints was conducted and no friction ridge prints suitable for comparison were observed on the kilo packages. The presence of contaminant material on the kilo packages precluded any further friction ridge print processing.
SRL:	**A visual examination for friction ridge prints was conducted and no friction ridge prints were observed on (specimen(s) or exhibit#). The presence of contaminant material on (specimen(s) or exhibit #) precluded any further friction ridge print processing.**
Example:	A visual examination for friction ridge prints was conducted and no friction ridge print was observed on the kilo packages. The presence of contaminant material on the kilo packages precluded any further friction ridge print processing.

Exhibit 3-2.8 Deferred Examination – Processing Examination – Additional Reporting Statement	
Criteria:	When the FRE is in the processing examination stage and has received documented concurrence from either case agent or the FRS to discontinue processing the exhibit.
SRL:	**Further processing of (specimen(s) or exhibit #) was deferred with the approval of (Title and name).**
Example:	Further processing of exhibit 1 was deferred with the approval of SA Smith.

Exhibit 3-3 Comparison Examination Results

Exhibit 3-3.1 Comparisons Performed (Friction Ridge (Latent) Prints)	
Criteria:	Identifiable friction ridge prints were compared to a set of known prints.
SRL:	**The_____was compared to the known (finger/palm) print card(s) of _____ (or) the above listed subjects.**
Multiple Subjects Example:	The latent print(s) was compared to the known palm print cards of the above listed subjects.
One Subject Example:	The latent print was compared to the known fingerprint card of Thomas Jones.

Exhibit 3-3.2 Comparison Performed (Known Prints)	
Criteria:	Known print card compared to a known print card.
SRL:	**The known (finger/palm) print card of_____was compared to the known (finger/palm) print card of_____.**
Example:	The known fingerprint card of Joe Smith was compared to the known fingerprint card of John Smith.

Exhibit 3-3.3 Source Identification Made (Friction Ridge (Latent) Prints)	
Criteria:	The friction ridge print and the known print came from the same source.
SRL:	**(Indicate #) latent print(s) from (specific specimen(s)) was identified to the known (finger/palm) print card of_____, (UCN/SID (if known)).**
Example:	Five latent prints from two clear plastic bags were identified to the known fingerprint card of Thomas Jones, UCN123456789.

Exhibit 3-3.4 Source Identification Made (Known Prints)	
Criteria:	The known print(s) came from the same source.
SRL:	**The known (finger/palm) print(s) of_____, (UCN/SID/DOB (if known)) was identified to the known (finger/palm) print card of_____ _____, (UCN/SID/DOB (if known)).**
Example:	The known fingerprints of Thomas Jones, DOB 12/12/1966, were identified to the known fingerprint card of Thomas J. Jones, UCN 123456789.

Exhibit 3-3.5 Remaining Friction Ridge (Latent) Prints – Additional Reporting Statement	
Criteria:	Remaining friction ridge prints was compared and was excluded with the same individual(s).
SRL:	**The remaining latent (finger/palm) print(s) was excluded from the known (finger/palm) print card(s) of____.**

Example:	The remaining latent print(s) was excluded from the known fingerprint card of Thomas Jones.

Exhibit 3-3.6 Deferred Examination – Remaining Friction Ridge (Latent) Prints – Additional Reporting Statement	
Criteria:	A friction ridge print was identified to a subject in the exhibit, and the FRE has received documented concurrence from either the case agent or the FRS to discontinue any further comparisons of unidentified friction ridge print.
SRL:	**Further comparison of the unidentified latent (finger/palm) prints with the known (finger/palm) card(s) of__was deferred with the approval of _____. Additional comparisons to the unidentified latent print(s) in this exhibit will be made upon request.**
Example:	Further comparison of the unidentified latent fingerprints with the known fingerprint card of Thomas Jones was deferred with the approval of SA John Smith. Additional comparisons to the unidentified latent print(s) in this exhibit will be made upon request.

Exhibit 3-3.7 Source Exclusion (Friction Ridge (Latent) Prints)	
Criteria:	The friction ridge print and the known print(s) did not come from the same source.
SRL:	**(Indicate # or The) latent (fingerprint/palm) print(s) was excluded from the known (finger/palm) print card(s) of_____(or) the above listed subjects.**
One Subject Example:	One latent fingerprint was excluded from the known fingerprint card of Thomas Jones.
Multiple Subjects Example:	The latent palm print was excluded from the known fingerprint card of the above listed subjects.

Exhibit 3-3.8 Source Exclusion (Known Prints)	
Criteria:	The known prints did not come from the same source.
SRL:	**The known (finger/palm) print card(s) of_____, (UCN/SID/DOB (if known)) was excluded from the known (finger/palm) print card of_____, (UCN/SID/DOB (if known)).**

Example:	The known fingerprint card of Thomas Jones, DOB 12/12/1966, was excluded from the known fingerprint card of Thomas J. Jones, UCN 123456789.

Exhibit 3-3.9 Deferred Comparison – Additional Reporting Statement	
Criteria:	Friction ridge prints have not been identified to a subject in the exhibit. The FRE has received documented concurrence from either the case agent or the FRS to discontinue any further comparisons.
SRL:	**Further comparison of the unidentified latent (finger/palm) prints with the known (finger/palm) print card(s) of_____was deferred with the approval of _____. Additional comparisons to the unidentified latent (finger/palm) print(s) in this exhibit will be made upon request.**
Example:	Further comparison of the unidentified latent fingerprints with the known fingerprint cards of Thomas Jones and Edith Jones was deferred with the approval of SA Smith. Additional comparisons to the unidentified latent fingerprints in this exhibit will be made upon request.

Exhibit 3-3.10 Inconclusive Comparison – Lack of Features (Friction Ridge (Latent) Prints)	
Criteria:	One or more friction ridge prints could not be identified to, or excluded from the submitted subject known prints, due to the lack of features (orientation, location, quality of detail, and/or missing key information).
SRL:	**Due to the lack of features in (#) latent (finger/palm) print(s) from (#, specimen(s)), the comparison results were inconclusive to the known finger/palm print card of _____.**
Example:	Due to the lack of features in one latent fingerprint from one plastic bag, the comparison results were inconclusive to known fingerprint card of Thomas Jones.

Exhibit 3-3.11 Inconclusive Comparison - Incomplete (Known Prints)	
Criteria:	One or more friction ridge print could not be identified to, or excluded from the submitted known prints, because the area needed for comparison isn't available (due to incompleteness) and/or because the known print is unclear (due to lack of clarity).
SRL:	**(Due to_____) of the known (finger/palm) print card(s) of_____, the results were inconclusive when compared to_____. Additional known (_____) are required for a conclusive comparison.**

Example:	Due to the lack of clarity of the known fingerprint card of Thomas Jones, the results were inconclusive when compared to the remaining unidentified latent fingerprints. Additional known clear and complete ridge detail of the tip of fingers is required for a conclusive comparison.

Exhibit 3-3.12 Known Fingerprints Standards or Subject Data Required – Additional Reporting Statement	
Criteria:	Known print cards or subject data is needed to conduct a comparison of the unidentified latent print(s).
SRL:	**(A) Known (finger/palm) print cards(s) or an (FBI UCN, SID) of (subject name or the above listed subjects) is needed to complete the comparison request.**
Example:	An FBI UCN of Thomas Jones is needed to complete the comparison request.

Exhibit 3-3.13 Known Palm Print Standards – Additional Reporting Statement	
Criteria:	When the FRE has attempted to obtain a set of palm print cards from the FBI NGI database and receives a negative result.
SRL:	**After requesting known palm prints cards from the FBI NGI database and receiving a negative result, known palm print cards of_____are needed to conduct a comparison.**
Example:	After requesting known palm print cards from the FBI NGI database and receiving a negative result, known palm print cards of Thomas Jones are needed to conduct a comparison.

Exhibit 3-4 Automated Fingerprint Identification Results

Exhibit 3-4.1 No AFIS Suitable Friction Ridge (Latent) Prints	
Criteria:	The exhibit contains unidentified friction ridge print(s). However, the unidentified friction ridge print(s) is not suitable for AFIS processing.
SRL:	**An AFIS evaluation of the unidentified latent (finger/palm) print(s) led to the determination that no latent prints were suitable for AFIS processing.**
Example:	An AFIS evaluation of the unidentified latent fingerprints led to the determined that no latent prints were suitable for AFIS processing.

Exhibit 3-4.2 AFIS Suitable Friction Ridge Prints	
Criteria:	The exhibit contains unidentified friction ridge print(s) that is suitable for AFIS processing.
SRL:	**An AFIS evaluation of the unidentified latent (finger/palm) print(s) led to the determination that _____is suitable for AFIS processing.**
Example:	An AFIS evaluation of the unidentified latent fingerprints led to the determination that three latent prints are suitable for AFIS processing.

Exhibit 3-4.3 Deferred AFIS Evaluation	
Criteria:	The exhibit contains unidentified friction ridge prints that have not be evaluated for suitability for AFIS processing.
SRL:	**An AFIS evaluation of the remaining unidentified latent prints was deferred with the approval of _____. Additional AFIS evaluations to the unidentified latent prints in this exhibit will be made upon request.**
Example:	An AFIS evaluation of the remaining unidentified friction ridge prints was deferred with the approval Friction Ridge Supervisor Jones. Additional AFIS evaluations to the unidentified latent prints in the exhibit will be made upon request.

Exhibit 3-4.4 Notification of AFIS Suitable Friction Ridge (Latent) Prints	
Criteria:	The exhibit contains an unidentified friction ridge print(s) that is suitable for AFIS processing. The FRE chooses to notify the agency about the presence of AFIS suitable friction ridge print(s) before searching them in AFIS.
SRL:	**An AFIS evaluation of the unidentified latent (finger/palm) print(s) led to the determination that _____is suitable for AFIS processing. Further AFIS examination will be performed upon request.**
Example:	An AFIS evaluation of the unidentified latent fingerprints led to the determination that three latent prints are suitable for AFIS processing. Further AFIS examination will be performed upon request.

Exhibit 3-4.5 Elimination Prints Requested	
Criteria:	The exhibit contains unidentified friction ridge prints that are suitable for AFIS processing. Circumstances in the exhibit indicate that elimination prints need to be submitted before AFIS processing is performed.
SRL:	**An AFIS search of the unidentified latent (finger/palm) print(s) will not be conducted until elimination_____prints of_____are submitted.**
Example:	An AFIS search of the unidentified latent prints will not be conducted until elimination fingerprints of Thomas Jones are submitted.

Exhibit 3-4.6 Friction Ridge (Latent) Prints and Known Prints – No Source Identification Made	
Criteria:	An AFIS search was conducted of the unidentified (friction ridge prints or known prints) and no identification was made.
Latent SRL:	**An AFIS search of the unidentified (latent finger/palm or known) print(s) was conducted in the (name of) database, and no identification was made.**
Example:	An AFIS search of the unidentified latent print was conducted in the FBI NGI database, and no identification was made.
Known SRL:	**An AFIS search of the known (finger/palm) print(s) of (name – if available) was conducted in the (name of) database, and no identification was made.**
Example:	An AFIS search of the known thumb print of Thomas Jones was conducted in the FBI NGI database, and no identification was made.

Exhibit 3-4.7 Friction Ridge (Latent) Prints and Known Prints – Source Identification Made	
Criteria:	An AFIS search was conducted and a friction ridge print(s) or known print(s) was identified.
Latent SRL:	**An AFIS search of (#) latent (finger/palm) print(s) from (specimen(s)) was conducted in the (name of) database._____latent print(s) from the _____was identified to a known (finger/palm) print card of_____, (UCN/SID).**
Example:	An AFIS search of two latent fingerprints from the plastic bag was conducted in the FBI NGI database. One latent fingerprint from the plastic bag was identified to a known fingerprint card of Thomas Jones, UCN123456789.

Known SRL:	**An AFIS search was conducted with the known (finger/palm) (print/print card) of and was identified to a known (finger/palm) print card of _____ (UCN/SID).**
Example:	An AFIS search was conducted with the known thumbprint of Thomas Johns and was identified to a known fingerprint card of Thomas Jones, UCN123456789.

Exhibit 3-4.8 Remaining Friction Ridge (Latent) Prints – Additional Reporting Statement	
Criteria:	No AFIS identification was made with the remaining AFIS latent print(s) searched.
SRL:	**No AFIS identification was made with the remaining (#) latent print(s) searchedin the (name of) database.**
Example:	No AFIS identification was made with the remaining two latent prints searched in the FBI NGI database.

Exhibit 3-4.9 Deferred AFIS Searches – Additional Reporting Statement	
Criteria:	Latent prints have been searched in an AFIS database and have not been identified. The FRE has received documented concurrence from either the case agent or the FRS to discontinue AFIS searches.
SRL:	**Further AFIS searches of the unidentified latent print(s) were deferred with the approval of_____. Additional AFIS searches of the unidentified latent print(s) in this exhibit will be made upon request.**
Example:	Further AFIS searches of the unidentified latent prints were deferred with the approval of SA Smith. Additional AFIS searches of the unidentified latent prints in this exhibit will be made upon request.

Exhibit 3-4.10 Registered in Unsolved Friction Ridge (Latent) Print File (Optional)	
Criteria:	The unidentified friction ridge print(s) searched in AFIS was registered in the AFIS unsolved latent file.
SRL:	**The unidentified latent (finger/palm) print(s) was registered in the (name) unsolved latent print file.**
Example:	The unidentified latent fingerprint was registered in the FBI NGI database unsolved latent file.

Exhibit 3-4.11 Post AFIS Identification Friction Ridge (Latent) Prints	
Criteria:	Unidentified AFIS suitable friction ridge print(s) was registered in an unsolved AFIS unsolved latent file. At least one of the registered latent print was identified as the result of a comparison to a known finger or palm print card.
SRL:	**A subsequent response of the registered latent print was received from the (name) unsolved latent file. The latent print was identified to the known (finger or palm) print card(s) of_____, (UCN/SID).**
Example:	A subsequent response of the registered latent print was received from the FBI NGI unsolved latent file. A latent print was identified to the known fingerprint card of Thomas Jones, UCN123456789.

Exhibit 3-5 Additional Friction Ridge (Latent) Print Results or Reports

Exhibit 3-5.1 Field Investigations Results	
Criteria:	Friction ridge print lift card(s) was made, and photographs were taken at a field investigation and released to the SA, TFO, or DI.
SRL:	**On (date), Friction Ridge Examiner (name) responded to (location-address) at the request of (Title and name) to process miscellaneous specimens at/in a _____for friction ridge detail. Photographs were taken of the specimens examined, as well as the scene. (Number) friction ridge print lift card(s) were made and released to (Title and name) at the scene.**
Example:	On October 1, 2013, Friction Ridge Examiner Brown responded to 111 Fifth St., Arlington, VA, at the request of SA Smith to process miscellaneous specimens at a clandestine laboratory for friction ridge processing. Photographs were taken of the specimens examined, as well as the scene. Ten friction ridge print lift cards were made and released to SA Smith at the scene.

Exhibit 3-5.2 Supplemental Reports	
Criteria:	When additional information becomes available, a supplemental FRER will be generated to reflect the additional information.

(LIMS) FRER	A Supplemental Report is selected for the type of Examination Requested. The Examination Results and Conclusions section will begin with the following two statements:
SRL:	**Supplemental report to reflect XXX by (Title and name). (XXX will be replaced with additional request.)** **Refer to the original Friction Ridge Examination Report dated mm/dd/yyyy. NOTE: The date referenced will be the date the original report was approved.**
Example:	Supplemental report to reflect additional comparison request made by SA Smith. Refer to the original Friction Ridge Examination Report dated 01/31/2013.

Exhibit 3-5.3 Amended Reports	
Criteria:	When corrections are required on the original report, an amended FRER will be generated to reflect the corrected information. (See LOM Chapter 7300)
(LIMS) FRER	An Amended Report is selected for the type of Examination Requested. The Examination Results and Conclusions section will begin with the following two statements:
SRL:	**Amended report to correct XXX. (XXX will be replaced with the corrected information).** **Refer to the original report Friction Ridge Examination Report dated mm/dd/yyyy.** **NOTE: The date referenced will be the date the original report was approved.**
Example:	Amended report to correct the spelling of the submitted subject's name. Refer to original Friction Ridge Examination Report dated 01/31/2013.

Exhibit 3-5.4 Consensus Conclusion Statements Friction Ridge (Latent) Prints	
Criteria:	When the consensus panel has formulated an opinion to resolve a technical disagreement.
(LIMS) FRER	Comparison is selected for the type of Examination Requested. The Examination Results and Conclusions section will begin with the following two statements:
SRL:	**A panel of DEA Friction Ridge Examiners independently reviewed the friction ridge print(s) and formulated a consensus of opinion to resolve a difference of technical opinion between two Friction Ridge Examiners initially involved in the**

	examination. **The latent print(s) from (indicate specific specimen(s)) was (identified to/excluded from) the known (finger/palm) prints of _____(UCN, if known) as a result of a consensus panel process.** **Or:** **An inconclusive decision with the latent print(s) from (indicate specific specimen(s)) was effected as a result of a consensus panel process.**
Example:	A panel of DEA Friction Ridge Examiners independently reviewed the latent print(s) and formulated a consensus of opinion to resolve a difference of technical opinion between two Friction Ridge Examiners initially involved in the examination. The latent print from the clear plastic bag was excluded from the known fingerprints of Thomas Jones as a result of a consensus panel process.

Exhibit 3-5.5 Department of Justice (DOJ) Approved Uniform Language for Testimony and Reports (ULTR)	
Criteria:	Qualify Significance of Association - Identification
SRL:	Identification is an examiner's conclusion that two friction ridge skin impressions originated from the same source. This conclusion is an examiner's opinion that the observed friction ridge skin features are in sufficient correspondence such that the examiner would not expect to see the same arrangement of features repeated in an impression that came from a different source and has found insufficient friction ridge skin features in disagreement to conclude that the impressions came from different sources. The basis for an identification conclusion is an examiner's opinion that the observed corresponding friction ridge skin features provide extremely strong support for the proposition that the two impressions came from the same source and extremely weak support for the proposition that the two impressions came from different sources. An identification is the statement of an examiner's opinion that the probability that the two impressions were made by different sources is so small that it is negligible.

Exhibit 3-5.6 Department of Justice (DOJ) Approved Uniform Language for Testimony and Reports (ULTR)

Criteria:	Qualify Significance of Association - Exclusion
SRL:	Exclusion is an examiner's conclusion that two friction ridge skin impressions did not originate from the same source. The basis for an exclusion conclusion is an examiner's opinion that the observed friction ridge skin features are in sufficient disagreement and provide extremely strong support for the proposition that the two impressions came from different sources and extremely weak or no support for the proposition that the two impressions came from the same source.

Exhibit 3-5.7 Department of Justice (DOJ) Approved Uniform Language for Testimony and Reports (ULTR)	
Criteria:	Qualify Significance of Association - Inconclusive
SRL:	Inconclusive is an examiner's conclusion that there is insufficient quantity and/or clarity of corresponding friction ridge skin features between two impressions such that the examiner is unable to identify or exclude the two impressions as originating from the same source. The basis for an 'inconclusive' conclusion is an examiner's opinion that an identification or an exclusion' cannot be made due to insufficient information in either of the two impressions examined.

Exhibit 3-5.8 Department of Justice (DOJ) Approved Uniform Language for Testimony and Reports (ULTR)	
Criteria:	Reference to the standardization of language required by the DOJ for the FRER.
SRL:	The terminology used in the preparation of this report is consistent with the current Department of Justice Uniform Language for Testimony and Reports for the Forensic Latent Print Discipline.

Exhibit 4/7710 ANALYSIS OF FRICTION RIDGE DETAIL

A. First Level Detail
   1. First level detail of friction ridge print features is the general overall direction of ridge flow in the print.
   2. First level detail is not limited to a defined classification pattern.
   3. First level detail can be used to determine anatomical source. (e.g., fingers, palms, and feet)
   4. First level detail cannot be used alone to identify.
   5. First level detail can be used to exclude under certain circumstances.

B. Second Level Detail
   1. Second level detail is the path of a specific ridge.
   2. The actual ridge path includes:
      a. The starting position of the ridge
      b. The path the ridge takes
      c. The length of the ridge path
      d. Where the ridge path stops
   3. Second level detail is much more than the specific location of where a ridge terminates at a ridge ending or bifurcation, also known as friction ridge characteristics (minutiae).
   4. Sequences and configurations with other ridge paths.
   5. The ridge path and its length with terminations are unique.
   6. The sequences and configurations of a series of ridge paths are also unique.
   7. Second level details in a print cannot exist without first level details.
   8. The general direction of ridge flow will exist for a specific ridge path to occur.
   9. Second level detail is used in conjunction with first level detail to identify.
   10. Second level detail is used in conjunction with level one detail to exclude.

C. Third Level Detail
   1. Third level details are the shapes of the ridge structures.
   2. Third level detail encompasses the morphology (edges, textures, and pore positions) of the ridge.
   3. Other specific friction skin morphology includes secondary creases, ridge breaks, scars, incipient ridges, and other imperfections.
   4. Third level details are unique in their shapes, sequences, and configurations.

5. The clarity of the print might limit an examiner's ability to perceive the morphology, sequences, and configurations of third level detail.
6. The general direction of ridge flow and a specific ridge path will exist for morphology or pore positions of a ridge to be visibly present as third level detail in a print.
7. Third level detail is used in conjunction with level one and level two detail to identify.
8. Third level detail is used in conjunction with level one and level two detail to exclude.
9. Other Features
10. May be used in conjunction with friction ridge details to identify or exclude.
11. May include creases, scars, warts, paper cuts, and blisters, for example.
12. May be permanent or temporary.
13. May contain first level detail, second level detail, and third level detail.

D. Complex Friction Ridge Prints

A number of factors may be involved in the analysis of a CFRP, and these factors may include:

1. Superimposed friction ridge prints (e.g., double taps)
2. Deposition pressure distortion
3. Slippage
4. Non-contiguous ridge detail
5. Substrate distortion
6. Matrix distortion
7. Development medium (incomplete ridge development)
8. Indistinct minutiae
9. Tonal reversal

Exhibit 5/7710 DEPARTMENT OF HOMELAND SECURITY AFIS GUIDELINES

The FRE:

A. Captures the friction ridge or known print at a minimum resolution of 500 ppi (1000 ppi is recommended), calibrated for 1:1, and saved in a "TIF" file format.

B. Includes a scale in the image.

C. Fills out requested LP DHS Guidelines and Search Request Form or the LP DHS Guidelines and 10 Print Search Request form. (See SFDCC)

D. Submits DHS Latent Case Submittal form and the digital image(s) (attachment) to an electronic mail message.

E. Uses the unique identifier of the exhibit as the reference number in the subject line.

F. Considers email file size limitations when attaching multiple images to a message.

G. Provides the following statements in the narrative portion of the message:

1. "The attached image is being submitted to the Department of Homeland Security for search by the Biometric Support Center, in connection with an official investigation of a criminal matter by the Drug Enforcement Administration.
2. The image was captured at a minimum resolution of 500 ppi, calibrated for 1:1, and saved in a "TIF" format. Please respond via electronic mail with the results of your search to: Friction Ridge Examiner (name) at: REDACTED
3. Your assistance in this matter is appreciated. FRE (name) can be reached at (phone number), if you have any questions regarding this request."

Exhibit 6/7710 DOJ ULTR

The Uniform Language for Testimony and Reports (ULTR) provides guidance on the submission of scientific statements and can be located at Approved ULTR for the Forensic Latent Print Discipline (justice.gov)

Exhibit 7/7710 STANDARD OPERATING PROCEDURES FOR FRICTION RIDGE PROCESSING

Exhibit 7-01 1,2-Indanedione-Zinc Chloride Petroleum Ether (non-thermal paper)

Exhibit 7-02 1,2-Indanedione-Zinc Chloride Petroleum Ether (thermal paper)

Exhibit 7-03 1,8-Diazafluoren-9-one (DFO)

Exhibit 7-04 Alternate Black Powder

Exhibit 7-05 Alternate Light Source

Exhibit 7-06 Ardrox (Fluorescent Dye)

Exhibit 7.07 Cyanoacrylate Fuming

Exhibit 7.08 Gentian Violet

Exhibit 7.09 Gun Bluing Solution

Exhibit 7.10 Iodine Fuming

Exhibit 7-11 Laser (Light Amplification of Stimulated Emission Radiation)

Exhibit 7-12 MBD (Fluorescent Dye)

Exhibit 7-13 Ninhydrin (Acetone Base)

Exhibit 7-14 Ninhydrin (Hexane Base)

Exhibit 7-15 Ninhydrin (Petroleum Ether Base)

Exhibit 7-16 Physical Developer

Exhibit 7-17 Powders

Exhibit 7-18 RAM (Fluorescent Dye)

Exhibit 7-19 Reflective Ultraviolet Imaging System (RUVIS)

Exhibit 7-20 Rhodamine 6G (Fluorescent Dye)

Exhibit 7-21 Rhodamine 6G – Methanol/Isopropanol (Fluorescent Dye)

Exhibit 7-22 Wetting Agent

Exhibit 7-23 Ultraviolet (UV) Light

Exhibit 7-24 Sticky Side Powder

Exhibit 7-25 Tape Chart – Processing the Adhesive Side of Tape

Exhibit 7-01 1,2-Indanedione-Zinc Chloride Petroleum Ether (non-thermal paper)

Exhibit 7-01.1 Scope

1,2-Indanedione-zinc chloride (Ind-Zn) is used on porous surfaces to develop friction ridge prints. It reacts with the amino acids that are often present in friction ridge print impressions. These prints can be seen without further lighting techniques, but are best visualized by the use of a laser. A different formulation of 1,2- Indanedione-zinc chloride than the one listed below should be used on thermal paper.

Exhibit 7-01.2 Limitations

Ind-Zn can only be used on porous surfaces and must be used prior to Ninhydrin processing.

Exhibit 7-01.3 Equipment/Materials/Reagents

A. Beakers
B. Graduated Cylinders
C. Laser
D. Analytical Balance
E. Magnetic Stirrer and Stir Bar
F. Squirt Bottle/Sprayer
G. Glass Tray
H. Storage Bottles – Dark
I. 1,2-Indanedione
J. Ethyl Acetate
K. Glacial Acetic
L. Acid Zinc
M. Chloride
N. Absolute Ethanol
O. Petroleum Ether
P. Storage Bottle - Dark

Exhibit 7-01.4 Solution Preparation

Exhibit 7-01.4.1 1,2-Indanedione Stock Solution

A. Combine 1,2-Indanedione and ethyl acetate and place on a magnetic stirrer until all of the powder has dissolved.
    1. 1,2-Indanedione 4 g

2. Ethyl acetate 450 mL
3. Glacial Acetic Acid 50 mL

B. Add the glacial acetic acid, but do not stir.

C. Place into a dark bottle to store for later use.

Exhibit 7-01.4.2 Zinc Chloride Stock Solution

A. Combine and place on a magnetic stirrer until all of the powder has dissolved.

1. Zinc Chloride 8 g
2. Absolute Ethanol 200 mL

B. Place into a dark bottle to store for later use.

Exhibit 7-01.4.3 1,2-Indanedione-Zinc Chloride Working Solution

A. Combine the above ingredients into a beaker in the order that they are listed.

1. 1,2-Indanedione Stock Solution 50 mL
2. Zinc Chloride Stock Solution 2 mL
3. Petroleum Ether 450 mL

B. Do not place the solution on a magnetic stirrer.

C. Place unused contents into a dark bottle and store for later use.

Exhibit 7-01.5 Processing Procedure

A. Apply 1,2-indanedione–zinc chloride working solution to the specimen by spraying, dipping, or squirting.

B. Allow the sample to air dry and then develop in a humidity chamber at 40-80°C and 65-80% relative humidity for 10 minutes or with a steam iron.

C. View fluorescence under a laser or an alternate light source at wavelength 490 nm – 560 nm with orange goggles or band-pass barrier filter.

D. Mark friction ridge prints.

Exhibit7-01.6 Storage

Dark bottles

Exhibit 7-01.6.1 Shelf Life

A. 1,2-Indanedione Stock Solution 12 months

B. Zinc Chloride Stock Solution 12 months

C. Working Solution 3 months

Exhibit 7-01.7 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process.

C. Dispose of working solution in waste stream.

D. When using the laser and alternate light sources:

E. Wear goggles with the appropriate filters.

F. Cover skin to eliminate exposure to light.

G. Never look directly into the light.

H. Use appropriate warning device to indicate when the UV light, laser, or alternate light source is in use.

Exhibit 7-01.8 Calibration

Analytical balances are calibrated yearly according to manufacturer protocol.

Exhibit 7-01.9 Verification

See Verification Report.

Exhibit 7-01.10 Literature References

A. Bicknell, D. E.; Ramotowski, R. S. “Use of an Optimized 1,2-Indanedione Process for the Development of Latent Prints”. Journal of Forensic Science 2008, 53 (5), 1108–1116.

B. Fritz, P., van Bronswijk, W., Patton, E., Lewis, S., “Variability in Visualization of Latent Fingermarks Developed with 1,2-Indanedione- Zinc Chloride”. Journal of Forensic Identification 63, 6 (2013).

C. Holder, E, Robinson, L., Laub, J, The Fingerprint Sourcebook, Washington, D.C., U.S. Dept. of Justice, Office of Justice Programs, National Institute of Justice, 2011.

D. Holt, D., “Determining the Quality and Sustainability of Friction Ridge Deposits on Envelopes Sent Through the Postal System”. Journal of Forensic Identification 63, 3 (2013).

E. Mostowtt, T, Ramotowski, R.S., Morgan, J.P. Jr., “A Comparison of Thermal Fingerprint Development to Current Recommended Chemical Development Techniques on Porous Surfaces”, Journal of Forensic Identification 66, 4 (2016).

F. Technical Note, Journal of Forensic Identification 52 (5,2002/551).

Exhibit 7-02 1,2-Indanedione-Zinc Chloride Petroleum Ether (thermal paper)

Exhibit 7-02.1 Scope

1,2-Indanedione-zinc chloride (Ind-Zn) is used on porous surfaces to develop friction ridge prints. It reacts with the amino acids that are often present in friction ridge print impressions. These prints can be seen without further lighting techniques, but are best visualized by the use of a laser. A different formulation of 1,2- Indanedione-zinc chloride than the one listed below should be used on non-thermal paper.

Exhibit 7-02.2 Limitations

Ind-Zn can only be used on porous surfaces and must be used prior to Ninhydrin processing.

Exhibit 7-02.3 Equipment/Materials/Reagents

A. Graduated Cylinders
B. Magnetic Stirrer and Stir Bar
C. Laser
D. Analytical Balance
E. Squirt Bottle/Sprayer
F. Glass Tray
G. Storage Bottles – Dark
H. 1,2-Indanedione
I. Zinc Chloride
J. Ethanol
K. Dichloromethane
L. Ethyl Acetate
M. Petroleum Ether

Exhibit 7-02.4 Solution Preparation

Exhibit 7-02.4.1 1,2-Indanedione-Zinc Chloride Stock Solution

A. Combine above ingredients into a beaker and place on a magnetic stirrer until all of the powder has dissolved.
    1. 1,2-Indanedione 1.5 g
    2. Zinc Chloride 40 mg
    3. Ethanol 1 mL
    4. Dichloromethane 30 mL

5. Ethyl Acetate 70 mL

B. Place into a dark bottle to store for later use.

Exhibit 7-02.4.2 1,2-Indanedione-Zinc Chloride Working Solution

A. Combine the above ingredients into a beaker in the order that they are listed.

1. 1,2-Indanedione-Zinc Chloride Stock Solution 25 mL
2. Petroleum Ether 225 mL

B. Do not place the solution on a magnetic stirrer.

C. Place unused contents into a dark bottle, and store for later use.

Exhibit 7-02.5 Processing Procedure

A. Apply the working solution to non-evidentiary paper by spraying, dipping, or squirting. The paper should be of sufficient size so the item(s) of evidence can be sandwiched between the treated papers.

B. Allow the treated paper to air dry. Use the treated paper within 24 hours of preparation.

C. Place the item(s) of evidence between the treated papers, seal in a plastic zip top bag, and leave in a dark space, unweighted, for at least 24 hours.

D. If no prints develop at the 24-hour mark, continue to let develop for an additional 24 hours.

E. Examine item under laser or light source at 490 nm to 560 nm using orange goggles or band- pass barrier filter.

F. Mark latent prints.

Exhibit 7-02.6 Storage

Dark bottles.

Exhibit 7-02.6.1 Shelf Life

A. 1,2-indanedione-Zinc Chloride Stock Solution: 6 months

B. Working Solution: 6 months

Exhibit 7-02.7 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process.

C. Dispose of working solution in waste stream.

D. When using the laser and alternate light sources:

E. Wear goggles with the appropriate filters

1. Cover skin to eliminate exposure to light

F. Never look directly into the light

G. Use appropriate warning device to indicate when the UV light, laser, or alternate light source is in use.

Exhibit 7-02.8 Calibration

Analytical balances are calibrated yearly according to manufacturer protocol.

Exhibit 7-02.9 Verification

See Validation Report.

Exhibit 7-02.10 Literature References

A. Fritz, P., van Bronswijk, W., Darren, F., Lewis, S., “Preliminary Investigations into a Commercial Thermal Fingerprint Developer for the Visualization of Latent Fingermarks on Paper Substrates”. Journal of Forensic Identification 64, 6 (2014).

B. Patton, E.; Brown, D.; Lewis, S. “Detection of Latent Fingermarks on Thermal Printer Paper by Dry Contact with 1,2-indanedione”. Analytical Methods 2010, 2 (6), 631–637.

Exhibit 7-03 1,8-Diazafluoren-9-one (DFO)

Exhibit 7-03.1 Scope

DFO is used to develop friction ridge prints on porous surfaces. DFO reacts with the amino acids that are present in perspiration. All developed prints will fluoresce under a laser or alternate light source.

Exhibit 7-03.2 Limitations

DFO cannot be used on non-porous surfaces.

Exhibit 7-03.3 Equipment/Materials/Reagents

A. Beakers
B. Glass Tray
C. Graduated Cylinders
D. Laser or Alternate Light Source
E. Magnetic Stirrer and Stir Bar
F. Oven or Dry Iron
G. Analytical Balance
H. Squirt Bottle/Sprayer
I. Storage Bottles – Dark
J. DFO
K. Ethyl Acetate
L. Glacial Acetic
M. Acid Methanol
N. Petroleum Ether

Exhibit 7-03.4 Solution Preparation

Exhibit 7-03.4.1 Stock Solution

Combine and place on a magnetic stirrer until all of the DFO is dissolved.

A. DFO	1 g
B. Methanol	200 mL
C. Ethyl Acetate	200 mL
D. Glacial Acetic Acid	40 mL

Exhibit 7-03.4.2 Working Solution

Dilute the stock solution with the petroleum ether to make 2 L of working solution. The solution should be a clear, gold color.

A. Stock Solution 440 mL

B. Petroleum Ether 1560 mL

Exhibit 7-03.5 Processing Procedure

A. Apply DFO to the specimen by spraying or dipping.

B. Allow specimens to dry.

C. Place in an oven at 100°C for 20 minutes.

D. View fluorescence under a laser or alternate light source at approximately 515 nm.

Exhibit7-03.6 Storage

Both solutions: dark bottles.

Exhibit 7-03.6.1 Shelf Life

Both solutions: greater than 6 months.

Exhibit 7-03.7 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the safety data sheet (SDS) for each chemical used in the process.

C. Dispose of used DFO in waste stream.

D. When using the laser and alternate light sources:

1. Wear goggles with the appropriate filters.
2. Cover skin to eliminate exposure to light.
3. Never look directly into the light.
4. Use appropriate warning device to indicate when the laser or alternate light source is in use.

Exhibit 7-03.8 Calibration

Analytical balances are calibrated yearly according to manufacturer protocol.

Exhibit 7-03.9 Verification

See Verification Report.

Exhibit 7-03.10 Literature References

A. LIA Laser Safety Committee, Edited by David H. Sliney, Laser Safety Guide, Ninth Edition, Laser Institute of America, Orlando, 1993.

B. Pounds, C. A., Grigg, R. and Mongkolaussavaratana, T., "The Use of 1,8-Diazafluoren-9-one (DFO) for the Fluorescent Detection of Latent Fingerprints on Paper: A Preliminary Evaluation", Journal of Forensic Sciences, 35, 169 (1990).

C. Trozzi, T. A., Schwartz, R. L., and Hollars, M. L., Processing Guide for Developing Latent Prints, FBI Laboratory, Washington, DC 2001.

Exhibit 7-04 Alternate Black Powder

Exhibit 7-04.1 Scope

Alternate Black Powder is used to process the adhesive side of many different types and colors of tape.

Exhibit 7-04.2 Limitations

See Tape Chart.

Exhibit 7-04.3 Equipment/Materials/Reagents

A. Brushes – Camel-Hair or another small brush
B. Petri or Shallow Dish
C. Teaspoon
D. Distilled water
E. Black or White Powder
F. Wetting Agent

Exhibit 7-04.4 Solution Preparation

A. Working Solution:
    1. Black or White Powder 1 tsp
    2. Wetting Agent (diluted 50:50 with distilled water)
B. Combine in a petri or shallow dish and stir until the solution has the consistency of shaving cream.

Exhibit 7-04.5 Processing Procedure

A. Paint the solution onto the adhesive surface with a brush.
B. Let sit for 30 to 60 seconds.
C. Rinse with a slow stream of cold tap water.
D. Allow to dry.
E. Repeat procedure if necessary.

Exhibit7-04.6 Storage

None - Prepare as needed.

Exhibit 7-04.6.1 Shelf Life

Prepare as needed.

Exhibit 7-04.7 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process.

Exhibit 7-04.8 Verification

See Verification Report.

Exhibit 7-04.9 Literature References

A. Lo, I. K. L., "A Review on Detection of Latent Prints on Self-Adhesive Tapes", Fingerprint Whorld, 19, 89 (1993).

B. Sneddon, N., "Black Powder Method to Process Duct Tape", Journal of Forensic Identification", 49, 347 (1999).

C. Trozzi, T. A., Schwartz, R. L., and Hollars, M. L., Processing Guide for Developing Latent Prints, FBI Laboratory, Washington, DC 2001.

Exhibit 7-05 Alternate Light Source

Exhibit 7-05.1 Scope

The Alternate Light Source (ALS) is a source of light that is used to examine any type of evidence for the presence of friction ridge prints. The ALS is used before any processing is done to visualize any inherent fluorescence and in conjunction with certain dyes and processes that may result in fluorescence.

Exhibit 7-05.2 Limitations

A. Limited amount of power is available at each wavelength.

B. All examinations should be performed with the room lights off.

Exhibit 7-05.3 Processing Procedure

A. Turn on the fan.

B. Turn on the lamp.

C. Use the buttons on the front of the instrument to select the wave length.

D. Place evidence under the light and examine.

E. Mark prints.

F. Turn off the lamp.

G. Turn off the fan.

Exhibit 7-05.4 Safety

A. Always wear safety goggles with the appropriate filter - many wavelengths are available between 515 nm and 630 nm, depending on the wavelength of light being used.

B. Wear a lab coat to cover exposed skin.

C. When using the UV light and alternate light sources:

D. Wear goggles with the appropriate filters.

E. Cover skin to eliminate exposure to UV light.

F. Never look directly into the light.

G. Use appropriate warning device to indicate when the UV light or alternate light source is in use.

Exhibit 7-05.5 Calibration

Refer to owner's manual to see how different wavelengths are selected for viewing by the examiner.

Exhibit 7-05.6 Literature References

Lee, Henry C. and Gaensslen, R. E., Advances in Fingerprint Technology, CRC Press, Inc., Florida, 1994.

Exhibit 7-06 Ardrox (Fluorescent Dye)

Exhibit 7-06.1 Scope

Ardrox is a fluorescent dye used to make cyanoacrylate-developed prints more visible on various colored surfaces. It is used in conjunction with long-wave ultraviolet light.

Exhibit 7-06.2 Limitations

Must be used after cyanoacrylate fuming.

Exhibit 7-06.3 Equipment/Materials/Reagents

A. Beakers
B. Graduated Cylinders
C. Squirt Bottles
D. Ultraviolet Light – Long-wave
E. Ardox P133D
F. Acetone
G. Methanol
H. Isopropanol
I. Acetonitrile
J. Petroleum
K. Ether
L. Storage Bottle – Clear or Dark

Exhibit 7-06.4 Solution Preparation

A. Working Solution

1.	Ardorox P133D (undiluted)	2 mL
2.	Acetone	10 mL
3.	Methanol	25 mL
4.	Isopropanol	10 mL
5.	Acetonitrile	8 mL
6.	Petroleum Ether	945 mL

B. Combine in a beaker in the order listed. DO NOT place on a magnetic stirrer.

Exhibit 7-06.5 Processing Procedure

A. Apply the developer to the specimens by dipping or using a squirt bottle.

B. Allow specimen to dry.

C. View under a long-wave UV light.

D. Mark prints.

Exhibit7-06.6 Storage

Clear or dark bottles.

Exhibit 7-06.6.1 Shelf Life

Up to 6 months.

Exhibit 7-06.7 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the safety data sheet (SDS) for each chemical used in the process.

C. Dispose of used DFO in waste stream.

D. When using the UV and alternate light sources:

1. Wear goggles with the appropriate filters.
2. Cover skin to eliminate exposure to light.
3. Never look directly into the light.
4. Use appropriate warning device to indicate when the laser or alternate light source is in use.

Exhibit 7-06.8 Verification

See Verification Report.

Exhibit 7-06.9 Literature References

A. Cummings, H., Hollars, M. L., and Trozzi, T. A., "Getting the Most from Cyanoacrylate Dyes", Journal of Forensic Identification 43, 37 (1993).

B. LIA Laser Safety Committee, Edited by David H. Sliney, Laser Safety Guide, Ninth Edition, Laser Institute of America, Orlando, 1993.

C. Trozzi, T. A., Schwartz, R. L., and Hollars, M. L., Processing Guide for Developing Latent Prints, FBI Laboratory, Washington, DC 2001.

Exhibit 7.07 Cyanoacrylate Fuming

Exhibit 7.07.1 Scope

Cyanoacrylate fuming is used to develop friction ridge prints on nonporous specimens.

Exhibit 7.07.2 Equipment/Materials/Regents

A. Aluminum Dish
B. Fuming Chamber
C. Heater (i.e., a hot plate)
D. Cyanoacrylate (premixed)

Exhibit 7.07.3 Solution Preparation

Not Applicable

Exhibit 7.07.4 Processing Procedure

A. If a humidified chamber is available, set humidity between 70% and 80% for best results.
B. Place the specimens in the chamber.
C. Place the aluminum dish on a heating surface.
D. Add liquid cyanoacrylate to cover the bottom surface of the dish.
E. Turn the heater to the appropriate setting.
F. Secure the chamber door.
G. The cyanoacrylate begins to fume at a steady pace.
H. Allow specimens to be fumed. Fuming time varies depending on the size of the chamber.
I. Remove the specimens to look for friction ridge prints.
J. Re-fume if necessary.

Exhibit 7.07.5 Storage

Original container.

Exhibit 7.07.5.1 Shelf Life

Indefinite.

Exhibit 7.07.6 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process.

Exhibit 7.07.7 Verification

See Verification Report.

Exhibit 7.07.8 Literature References

A. Lewis, L. A., Smithwick, R. W., Devault, G. L., Bolinger, B., and Lewis, S. A., "Processes involved in the Development of Latent Fingerprints using the Cyanoacrylate Fuming Method", Journal of Forensic Science 46, 241 (2001).

B. Trozzi, T. A., Schwartz, R. L., and Hollars, M. L., Processing Guide for Developing Latent Prints, FBI Laboratory, Washington, DC 2001.

Exhibit 7.08 Gentian Violet

Exhibit 7.08.1 Scope

Gentian Violet can be used to process many different types and colors of tape.

Exhibit 7.08.2 Limitations

Gentian Violet should not be used on water-soluble tapes. (See Tape Chart)

Exhibit 7.08.3 Equipment/Materials/Regents

A. Beakers
B. Tray
C. Magnetic Stirrer and Stir Bar
D. Analytical Balance
E. Storage Bottles – Clear and Dark
F. Distilled Water
G. Gentian Violet

Exhibit 7.08.4 Solution Preparation

A. Working Solution:
    1. Gentian Violet 1 g
B. Distilled Water 1000 mL
C. Combine in a beaker and place on a stirring device for approximately 25 minutes.

Exhibit 7.08.5 Processing Procedure

A. Place solution in a glass tray.
B. Dip the specimen into the solution for 1 to 2 minutes.
C. Rinse with cold tap water.

Exhibit 7.08.6 Storage

Clear or dark bottles.

Exhibit 7.08.6.1 Shelf Life

Indefinite.

Exhibit 7.08.7 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process.

C. Dispose of working solution down the drain.

Exhibit 7.08.8 Calibration

Analytical balances are calibrated yearly according to manufacturer protocol.

Exhibit 7.08.9 Verification

See Verification Report.

Exhibit 7.08.10 Literature References

A. Lo, I. K. L., "A Review on Detection of Latent Prints on Self-Adhesive Tapes", Fingerprint Whorld, 19, 89 (1993).

B. Trozzi, T. A., Schwartz, R. L., and Hollars, M. L., Processing Guide for Developing Latent Prints, FBI Laboratory, Washington, DC 2001.

Exhibit 7.09 Gun Bluing Solution

Exhibit 7.09.1 Scope

Gun bluing contains cupric salt, selenious acid, and an acid. Cupric ions and selenious acid are reduced by the oxidized (etched) metals of copper, aluminum, zinc, and iron. The reagent etches the cartridge's metal surface not protected by sebaceous-containing friction ridge print residue, and deposits a dark-colored Cu- Se coating to reveal friction ridge detail. Cartridges should be first briefly fumed with cyanoacrylate ester, and then immersed into the gun bluing solution. A water bath stops the chemical reaction.

Exhibit 7.09.2 Limitations

A. should be used after a light cyanoacrylate fuming.

B. should over-development occur, excess gun bluing may be removed from the metal cartridge cases using acidified hydrogen peroxide.

C. The use of cyanoacrylate fuming as a pretreatment may be skipped. A clear lacquer spray can be applied to the cartridge cases to stabilize the development process and to enhance the contrast of the developed friction ridge detail.

D. A number of gun bluing products sold under various trade names can be used in a diluted solution to reveal friction ridge detail on cartridge surfaces.

E. Lacquered steel cartridges or those cartridges with a polymer jacket around the casing will resist the oxidation/reduction resulting in little or no development.

Exhibit 7.09.3 Equipment/Materials/Regents

A. Beakers

B. Squirt Bottles

C. Graduated Cylinders

D. Storage Bottles - Clear and Dark

E. Commercial gun bluing – (i.e. Formula 44/40 Instant Gun Blue, Brass Black Metal Touch Up BB2, Gunslick Gun Blue, Perma Blue Liquid Gun Blue PB22, Outer's Gun Blue or Super Blue Extra Strength brand gun bluing)

F. Distilled Water

Exhibit 7.09.4 Solution Preparation

Working Solution

A. Commercial gun bluing (undiluted)	4 mL
B. Distilled Water	160 mL

Exhibit 7.09.5 Processing Procedure

A. Light fuming of cartridges with cyanoacrylate ester. (Superglue chamber not recommended - use alternate method to avoid over processing with glues fumes).

B. Immerse cartridges in the prepared reagent.

C. Gently stir and roll the cartridges in the solution.

D. Monitor closely for development.

E. Halt development by immersing in distilled water for 2 minutes.

F. Allow specimen to dry.

Exhibit 7.09.6 Storage

Clear or dark bottles.

Exhibit 7.09.6.1 Shelf Life

Undetermined; test each solution prior to use.

Exhibit 7.09.7 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process.

C. Dispose of working solution in waste stream.

Exhibit 7.09.8 Calibration

Analytical balances are calibrated yearly according to manufacturer protocol.

Exhibit 7.09.9 Verification

See Verification Report.

Exhibit 7.09.10 Literature References

A. Cantu, A.A., Leben, D.A., Ramotowski, R., Kopera, J., Simms, J.R.,"Use of Acidified Hydrogen Peroxide to Remove Excess Gun Blue from Gun Blue-Treated Cartridge Cases and to Develop Latent Prints on Untreated Cartridge Cases", Jor. Forensic Sciences, Vol. 43, No. 2, pp. 294 – 298.

B. Chesapeake Bay Division-International Association for Identification processing brass cartridge cases with gun bluing. http://www.cbdiai.org/Reagents/bluing.html

C. Migron, Y.,Hocherman, G., Springer, E., Almog, J., and Mandler, D., "Visualization of Sebaceous Fingerprints on Fired Cartridge Cases: A Laboratory Study", J. Forensic Sciences, Vol. 43, No. 3, May 1998, pp. 543-548.

Exhibit 7.10 Iodine Fuming

Exhibit 7.10.1 Scope

Iodine fumes adhere to grease or oils on porous surfaces and appear as yellow stains.

Exhibit 7.10.2 Limitations

Prints developed MUST be photographed immediately.

Exhibit 7.10.3 Equipment/Materials/Regents

A. Ceramic or Glass Dish
B. Fuming Chamber
C. Heat Source (i.e., a hot plate)
D. Iodine (ACS Reagent Grade)

Exhibit 7.10.4 Processing Procedure

A. Place iodine crystals in a ceramic or glass dish.
B. Place dish into the fuming chamber.
C. Apply heat to the crystals.
D. Watch for print development.
E. Remove specimens from chamber when sufficient development has occurred.
F. Photograph.

Exhibit 7.10.5 Storage

Original Container.

Exhibit 7.10.5.1 Shelf Life

Indefinite.

Exhibit 7.10.6 Safety

A. Always use under an operational hood.
B. Wear the appropriate PPE.
C. Familiarize yourself with the information found on the SDS for each chemical used in the process.
D. Dispose of working solution in waste stream.

Exhibit 7.10.7 Verification

See Verification Report.

Exhibit 7.10.8 Literature References

A. Pounds, C. A., Allman, D. S. and Wild, F. M., "The Development of Latent Fingerprints Using an Iodine Spray Technique", CRSE Report No. 746 (1992).

B. Trozzi, T. A., Schwartz, R. L., and Hollars, M. L., Processing Guide for Developing Latent Prints, FBI Laboratory, Washington, DC 2001.

Exhibit 7-11 Laser (Light Amplification of Stimulated Emission Radiation)

Exhibit 7-11.1 Scope

The laser is used to examine any type of evidence for the presence of friction ridge prints. The laser is used before any processing is done to visualize any inherent fluorescence and in conjunction with certain dyes and processes that may result in fluorescence.

Exhibit 7-11.2 Limitations

Refer to the owner's manual to determine the laser output wavelength.

Exhibit 7-11.3 Equipment/Materials/Regents

A. The laser and all of its components.

B. Safety goggles with an appropriate filter to block the laser light but not the fluorescence.

Exhibit 7-11.4 Processing Procedure

A. Turn on the laser. (Refer to owner's manual)

B. Conduct a friction ridge print examination.

C. Turn off the lights in the room.

D. Wear goggles with appropriate filter.

E. Begin the emission of laser light as described in the owner's manual.

F. Place evidence in the viewing area and examine.

G. Mark prints.

H. Turn off emission of laser light as described in owner's manual.

I. Turn off the laser. (Refer to owner's manual)

J. Power down laser. (Refer to owner's manual)

Exhibit 7-11.5 Safety

A. Always wear safety goggles with the appropriate filter for the wavelength of light emitted from the laser. Wear a lab coat to cover exposed skin.

B. Never look directly into the light.

C. Use appropriate warning device to indicate when laser is in use.

Exhibit 7-11.6 Calibration

The laser is calibrated by the service engineer during service visits.

Exhibit 7-11.7 Verification

See Verification Report.

Exhibit 7-11.8 Literature References

A. Lee, Henry C. and Gaensslen, R. E., Advances in Fingerprint Technology, CRC Press, Inc., Florida, 1994.

B. LIA Laser Safety Committee, Edited by David H. Sliney, Laser Safety Guide, Ninth Edition, Laser Institute of America, Orlando, 1993.

C. Menzel, E. Roland, Fingerprint Detection with Lasers, Second Edition, Marcel Dekker, Inc., New York, 1999.

Exhibit 7-12 MBD (Fluorescent Dye)

Exhibit 7-12.1 Scope

MBD is a fluorescent dye used to make cyanoacrylate-developed prints more visible on various colored surfaces.

Exhibit 7-12.2 Limitations

Must be used after cyanoacrylate fuming.

Exhibit 7-12.3 Equipment/Materials/Regents

A. Alternate Light Source

B. Beakers

C. Glass Tray

D. Graduated Cylinders

E. Magnetic Stirrer and Stir Bar

F. Analytical Balance

G. Squirt Bottles
H. Acetone
I. Isopropanol
J. 7-P-methoxybenzylamino-4nitrobenz-2 oxa-1-3-diazole (MBD)
K. Methanol
L. Petroleum Ether
M. Storage Bottles – Dark

Exhibit 7-12.4 Solution Preparation

Exhibit 7-12.4.1 Stock Solution

Combine in a beaker and place on a magnetic stirrer until all the MBD is dissolved.

A. MBD	1 g
B. Acetone	1000 mL

Exhibit 7-12.4.2 Working Solution

Combine in a beaker in the order listed. DO NOT place on a stirrer.

A. MBD Stock Solution	10 mL
B. Methanol	30 mL
C. Isopropanol	10 mL
D. Petroleum Ether	950 mL

Exhibit 7-12.5 Processing Procedure

A. Apply the working solution to the specimen by dipping or squirting.
B. View fluorescence under an alternate light source at wavelengths in the mid-400 nm range.
C. Mark prints.

Exhibit 7-12.6 Storage

Dark bottles.

Exhibit 7-12.6.1 Shelf Life

A. Stock Solution:	Indefinite
B. Working Solution:	Up to 6 months

Exhibit 7-12.7 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process.

C. Dispose of working solution in waste stream.

D. When using the laser and alternate light sources:

   1. Wear goggles with the appropriate filters.

E. Cover skin to eliminate exposure to light.

F. Never look directly into the light.

G. Use appropriate warning device to indicate when the laser or alternate light source is in use.

Exhibit 7-12.8 Calibration

Analytical balances are calibrated yearly according to manufacturer protocol.

Exhibit 7-12.9 Verification

See Verification Report.

Exhibit 7-12.10 Literature References

A. Cummings, H., Hollars, M. L., and Trozzi, T. A., "Getting the Most from Cyanoacrylate Dyes", Journal of Forensic Identification 43, 37 (1993).

B. LIA Laser Safety Committee, Edited by David H. Sliney, Laser Safety Guide, Ninth Edition, Laser Institute of America, Orlando, 1993.

C. Trozzi, T. A., Schwartz, R. L., and Hollars, M. L., Processing Guide for Developing Latent Prints, FBI Laboratory, Washington, DC 2001.

Exhibit 7-13 Ninhydrin (Acetone Base)

Exhibit 7-13.1 Scope

Ninhydrin is used to develop prints on porous surfaces. It reacts with the amino acids that are present in perspiration.

Exhibit 7-13.2 Limitations

Use before physical developer.

Exhibit 7-13.3 Equipment/Materials/Regents

A. Beakers

B. Brush

C. Glass Tray

D. Magnetic Stirrer and Stir Bar

E. Graduated Cylinders

F. Humidity Chamber Steam Iron

G. Analytical Balance

H. Sprayer

I. Acetone
J. Ninhydrin
K. Storage Bottle - Dark

Exhibit 7-13.4 Solution Preparation

A. Working Solution:

1.	Ninhydrin	6 g
2.	Acetone	1000 mL

B. Combine in a beaker and place on a magnetic stirrer until the Ninhydrin has dissolved.

Exhibit 7-13.5 Processing Procedure

A. Apply the working solution to the specimen by spraying, dipping, or painting.

B. Allow specimen to dry.

C. Place in a humidity cabinet set at 60%-70% or use a steam iron.

Exhibit 7-13.6 Storage

Dark bottles.

Exhibit 7-13.6.1 Shelf Life

Up to 1 year.

Exhibit 7-13.7 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process. Dispose of working solution in waste stream.

Exhibit 7-13.8 Calibration

Analytical balances are calibrated yearly according to manufacturer protocol.

Exhibit 7-13.9 Verification

See Verification Report.

Exhibit 7-13.10 Literature References

A. Oden, S. and von Hofsten, B, "Detection of Fingerprints by the Ninhydrin Reaction", Nature, 173, 449 (1954).

B. Petruncio, A. V., "A Comparative Study for the Evaluation of Two Solvents for Use in Ninhydrin Processing of Latent Print Evidence", Journal of Forensic Identification, 50, 462 (2000).

C. Trozzi, T. A., Schwartz, R. L., and Hollars, M. L., Processing Guide for Developing Latent Prints, FBI Laboratory, Washington, DC 2001.

Exhibit 7-14 Ninhydrin (Hexane Base)

Exhibit 7-14.1 Scope

Ninhydrin is used to develop prints on porous surfaces. It reacts with amino acids that are present in perspiration.

Exhibit 7-14.2 Limitations

Use before physical developer.

Exhibit 7-14.3 Equipment/Materials/Regents

A. Beakers and/or Graduate Cylinders Brush
B. Glass Tray
C. Squirt bottle and/or Sprayer
D. Humidity Chamber
E. Steam Iron
F. Magnetic stirrer and stir bars, or glass stirrer (rod)
G. Analytic balance
H. Heating element – hot plate
I. Ninhydrin
J. Methanol
K. Ethyl Acetate
L. Hexane
M. Storage Bottle - Dark

Exhibit 7-14.4 Solution Preparation

A. Working Solution:
    3. Ninhydrin 20 g
    4. Methanol 50 mL
    5. Ethyl Acetate 750 mL
    6. Hexane 3200 mL
B. Combine Ninhydrin and methanol in a beaker.
C. Place beaker on a hot plate or other heating type element.
D. Stir continuously using a glass rod or a magnetic stirrer until all crystals are completely dissolved.

E. Transfer dissolved Ninhydrin crystals to a dark storage bottle.

F. Add ethyl acetate.

G. Add hexane.

H. Stir or shake.

Exhibit 7-14.5 Processing Procedure

A. Apply the working solution to the specimen by spraying, dipping, or painting.

B. Allow specimen to dry.

C. Place in a humidity cabinet set at 60%-75% and/or use a steam iron.

Exhibit 7-14.6 Storage

Dark bottles.

Exhibit 7-14.6.1 Shelf Life

Test periodically.

Exhibit 7-14.7 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process.

C. Dispose of working solution in waste stream.

Exhibit 7-14.8 Calibration

Analytical balances are calibrated yearly according to manufacturer protocol.

Exhibit 7-14.9 Verification

See Verification Report.

Exhibit 7-14.10 Literature References

Scarborough, S., Success of Hexane-based Ninhydrin Amino Acid Reagent Processing on Various Inks and Ages of Porous Evidence. Journal of For. Identification, 51, 581 (2001).

Exhibit 7-15 Ninhydrin (Petroleum Ether Base)

Exhibit 7-15.1 Scope

Ninhydrin is used to develop prints on porous surfaces. It reacts with the amino acids that are present in perspiration.

Exhibit 7-15.2 Limitations

Use before physical developer.

Exhibit 7-15.3 Equipment/Materials/Regents

A. Beakers
B. Brush
C. Glass Tray
D. Steam Iron
E. Graduated Cylinders
F. Magnetic Stirrer and Stir Bar
G. Humidity Chamber
H. Analytical Balance
I. Sprayer
J. Storage Bottles – Dark
K. Isopropanol
L. Methanol
M. Ninhydrin
N. Petroleum Ether

Exhibit 7-15.4 Solution Preparation

A. Working Solution:

7.	Ninhydrin	5 g
8.	Methanol	30 mL
9.	Isopropanol	40 mL
10.	Petroleum Ether	930 mL

B. Combine ninhydrin and methanol in a beaker, and place on a magnetic stirrer until the Ninhydrin has dissolved.
C. Combine with isopropanol, then add the mixture to the petroleum ether.

Exhibit 7-15.5 Processing Procedure

A. Apply the working solution to the specimen by spraying, dipping, or painting.

B. Allow specimen to dry.

C. Place in a humidity cabinet set at 60%-70% or use a steam iron.

Exhibit 7-15.6 Storage

Dark bottles.

Exhibit 7-15.6.1 Shelf Life

Up to 1 year.

Exhibit 7-15.7 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process.

C. Dispose of working solution in waste stream.

Exhibit 7-15.8 Calibration

Analytical balances are calibrated yearly according to manufacturer protocol.

Exhibit 7-15.9 Verification

See Verification Report.

Exhibit 7-15.10 Literature References

A. Oden, S. and von Hofsten, B, "Detection of Fingerprints by the Ninhydrin Reaction", Nature, 173, 449 (1954).

B. Petruncio, A. V., "A Comparative Study for the Evaluation of Two Solvents for Use in Ninhydrin Processing of Latent Print Evidence", Journal of Forensic Identification, 50, 462 (2000).

C. Trozzi, T. A., Schwartz, R. L., and Hollars, M. L., Processing Guide for Developing Latent Prints, FBI Laboratory, Washington, DC 2001.

Exhibit 7-16 Physical Developer

Exhibit 7-16.1 Scope

Physical developer (PD) is used to develop friction ridge prints on porous surfaces. It has also been found to be very effective in developing friction ridge prints on paper currency. PD is normally applied after the DFO and Ninhydrin treatments.

Exhibit 7-16.2 Limitations

A. Stains on blueprints, photographs, or photocopies caused by the PD treatment cannot be removed without defacing the specimens.

B. PD will negate the silver nitrate process: therefore, do not use them in conjunction with each other. Treatment with Ninhydrin and DFO must be done before PD.

Exhibit 7-16.3 Equipment/Materials/Regents

A. Beakers

B. Glass Trays

C. Graduated Cylinders

D. Iron

E. Magnetic Stirrer and Stir Bars

F. Orbital Shaker

G. Analytical Balance

H. Citric Acid (Reagent Grade)

I. Distilled Water

J. n-Dodecylamine Acetate

K. Ferric Nitrate (100% purity)

L. Ferric Ammonium Sulfate (Reagent Grade)

M. Maleic Acid

N. Silver Nitrate (Reagent Grade, >99%)

O. Sodium Hypochlorite (or Household Bleach)

P. Synperonic-N

Q. Storage Bottle – Dark

Exhibit 7-16.4 Solution Preparation

Exhibit 7-16.4.1 Solution 1 – Maleic Acid

Combine in a beaker and place on a magnetic stirrer until the maleic acid has dissolved:

A. Distilled Water 1000 mL

B. Maleic Acid 25 g

Exhibit 7-16.4.2 Solution 2 – Redox

Combine in a beaker and place on a magnetic stirrer until the solids have dissolved.

A. Ferric Nitrate 30 g

B. Ferrous Ammonium Sulfate 80 g

C. Citric Acid 20 g

D. Distilled Water 1000 mL

Exhibit 7-16.4.3 Solution 3 – Detergent

Combine in a beaker and place on a magnetic stirrer until the solids have dissolved.

A. n-Dodecylamine Acetate 3 g

B. Synperonic-N 4 g

C. Distilled Water 1000 mL

Exhibit 7-16.4.4 Solution 4 – Silver Nitrate

Combine in a beaker and place on a magnetic stirrer until the silver nitrate has dissolved.

A. Silver Nitrate 200 g

B. Distilled Water 1000 mL

Exhibit 7-16.5 Working Solution

Combine in a beaker in the order that they are listed. Place solution 2 in a beaker on a magnetic stirrer, then add solutions 3 and 4. Stir for 3-5 minutes.

A. Solution 2 1000 mL

B. Solution 3 40 mL

C. Solution 4 50 mL

D. Sodium Hypochlorite - IF NEEDED

E. Combine and place in a beaker.

F. Sodium Hypochlorite 500 mL

G. Distilled water 500 mL

NOTE: The sodium hypochlorite solution darkens friction ridge prints developed with PD, lightens the background, and removes any ninhydrin stains that may still be present on the specimen. This process is especially effective on paper bags and paper currency.

Exhibit 7-16.6 Processing Procedure

Exhibit 7-16.6.1 Tray 1 – Solution 1

A. Place solution in a glass tray.

B. Place specimens in the glass tray.

C. Submerge specimens and let sit for 5 minutes (if bubbling occurs, let sit until bubbling ceases).

Exhibit 7-16.6.2 Tray 2 – Working Solution

A. Place a glass tray on an orbital shaker.

B. Place solution in the glass tray.

NOTE: Approximately 15 check-sized specimens can normally be processed with 1 liter of working solution.

C. Turn on shaker to achieve a gentle rocking motion (if an orbital shaker is not available, rock the tray back and forth manually).

D. Place specimens in the glass tray.

E. Submerge specimens in the solution for 5-15 minutes. The amount of time will depend on the number of specimens.

Exhibit 7-16.6.3 Tray 3 – Water Rinse

A. Place water in a tray.

B. Place specimens in the tray.

C. Be sure to rinse specimens before they dry. The chemicals in Tray 2 may cause the specimens to become brittle upon drying, which could result in damage to or destruction of the specimens.

D. Sodium Hypochlorite - IF NOT NECESSARY, PROCEED TO DRYING STEP

E. Place specimens in the solution for 15 seconds

F. Thoroughly rinse with water

Exhibit 7-16.6.4 Drying

Specimens can be air dried or dried with an iron.

Exhibit 7-16.7 Storage

A. Solution 1-3: Clear or dark bottles.

B. Solution 4: Dark bottles.

Exhibit 7-16.7.1 Shelf Life

A. Solution 1-2: Indefinite.

B. Solution 3-4: Up to one year.

Exhibit 7-16.8 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process.

C. Dispose of working solution in waste stream.

D. All silver containing solutions must be disposed of separately.

E. Maleic acid can be disposed of down the drain with water running.

Exhibit 7-16.9 Calibration

Analytical balances are calibrated yearly according to manufacturer protocol.

Exhibit 7-16.10 Verification

See Verification Report.

Exhibit 7-16.11 Literature References

A. Phillips, C. E., Cole, D. O., and Jones, G. W., Physical Developer: A Practical and Productive Latent Print Developer", Journal of Forensic Identification, 40, 135 (1990).

B. Trozzi, T. A., Schwartz, R. L., and Hollars, M. L., Processing Guide for Developing Latent Prints, FBI Laboratory, Washington, DC 2001.

Exhibit 7-17 Powders

Exhibit 7-17.1 Scope

Powdering is the application of finely ground, colored powder to a nonporous object to make friction ridge prints visible. The powder adheres to moisture, oils, and other residues. There are different types and colors of powder.

Exhibit 7-17.2 Limitations

Use only on nonporous items.

Exhibit 7-17.3 Equipment/Materials/Regents

A. Camel-hair brush
B. Cotton
C. Feather duster
D. Fiberglass filament brush
E. Magna brush wand
F. Paper
G. Black powder
H. Gray powder
I. White powder
J. Magnetic powder

Exhibit 7-17.4 Processing Procedure

Exhibit 7-17.4.1 Non-magnetic Powers

A. Pour needed amount of powder into a small pile.
B. Dip tips or bristles of brush into powder.
C. Apply a small amount of powder onto the surface and begin to brush.
D. Brush in the direction of any ridges that begin to appear.
E. Build powder onto ridges and stop when the friction ridge print reaches a point of sufficient clarity.
F. Clean the excess powder from between the ridges using a brush or cotton.
G. When processing large areas:
    1. Dip cotton into the powder and lightly wipe over the surface.
H. When the outline of a print appears, begin using the brush for full development.

Exhibit 7-17.4.2 Magnetic Powders

A. Place the magna brush wand, with the magnet engaged, into a container of magnetic powder. This will produce a bristle-like effect at the end of the wand when withdrawn.

B. Apply in a circular motion, making sure that the powder touches the surface and not the wand.

C. Upon completion of development, release excess powder into the container by disengaging the magnet by withdrawing the control rod.

D. Re-engage the magnet, and pass the clean wand over the developed print and surrounding area to remove excess powder.

Exhibit 7-17.5 Storage

Original containers.

Exhibit 7-17.5.1 Shelf Life

Indefinite

Exhibit 7-17.6 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process.

Exhibit 7-17.7 Literature References

A. Sodhi, G. S. and Kaur, J., "Powder Method for Detecting Latent Fingerprints: A Review", Forensic Science International, 120, 172 (2001).

B. Trozzi, T. A., Schwartz, R. L., and Hollars, M. L., Processing Guide for Developing Latent Prints, FBI Laboratory, Washington, DC 2001.

Exhibit 7-18 RAM (Fluorescent Dye)

Exhibit 7-18.1 Scope

RAM is used to dye cyanoacrylate-developed friction ridge prints. These prints can be better visualized by the use of an alternate light source or laser. The dye can be used on all colors of nonporous surfaces.

Exhibit 7-18.2 Limitations

RAM can only be used after treating the specimen with cyanoacrylate fuming.

Exhibit 7-18.3 Equipment/Materials/Regents

A. Beakers
B. Glass Tray
C. Graduated Cylinders
D. Laser or Alternate Light Source
E. Magnetic Stirrer and Stir Bar
F. Analytical Balance
G. Squirt Bottle/Sprayer
H. Storage Bottles - Dark
I. Rhodamine 6G (dye content 99%)
J. 7-P-methoxybenzylamino-4-nitrobenz-2 oxa-1-3-diazole (MBD)
K. Ardrox P133D
L. Methanol
M. Acetone
N. Isopropanol
O. Acetonitrile
P. Petroleum Ether

Exhibit 7-18.4 Solution Preparation

Exhibit 7-18.4.1 Stock Solution 1 (Rhodamine 6G)

Combine and place on a magnetic stirrer until all of the dye is dissolved. Set aside for later use.

A.	Rhodamine 6G	1 g
B.	Methanol	1000 mL

Exhibit 7-18.4.2 Stock Solution 2 (MBD)

A. Combine and place on a magnetic stirrer until all of the dye is dissolved. Set aside for later use.

1.	MBD	1 g
2.	Acetone	1000 mL

B. Use undiluted, directly from the container.

C. Ardrox P133D

Exhibit 7-18.4.3 RAM Working Solution

Combine the below ingredients into a beaker in the order that they are listed. Do not place the solution on a magnetic stirrer.

A.	Stock Solution 1	3mL
B.	Ardox P133 D	2mL
C.	Stock Solution 2	7mL
D.	Methanol	20 mL
E.	Isopropanol	10 mL
F.	Acetonitrite	8 mL
G.	Petroleum Ether	950 mL

Exhibit 7-18.5 Processing Procedure

A. Apply RAM to the specimen by spraying, dipping, or squirting.

B. View fluorescence under a laser or alternate light source at wavelengths 365 nm-540 nm.

C. Mark prints.

Exhibit 7-18.6 Storage

Dark bottles.

Exhibit 7-18.6.1 Shelf Life

A. Stock Solutions 1 and 2: indefinite

B. Working solution (without petroleum ether): Indefinite

1. Working solution (with petroleum ether): 30 days then check for separation; if solution is separated, shake vigorously.

C. If solution does not return to suspension, discard.

Exhibit 7-18.7 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process.

C. Dispose of used RAM in waste stream.

D. When using the UV light, laser and alternate light sources:

   1. Wear goggles with the appropriate filters.

E. Cover skin to eliminate exposure to light.

F. Never look directly into the light.

G. Use appropriate warning device to indicate when the UV light, laser, or alternate light source is in use.

Exhibit 7-18.8 Calibration

Analytical balances are calibrated yearly according to manufacturer protocol.

Exhibit 7-18.9 Verification

See Verification Report.

Exhibit 7-18.10 Literature References

A. Cummings, H., Hollars, M. L., and Trozzi, T. A., "Getting the Most from Cyanoacrylate Dyes", Journal of Forensic Identification 43, 37 (1993).

B. LIA Laser Safety Committee, Edited by David H. Sliney, Laser Safety Guide, Ninth Edition, Laser Institute of America, Orlando, 1993.

C. Trozzi, T. A., Schwartz, R. L., and Hollars, M. L., Processing Guide for Developing Latent Prints, FBI Laboratory, Washington, DC 2001.

Exhibit 7-19 Reflective Ultraviolet Imaging System (RUVIS)

Exhibit 7-19.1 Scope

The Reflective Ultraviolet Imaging System (RUVIS), when coupled with a short wave UV light source, is used to detect friction ridge prints without treatment on non-porous types of evidence. Cyanoacrylate treatment will further enhance the results of the RUVIS, increasing the number of different surface types where a latent can be visualized and photographed.

Exhibit 7-19.2 Limitations

All examinations must be performed in conjunction with a UV light (short wave). The screen on the RUVIS is low resolution.

Exhibit 7-19.3 Equipment/Materials/Regents

Refer to owner's manual for detailed instructions for camera usage (image capture device).

Exhibit 7-19.4 Processing Procedure

A. Turn on RUVIS.
B. Place evidence under lens.
C. Turn on and position UV light.
D. Focus RUVIS and adjust UV light until prints come into view.
E. Mark prints.
F. Photograph prints.
G. Turn off RUVIS.

Exhibit 7-19.5 Safety

A. Wear safety goggles, gloves, and lab coat to cover exposed skin.
B. Never look directly into the UV light.

Exhibit 7-19.6 Calibration

Analytical balances are calibrated yearly according to manufacturer protocol.

Exhibit 7-19.7 Verification

See Verification Report.

Exhibit 7-19.8 Literature References

A. Saferstein, R. and Graf, S., Evaluation of a Reflected Ultraviolet Imaging System for Fingerprint Detection. Journal of For. Identification, 51, 385 (2001).

B. Lin, S. S.; Yemelyanov, K. M.; Pugh, Jr. E. N.; Engheta, N. Polarization-Based and Specular-Reflection-Based Noncontact Latent Fingerprint Imaging and Lifting. J. Opt. Soc. Am. 2006, 23 (9), 2137-2153.

C. Cantu, Antonio A., "The Physical Principles of the Reflected Ultraviolet Imaging Systems", Journal of For. Identification, 64, 123 (2014).

Exhibit 7-20 Rhodamine 6G (Fluorescent Dye)

Exhibit 7-20.1 Scope

Rhodamine 6G is a fluorescent dye used to make cyanoacrylate developed prints more visible on various colored surfaces.

Exhibit 7-20.2 Limitations

Must be used after cyanoacrylate fuming.

Exhibit 7-20.3 Equipment/Materials/Regents

A. Beakers
B. Glass Tray
C. Graduated Cylinders
D. Laser or Alternate Light Source
E. Magnetic Stirrer and Stir Bar
F. Analytical Balance
G. Squirt Bottles or Sprayer
H. Storage Bottles - Dark Acetone
I. Acetonitrile
J. Isopropanol
K. Methanol
L. Petroleum Ether
M. Rhodamine 6G (dye content >99%)

Exhibit 7-20.4 Solution Preparation

Exhibit 7-20.4.1 Stock Solution

Combine in a beaker and place on a magnetic stirrer until all the Rhodamine 6G is dissolved:

A.	Rhodamine 6G	1 g
B.	Methanol	1000 mL

Exhibit 7-20.4.2 Working Solution

Combine in a beaker in the order listed. DO NOT place on a stirrer.

A.	Rhodamine 6G Stock Solution	3 mL
B.	Acetone	15 mL
C.	Acetonitrile	10 mL
D.	Methanol	15 mL

E.	Isopropanol	32 mL
F.	Petroleum Ether	925 mL

Exhibit 7-20.5 Processing Procedure

A. Apply the Working Solution to the specimen by dipping, spraying, or squirting.

B. View fluorescence under a laser or alternate light source at wavelengths in upper 400 nm - 530 nm range.

C. Mark prints.

Exhibit 7-20.6 Storage

Dark bottles.

Exhibit 7-20.6.1 Shelf Life

A. Stock Solution: Indefinite.

B. Working Solution: Up to 6 months.

Exhibit 7-20.7 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process.

C. Dispose of working solution in waste stream.

D. When using the laser and alternate light sources:

1. Wear goggles with the appropriate filters.

E. Cover skin to eliminate exposure to light.

F. Never look directly into the light.

G. Use appropriate warning device to indicate when the laser or alternate light source is in use.

Exhibit 7-20.8 Calibration

Analytical balances are calibrated yearly according to manufacturer protocol.

Exhibit 7-20.9 Verification

See Verification Report.

Exhibit 7-20.10 Literature References

A. Cummings, H., Hollars, M. L., and Trozzi, T. A., "Getting the Most from Cyanoacrylate Dyes", Journal of For. Identification 43, 37 (1993).

B. LIA Laser Safety Committee, Edited by David H. Sliney, Laser Safety Guide, Ninth Edition, Laser Institute of America, Orlando, 1993.

C. Trozzi, T. A., Schwartz, R. L., and Hollars, M. L., Processing Guide for Developing Latent Prints, FBI Laboratory, Washington, DC 2001.

Exhibit 7-21 Rhodamine 6G – Methanol/Isopropanol (Fluorescent Dye)

Exhibit 7-21.1 Scope

Rhodamine 6G is a fluorescent dye used to make cyanoacrylate developed prints more visible on various colored surfaces.

Exhibit 7-21.2 Limitations

Must be used after cyanoacrylate fuming.

Exhibit 7-21.3 Equipment/Materials/Regents

A. Beakers
B. Glass Tray
C. Graduated Cylinders
D. Laser or Alternate Light Source
E. Magnetic Stirrer and Stir Bar
F. Analytical Balance
G. Squirt Bottles or Sprayer Storage Bottles - Dark
H. Isopropanol
I. Methanol
J. Rhodamine 6G (dye content >99%)

Exhibit 7-21.4 Solution Preparation

A. Working Solution:
    1. Rhodamine 6G 0.1 g
    2. Methanol (or Isopropanol) 1000 mL
B. Combine in a beaker and place on a magnetic stirrer until all the Rhodamine 6G is dissolved.

Exhibit 7-21.5 Processing Procedure

A. Apply the working solution to the specimen by dipping, spraying, or squirting.
B. View fluorescence under a laser or alternate light source at wavelengths in upper 400 nm - 530 nm range.
C. Mark prints.

Exhibit 7-21.6 Storage

Dark bottles.

Exhibit 7-21.6.1 Shelf Life

Working Solution: Up to 6 months.

Exhibit 7-21.7 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process.

C. Dispose of working solution in waste stream.

1. When using the laser and alternate light sources:

D. Wear goggles with the appropriate filters.

E. Cover skin to eliminate exposure to light.

F. Never look directly into the light.

G. Use appropriate warning device to indicate when the laser or alternate light source is in use.

Exhibit 7-21.8 Calibration

Analytical balances are calibrated yearly according to manufacturer protocol.

Exhibit 7-21.9 Verification

See Verification Report.

Exhibit 7-21.10 Literature References

A. Cummings, H., Hollars, M. L., and Trozzi, T. A., "Getting the Most from Cyanoacrylate Dyes", Journal of Forensic Identification 43, 37 (1993).

B. Kent, Terry, ed. Fingerprint Development Techniques; Heanor Gate Publisher: Derbyshire, England, 1993.

C. Lennard, Christopher J.; Pierre, A. Margot. “Sequencing of Reagents for the Improved Visualization of Latent Fingerprints” Journal of Forensic Identification, September/October 1988, 38, 5, 197-210.

D. LIA Laser Safety Committee, Edited by David H. Sliney, Laser Safety Guide, Ninth Edition, Laser Institute of America, Orlando, 1993.

E. Masters, Nancy E. “Rhodamine 6G: Taming the Beast”; Journal of Forensic Identification, September/October 1990, 40, 5, 265-270.

F. Menzel, E. Roland. “Detection of Latent Fingerprints by Laser-Excited Luminescence”; Analytical Chemistry, 1989, 61, 8, 557-561.

G. Trozzi, T. A., Schwartz, R. L., and Hollars, M. L., Processing Guide for Developing Latent Prints, FBI Laboratory, Washington, DC 2001.

Exhibit 7-22 Wetting Agent

Exhibit 7-22.1 Scope

Wetting Agent is used to process the adhesive side of many different types and colors of tape.

Exhibit 7-22.2 Limitations

See Tape Chart.

Exhibit 7-22.3 Equipment/Materials/Regents

A. Brushes: Camel-Hair or another Small Brush
B. Petri or Shallow Dish
C. Distilled Water
D. Wetting Agent (e.g., Photo-Flo™ 200 Solution)
E. Sticky-Side Powder

Exhibit 7-22.4 Solution Preparation

A. Working Solution:
    1. Sticky-Side Powder 1 tsp
B. Wetting Agent (diluted 50:50 with distilled water)
C. Place sticky-side powder in a petri or shallow dish. Add diluted wetting agent, and stir until the mixture has the consistency of thin paint.

Exhibit 7-22.5 Processing Procedure

A. Paint the solution onto the adhesive surface with a brush.
B. Let sit for 30 to 60 seconds.
C. Rinse with a slow stream of cold tap water.
D. Allow to dry.
E. Repeat procedure if necessary.

Exhibit 7-22.6 Storage

None – Prepare as needed.

Exhibit 7-22.6.1 Shelf Life

None – Prepare as needed.

Exhibit 7-22.7 Safety

A. Wear the appropriate PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process.

Exhibit 7-22.8 Verification

See Verification Report.

Exhibit 7-22.9 LiteratureReferences

A. Lo, I. K. L., "A Review on Detection of Latent Prints on Self-Adhesive Tapes", Fingerprint Whorld, 19, 89 (1993).

B. Trozzi, T. A., Schwartz, R. L., and Hollars, M. L., Processing Guide for Developing Latent Prints, FBI Laboratory, Washington, DC 2001.

Exhibit 7-23 Ultraviolet (UV) Light

Exhibit 7-23.1 Scope

The ALS-UV 2000U UV light is an alternate light source used to examine any type of evidence for the presence of friction ridge prints. The UV light is used before any processing is done to visualize any inherent fluorescence and in conjunction with certain dyes and processes that ‘may” result in fluorescence.

Exhibit 7-23.2 Limitations

A. Only 365 nm light is available.

B. All examinations should be performed with the room lights off.

Exhibit 7-23.3 Equipment/Materials/Regents

A. ALS-UV 2000U UV light source.

B. Safety goggles with an appropriate filter to block the emitted light but not the fluorescence.

Exhibit 7-23.4 Processing Procedure

A. Turn on the UV light.

B. Wait a few minutes in order to reach optimum power.

C. Place evidence under the light and examine.

D. Mark prints.

E. Turn off the UV light.

Exhibit 7-23.5 Safety

A. Always wear safety goggles with the appropriate filter - typically 515 nm or 530 nm.

B. Wear a lab coat to cover exposed skin.

C. Never look directly into the light.

D. Use appropriate warning device to indicate when the UV light is in use.

Exhibit 7-23.6 Literature References

A. Lee, Henry C. and Gaensslen, R. E., Advances in Fingerprint Technology, CRC Press, Inc., Florida, 1994.

B. Trozzi, T. A., Schwartz, R. L., and Hollars, M. L., Processing Guide for Developing Latent Prints, FBI Laboratory, Washington, DC 2001.

Exhibit 7-24 Sticky Side Powder

Exhibit 7-24.1 Scope

Black and white sticky side powder (e.g.,Wetwop™ - a commercially prepared solution) for developing friction ridge prints on several surfaces including duct tape, adhesive bandages, paper backed labels, masking tape, clear tape, cloth and plastic surgical tapes, packing labels, double-sided foam tape, adhesive side of sticky notes, frosted tape, black electrical tape, latex gloves, and shelf or contact papers.

Exhibit 7-24.2 Limitations

See Tape Chart. (See 34.0)

Exhibit 7-24.3 Equipment/Materials/Regents

A. Beaker or Flat Dish

B. Camel-Hair Brush

C. Sticky side powder (white or black)

Exhibit 7-24.4 Solution Preparation

Working Solution:

A. Sticky side powder (white or black)

Exhibit 7-24.5 Processing Procedure

A. Place test prints on the type of adhesive surfaces similar to that being processed in casework.

B. Shake the bottle of sticky side powder thoroughly and pour a small amount into a beaker or dish.

C. Using a camel-hair brush, apply sticky side powder to the adhesive side of the tape with a painting action and completely cover the surface.

D. Allow solution to sit for about 15-30 seconds, and rinse the solution off the adhesive surface with a gentle stream of tap water.

E. Once the surface is rinsed, set the item aside and allow to dry.

F. A visual examination is conducted and the results are photographed.

Exhibit 7-24.6 Storage

Manufacturer's containers..

Exhibit 7-24.6.1 Shelf Life

See manufacturer's recommendations.

Exhibit 7-24.7 Safety

A. Wear the appropriate personal PPE.

B. Familiarize yourself with the information found on the SDS for each chemical used in the process.

Exhibit 7-24.8 Verification

See Verification Report.

Exhibit 7-24.9 LiteratureReferences

A. Lightning Powder Technical Note, Wetwop™ - Black- White

B. Pleckaitis, John; Developing Friction Ridge Detail on the Interior of Latex and Nitrile Gloves, Journal of Forensic Identification, 2007, 57(2), 230-239.

Exhibit 7-25 Tape Chart – Processing the Adhesive Side of Tape

Table 5 Tape Chart – Processing the Adhesive Side of Tape

Method	Color	Brand	Description	Width	Alternate Method
Gentian Violet	CLEAR		Ordinary Scotch Tape	1"	Contrasting Sticky Side Powder,
	CLEAR	3M Transpore	Textured Tape	1"	Alternate Black Powder
	OFF WHITE	3M Tartan	Masking Tape	1"	
	OFF WHITE	Manco	Masking Tape	1 1/2"	
	WHITE	Johnson & Johnson	Cloth Tape	1"	
Sticky Side	WHITE	3M	Decorate/Repair	1 1/2"	
	WHITE	Manco	Duct Tape	2"	
	LT BROWN		Packing Tape	3"	
Sticky Side	DARK BROWN	Manco	Duct Tape	2"	
	DARK BROWN	American Tape	Packing Tape	2 3/4"	
	YELLOW	3M Scotch	Trans. Packing	2"	
	YELLOW	3M Scotch	Trans. Packing	2 3/4"	
	YELLOW	3M Scotch	Heavy Duty Tape	3"	
	RED	3M Scotch	Trans. Packing	2"	
	GREEN	3M Scotch	Heavy Duty Tape	1"	
	GREEN	3M Scotch	Trans. Packing	2"	
	BLUE	3M Scotch	Trans. Packing	2"	
	GRAY	3M Highland	Duct Tape	2"	
Gentian Violet	CLOUDY		Ordinary Scotch	3/4"	
	CLOUDY	3M Scotch	Ordinary Scotch	1"	

Sticky Side +PhotoFlo 100	WHITE	3M Scotch	Trans. Packing	2"	
	ORANGE	3M Scotch	Trans. Packing	2"	
	CLEAR		Packing Tape	2"	
	CLEAR w/ White Stripes		Strapping Tape	3/4"	
Titanium Dioxide	BLACK	3M Scotch	Heavy Duty Tape	2"	Sticky Side Powder
	BLACK	3M	Decorate/Repair	1 ½”	
	BLACK		Vinyl Electrical	3/4"	

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