LATENT PRINTS

QUALITY MANUAL

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CONTENTS

1 SCOPE

This manual follows the requirements specified by ANSI-ASQ National Accreditation Board (ANAB), which is based on the ISO/IEC 17025:2017 standards and the 2017 ANAB ISO/IEC 17025:2017 — Forensic Science Testing and Calibration Laboratories Accreditation Requirements (AR 3125).

The manual follows the outline of the *ASCL Quality Manual* (ASCL-DOC-01).

1.1 INTERNATIONAL STANDARD: GENERAL REQUIREMENTS

See *ASCL-DOC-01 Quality Manual.*

1.2 INTERNATIONAL STANDARD: SCOPE

See *ASCL-DOC-01 Quality Manual.*

1.2.1 ANAB PROGRAM

See *ASCL-DOC-01 Quality Manual.*

The Arkansas State Crime Laboratory follows the Department of Justice language for testimony and reports, such as:

Qualifications and Limitations of Latent Print Comparison Conclusions

- An examiner shall not assert that two friction ridge impressions originated from the same source to the exclusion of all other sources or use the terms 'individualize' or 'individualization.' This may wrongly imply that a source identification is based upon a statistically-driven or verified measurement or comparison of all friction ridge skin impression features in the world's population, rather than an examiner's expert conclusion.
- An examiner shall not assert a 100% level of certainty in his/her conclusion, or otherwise assert that it is numerically calculated.
- An examiner shall not assert that latent print examination is infallible or has a zero error rate.
- An examiner shall not cite the number of latent print comparisons performed in his or her career as a measure of accuracy of a conclusion offered in the instant case.
- An examiner shall not use the expressions 'reasonable degree of scientific certainty,' 'reasonable scientific certainty' or similar assertions of reasonable certainty as a description of the confidence held in his or her conclusion in either reports or testimony unless required to do so by a judge or applicable law.

2 NORMATIVE REFERENCES

This section follows references from the *ASCL-DOC-01 Quality Manual* and all other references listed in this manual are located in the Latent Print section or on the Latent Print S: drive.

3 TERMS AND DEFINITIONS

Terms and definitions are located in the *ASCL Quality Manual* (ASCL-DOC-01).

Abbreviations used by the Latent Print section are located in section 9.2 of this manual and in Qualtrax under the Latent Print discipline.

Below are some terms used in the Latent Print Section:

AFIS: Acronym for Automated Fingerprint Identification System

Characteristics: Distinctive details of the friction ridges referring to the Level I, II, and III details.

Complete Friction Ridge Exemplars: A systematic recording of all friction ridge detail appearing on the palmar sides of the hands. This includes the extreme sides of the palms, joints, tips, and sides of the fingers (also known as Major Case Prints).

Exemplars: The prints of an individual, associated with a known or claimed identity, and deliberately recorded electronically, by ink, or by another medium (also known as Known Prints).

IAFIS: The acronym for the Integrated Automated Fingerprint Identification System, the FBI's national database.

Sufficiency: The product of the quality and quantity of the objective data under observation.

Suitable: The determination that there is sufficiency in an impression to be of value for further analysis or comparison.

4 GENERAL REQUIREMENTS

4.1 IMPARTIALITY

See *ASCL-DOC-01 Quality Manual.*

4.1.1 GENERAL

See *ASCL-DOC-01 Quality Manual.*

4.1.2 PERSONNEL

See *ASCL-DOC-01 Quality Manual.*

4.1.3 FISCAL

See *ASCL-DOC-01 Quality Manual.*

4.1.4 RISKS TO IMPARTIALITY

See *ASCL-DOC-01 Quality Manual.*

4.1.5 ACTIONS TAKEN IN RESPONSE TO RISK

See *ASCL-DOC-01 Quality Manual.*

4.2 CONFIDENTIALITY

4.2.1 STATUTE

See *ASCL-DOC-01 Quality Manual.*

4.2.2 THIRD-PARTY RELEASE

See *ASCL-DOC-01 Quality Manual.*

4.2.3 THIRD-PARTY SOURCE

See *ASCL-DOC-01 Quality Manual.*

4.2.4 SCOPE

See *ASCL-DOC-01 Quality Manual.*

5 STRUCTURAL REQUIREMENTS

5.1 ESTABLISHMENT

See *ASCL-DOC-01 Quality Manual.*

5.2 MANAGEMENT

The Arkansas State Crime Laboratory is managed by the Director, who has overall responsibility for the laboratory.

For 5.2.1 – 5.2.8 See *ASCL-DOC-01 Quality Manual*.

5.2.1.1 LATENT PRINT STAFF

5.2.1.2 CHIEF LATENT PRINT EXAMINER

QUALIFICATIONS

A baccalaureate degree from an accredited college or university with a major in forensic science, criminalistics, or in a physical or natural science (or equivalent) and five years of technical and professional experience as a Latent Fingerprint Examiner in a forensic laboratory or identification division is required. The Chief Latent Print Examiner should be an IAI Certified Latent Print Examiner.

Professional experience as a latent fingerprint examiner in a recognized forensic laboratory, institution, or an identification division may be substituted on a one year work time for one year of the required educational background. The individual must have testified as an expert in the field of latent fingerprint identification in a court of law.

AUTHORITIES & RESPONSIBILITIES

The Latent Print Section Chief will have the overall responsibility for the technical operations and the provision of the resources needed to ensure the required quality of laboratory operations, in addition to the following:

- Overseeing day-to-day operation of the Latent Print Division (e.g., scheduling workload, supervising analysts, monitoring and reviewing results and case reports). These duties may be distributed among the latent print personnel to facilitate case flow.
- Establishing professional liaisons with colleagues engaged in latent print testing and research.
- Conducting informational seminars for the principal users of the laboratory (e.g., judges, prosecutors, police administrators and investigators).
- Monitoring training programs for the latent print unit personnel.

- Enforcing safety procedures.
- Analyzing casework, providing expert testimony, and performing other routine duties of a latent print examiner (also see Latent Print Examiner job description).
- Ensuring compliance with ANAB requirements within the Latent Print Division and its categories of testing.

5.2.1.3 LATENT PRINT EXAMINER

QUALIFICATIONS

A baccalaureate degree from an accredited college or university with a major in forensic science, criminalistics, or a physical or natural science (or equivalent) is required. Three years' experience in the latent prints discipline, preferably in an accredited laboratory, may be substituted for this educational requirement.

AUTHORITIES & RESPONSIBILITIES

- The Latent Print Examiner will analyze and compare latent prints, collect and preserve latent prints and other physical evidence in the laboratory, as well as under potentially adverse conditions at major crime scenes when necessary.
- Locate, develop, recover and preserve latent impressions on a wide variety of materials and surfaces using physical, chemical, electronic, and optical techniques.
- Photograph latent impressions using digital imaging equipment.
- Evaluate and enter suitable latent prints into the Automated Fingerprint Identification System (AFIS).
- Determine identifications and non-identifications by comparison and verification of each latent print to AFIS candidate lists.
- Write detailed reports concerning results of analysis.
- Recover fingerprints, palm prints, and footprints from deceased and decomposed bodies, victims of crime, and potentially violent suspects.
- Provide training to law enforcement personnel concerning the proper collection and preservation of physical evidence.
- Testify in criminal legal proceedings as needed concerning methods of analysis and results.
- The Latent Print Examiner, upon completion of training and competency examination, may be required to record, collect and examine evidence for shoe and tire track comparison.

5.2.1.4 LATENT PRINT TECHNICIAN

QUALIFICATIONS

A high school diploma (or equivalent) is required.

An individual selected as a latent print technician must be able to successfully complete the Arkansas State Crime Laboratory Latent Fingerprint Technician Training Program as outlined in LP-DOC-06.

AUTHORITIES & RESPONSIBILITIES

- The Latent Print Technician will analyze, collect and preserve latent prints and other physical evidence in the laboratory, as well as under potentially adverse conditions at major crime scenes when necessary.
- Locate, develop, recover and preserve latent impressions on a wide variety of materials and surfaces using physical, chemical, electronic, and optical techniques.
- Photograph latent impressions using digital imaging equipment.
- The Latent Print Technician will be permitted to write detailed reports concerning results of analysis.
- Recover fingerprints, palm prints, and footprints from deceased and decomposed bodies, victims of crime, and potentially violent suspects.
- Provide training to law enforcement personnel concerning the proper collection and preservation of physical evidence.
- Testify in criminal legal proceedings as needed concerning methods of analysis and results.

5.2.1.5 SECTION QUALITY MANAGER

QUALIFICATIONS

The Section Quality Manager will be appointed by the Section Chief to ensure that the management system related to quality is implemented and followed at all times.

AUTHORITIES AND RESPONSIBILITIES

- Maintains and updates the section quality and training manuals.
- Manages document control within the section.
- Reviews Employee History Binders semi-annually to verify individual maintenance of necessary documentation.
- Monitors section practices to verify continuing compliance with policies and procedures.
- Monitors reagents, standards, and controls and respective logbooks to ensure proper documentation.
- Evaluates instrument calibration and maintenance records. Periodically assesses the adequacy of report review activities.
- Ensures the validation of new technical procedures.
- Investigates technical problems, proposes remedial action, and verifies implementation.
- Recommends training to improve the quality of the section staff.
- Proposes corrections and improvements in the quality system within the section.
- Ensures compliance with the ANAB accreditation standards.

5.2.1.6 SECTION HEALTH AND SAFETY MANAGER

QUALIFICATION

The Section Safety Manager will be appointed by the Section Chief to ensure that the management system related to health and safety is implemented and followed at all times.

AUTHORITIES AND RESPONSIBILITIES

- Assists the Section Chief in teaching safety rules, regulations and procedures within the section.
- Conducts safety surveys and ensures that proper practices and procedures are being followed.
- Reviews and evaluates the effectiveness of the section safety manual in conjunction with the safety committee.
- Recommends and implements changes in safety rules, regulations and procedures to the Section Chief; assists in resolving safety incidents and maintain records of such incidents.
- Monitors the procurement, use, and disposal of chemicals used in the section.
- Maintains a current copy of the section MSDS
- Provides regular, documented formal chemical hygiene and housekeeping inspections including routine inspections of emergency equipment.
- Seeks for ways to improve the safety program within the section.

The Chief Latent Print Examiner will appoint an examiner to serve as a deputy for key management personnel when the Chief Latent Print Examiner will be absent for three days or longer. All affected personnel shall be notified.

All section employees will be notified of their responsibilities and expectations concerning the objective of the ASCL quality system and will be provided feedback on actual job performance though annual performance evaluations.

Information concerning the quality system will be conveyed by the Chief Latent Print Examiner to all personnel by means of routine section meetings and/or electronic communication.

5.3 SCOPE OF LABORATORY ACTIVITIES

See *ASCL-DOC-01 Quality Manual.*

5.4 NORMATIVE DOCUMENTS

See *ASCL-DOC-01 Quality Manual.*

5.4.1 USE OF ACCREDITATION SYMBOLS

See *ASCL-DOC-01 Quality Manual.*

5.4.2 STATUTORY AUTHORITY

See *ASCL-DOC-01 Quality Manual.*

5.5 LABORATORY OPERATIONS

See *ASCL-DOC-01 Quality Manual.*

5.5.1 GENERAL

See *ASCL-DOC-01 Quality Manual.*

5.5.2 AUTHORITIES AND RELATIONSHIPS

See *ASCL-DOC-01 Quality Manual.*

5.5.3 QUALITY MANUAL

See *ASCL-DOC-01 Quality Manual.*

5.6 QUALITY MANAGEMENT

See *ASCL-DOC-01 Quality Manual.*

5.7 MANAGEMENT SYSTEM COMMUNICATION AND INTEGRITY

See *ASCL-DOC-01 Quality Manual.*

6 RESOURCE REQUIREMENTS

6.1 GENERAL

See *ASCL-DOC-01 Quality Manual.*

6.2 PERSONNEL

6.2.1 GENERAL

See *ASCL-DOC-01 Quality Manual.*

6.2.2 COMPETENCE REQUIREMENTS

See *ASCL-DOC-01 Quality Manual.*

6.2.3 COMPETENCE OF STAFF

See *ASCL-DOC-01 Quality Manual.*

6.2.4 DUTIES, RESPONSIBILITIES, AND AUTHORITIES

See *ASCL-DOC-01 Quality Manual.*

6.2.5 PERSONNEL REQUIREMENTS

See *ASCL-DOC-01 Quality Manual.*

6.2.6 AUTHORIZATIONS

See *ASCL-DOC-01 Quality Manual.*

6.3 FACILITIES AND ENVIROMENTAL CONDITIONS

6.3.1 GENERAL

See *ASCL-DOC-01 Quality Manual.*

6.3.2 DOCUMENTATION

See *ASCL-DOC-01 Quality Manual.*

6.3.3 MONITORING RECORDS

See *ASCL-DOC-01 Quality Manual.*

6.3.4 CONTROL OF FACILITIES

See *ASCL-DOC-01 Quality Manual.*

6.3.5 EXTERNAL ACTIVITIES

See *ASCL-DOC-01 Quality Manual.*

6.4 EQUIPMENT

6.4.1 ACCESS

The latent print section consists of six office areas, the AFIS room (which includes the AFIS/ IAFIS, Foray Workstation with camera and the section printer), the powder processing room, the chemical processing room, and the ALS/reagent storage room. The six offices and processing rooms may serve as a temporary secure storage facility for evidence controlled by an individual analyst.

Access to the main portion of the latent print section is access controlled by security fobs. The six offices located in the main latent print section require a key.

The Latent Print section utilizes the Automated Fingerprint Identification System (AFIS). Employees utilizing this database must receive proper training and/or clearance through the Arkansas State Police (ASP). Access to individual characteristic database samples is restricted to those employees authorized by the Executive Director. The Chief Latent Print Examiner will keep an updated list of employees that have access to the database samples.

Also please refer to *ASCL Quality Manual* (ASCL-DOC-01).

6.4.2 OUTSIDE EQUIPMENT

MORPHOTRAK (SAFRAN GROUP) LATENT STATIONS

The Latent Print Section has three MorphoTrak Latent Stations located in the AFIS room. The MorphoTrak Latent stations provide latent entry, image enhancement, editing and charting of latent prints, and search review capabilities. The operator can enter and encode minutiae on latent fingerprints and palm prints and initiate a comparison of a latent print to an existing tenprint, palm print or unsolved latent record file. Search results are reviewed onscreen. The AFIS Operational Readiness Verification (ORV) is a performance check and is run monthly by a Latent Print Examiner on each latent station. The AFIS ORV performance check will be carried out as follows:

To ensure that the AFIS system is working properly, a benchmark print in the same format as the latent print (e.g., 1X (normal) and/or 5X (traced)) should be run on a monthly basis. The benchmark print will be captured (direct read) and searched in a 1X and/or 5X format, without editing. However, the finger number and pattern type will be utilized as part of the search criteria. After verifying that the respondent list contains the source of the known test impression, the "Match Report" is printed and maintained in the AFIS ORV logbook located in the AFIS room for the assessment cycle. The result is logged, initialed and dated for each workstation on LP-FORM-26. After a year, the previous ORV logs and Match Reports will be scanned onto the S:Latents drive, the ORV completed verifications folder.

If the known candidate is not on the candidate list, an additional search will be initiated. If the known candidate does not appear on the second candidate list, a service call will be made to the AFIS Help Desk. The terminal will also be marked as being "Out of Service" to include the date. This will be recorded in the Latent Print General Maintenance Log. Additionally, the AFIS entries made since the last positive control may need to be researched depending on the identified problem.

Also please refer to *ASCL Quality Manual* (ASCL-DOC-01).

6.4.3 PROPER FUNCTIONING

The Latent Print Section has adequate equipment to perform the necessary testing. The equipment is maintained by personnel of the latent print section who utilize it.

Before instrumentation/equipment is placed into service, a calibration or performance verification shall be performed to ensure that it meets the specifications required by the appropriate method and will be documented in the Latent Print Instrument/Equipment & Performance Verification and/or General Maintenance Logs.

Designated instrumentation/equipment will also be subject to a schedule of performance verifications or calibrations that will be recorded in the Latent Print Instrument/Equipment & Performance Verification and/or General Maintenance Logs, unless otherwise stated. Any adjustments to, and maintenance of, the instrument/equipment will also be recorded in these logbooks.

If an instrumentation/equipment does not function to the performance standard, it will be taken out of service and either replaced or repaired prior to being placed back into service.

After significant maintenance has been performed, a calibration or performance verification shall be performed and recorded in the Latent Print Instrument/Equipment & Performance Verification and/or General Maintenance Logs.

AIR SCIENCE SAFEFUME™

The Latent Print Section has one SafeFume™ cyanoacrylate fuming chamber located in the processing room. The automatic control system programs the fuming cycle and controls all functions start-to-finish. It establishes the proper fuming intensity and duration. The fuming time,

humidity, and chamber fume evacuation can be user-set. Performance verification is conducted on a daily basis if the fuming chamber is involved in a processing method for a given item or items of evidence. The Daily Reagent Verification Log located in the processing room contains the LP-FORM-06 for recording results. The analyst conducting the performance verification will initial and date this form accordingly.

FORENSIC LIGHT SOURCES

The Latent Print Section has three forensic light sources; the Omnichrome Spectrum 9000+ and the Omnichrome 1000 located in the processing room and the Rofin Polilight PL 400 located at the digital imaging/ processing station in the AFIS room. The Omnichrome Spectrum 9000+ has tunable output covering the spectrum from the ultraviolet to the near-infrared (300 nm to 750 nm) and the ability to adjust both bandwidth and wavelength in 1-nm increments. The Omnichrome Omniprint™ 1000 has a tunable output ranging from an open setting with a UV filter to 570 nm. The Rofin Polilight PL 400 is a state-of-the-art forensic light source with 10 output bands from 400 nm to 530 nm.

The Latent Print General Maintenance Log is available for each alternate light source in use in the Latent Print Section, in the case that any maintenance is needed. However, the alternate light source does not require regular maintenance or performance verification.

Should an analyst encounter a problem with the alternate light source during use, the "Troubleshooting Checks" provided in Table 2 will assist the analyst in determining the problem so it may be corrected. Any maintenance resulting from a Troubleshooting Check will be recorded on the appropriate log sheet.

Table 1: Alternate Light Source Troubleshooting Guide

Troubleshooting Checks	Actions
Is light bulb damaged?	If damaged, replace bulb, document in maintenance log
Is the wavelength set in a viewable range for the dye stain?	Adjust as necessary (450nm to 540nm for R6G) Also refer to Test Methods Section 5.4 of this manual
Are the correct barrier filters (goggles) being used?	Orange or red goggles are recommended for viewing of R6G. Also refer to Test Methods Section 5.4 of this manual

If any of the above actions fail to correct the problem then the alternate light source must be removed from service for repair/replacement. After the alternate light source is repaired/replaced, the alternate light source should be checked to ensure proper functionality and wavelength. All repairs and maintenance must be documented on the Latent Print General Maintenance Log.

SIRCHIE ALL PURPOSE FUMING CABINET AND HEATING CHAMBER

The Latent Print General Maintenance Log is available for the Sirchie All Purpose Fuming Cabinet in use in the Latent Print Section. The Sirchie All Purpose Fuming Cabinet does not require regular performance verification.

Should an analyst encounter a problem with the all-purpose fuming cabinet during use, the "Troubleshooting Checks" provided in Table 2 will assist the analyst in determining the problem so it may be corrected. Any maintenance resulting from a Troubleshooting Check will be recorded on the appropriate log sheet.

Table 2: Sirchie All Purpose Fuming Cabinet and Heating Chamber Troubleshooting Guide

Troubleshooting Checks	Actions
Is heating element turned on?	Adjust the Thermostat switch to ON
Is the heating element set to reach a boiling temperature?	Adjust the Thermo Control to HI

If any of the above actions fail to correct the problem then the all-purpose fuming cabinet must be removed from service for repair/replacement. After it has been repaired/replaced, the all-purpose fuming cabinet should be checked to ensure proper functionality. All repairs and maintenance must be documented on the Latent Print General Maintenance Log.

Reagents/Chemicals

The following rules shall be followed for reagents, chemicals and controls:

- Items with a manufacturer-specified expiration date may not be used after that date without documentation to support continued reliability.
- For items without a manufacturer-specified expiration date, dates will be based on experience, industry standard, or scientific consensus.
- Appropriate logs must be maintained within each discipline for reagents and standards used.
- Each analyst must ensure that the controls, reagents and/or chemicals used in their analysis are of satisfactory quality.[1]
- Controls, reagents, or chemicals which are determined not to be reliable must be removed from use immediately.[2]
- Chemicals and solvents used in reagents should be of at least American Chemical Society (ACS) reagent grade.
- Water used in reagent preparation should be deionized (DI)
- Stock solutions of general test reagents will be prepared using good laboratory practices as needed. After being made, they will be checked as appropriate with the control listed below in Table 1 and the date the reagent verification is completed will be documented in the Latent Print section's Reagent Logbook.

Table 3: Common Reagents and Appropriate Check Compounds

Reagent	Control
Amido Black	Known dried blood sample on substrate
Gentian Violet	Friction ridge skin residue on sticky side of tape
Ninhydrin	Friction ridge skin residue on porous substrate

[1] Non-routine reagents prepared for one time use may be recorded with the above items in the laboratory case notes and any excess reagent discarded after use.
[2] The reliability testing shall occur before use or, if appropriate, concurrent with the test.

Reagent	Control
Rhodamine 6G	Friction ridge skin residue processed with Cyanoacrylate Ester on non-porous substrate
Gun Blue (Perma Blue)	Friction ridge skin residue on metal ammunition

Reagents will also be checked daily prior to use in case work, as appropriate, and documented in the case notes as well as the Reagent Daily Use Verification Logbook. If reagent does not meet standard, it will not be used, and a new solution will be prepared. Reagent verification will be conducted with the new solution to determine if it is working properly and documented in the Latent Print Reagent Logbook.

The preparer of the reagent is responsible for ensuring the proper labeling of the chemical or reagent.

See *ASCL Quality Manual* (ASCL-DOC-01) for proper documentation and labeling requirements of reagents.

6.4.4 PERFORMANCE VERIFICATION

Visual examination of evidence is the first step in the processing procedure. Visual examination is the inspection for latent print residue that may be preserved photographically or determined to be unsuitable as it exists. In addition, visual inspection is the mechanism by which processing procedures are selected from observation of the residue, its condition, and composition, and of the article. Expertise is the ability of an examiner or technician to determine as many factors as possible and to select examination approaches accordingly. Examination documentation shall include each examination activity conducted, the sequence of those activities and the results of each examination activity. Examination activities include: development technique applied, photography/capture, AFIS/IAFIS search, and comparisons made. The ASCL facilities provide sufficient environmental conditions to conduct all tests listed in this Procedures Manual with no further consideration required.

This section of the ASCL LP Quality Manual is arranged according to protocols for various types of substrate materials and residues encountered in latent print processing. It contains further descriptions when surface condition and/or deposit factors are a major influence upon technique selection. Additional factors may require some modification or adjustment to the technique or sequence of techniques indicated. In some instances procedures which fall into the general processing guidelines for a particular substrate but are inappropriate or destructive due to other factors should be modified so as to accomplish the best possible processing sequence for that specific item. This manual cannot list every substrate an examiner will encounter in casework and all procedures are subject to revision as new techniques or research reveals improvement.

If it becomes necessary to make a deviation from a documented method and/or procedure, it must be technically justified and authorized by the LP Section Chief. The deviation will be documented in the case record. Each Section Chief will keep a log of method/procedure deviations.

SELECTION OF METHODS

The ASCL shall use test methods that meet the needs of the customer and are appropriate for the tests undertaken. Standard Methods, Laboratory-Developed Methods or Non-Standard Methods may be utilized in casework after the appropriate validation and/or performance verifications have been performed as described in the lab wide manual. The most current version of the method must be documented and readily available to the analyst for reference unless it is not appropriate or possible to do so.

VALIDATION OF METHODS

*Refer to ASCL Quality Manual (*ASCL-DOC-01)

ELECTRONIC DATA

Latent print images captured in Foray™ More Hits prior to 2008 will be archived on suitable media. Current Foray ™ images will be backed up and archived on suitable recording media and maintained off site. Original images are secured by Foray™ and will remain unchanged.

6.4.5 FITNESS FOR SERVICE

All equipment will be maintained in a clean, orderly, and safe condition. The Latent Print Section equipment shall be handled responsibly to ensure optimal performance and to avoid contamination and premature wear and damage. It is the Latent Print Section Chief's responsibility to ensure that proper planning and care is taken when equipment is initially located or subsequently moved. Equipment that is infrequently used shall be stored (covered, powered-down, etc.) per the manufacturer's recommendations.

A performance verification shall be performed on instrumentation and equipment that has gone outside of the direct control of the laboratory (e.g., for repair or preventive maintenance) to ensure that its calibration status is satisfactory before being returned to service. The Latent Print Instrument/Equipment & Performance Verification and/or General Maintenance Logs will reflect that the equipment was functioning properly prior to being returned to service.

Also please refer to *ASCL Quality Manual* (ASCL-DOC-01).

6.4.6 CALIBRATION REQUIREMENT

Instruments and equipment used for tests having a significant effect on the accuracy or validity of the result of the test shall be calibrated or performance verified before use in casework. See section 5.5 of this manual for calibration and performance verification procedures for the instruments and equipment of the Latent Print section.

Also please refer to *ASCL Quality Manual* (ASCL-DOC-01).

6.4.7 CALIBRATION PROGRAM

See *ASCL-DOC-01 Quality Manual.*

6.4.8 LABELLING

See *ASCL-DOC-01 Quality Manual.*

6.4.9 OUT OF SERVICE

If equipment is not working properly or potential problems are observed, it is the duty of the analyst to immediately take the appropriate steps to repair/correct the problem or inform the appropriate individual of the problem. Any problem and the action to correct the problem must be logged in the Latent Print Instrument/Equipment & Performance Verification and/or General Maintenance Logs.

Equipment that is not working properly must be clearly marked as being 'OUT OF SERVICE' in order to prevent inadvertent use of the equipment. The equipment will not be used in casework until appropriate calibration or verification is performed.

When it has been determined that equipment was not working properly, the Section Chief shall take into consideration the effect the problem may have had on previous tests and if there is an issue of non-conforming work (see Section of the *ASCL Quality Manual* (ASCL-DOC-01).).

Also please refer to *ASCL Quality Manual* (ASCL-DOC-01).

6.4.10 INTERMEDIATE CHECKS

See *ASCL-DOC-01 Quality Manual.*

6.4.11 CORRECTION FACTORS

See *ASCL-DOC-01 Quality Manual.*

6.4.12 EQUIPMENT ADJUSTMENT

When quality control data is found to be outside the acceptable criteria, planned action shall be taken to correct the problem and to prevent incorrect results to be reported. If reagent does not meet the acceptable criteria, it will not be used; a new solution will be prepared, checked to determine if it is working properly and documented in the Latent Print Reagent Log. Instrument/ equipment that do not meet the acceptable criteria shall be removed from service until they have been repaired and re-calibrated, if necessary. Any adjustments made will be documented in the Latent Print Instrument/Equipment & Performance Verification and General Maintenance Logs.

Also please refer to *ASCL Quality Manual* (ASCL-DOC-01).

6.4.13 EQUIPMENT RECORDS

The Latent Print Instrument/Equipment & Performance Verification and General Maintenance Logs will be kept in the Latent Print AFIS room.

Also please refer to *ASCL Quality Manual* (ASCL-DOC-01).

6.5 METROLOGICAL TRACEABILITY

6.5.1 GENERAL

See *ASCL-DOC-01 Quality Manual.*

6.5.2 TRACEABILITY TO THE INTERNATIONAL SYSTEM OF UNITS

See *ASCL-DOC-01 Quality Manual.*

6.5.3 ALTERNATE TRACEABILITY

See *ASCL-DOC-01 Quality Manual.*

6.6 EXTERNALLY-PROVIDED PRODUCTS AND SERVICES

6.6.1 GENERAL

See *ASCL-DOC-01 Quality Manual.*

6.6.2 RECORDS

See *ASCL-DOC-01 Quality Manual.*

6.6.3 COMMUNICATION

See *ASCL-DOC-01 Quality Manual.*

7 PROCESS REQUIREMENTS

7.1 REVIEW OF REQUESTS, TENDERS, AND CONTRACTS

7.1.1 GENERAL

The *ASCL Evidence Submission Form* (ASCL-FORM-12) shall normally be utilized to record the request, tender and contract with the customer.

Refer to the *ASCL Quality Manual* (ASCL-DOC-01) for the definitions of "request", "tenders", and "contracts".

REVIEW OF REQUESTS

The customer should be contacted with any questions related to the agency's request. Case-related discussions with the customer concerning specific results of an examination, details of the crime directly affecting analytical methods, and any changes to the existing request will be documented on the *Agency Contact Form* (ASCL-FORM-06), e-mail, or equivalent document. These documents will be entered into the JusticeTrax case file under the Case Images section.

Before analysis begins, an initial review is conducted by Evidence Technicians followed by a second review conducted by the Section Chief and/or analyst to determine if there is anything more specific about the request and to determine if the laboratory has the capability and resources to perform the services requested (e.g., adequate standards, controls and approved test methods). The customer will be notified (e.g., iResults, phone call, e-mail, etc.) if a request is cancelled, resulting in no analysis being performed.

MEDICAL EXAMINER LATENT PRINT REQUESTS

Requests for identification of deceased individuals from the Medical Examiner's office are initiated by a phone call or email to an analyst in the Latent Print Section. Upon analyst assignment to the case, morgue technicians initiate an LP/ME Identification request in Justice Trax. Any postmortem prints and appendages collected by the LP analyst to assist in identification efforts will be handled as evidence. After print examination and analysis is complete, any postmortem prints will be transferred to the Evidence Receiving Section and any appendages will be transferred to morgue personnel.

7.1.2 INAPPROPIATE REQUESTS

See *ASCL-DOC-01 Quality Manual.*

7.1.3 STATEMENTS OF CONFORMITY

See *ASCL-DOC-01 Quality Manual.*

7.1.4 RESOLUTION OF DIFFERENCES

See *ASCL-DOC-01 Quality Manual.*

7.1.5 DEVIATION FROM THE CONTRACT

See *ASCL-DOC-01 Quality Manual.*

7.1.6 AMENDMENT OF THE CONTRACT

See *ASCL-DOC-01 Quality Manual.*

If the contract needs to be amended after work has begun, all affected personnel shall be notified.

7.1.7 COOPERATION WITH CUSTOMERS

See *ASCL-DOC-01 Quality Manual.*

7.1.8 RECORDS OF REVIEW

See *ASCL-DOC-01 Quality Manual.*

7.1.9 DATABASE SEARCH EXTENT

7.1.9.1 AUTOMATED FINGERPRINT IDENTIFICATION SYSTEM (AFIS)

INTRODUCTION

Automated Fingerprint Identification System (AFIS) is a laboratory instrument that can be used to perform searches of the Arkansas state database of known finger and palm prints. The system is housed and maintained by the Arkansas State Police (ASP).

Integrated Automated Fingerprint Identification System (IAFIS) is another AFIS system used to perform searches, utilizing the Universal Latent Workstation (ULW) software, of the FBI's known fingerprints only; palm print capabilities are not available at this time. The system is housed and maintained by the FBI. The ULW software and updates are provided by the FBI.

PROCEDURES

All latent prints (fingers and palms) that are of AFIS quality and have not been directly identified from known fingerprints should be searched in AFIS. Determination of which prints are AFIS quality is conducted by the examiner. The examiner should consider several factors when determining which prints should be searched such as: type of evidence; the quality and quantity of minutiae detail; and AFIS/IAFIS limitations. When searching fingerprints in the AFIS, the examiner should observe a minimum of eight discernable minutiae. When searching palm prints in the AFIS,

the examiner should observe a minimum of twelve discernable minutiae. Latent fingerprints searched in the IAFIS should have ten discernable minutiae present while fourteen discernable minutiae should be present in palm prints. Latent prints such as lower joints or the extreme sides of the fingers are examples of what may not be suitable for entry into AFIS/IAFIS. It should be noted that while in the Arkansas AFIS system, searching of extreme tips may not yield consistently high percentages of hits; however, the IAFIS system may be more effective. The AFIS system captures minutiae beginning in the core of the finger and works toward the outside edges of the finger until the maximum number of minutiae for that finger are captured. The IAFIS system begins at the tip of the finger and works toward the baseline of the finger capturing minutiae; therefore, consistently recording the tips of the fingers, if recorded.

No identifications will be made by solely viewing the prints on the monitor. A hard copy of the AFIS fingerprint record must be used for documenting identifications and verifications.

The examiner is encouraged to initiate latent print searches using the probable fingers and appropriate areas of the palms and to limit the search to the probable finger/palm.

Printouts of the entire candidate list resulting from AFIS entries will be retained as examination documentation for each latent print searched.

7.2 SELECTION AND VERIFICATION OF METHODS

7.2.1.1 SELECTION AND VERIFICATION OF METHODS

7.2.1.2 SELECTION OF METHODS

Visual examination of evidence is the first step in the processing procedure. Visual examination is the inspection for latent print residue that may be preserved photographically or determined to be unsuitable as it exists. In addition, visual inspection is the mechanism by which processing procedures are selected from observation of the residue, its condition, and composition, and of the article. Expertise is the ability of an examiner to determine as many factors as possible and to select examination approaches accordingly. Examination documentation shall include each examination activity conducted, the sequence of those activities and the results of each examination activity. Examination activities include: development technique applied, photography/capture, AFIS/IAFIS search, and comparisons made.

The selection of the processing techniques and their sequence depend on the surface of the evidence (substrate) and the composition of the latent residue deposited (matrix). The analyst/technician must use discretion when deciding on the process that will optimize development of friction ridge detail while also considering whether additional processing by other sections is requested. The processing techniques and their sequences are general guidelines; however, the exact procedures used are dependent on the nature of the evidence and the details of the case.

The ASCL facilities provide sufficient environmental conditions to conduct all tests listed in this Procedures Manual with no further consideration required.

This section of the ASCL LP Quality Manual is arranged according to protocols for various types of substrate materials and residues encountered in latent print processing. It contains further descriptions when surface condition and/or deposit factors are a major influence upon technique selection. Additional factors may require some modification or adjustment to the technique or sequence of techniques indicated. In some instances procedures which fall into the general processing guidelines for a particular substrate but are inappropriate or destructive due to other factors should be modified so as to accomplish the best possible processing sequence for that specific item. This manual cannot list every substrate an examiner will encounter in casework and all procedures are subject to revision as new techniques or research reveals improvement.

ELECTRONIC DATA

Latent print images captured in Foray™ More Hits prior to 2008 will be archived on suitable media. Current Foray ™ images will be backed up and archived on suitable recording media and maintained off site on a weekly basis. Original images are secured by Foray™ and will remain unchanged.

7.2.1.2.1 COMPARSION OF KNOWNS AND UNKNOWNS

The minimum standards and controls for the recording of postmortem prints requires the inspection of each area recorded to determine if the detail present is a clear and accurate depiction of the area that is being recorded.

7.2.1.2.2 CALIBRATION METHOD SELECTION

See *ASCL-DOC-01 Quality Manual.*

Refer to Section 6.4 on equipment for specific calibration guidelines and verification documentation.

7.2.1.3 METHOD AVAILABILITY

See *ASCL-DOC-01 Quality Manual.*

Hard copies of methods and instruments are kept by instrument or stored digitally in Qualtrax and/or the latent print section drive (S drive).

7.2.1.4 METHOD VERSION

See *ASCL-DOC-01 Quality Manual.*

7.2.1.5 METHOD SELECTION

The ASCL shall use test methods that meet the needs of the customer and are appropriate for the tests undertaken. Standard Methods, Laboratory-Developed Methods or Non-Standard Methods may be utilized in casework after the appropriate validation and/or performance verifications have been performed as described in the lab-wide manual. The most current version of the method must be documented and readily available to the analyst for reference unless it is not appropriate or possible to do so.

7.2.1.6 VALIDATION OF METHODS

See *ASCL-DOC-01 Quality Manual.*

7.2.1.7 METHOD DEVELOPMENT

See *ASCL-DOC-01 Quality Manual.*

7.2.1.8 DEVIATION FROM METHOD

If it becomes necessary to make a deviation from a documented method and/or procedure, it must be technically justified and authorized by the LP Section Chief. The deviation will be documented in the case record. Each Section Chief will keep a log of method/procedure deviations.

7.2.2 VALIDATION OF METHODS

See *ASCL-DOC-01 Quality Manual.*

7.2.2.1 EXTENT OF VALIDATION

See *ASCL-DOC-01 Quality Manual.*

7.2.2.1.1 VALIDATION PROCEDURE

See *ASCL-DOC-01 Quality Manual.*

7.2.2.2 CHANGES TO VALIDATED METHODS

See *ASCL-DOC-01 Quality Manual.*

7.2.2.3 RELEVANCE TO NEEDS

See *ASCL-DOC-01 Quality Manual.*

7.2.2.4 VALIDATION RECORDS

See *ASCL-DOC-01 Quality Manual.*

7.3 SAMPLING

See *ASCL-DOC-01 Quality Manual.*

7.3.1 GENERAL

See *ASCL-DOC-01 Quality Manual.*

7.3.2 SAMPLING METHOD

See *ASCL-DOC-01 Quality Manual.*

7.3.3 SAMPLING RECORDS

See *ASCL-DOC-01 Quality Manual.*

7.4 HANDLING OF TEST ITEMS

7.4.1 GENERAL

Evidence will be checked out from Evidence Receiving in accordance with evidence policies. Be aware of all the sections and testing that involves the evidence prior to examination. Take the necessary precautions to preserve the integrity of the evidence.

RESPONSIBILITIES AND PROCEDURES

In order to determine the items most likely to assist in the investigation and to prioritize those items for examination, the examiner or analyst may conduct a review of large, bulky submissions. Whenever possible, this review will occur with the agency representative in person, by email or by phone to assist with the investigation and to eliminate unnecessary examinations or analyses.

Cases containing evidence for processing as well as latent print lift cards and/or digital images will be examined by the Latent Print Technician first. The latent print lifts will be examined before processing begins and if they are deemed sufficient by the technician and the verifier, the technician will transfer the entire case to an analyst. The analyst will process and examine the evidence further and complete the case. If the technician and the verifier deem the prints insufficient, the technician will complete the case. The evidence will be returned to Evidence Receiving in a timely manner after completion.

SUITABILITY OF TEST ITEMS

Evidence submitted to the laboratory must be properly packaged, labeled and sealed to prevent contamination, loss or deleterious change. If there is any packaging deficiency noted at the time of receipt, it must be corrected, preferably by the submitting customer. If the customer is not available or it is not expedient to call the customer back to correct the deficiency, an Evidence Technician

may take steps to correct the problem (e.g., provide a remedial seal). However, if the deficiency is serious enough to bring into question the integrity or identity of the test item, the appropriate Section Chief and customer agency must be contacted to resolve the issue before the evidence is analyzed.

If a packaging deficiency is not apparent until the case is checked out by an analyst, the analyst may correct the deficiency. If there is any concern that the packaging deficiency has affected the integrity or identity of the test item, the Chief Latent Print Examiner and the customer agency shall be advised and consulted with for further instructions.

If the analyst discovers an inconsistency between the stated and actual contents of a package or the suitability of an evidence item for testing, the analyst shall make all attempts to contact the customer and document the discussion (e.g., *Agency Contact Form* (ASCL-FORM-06), email, etc.) prior to issuing a report. For minor inconsistencies, the analyst shall use their judgment on whether to contact the customer, but must make a note of the discrepancy in the case file.

All remedial actions taken to correct packaging or evidence deficiencies shall be noted in the case record (e.g., submission form or analyst's notes).

SAFEGUARDING THE INTEGRITY OF EVIDENCE

Evidence in the Latent Print Section may be stored in secured individual offices of analysts and the powder and chemical processing rooms. Evidence must be kept in one of these locations for overnight storage. Evidence shall be maintained under appropriate conditions to prevent deterioration, loss or damage to the evidence during storage, handling or the testing process.

Medical Examiner requests for identification of deceased will be handled as evidence.

Postmortem prints and/or appendages will be transferred to the examiner prior to assessment and returned to the appropriate evidence storage location after testing procedures are concluded.

Collection of transfer DNA swabs from evidence items will be conducted as requested or as deemed necessary by the examiner.

1) Wear gloves and a mask, if necessary, to prevent contamination of the evidence item.
2) After swabs have been obtained, evidence may be handled according to lab wide personal protective equipment requirements (see *ASCL Health and Safety Manual* Appendix D).
3) Clean the work area with 10% bleach solution.
    a) Alternatively, the evidence item may be kept in its container, rather than placed on the countertop, during the swabbing process.
4) Lay down clean paper.
5) Lightly moisten a swab with distilled water.
6) Swab surfaces of the evidence item that are likely to have DNA.
    a) Use as few swabs as possible to concentrate the DNA obtained.
7) Dry the swabs, then package the swabs in an envelope.

8) In JusticeTrax, itemize and de-containerize an envelope under the parent item to hold the swab envelopes. Then, individually itemize the swab envelopes under the evidence item and show their location as being in the de-containerized envelope.
9) The swabs will be transferred to the Physical Evidence section for long term storage on a reasonable time basis.

Drug evidence will be separated prior to examination by the Latent Print Section, except under special circumstances.

INDIVIDUAL CHARACTERISTIC DATABASES

The Latent Print section utilizes the Automated Fingerprint Identification System (AFIS). Employees utilizing this database must receive proper training and/or clearance through the Arkansas State Police (ASP).

DATABASE SAMPLES

Individual characteristic database samples of the Latent Print Section include copies of ten print cards of known individuals. These ten print cards are treated as examination documentation. The known finger and palm prints of the AFIS are entered and controlled by the Arkansas State Police Identification Bureau. The records are stored according to State Identification Numbers (SID). The Arkansas State Crime Laboratory has no control over these records.

7.4.1.1 HANDLING PROCEDURES

7.4.1.1.1 STORAGE

SECURING EVIDENCE

All evidence not in the process of examination/analysis shall be maintained in a secured, limited-access storage area under proper seal. This will normally be the evidence storage area in Evidence Receiving, but the secured individual offices of analysts may also serve as a storage area for such evidence temporarily.

UNATTENDED EVIDENCE

Evidence in the process of examination may be left unattended for limited periods of time (e.g., lunch, short breaks, etc.) but must be in a secure limited access area. If the analyst needs to be away for a longer period of time, the evidence shall be secured in a short term storage location, whenever practical. If this is not possible, the analyst shall take reasonable precautions to protect the evidence from loss, cross-transfer, contamination and/or deleterious change.

Evidence shall not be left unattended if it is not in the process of being examined or there is no expectation of frequent examination.

EVIDENCE IN THE PROCESS OF EXAMINATION

Items with an expectation of frequent analysis may be considered “evidence in the process of examination/analysis” and may be stored unsealed in a limited access area as long as the evidence is protected from loss, cross-transfer, contamination and/or deleterious change. After 60 consecutive days of no analysis or new requests for comparisons, a case is no longer considered “in the process of examination.” Cases no longer in the process of examination should be closed and the evidence sealed properly until analysis resumes or a new service request is received.

7.4.1.1.2 PACKAGAING AND SEALING

Description of evidence packaging and evidence will be documented on LP-FORM-17. Dual trained Physical Evidence/Latent Print Technicians may use LP-FORM-17 or SER-FORM-01 and/or SER-FORM-03.

EVIDENCE SEALING

Evidence will be sealed in a manner in which the contents cannot readily escape and in such a manner that opening the container would result in obvious damage or alteration to the container or its tape seal. All evidence must bear a proper seal which shall include the initials or other identification of the person sealing the evidence across the seal.

When the container is opened, the original seal shall be left intact, whenever practical, and a new opening made. When the analysis or examination is completed, the new opening shall be sealed, as outlined in these procedures; thus the original container seals will be intact and all seals will be clearly marked.

If reusing the original container is impractical, a new evidence container may be used. It shall also be marked and sealed according to the above procedures and the original evidence packaging shall be kept inside the second evidence container. If the original packaging cannot be kept, there must be complete documentation along with a picture of original packaging retained in the case record. (Toxicology samples only need a written description of the packaging.) Documentation of the change in packaging along with description must be documented in the case record for future reference.

7.4.1.1.3 CHAIN OF CUSTODY

DATABASE SAMPLE ACCESS

Access to individual characteristic database samples is restricted to those employees authorized by the Executive Director. The Chief Latent Print Examiner will keep an updated list of employees that have access to the database samples.

TRANSFER OF EVIDENCE ITEMS FOR VERIFICATION AND/OR EXCLUSION PURPOSES:

Evidence items, (e.g., latent print lifts, known fingerprint exemplars), transferred to another examiner for verification or exclusion purposes shall be recorded on LP-FORM-19 indicating the verifiers initials and date.

See *ASCL-DOC-01 Quality Manual.*

7.4.1.1.4 CUSTOMER NOTIFICATION

PHOTOGRAPHIC EVIDENCE

After evidence is examined and latent prints of value for identification or elimination purposes are developed or noted, the latent prints will be preserved from change. A permanent record of all latent prints of value for identification will be made by lifting, photography and/or by digital imaging when appropriate.

When latent print and impression evidence can only be recorded or collected by photography or digital imaging and the impression itself is not recoverable, the photographic/digital image must be treated as evidence. In these instances the digital image will be copied and locked onto suitable media and returned, along with the original evidence, to the submitting agency.

The Foray™ Digital Workplace will be used for the digital imaging and retention of latent prints and impression evidence when appropriate.

See *ASCL-DOC-01 Quality Manual.*

7.4.2 ITEM IDENTIFICATION

A unique case number is assigned to every case when evidence is initially received by ASCL. Each exterior container must have its unique barcode label affixed to it. Agency evidence numbers will be used to identify the evidence whenever practical.

If testing requires that uniquely identified items be subdivided within the laboratory, appropriate sub-item identifiers shall be assigned and the item(s) labeled by the analyst so that the sub-item may be easily tracked and identified as having originated from a particular item.

EVIDENCE MARKING

Each piece of evidence or its most appropriate proximal container must bear the following identifiers:

1) Laboratory number (e.g., YYYY-000000)
2) Item number
3) Examiner's initials

7.4.2.1 EXTENT

See *ASCL-DOC-01 Quality Manual.*

7.4.3 ENVIROMENTAL CONDITIONS

See *ASCL-DOC-01 Quality Manual.*

7.4.4 DEVIATIONS

See *ASCL-DOC-01 Quality Manual.*

7.5 TECHNICAL RECORDS

7.5.1 GENERAL

Examination records are any records generated by the analyst/examiner for a case file (e.g., notes, worksheets, photographs, spectra, printouts, charts and other data). Examination records that are essential for the evaluation and interpretation of the data must be stored in the appropriate folder within the 'Request' folder in the LIMS case file. The unique Arkansas State Crime Laboratory (ASCL) case number (YYYY-000000) (handwritten or electronically generated) and the analyst's handwritten initials or secure electronic equivalent of initials or signature must be on all examination records in the case file.

When the analyst/examiner has completed the request, they will set the milestone(s) in JusticeTrax to 'draft complete.' Examination records for a request will be considered "completed" once the request has been 'draft completed' in JusticeTrax.

7.5.1.1 TECHNICAL RECORD RETENTION

When it is not feasible to incorporate the original examination records (e.g., digital, scanned, and/or processed images) in the LIMS case file, these records may be stored external to the LIMS case file in archived Morehits®/Foray® image files or the Foray® Digital Workplace imaging system, hereinafter referred to as Foray. The location of these records will be specified in the case file.

Latent print images captured in Foray™ More Hits prior to 2008 will be archived on suitable media and located in the Latent Print Section Current Foray ™ images will be backed up and archived on suitable recording media and maintained off site on a weekly basis. Original images are secured by Foray™ and will remain unchanged.

All other records contained in the case file will be considered administrative records and will be stored in the 'Case Images' folder in the LIMS case file. The unique Arkansas State Crime Laboratory (ASCL) case number (YYYY-000000) (handwritten or electronically generated) must be on all administrative records in the case file.

Each case record will contain enough information to identify factors to enable re-analysis to be conducted under conditions as close to the original as possible. The identity of the individuals who sampled evidence, conducted testing, and/or verified results will be reflected in the case record.

7.5.1.2 ABBREVIATIONS

Please refer to Terms and Definitions in Latent Print Manual Section 3 or see *ASCL-DOC-01 Quality Manual.*

7.5.1.3 TECHNICAL RECORD SUFFICIENCY

Latent Print analysts testifying based on the examination records generated by another individual shall complete a *Court Case Review Form* (ASCL-FORM-57) on the particular case prior to testifying.

7.5.1.4 TECHNICAL RECORD PERMANENCY

See *ASCL-DOC-01 Quality Manual.*

7.5.1.5 REJECTION

See *ASCL-DOC-01 Quality Manual.*

7.5.1.6 CALIBRATION DATA

Refer to Section 6.4.12

See *ASCL-DOC-01 Quality Manual.*

7.5.2 AMENDMENTS TO TECHNICAL RECORDS

If a change to the examination record is made after this milestone, the original record will remain in the electronic case file and the changed record will be stored with a different name (e.g., amended notes).

See *ASCL-DOC-01 Quality Manual.*

7.6 EVALUATION OF MEASUREMENT UNCERTAINTY

See *ASCL-DOC-01 Quality Manual.*

7.6.1 UNCERTAINTY COMPONENTS

See *ASCL-DOC-01 Quality Manual.*

7.6.1.1 METHOD REQUIREMENTS

See *ASCL-DOC-01 Quality Manual.*

7.6.2 CALIBRATION

See *ASCL-DOC-01 Quality Manual.*

7.6.3 ESTIMATION PROCEDURE

See *ASCL-DOC-01 Quality Manual.*

7.6.3.1 EVALUATION REQUIREMENTS

See *ASCL-DOC-01 Quality Manual.*

7.6.4 REQUIRED RECORDS

See *ASCL-DOC-01 Quality Manual.*

7.7 ENSURING THE VALIDITY OF RESULTS

7.7.1 GENERAL

This section will contain quality control procedures to continually monitor and ensure the validity of test results. Quality control data will be recorded in a way to allow trends to be detected and whenever practical, statistical techniques will be used to review the data. The records should be retained to show that all appropriate quality control measures have been taken and are acceptable. The following is a list of quality control items that are utilized at the ASCL to ensure that ASCL test results are of the highest quality:

- Regular use of certified reference materials and/or internally generated secondary reference standards.
- Where appropriate, the use of positive and negative controls and internal standards
- 100% technical and administrative review of case records prior to issuance of the laboratory report
- Competency testing of analysts prior to beginning casework
- Annual proficiency testing of all analysts and technicians
- Replicate testing using the same or different methods, where practical.
- Independent verification of all latent print analytical conclusions.
- Re-analysis of casework.
- Annual courtroom testimony monitoring for all testifying analysts

7.7.1.1 QUALITY CONTROL DATA

When quality control data is found to be outside the acceptable criteria, planned action shall be taken to correct the problem and to prevent incorrect results to be reported. If reagent does not meet the acceptable criteria, it will not be used; a new solution will be prepared, checked to

determine if it is working properly and documented in the Latent Print Reagent Log. Instrument/ equipment that do not meet the acceptable criteria shall be removed from service until they have been repaired and re-calibrated, if necessary. Any adjustments made will be documented in the Latent Print Instrument/Equipment & Performance Verification and General Maintenance Logs.

7.7.1.1.1 VERIFICATION

Verification is an independent examination of the evidence by another competent analyst to either support or refute the conclusions of the original examiner.

All analytical conclusions resulting from friction ridge examination(s) shall be verified by another examiner through separate and independent application of the ACE phases of the ACE-V methodology.

If the verifying analyst draws the same conclusion as the primary analyst, documentation shall be clear as to what was verified, who performed the verification, and the date the verification was performed.

Verifications will be documented in the case file as follows:

LIFTS AND FORAY IMAGES

The verifying examiner shall initial and date each item that was examined in the course of the verification.

Other such written documentation and notations relevant to verification(s) will be made on the applicable worksheets by the case examiner as has been standard procedure.

DEVELOPED FRICTION RIDGE DETAIL

The verifier will initial and date the actual item of evidence that was examined and/or the processing worksheet in the course of the verification.

NO DISTINGUISHABLE FRICTION RIDGE DETAIL

Evidence items that do not exhibit any distinguishable friction ridge detail need not be preserved by means of high resolution imaging.

All analytical conclusions by an examiner and/or technician that an examined item of evidence does not exhibit any distinguishable friction ridge detail must be verified.

Other such written documentation and notations relevant to verification(s) will be made on the applicable worksheets by the case examiner as has been the standard procedure.

OTHER REQUIREMENTS

Verification documentation on examination material (e.g., lifts, exemplars, etc.) when applicable shall include the initials of both the primary and confirming analysts, the dates associated with each

analyst's independent conclusion, and a clear indicator of what was verified (e.g., subject's name, finger number, right or left palm, specific shoe).

7.7.1.1.2 CASE REVIEW

All cases will be technically and administratively reviewed. The review process must confirm that electronic versions of all necessary documentation are in the imaging module of the LIMS plus program.

If a reviewer discovers an error in the case record, the reviewer must document the error on the *ASCL Case Review Form* (see LP-FORM-18) and inform the analyst. If the analyst and the reviewer cannot reach consensus, then both the analyst and reviewer must meet with the Section Chief (or designee) for resolution.

ADMINISTRATIVE REVIEW

The administrative reviewer of a case that has been technically reviewed by an outside agency will push the technical review in the LIMS before proceeding with the administrative review. The administrative reviewer will ensure that the completed review form has been scanned into the case file.

Refer to sections 7.7.1.2.1 of the *ASCL Quality Manual* (ASCL-DOC-01) for more information on Technical and Administrative Reviews.

7.7.1.1.2.1 TECHNICAL REVIEW

If the technical review is conducted by a qualified analyst who is not an employee of the Arkansas State Crime Laboratory, the reviewer must be from an accredited laboratory. The accreditation certificate for the laboratory and a CV for the individual conducting the review will be maintained on file (S:\Technical Reviewers).

7.7.1.1.2.2 TESTIMONY REVIEW

Refer to sections 7.7.1.2.2 of the *ASCL Quality Manual* (ASCL-DOC-01) for information on Testimony Reviews.

Latent Print analysts issuing a report based on the examination records generated by another individual shall complete and document a review of all relevant pages of documentation in the case record. This will be conducted by the reporting analyst and will include initialing and dating each page of the examination record and the use of a review statement (e.g., "SOP compliant"/Examiner Initials/ Date) to be documented at minimum on the first or last page of the examination records.

The same documented review shall be conducted in the cases that both a Latent Print Technician and a Latent Print Examiner have produced examination records. This review statement should be documented by the Latent Print Examiner to include compliance with the discipline SOP and initialed and dated. (e.g., "SOP compliant"/Examiner Initials/Date). The Latent Print Examiner shall initial each examination record completed by the Latent Print Technician in the case file.

If examination records are generated in Foray, Latent Print analysts issuing a report or additional documentation based on the examination records generated by another individual shall complete and document a review of all relevant pages in the case record. This review shall be documented by the Latent Print Examiner using the *LP Examination Record Review Form* (LP-FORM-32) and included in the case record.

Latent Print analysts testifying based on the examination records generated by another individual shall complete a *Court Case Review Form* (ASCL-FORM-57) on the particular case prior to testifying.

7.7.2 INTERLABORATORY COMPARSIONS

Refer to sections 7.7.2 of the *ASCL Quality Manual* (ASCL-DOC-01) for information on inter-laboratory comparisons.

7.7.2.1 EXTERNAL PROFICIENCY

The Arkansas State Crime Laboratory maintains a proficiency testing program designed to provide independent evaluation of individual technical expertise, as well as a mechanism to monitor training needs and procedural weaknesses for both individual analysts and each discipline within the laboratory.

Technical review, verification, and administrative review policies shall be employed during proficiency testing as they are normally applied to casework. All parts of a proficiency test provided by an approved test provider should be examined as completely as the discipline's procedures allow.

Each analyst and technical support personnel engaged in testing activities shall successfully complete at least one internal or external proficiency test per calendar year in his/her forensic science discipline(s). The first analyst(s) taking the test will submit the results to the external provider before any of the succeeding analysts receive the test. This will be considered an External Proficiency Test. The remaining analysts will take the exam by the prescribed due date from the test provider. These tests will be considered Internal Proficiency Tests. (Note: The cases in JusticeTrax will be restricted so that the other analysts taking the test cannot access the case).

Each analyst and technical support personnel engaged in testing activities shall be proficiency tested at least once during each five-year accreditation cycle, in each category of testing appearing on the ASCL's Scope of Accreditation, in which the individual performs testing. The categories of testing for the Latent Print discipline include:

- Latent Print Processing
- Latent Print Comparison

See *ASCL-DOC-01 Quality Manual.*

The Chief Latent Print examiner or designee shall maintain a log of proficiency testing in each individual's Employee History Binder. This log shall contain the following:

- Individual's name
- Unique ASCL case number
- External proficiency identifier, if applicable
- Proficiency provider
- Date proficiency case file assigned
- Date test completed
- Date results reviewed

All internal and external proficiency tests will have a case file generated in JusticeTrax. All administration and examination documentation will be in the assigned electronic case file. This electronic version is considered the official proficiency case record. In addition, the following will be maintained in the case file:

- How the samples were obtained or created (after testing is complete and results have been received)
- Proficiency test results from the provider
- Corrective Action Request documentation, when applicable

The Chief Latent Print examiner or designee is responsible for comparing the analytical results to the expected results, determining if the analytical results are acceptable, and for reviewing these results with the analyst.

Proficiency/Competency tests that are internally prepared will be documented with the *Latent Print Section Proficiency Preparation Form* (LP-FORM-31) and scanned into the appropriate case file.

The following criteria shall be used for evaluating proficiency test results:

- All tests are graded as satisfactory or unsatisfactory.
  - A satisfactory grade is attained when the experimental results match the expected results.
- If there is a discrepancy between the expected results and the experimental results, the Chief Latent Print examiner must notify the lab-wide QA Manager.
- Minor discrepancies may be deemed satisfactory based on the following factors with approval of the QA Manager:
  - Discipline interpretation guidelines
  - Consensus results

If the results are deemed to be unsatisfactory, the Section Chief must initiate a Corrective Action Request in Qualtrax.

Proficiency testing records will be retained for at least 15 years.

7.7.3 MONITORING ACTIVITY ANALYSIS

See *ASCL-DOC-01 Quality Manual.*

7.7.4 INDIVIDUAL PROFICIENCY TESTING

See *ASCL-DOC-01 Quality Manual.*

7.7.5 PROFICIENCY TESTING REQUIREMENTS

The Arkansas State Crime Laboratory maintains a proficiency testing program designed to provide independent evaluation of individual technical expertise, as well as a mechanism to monitor training needs and procedural weaknesses for both individual analysts and each discipline within the laboratory.

Technical review, verification, and administrative review policies shall be employed during proficiency testing as they are normally applied to casework. All parts of a proficiency test provided by an approved test provider should be examined as completely as the discipline's procedures allow.

Each analyst and technical support personnel engaged in testing activities shall successfully complete at least one internal or external proficiency test per calendar year in his/her forensic science discipline(s). The first analyst(s) taking the test will submit the results to the external provider before any of the succeeding analysts receive the test. This will be considered an External Proficiency Test. The remaining analysts will take the exam by the prescribed due date from the test provider. These tests will be considered Internal Proficiency Tests. (Note: The cases in JusticeTrax will be restricted so that the other analysts taking the test cannot access the case).

Each analyst and technical support personnel engaged in testing activities shall be proficiency tested at least once during each four-year accreditation cycle, in each category of testing appearing on the ASCL's Scope of Accreditation, in which the individual performs testing. The categories of testing for the Latent Print discipline include:

- Latent Print Processing
- Latent Print Comparison

See *ASCL-DOC-01 Quality Manual.*

The Chief Latent Print examiner or designee shall maintain a log of proficiency testing in each individual's Employee History Binder. This log shall contain the following:

- Individual's name
- Unique ASCL case number
- External proficiency identifier, if applicable
- Proficiency provider
- Date proficiency case file assigned
- Date test completed
- Date results reviewed

All internal and external proficiency tests will have a case file generated in JusticeTrax. All administration and examination documentation will be in the assigned electronic case file. This electronic version is considered the official proficiency case record. In addition, the following will be maintained in the case file:

- How the samples were obtained or created (after testing is complete and results have been received)
- Proficiency test results from the provider
- Corrective Action Request documentation, when applicable

The Chief Latent Print examiner or designee is responsible for comparing the analytical results to the expected results, determining if the analytical results are acceptable, and for reviewing these results with the analyst.

Proficiency/Competency tests that are internally prepared will be documented with the *Latent Print Section Proficiency Preparation Form* (LP-FORM-31) and scanned into the appropriate case file.

The following criteria shall be used for evaluating proficiency test results:

- All tests are graded as satisfactory or unsatisfactory.
  - A satisfactory grade is attained when the experimental results match the expected results.
- If there is a discrepancy between the expected results and the experimental results, the Chief Latent Print examiner must notify the lab-wide QA Manager.
- Minor discrepancies may be deemed satisfactory based on the following factors with approval of the QA Manager:
  - Discipline interpretation guidelines
  - Consensus results

If the results are deemed to be unsatisfactory, the Section Chief must initiate a Corrective Action Request in Qualtrax.

Proficiency testing records will be retained for at least 15 years.

7.7.6 PROFICIENCY TEST SCHEDULE

See *ASCL-DOC-01 Quality Manual.*

The latent print section will maintain a four year cycle of proficiency scheduling on the latent print S drive. (S:\Proficiency Testing Schedule LP)

7.7.7 PROFICIENCY TEST SOURCING

See *ASCL-DOC-01 Quality Manual.*

7.7.8 PROFICIENCY TEST RECORDS

Current proficiency test information is maintained in the Qualtrax® workflow. Additionally, the JusticeTrax file will contain all administrative and examination documentation.

7.8 REPORTING OF RESULTS

7.8.1 GENERAL

When analytical conclusions and/or opinions are made on evidence submitted for analysis, a 'Report of Laboratory Analysis' will be issued to the investigating agency. The results shall be reported accurately, clearly, unambiguously and objectively. Analytical findings and conclusions shall be reported for each specific item of evidence that was examined. Each analyst/examiner will proofread and sign their reports ensuring the report is accurate and error-free. LIMS allows the analyst to sign their reports electronically.

See *ASCL Quality Manual* (ASCL-DOC-01) for Laboratory Report Exceptions.

7.8.2 REPORTS

See *ASCL Quality Manual* (ASCL-DOC-01) for minimum requirements of information to be contained on the laboratory report.

ADDITIONAL REQUIREMENTS

The following information should be addressed in all Latent Print Section Reports:

- Latent print(s) present or developed on evidence should be specifically identified and reported as to what type and how many of each type were found on each Item.
- If needed, Latent Print Examiners should request appropriate additional record (e.g., finger, palm, finger and palm) prints in the ASCL laboratory report.
- Latent print examinations and comparisons can be limited in scope from what is specified in the "Analysis Requested" box on the *ASCL Evidence Submission Form* (ASCL-FORM-12) only after coordination with the submitter. If a limited examination/comparison is conducted, the identity of the individual with whom the action was coordinated, the date, and a clear explanation should be given in the *ASCL Agency Contact Form* (ASCL-FORM-06), the ADAMS Telephone Conversation Log or documented email and included in the case file. The explanation should be referenced on the laboratory report as well.
- All examination results shall be reported. When comparative Latent Print examinations result in an association or exclusion or inconclusive result, the report shall clearly communicate the result.
- Exclusions

- When comparative examinations result in the exclusion of an individual or object, the report shall clearly communicate the exclusion. Please see Suggested Reporting Format in the relevant Additional Statements in this section for reporting suggestions.

- Inconclusive Results
  - When results are inconclusive, the reason shall be clearly documented in the examination record. *Latent Print Worksheet (Lifts/Images)* (LP-FORM-19) has a checklist for reasoning, as well as a "Notes" section where this reason shall be documented. If the examination record is generated with the ADAMS ACE-V Documentation Module, the reason shall be documented within the module and resulting records. The *Latent Print Worksheet* also has a "Notes" section where this reason shall be documented.
- Opinions and Interpretations
  - The following statement (or equivalent) will appear on all laboratory reports: "The following represents the interpretations/opinions of the undersigned analyst."

ADDITIONAL STATEMENTS

In an effort to standardize report writing in the Latent Print Section the following suggested phrasing is provided. It is recognized that these phrases will not fit every reporting situation; exceptions are permissible. Examiners are encouraged to use this standardization in their notes and reports, but it is also recognized that some discretion is allowed for the variances of case circumstances.

7.8.3 LATENT FINGER/PALM PRINTS STANDARDIZED REPORT WORDING

7.8.3.1 ASSOCIATIONS

LATENT FINGER/PALM PRINTS EXAMINATION RESULTS

Latent print comparison results NEVER include qualified conclusions. There are only three possible latent print examination conclusions which will be used in reports generated by the ASCL Latent Print Section. The conclusions of identification and exclusion will be documented in notes and in reports; however, the determining factors need not be included in reports. Reasons for reaching inconclusive conclusions must be documented in notes and included in reports.

Unknown ridge detail should be referred to as "latent prints" in the case report. They may be referred to as latent fingerprints, latent palm prints, latent impressions, patent impressions, plastic impressions, etc., if the terminology clarifies a portion of the case report.

Suitable ridge detail that is not compared or analyzed must be indicated in the case report.

Latent print lifts created by the Latent Print Section must be returned to the submitting agency and indicated in the case report.

7.8.3.1.1 IDENTIFICATION

Identification is the decision by a Latent Print Examiner that there are sufficient features in agreement to conclude that two areas of friction ridge impressions originated from the same source.

Suggested Reporting Format:

- One latent print exhibiting sufficient unique characteristics to allow an identification to its source was observed on the evidence labeled E2.OR:
- The Item(s) 5A and 5C latent prints was/were searched in the AFIS with the following results:
- (Name) has been identified as the source of the latent finger/palm print labeled 5A.
  The previously submitted evidence items 5A and 5B were compared with the fingerprint record for (Name and SID#/FBI#) with the following results: (Name) has been identified as the source of the latent print labeled 5A.
- ME/LP request: The post-mortem inked print labeled PM1 has been identified as XXXXXX.
- ME/LP request: The imaged friction ridge skin labeled PM1 has been identified as XXXXXX.

7.8.3.1.2 EXCLUSION

Exclusion is the decision by the Latent Print Examiner that there are sufficient features (class and/or individual characteristics) in disagreement to conclude that two areas of friction ridge impressions did not originate from the same source. Source refers to the area of friction skin. Exclusion of a subject can only be reached if all relevant comparable anatomical areas are represented and legible in the known exemplars. Notes and reports shall clearly state if the exclusion refers only to the source or the subject.

Suggested Reporting Format:

- The latent fingerprint observed on the evidence labeled 3A exhibits reliable class characteristics to allow a comparison for possible exclusionary purposes.
- (Name and SID#) has been excluded as the source of the latent print labeled 3A.

7.8.3.1.3 INCONCLUSIVE

An inconclusive conclusion can occur when a Latent Print Examiner is unable to identify or exclude due to an absence of complete and legible known prints (e.g., poor quality fingerprints and lack of comparable areas). In such an instance, the inconclusive conclusion means that the impression needs to be reexamined and compared using clearly and completely recorded known impressions.

Inconclusive also encompasses those situations when the questioned impression(s) may be suitable for identification but the conclusion to either identify or exclude cannot be made (e.g., unable to determine friction ridge orientation).

Inconclusive conclusion can also result when corresponding features are observed but not sufficient to identify, or in the same instance dissimilar features may be observed but not sufficient to exclude (unable to explain whether a specific ridge event [or sequence of events] constitutes a

discrepancy or dissimilarity). The inconclusive conclusion here means that the unknown impression was neither identified nor excluded as originating from the same source.

Suggested Reporting Format:

The latent print labeled 5A was directly compared with the fingerprint record for (Name) with the following conclusion: (Name) cannot be identified or excluded as the source of the latent print labeled 5A.

- The complete and clearly recorded fingerprints and/or palm prints, including the (anatomical location) and/or the Arkansas State Identification Number of any suspected source of the 5A latent print should be submitted under this laboratory case number if any additional analysis is required.
- The fingerprint record for (Name and SID#)is insufficiently recorded to allow a complete comparison to the latent prints labeled 3A and 3B.

7.8.3.2 PROCESSING and EXAMINATION

This section details the processing examinations (e.g., visual, chemical and/or physical) and results for each item. The results shall include the number of latent prints recovered from each item. Every latent captured for analysis shall be designated a number regardless if it is of value for identification.

The below statements can be used for an item that was physically and/or chemically processed:

- The evidence labeled E1 was examined and processed for latent prints with no ridge detail developed.
- The evidence labeled E1 was examined and processed for latent prints with no latent prints exhibiting sufficient characteristics to allow for comparison.

The evidence labeled E1 does not exhibit sufficient unique characteristics and are of no value for comparison. The below can be used for an item that was determined not to be suitable for processing:

Item 1 was visually examined and determined not to be conducive to latent print processing and/or retention. The below can be used when ridge detail is captured. The number of latent prints captured shall be documented for each item processed:

- One latent print was lifted.
- Two latent prints were digitally captured.
- Five latent prints were lifted and/or digitally captured.

7.8.4 LATENT-TO-LATENT COMPARISONS OF FRICTION RIDGE SKIN

Latent-to-latent comparisons of friction ridge skin impressions are not conducted on a routine basis and any request for latent-to-latent comparisons must be coordinated with and approved by the Latent Print Section Chief.

- If approved to conduct a latent-to-latent comparison, only positive conclusions are reportable. AFIS should be used in these types of examinations to assist with large volume searches.
- No conclusions will be reached and reported regarding any negative findings.
- Latent prints unsuitable for identification will not be compared with other latent prints.
- Examples of conclusions rendered in latent-to-latent comparisons are as follows:
  - The latent prints in this case are not suitable for latent-to-latent comparisons.
  - The latent fingerprints on Item(s) 1A and 1B were made by the same source.
  - The latent print on Item 1A in this case was identified as having been made by the same source as the latent print on Item 2C in case number _____ during an AFIS search, but the source was not identified.
  - No conclusion can be made regarding the remaining latent prints on Item(s) 1A through 1C in this case as they are not suitable for a latent-to-latent comparison.

7.8.5 REPORT/TESTIMONY ON WORK OF OTHER ANALYSTS

Latent Print analysts issuing a report based on the examination records generated by another individual shall complete and document a review of all relevant pages of documentation in the case record. This will be conducted by the reporting analyst and will include initialing and dating each page of the examination record and the use of a review statement (e.g., "SOP compliant"/Examiner Initials/ Date) to be documented at minimum on the first or last page of the examination records.

The same documented review shall be conducted in the cases that both a Latent Print Technician and a Latent Print Examiner have produced examination records. This review statement should be documented by the Latent Print Examiner to include compliance with the discipline SOP and initialed and dated. (e.g., "SOP compliant"/Examiner Initials/Date). The Latent Print Examiner shall initial each examination record completed by the Latent Print Technician in the case file.

If examination records are generated in Foray, Latent Print analysts issuing a report or additional documentation based on the examination records generated by another individual shall complete and document a review of all relevant pages in the case record. This review shall be documented by the Latent Print Examiner using the *LP Examination Record Review Form* (LP-FORM-32) and included in the case record.

Latent Print analysts testifying based on the examination records generated by another individual shall complete a *Court Case Review Form* (ASCL-FORM-57) on the particular case prior to testifying.

7.8.6 REPORT FORMAT

Latent Print Section reports are generated using the LIMS and will be formatted in a manner to accommodate the types of tests conducted and to minimize the possibility for misunderstanding or misuse. The Latent Print Section Chief will ensure that discipline report designs are optimized for the clear presentation of test results.

Laboratory reports are often read by persons who have little experience with latent print examinations and are not familiar with how the results of these examinations are reported. Therefore, all reports should be simple, accurate, and complete. Whenever possible, reports should stand alone without referring to other documents.

See *ASCL Quality Manual* (ASCL-DOC-01) for Supplemental and Amended Reports.

7.8.7 REVIEW AND AUTHORIZATION OF RESULTS

See *ASCL-DOC-01 Quality Manual.*

7.8.7.1.1 DOCUMENTATION

See *ASCL-DOC-01 Quality Manual.*

7.8.7.2 REPORTS

See *ASCL Quality Manual* (ASCL-DOC-01) for minimum requirements of information to be contained on the laboratory report.

ADDITIONAL REQUIREMENTS

The following information should be addressed in all Latent Print Section Reports:

- Latent prints present or developed on evidence should be specifically identified and reported as to what type and how many of each type were found on each Item.
- If needed, Latent Print Examiners should request appropriate additional record (e.g., finger, palm, finger and palm) prints in the ASCL laboratory report.
- Latent print examinations and comparisons can be limited in scope from what is specified in the "Analysis Requested" box on the *ASCL Evidence Submission Form* (ASCL-FORM-12) only after coordination with the submitter. If a limited examination/comparison is conducted, the identity of the individual with whom the action was coordinated, the date, and a clear explanation should be given in the *ASCL Agency Contact Form* (ASCL-FORM-06), the ADAMS Telephone Conversation Log or documented email and included in the case file. The explanation should be referenced on the laboratory report as well.
- All examination results shall be reported. When comparative Latent Print examinations result in an association or exclusion or inconclusive result, the report shall clearly communicate the result.
- Exclusions
  - When comparative examinations result in the exclusion of an individual or object, the report shall clearly communicate the exclusion. Please see Suggested Reporting Format in the relevant Additional Statements in this section for reporting suggestions.
- Inconclusive Results
  - When results are inconclusive, the reason shall be clearly documented in the examination record. *Latent Print Worksheet (Lifts/Images)* (LP-FORM-19) has a checklist for reasoning, as well as a "Notes" section where this reason shall be documented. If the examination

record is generated with the ADAMS ACE-V Documentation Module, the reason shall be documented within the module and resulting records. *Latent Print Worksheet* (LP-FORM-19).

- Opinions and Interpretations
  - The following statement (or equivalent) will appear on all laboratory reports: "The following represents the interpretations/opinions of the undersigned analyst."

ADDITIONAL STATEMENTS

In an effort to standardize report writing in the Latent Print Section the following suggested phrasing is provided. It is recognized that these phrases will not fit every reporting situation; exceptions are permissible. Examiners are encouraged to use this standardization in their notes and reports, but it is also recognized that some discretion is allowed for the variances of case circumstances.

7.8.7.2.1 REPORT DISTRIBUTION

See *ASCL-DOC-01 Quality Manual.*

7.8.7.2.2 REPORTING PROCEDURE

See *ASCL-DOC-01 Quality Manual.*

7.8.7.2.3 CALIBRATION

The ASCL does not perform calibration or issue calibration reports.

7.8.7.3 SIMPLIFIED REPORTING

The ASCL, in agreement with its customers, reports in a simplified way. This agreement is documented on the submission form by the customer's signature.

7.8.7.3.1 REPORT ELEMENTS

A list of the specific report elements included and excluded on reports is available to the customer on the ASCL website. A link to where this list is located on the website is included on the *Evidence Submission Form* (ASCL-FORM-12_WD or ASCL-FORM-63). All elements are documented (when applicable) and available upon customer request.

7.8.8 COMMON REQUIREMENTS FOR REPORTS

7.8.8.1 REPORT ELEMENTS

See *ASCL-DOC-01 Quality Manual.*

7.8.8.2 RESPONSIBILITIES

See *ASCL-DOC-01 Quality Manual.*

7.8.9 SPECIFIC REQUIREMENTS FOR TEST REPORTS

See *ASCL-DOC-01 Quality Manual.*

7.8.9.1 ADDITIONAL STATEMENTS

See *ASCL-DOC-01 Quality Manual.*

7.8.9.1.1 STATUTORY REPORTING REQUIREMENTS

See *ASCL-DOC-01 Quality Manual.*

7.8.9.2 REPORTING SAMPLING

See *ASCL-DOC-01 Quality Manual.*

7.8.10 SPECIFIC REQUIREMENTS FOR CALIBRATION CERTIFICATES

See *ASCL-DOC-01 Quality Manual.*

7.8.11 REPORTING SAMPLING–SPECIFIC REQUIREMENTS

See *ASCL-DOC-01 Quality Manual.*

7.8.12 REPORTING STATEMENTS OF CONFORMITY

See *ASCL-DOC-01 Quality Manual.*

7.8.13 REPORTING OPINIONS AND INTERPRETATIONS

See *ASCL-DOC-01 Quality Manual.*

7.8.13.1 AUTHORIZATION

See *ASCL-DOC-01 Quality Manual.*

7.8.13.2 SCOPE OF OPINIONS/INTERPRETATIONS

LATENT FINGER/PALM PRINTS EXAMINATION RESULTS

Latent print comparison results NEVER include qualified conclusions. There are only three possible latent print examination conclusions which will be used in reports generated by the ASCL Latent Print Section. The conclusions of identification and exclusion will be documented in notes and in

reports; however, the determining factors need not be included in reports. Reasons for reaching inconclusive conclusions must be documented in notes and included in reports.

Unknown ridge detail should be referred to as "latent prints" in the case report. They may be referred to as latent fingerprints, latent palm prints, latent impressions, patent impressions, plastic impressions, etc., if the terminology clarifies a portion of the case report.

Suitable ridge detail that is not compared or analyzed must be indicated in the case report.

Latent print lifts created by the Latent Print Section must be returned to the submitting agency and indicated in the case report.

7.8.13.2.1 IDENTIFICATION

Identification is the decision by a Latent Print Examiner that there are sufficient features in agreement to conclude that two areas of friction ridge impressions originated from the same source.

Suggested Reporting Format:

- One latent print exhibiting sufficient unique characteristics to allow an identification to its source was observed on the evidence labeled E2.
  OR:
- The Item(s) 5A and 5C latent prints was/were searched in the AFIS with the following results:
- (Name) has been identified as the source of the latent finger/palm print labeled 5A.
  The previously submitted evidence items 5A and 5B were compared with the fingerprint record for (Name and SID#/FBI#) with the following results: (Name) has been identified as the source of the latent print labeled 5A.
- ME/LP request: The post-mortem inked print labeled PM1 has been identified as XXXXXX.
- ME/LP request: The imaged friction ridge skin labeled PM1 has been identified as XXXXXX.

7.8.13.3 EXCLUSION

Exclusion is the decision by the Latent Print Examiner that there are sufficient features (class and/or individual characteristics) in disagreement to conclude that two areas of friction ridge impressions did not originate from the same source. Source refers to the area of friction skin. Exclusion of a subject can only be reached if all relevant comparable anatomical areas are represented and legible in the known exemplars. Notes and reports shall clearly state if the exclusion refers only to the source or the subject.

Suggested Reporting Format:

- The latent fingerprint observed on the evidence labeled 3A exhibits reliable class characteristics to allow a comparison for possible exclusionary purposes.
- (Name and SID#) has been excluded as the source of the latent print labeled 3A.

7.8.13.4 INCONCLUSIVE

An inconclusive conclusion can occur when a Latent Print Examiner is unable to identify or exclude due to an absence of complete and legible known prints (e.g., poor quality fingerprints and lack of comparable areas). In such an instance, the inconclusive conclusion means that the impression needs to be reexamined and compared using clearly and completely recorded known impressions.

Inconclusive also encompasses those situations when the questioned impression(s) may be suitable for identification but the conclusion to either identify or exclude cannot be made (e.g., unable to determine friction ridge orientation).

Inconclusive conclusion can also result when corresponding features are observed but not sufficient to identify, or in the same instance dissimilar features may be observed but not sufficient to exclude (unable to explain whether a specific ridge event [or sequence of events] constitutes a discrepancy or dissimilarity). The inconclusive conclusion here means that the unknown impression was neither identified nor excluded as originating from the same source.

Suggested Reporting Format:

The latent print labeled 5A was directly compared with the fingerprint record for (Name) with the following conclusion: (Name) cannot be identified or excluded as the source of the latent print labeled 5A.

- The complete and clearly recorded fingerprints and/or palm prints, including the (anatomical location) and/or the Arkansas State Identification Number of any suspected source of the 5A latent print should be submitted under this laboratory case number if any additional analysis is required.
- The fingerprint record for (Name and SID#)is insufficiently recorded to allow a complete comparison to the latent prints labeled 3A and 3B.

7.8.13.5 PROCESSING AND EXAMINATION

This section details the processing examinations (e.g., visual, chemical and/or physical) and results for each item. The results shall include the number of latent prints recovered from each item. Every latent captured for analysis shall be designated a number regardless if it is of value for identification.

The below statements can be used for an item that was physically and/or chemically processed:

- The evidence labeled E1 was examined and processed with no ridge detail developed.
- The evidence labeled E1 was examined and processed for latent prints with no latent prints exhibiting sufficient characteristics to allow for comparison.

The evidence labeled E1 does not exhibit sufficient unique characteristics and are of no value for comparison. The below can be used for an item that was determined not to be suitable for processing:
Item 1 was visually examined and determined not to be conducive to latent print processing and/or retention. The below can be used when ridge detail is captured. The number of latent prints captured shall be documented for each item processed:

- One latent print was lifted.
- Two latent prints were digitally captured.
- Five latent prints were lifted and/or digitally captured.

7.8.14 LATENT-TO-LATENT COMPARISONS OF FRICTION RIDGE SKIN

Latent-to-latent comparisons of friction ridge skin impressions are not conducted on a routine basis and any request for latent-to-latent comparisons must be coordinated with and approved by the Latent Print Section Chief.

- If approved to conduct a latent-to-latent comparison, only positive conclusions are reportable. AFIS should be used in these types of examinations to assist with large volume searches.
- No conclusions will be reached and reported regarding any negative findings.
- Latent prints unsuitable for identification will not be compared with other latent prints.
- Examples of conclusions rendered in latent-to-latent comparisons are as follows:
  - The latent prints in this case are not suitable for latent-to-latent comparisons.
  - The latent fingerprints on Item(s) 1A and 1B were made by the same source.
  - The latent print on Item 1A in this case was identified as having been made by the same source as the latent print on Item 2C in case number _____ during an AFIS search, but the source was not identified.
  - No conclusion can be made regarding the remaining latent prints on Item(s) 1A through 1C in this case as they are not suitable for a latent-to-latent comparison.

7.8.14.1.1.1 DIALOGUE

7.8.15 AMENDMENTS TO REPORTS

7.8.15.1 IDENTIFYING THE CHANGE(S)

An amended report is necessary if an error is found on the original report (including reports uploaded to iResults). An “amended request” will be created in the LIMS and all administrative and examination records for the amended analysis will be added to the electronic case record. Administrative and technical reviews are required before an amended report is issued. When an amended report is necessitated by a change in analytical results, then the Section Chief or Section

Quality Manager will perform the technical review on the amended request. Documentation of this review will be incorporated into the original case file.

When an amended report is issued, any change of information will be clearly identified. Where appropriate, the reason for the change will be included in the report.

7.8.15.2 STYLE OF AMENDMENT

Any amendments to an issued report are made by issuing a complete new report.

7.8.15.3 IDENTIFYING THE AMENDED REPORT

The statement "*AMENDED REPORT TO ORIGINAL* [*TYPE*] *REPORT ON* [*DATE*]" (or equivalent) will appear below the header information and above the listing of the evidence and the results[3]. The amended report will contain all of the items on the original report and any amendments.

The original report will be removed from iResults by an iResults Administrator and replaced with a placeholder document. The original report must be stored in the JusticeTrax case record.

All original records will remain in the case record.

7.9 COMPLAINTS

7.9.1 GENERAL

EXTERNAL COMPLAINTS

Any staff member receiving a complaint should notify their supervisor. The complaint shall be documented and given to the supervisor. The supervisor shall forward the complaint to the Assistant Director who will investigate the situation and notify top management, when necessary.

When the concern takes on the nature of a complaint about the laboratory's activities or deficiencies in the quality system, the supervisor will investigate the situation and forward all the information to the QA Manager.

See *ASCL Quality Manual* (ASCL-DOC-01).

7.9.2 TRANSPARENCY OF PROCESS

See *ASCL Quality Manual* (ASCL-DOC-01).

7.9.3 COMPLAINT PROCESS

See *ASCL Quality Manual* (ASCL-DOC-01).

[3] The date of the original report must be entered in the "additional data" tab of the amended request.

7.9.4 RESPONSIBILTY

See *ASCL Quality Manual* (ASCL-DOC-01).

7.9.5 COMMUNICATION

See *ASCL Quality Manual* (ASCL-DOC-01).

7.9.6 INDEPENDENT EVALUATION

See *ASCL Quality Manual* (ASCL-DOC-01).

7.9.7 NOTICE OF COMPLETION

See *ASCL Quality Manual* (ASCL-DOC-01).

7.10 NONCONFORMING WORK

7.10.1 GENERAL

All employees and supervisory personnel must be vigilant for any indication of nonconforming tests and work.

For Level 1 and Level 2 Non-Conformities, the Latent Print Section Chief and lab-wide QA Manager will be notified immediately for consultation and to evaluate the significance of the nonconforming testing or work. A Corrective Action Request workflow in Qualtrax will be initiated.

Refer to ASCL-DOC-01 for definitions and levels of non-conforming work.

7.10.1.1 SIMPLE CORRECTION

See *ASCL Quality Manual* (ASCL-DOC-01).

7.10.1.2 LEVEL 2 NONCONFORMITY

See *ASCL Quality Manual* (ASCL-DOC-01).

7.10.1.3 LEVEL 1 NONCONFORMITY

See *ASCL Quality Manual* (ASCL-DOC-01).

7.10.2 RECORDS OF NONCONFORMING WORK

See *ASCL Quality Manual* (ASCL-DOC-01).

7.10.3 CORRECTIVE ACTION IMPLENTATION

See *ASCL Quality Manual* (ASCL-DOC-01).

7.10.4 CONTROL OF DATA and INFORMATION MANAGEMENT

7.10.5 ACCESS TO INFORMATION

See *ASCL Quality Manual* (ASCL-DOC-01).

7.10.6 LIMS VALIDATION

See *ASCL Quality Manual* (ASCL-DOC-01).

7.10.6.1 LABORATORY-DEVELOPED SOFTWARE

7.10.7 LIMS REQUIREMENTS

See *ASCL Quality Manual* (ASCL-DOC-01).

7.10.8 OFF-SITE LIMS

See *ASCL Quality Manual* (ASCL-DOC-01).

7.10.9 LIMS DOCUMENTATION

See *ASCL Quality Manual* (ASCL-DOC-01).

7.10.10 CALCULATIONS AND DATA TRANSFERS

See *ASCL Quality Manual* (ASCL-DOC-01).

7.10.10.1 CALCULATION AND DATA TRANSFER RECORDS

See *ASCL Quality Manual* (ASCL-DOC-01).

8 MANAGEMENT SYSTEM REQUIREMENTS

8.1 OPTIONS

8.1.1 GENERAL

See *ASCL Quality Manual* (ASCL-DOC-01).

8.1.2 OPTION A

See *ASCL Quality Manual* (ASCL-DOC-01).

8.1.3 OPTION B

See *ASCL Quality Manual* (ASCL-DOC-01).

8.2 MANAGEMENT SYSTEM DOCUMENTATION (OPTION A)

8.2.1 POLICIES AND OBJECTIVES

See *ASCL Quality Manual* (ASCL-DOC-01).

8.2.1.1 REQUIREMENT FOR WRITTEN EVIDENCE

See *ASCL Quality Manual* (ASCL-DOC-01).

8.2.2 MISSION AND QUALITY POLICY STATEMENTS

See *ASCL Quality Manual* (ASCL-DOC-01).

LATENT PRINTS/AFIS

Develop latent fingerprints using a full range of physical, chemical, and alternative light source methods and compare to prints of subjects in order to identify or eliminate. Utilize the computer-based Automated Fingerprint Identification System (AFIS) for searching, matching and storing fingerprints and related data.

8.2.3 COMMITMENT TO MANAGEMENT SYSTEM

See *ASCL Quality Manual* (ASCL-DOC-01).

8.2.4 DOCUMENTATION

See *ASCL Quality Manual* (ASCL-DOC-01).

8.2.5 ACCESSIBILITY

See *ASCL Quality Manual* (ASCL-DOC-01).

8.3 CONTROL OF MANAGEMENT SYSTEM DOCUMENTS (OPTION A)

8.3.1 CONTROLLED DOCUMENTS

See *ASCL Quality Manual* (ASCL-DOC-01).

CONTROLLED DOCUMENT PREPARATION

Internally generated documents should be prepared by personnel with adequate expertise in the subject.

8.3.2 CONTROLLED DOCUMENT POLICIES AND PROCEDURES

8.3.2.1 DOCUMENT APPROVAL

CONTROLLED DOCUMENT REVIEW AND APPROVAL

The Latent Print Quality Manual must be reviewed and approved by the Chief Latent Print Examiner, lab-wide QA Manager, Assistant Director and Executive Director.

All other discipline specific documents will be reviewed and approved by the Chief Latent Print Examiner and the lab-wide QA Manager.

Individuals may print hardcopies of internal documents as needed for personal use; however, these copies are unofficial. Official documents will be maintained on Qualtrax.

See *ASCL-DOC-01 Quality Manual.*

8.3.2.2 DOCUMENT REVIEW

See *ASCL-DOC-01 Quality Manual.*

8.3.2.3 DOCUMENT REVISION

See *ASCL-DOC-01 Quality Manual.*

8.3.2.4 DOCUMENT AVAILABILITY

See *ASCL-DOC-01 Quality Manual.*

8.3.2.5 DOCUMENT IDENTIFICATION

See *ASCL-DOC-01 Quality Manual.*

8.3.2.6 DOCUMENT OBOLESCENCE

See *ASCL-DOC-01 Quality Manual.*

8.4 CONTROL OF RECORDS (OPTION A)

8.4.1 RECORDS

Examination records are any records generated by the analyst/examiner for a case file (e.g., notes, worksheets, photographs, spectra, printouts, charts and other data). Examination records that are essential for the evaluation and interpretation of the data must be stored in the appropriate folder within the 'Request' folder in the LIMS case file. The unique Arkansas State Crime Laboratory (ASCL) case number (YYYY-000000) (handwritten or electronically generated) and the analyst's handwritten initials or secure electronic equivalent of initials or signature must be on all examination records in the case file.

When it is not feasible to incorporate the original examination records (e.g., digital, scanned, and/or processed images) in the LIMS case file, these records may be stored external to the LIMS case file in archived Morehits®/Foray® image files or the Foray® Digital Workplace imaging system, hereinafter referred to as Foray. The location of these records will be specified in the case file.

Latent print images captured in Foray™ More Hits prior to 2008 will be archived on suitable media and located in the Latent Print Section Current Foray ™ images will be backed up and archived on suitable recording media and maintained off site on a weekly basis. Original images are secured by Foray™ and will remain unchanged.

All other records contained in the case file will be considered administrative records and will be stored in the 'Case Images' folder in the LIMS case file. The unique Arkansas State Crime Laboratory (ASCL) case number (YYYY-000000) (handwritten or electronically generated) must be on all administrative records in the case file.

Each case record will contain enough information to identify factors to enable re-analysis to be conducted under conditions as close to the original as possible. The identity of the individuals who sampled evidence, conducted testing, and/or verified results will be reflected in the case record.

When the analyst/examiner has completed the request, they will set the milestone(s) in JusticeTrax to 'draft complete.' Examination records for a request will be considered "completed" once the request has been 'draft completed' in JusticeTrax. If a change to the examination record is made after this milestone, the original record will remain in the electronic case file and the changed record will be stored with a different name (e.g., amended notes).

8.4.2 RECORD POLICIES AND PROCEDURES

8.4.2.1 RECORD RETENTION

See *ASCL-DOC-01 Quality Manual.*

Historical non-electronic case files for the Latent Print section are stored in the file rooms located in the annex, or off-site storage. The electronic case files are located in the LIMS.

8.4.2.2 CONFIDENTIALITY

See *ASCL-DOC-01 Quality Manual.*

8.5 ACTIONS TO ADDRESS RISKS AND OPPORTUNITIES (OPTION A)

8.5.1 RISKS AND OPPORTUNITIES (OPTION A)

See *ASCL-DOC-01 Quality Manual.*

8.5.1.1 HEALTH AND SAFETY

See *ASCL-DOC-01 Quality Manual.*

8.5.2 PLANNING

See *ASCL-DOC-01 Quality Manual.*

8.5.3 PROPORTIONALITY

See *ASCL-DOC-01 Quality Manual.*

8.6 IMPROVEMENT (OPTION A)

8.6.1 IMPROVEMENT

See *ASCL-DOC-01 Quality Manual.*

8.6.2 EXTERNAL FEEDBACK

See *ASCL-DOC-01 Quality Manual.*

8.7 CORRECTIVE ACTIONS (OPTION A)

8.7.1 NONCONFORMITIES

See *ASCL-DOC-01 Quality Manual.*

8.7.2 PROPORTIONALITY

See *ASCL-DOC-01 Quality Manual.*

8.7.3 RECORDS

See *ASCL-DOC-01 Quality Manual.*

8.8 INTERNAL AUDITS (OPTION A)

8.8.1 INTERNAL AUDITS

See *ASCL-DOC-01 Quality Manual.*

8.8.1.1 SCHEDULE

See *ASCL-DOC-01 Quality Manual.*

8.8.2 AUDIT POLICIES AND PROCEDURES

See *ASCL-DOC-01 Quality Manual.*

8.9 MANAGEMENT REVIEWS (OPTION A)

8.9.1 MANAGEMENT REVIEW

See *ASCL-DOC-01 Quality Manual.*

8.9.1.1 TIMEFRAME

See *ASCL-DOC-01 Quality Manual.*

8.9.2 INPUTS

See *ASCL-DOC-01 Quality Manual.*

8.9.3 OUTPUTS

See *ASCL-DOC-01 Quality Manual.*

9 TEST METHODS

9.1 GENERAL

9.1.1 Inherent Luminescence

9.1.1.1 Introduction

The use of alternate light sources in conjunction with various chemical techniques and dyes has proven very effective in visualizing latent impressions. Substances found in latent print residue may luminesce when illuminated by the proper wavelength of light and viewed with the appropriate filters. B-vitamin complexes, that are a natural component of perspiration, may be the cause of this reaction. Various contaminants such as cosmetics may become part of latent print residue and may inherently luminesce as well. Additionally certain materials such as styrofoam and galvanized or zinc plated metal are observed to consistently produce impressions that will luminesce without the application of chemical processing or dyes. This inherent luminescence allows for examination of items that may be destroyed by other techniques.

Proper safety precautions including avoiding skin exposure and proper eye protection with appropriate optical densities should be utilized when operating ultraviolet light sources, or alternate light sources. Consult the appropriate user's manuals for the safe use and appropriate eye protection for the specific piece of equipment being utilized.

9.1.1.2 PREPARATIONS

No specific preparations required.

9.1.1.3 INSTRUMENTATION

Alternate Light Source

9.1.1.4 MINIMUM STANDARDS AND CONTROLS

9.1.1.5 THE ALTERNATE LIGHT SOURCE IS CHECKED TO ENSURE THAT IT IS IN GOOD WORKING ORDER BY POWERING IT ON. Procedure or Analysis

The procedure for this technique consists of examining the item with the alternate light sources using appropriate filtration. Common wavelengths used are 450 nm, 485 nm and 530 nm. In most cases an orange barrier filter is appropriate for examination. Some success may be seen with the

use of ultraviolet light sources and the various wavelengths produced by alternate light sources. The examiner must choose the appropriate filters and eye protection for these light sources and the wavelengths selected.

9.1.1.6 INTERPRETATION OF RESULTS

Items can be examined for inherent luminescence without destruction of the item. Photographic preservation of developed impressions which may be of value for identification is essential and must be accomplished as soon as possible. In addition many surfaces should be routinely examined using this technique as it has been shown to produce consistent results. The item being examined may luminesce and this background luminescence may improve the contrast of visible impressions much as the use of metal salt post treatment of ninhydrin developed impressions. This non-destructive process is a relatively simple technique that has been proven to be very successful in producing positive results.

9.1.2 NINHYDRIN–POROUS ITEMS

9.1.2.1 INTRODUCTION

Ninhydrin, or triketo-hydrindene hydrate, is an extremely sensitive indicator of alpha-amino acids, proteins, peptides and polypeptides. The reaction produces a violet to blue-violet coloring of these substances and is effective even with older deposits and/or minute amounts of amino acids. While ninhydrin can be used on any surface, processing normally is confined to porous items which are not water-soaked and do not contain inherent animal proteins.

9.1.2.2 PREPARATIONS

Ninhydrin is readily soluble in most organic solvents. Working solutions of ninhydrin are governed by the nature of the solvent and the strength of the solution. Concentrations of the ninhydrin solution may vary according to application, but generally a 0.5% to 1.0% weight to volume mixture produces the best results. A 0.5% concentration is recommended for routine porous item processing. Ethanol, methanol, petroleum ether, and acetone have high damage potential but are acceptable for non-document porous material. Any of the listed solvents may be used at the examiner's discretion. Commercially prepared ninhydrin may be used, no specific preparation is needed.

Recommended Preparation: 0.5% concentration

9.1.2.2.1 PETROLEUM ETHER

CHEMICALS REQUIRED:

- 10 grams Ninhydrin
- 60 mL Methanol

- 80 mL 2-Propanol (Isopropyl Alcohol)
- 1860 mL Petroleum Ether (Fill measured beaker to the 2000 mL Level)

DIRECTIONS:

1) Dissolve Ninhydrin crystals in Methanol.
2) Add 2-Propanol to Ninhydrin/Methanol solution and stir.
3) Add Ninhydrin, Methanol, 2-Propanol solution to Petroleum Ether and stir.

9.1.2.2.2 ACETONE

CHEMICALS REQUIRED

- 25 grams Ninhydrin
- 4 liters of Acetone

DIRECTIONS

1) Dissolve Ninhydrin crystals in Acetone.

9.1.2.2.3 STOCK SOLUTION

CHEMICALS REQUIRED

- 25 grams Ninhydrin
- 300 mL Ethyl alcohol (use Absolute Ethanol , DO NOT use Denatured Ethanol)

DIRECTIONS

1) Dissolve Ninhydrin crystals in Ethyl alcohol.

9.1.2.3 INSTRUMENTATION

A humidity chamber or a steam iron may be used to control the heat and relative humidity to accelerate the development of latent prints after processing.

9.1.2.4 MINIMUM STANDARDS AND CONTROLS

Process a test strip. If the test strip turns purple the working solution can be used to process evidence. This testing procedure must be performed for each working solution at the time the solution is made. Documentation of this process must be done in the form of a reagent log to include a lot number. If additional batches are made on the same day, add an alpha character to the lot number (#####a, b, c, etc.). The lot number must be placed on the original/working container. Documentation of this process must be included in the reagent logbook by placing the date and initials of the preparer adjacent to the quantity made and by recording the lot number. The LP verifying analyst must initial by the preparer's documentation, indicating a positive reaction with a test material. This test shall also be performed for each day that the reagent is needed. Documentation of this process will be entered in the Daily Reagent Verification Logbook by the LP

analyst initialing adjacent to the test date and by recording the batch number. Reagent shall be stored in a dark bottle and have a shelf life not exceeding one year.

9.1.2.5 PROCEDURE OR ANALYSIS

All applications should be done in a fume hood.

DIPPING

1) Completely immerse each item to be processed in the working solution until the item is completely saturated, usually five seconds or less. The item can be manipulated using tongs or forceps.
2) Remove and allow the item to dry completely.
3) Place the item in the heat/humidity chamber at no greater than 80 degrees Celsius/176 degrees Fahrenheit and between 60% and 80% relative humidity; or the item may be steam ironed. A certified hygro-thermometer must be utilized to monitor the heat/humidity levels in the chamber.
4) Check the item periodically to monitor the impression development. Care should be taken not to saturate the item with water vapor.

BRUSHING AND SPRAYING

Larger items which will not fit conveniently into processing trays can be saturated with the Ninhydrin solution using a soft bristle paint brush. The items may also be processed by spraying. Spray the item until saturated and air dry; then follow the instructions detailed in the dipping procedure post drying.

9.1.2.6 INTERPRETATION OF RESULTS

Ninhydrin coloration is not permanent, and while some impressions have remained visible for years, others have faded in a matter of days. Photographic preservation of developed impressions which may be of value for identification is essential and must be accomplished as soon as possible.

9.1.2.7 REFERENCES

Cowger, James F. Friction Ridge Skin Comparison and Identification of Fingerprints; Boca Raton: CRC Press, 1993.

Lee, Henry C.; Gaensslen, R. E., eds. Advances in Fingerprint Technology; CRC Press LLC, Boca Raton, FL, 1994.

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, pp 197-210.

Olson, Robert. Scott’s Fingerprint Mechanics; Charles C. Thomas Publisher; Springfield, IL, 1978.

Lee, Henry C. and R.E. Gaensslen., eds. Advances in Fingerprint Technology. Boca Raton: CRC Press, 2001.

Hewlett, D. F.; Sears, V. G. “Replacement for CFC113 in Ninhydrin Process”, Journal of Forensic Identification, 47(3), 1997, p287.

Watling, W. J. and Smith, K. O., “Heptane, an Alternative to the Freon Ninhydrin Mixture,” J. Forensic Identification, 43(2) 1993, p. 131.

Wertheim, Pat A. “Ninhydrin: Basic to Advanced,” Forensic Identification Training Seminars, Ltd., Iowa Division for International Association for Identification, 2008; http://www.iowaiai.org/ninhydrin_basic_to_advanced.html

FBI Processing Guide for Developing Latent Print, 2000; http://onin.com/fp/fbi_2000_lp_guide.pdf

9.1.3 Powders

9.1.3.1 INTRODUCTION

Fingerprint powders are very fine particles with an affinity for moisture throughout a wide range of viscosity. Palmar sweat, grease, oil, and most contaminants that coat the surface of friction ridge skin possess sufficient moisture and viscosity to attract and bind the fine particles together. Contact between friction ridge skin and a non-porous surface will sometimes result in a transfer of the skin coating to that surface. The non-absorbency of the surface prevents penetration by the deposited moisture. All fingerprint powders are indiscriminate in adhesion to moisture. Surfaces coated with residue in addition to suspected latent prints will attract powders all over the surface

Dependent upon the composition of the residue, the deposited moisture will range from a most apparent appearance to the barely perceptible or invisible, even under oblique lighting. Powder application is the effort to produce or improve the appearance for preservation.

The most effective agent in terms of adherence to moisture, non-adherence to dry surfaces, particle size, shape, uniformity, and intensity of color is carbon. Carbon is black, and as a result, black powders which contain carbon will consistently produce the best results. Most commercial black fingerprint powders have a high carbon base. According to the manufacturer's particular formula and production methods, the carbon base may be from a variety of sources, including lamp black, bone, or wood charcoal. Commercial powders contain milled carbon of highly uniform size and shape along with additional ingredients to preserve the milled condition and retard moisture absorption. Other colored powders may be required due to the substrate encountered, but should be restricted to absolute necessity.

Magnetic powders are powder-coated, fine iron filings subject to magnetic attraction. These adhere to moisture to a lesser degree than carbon powders, but can be applied with less destructive force to the surface.

Redwop fluorescent powders have a lycopodium base and were developed specifically to be luminescent-excited by light sources emitting blue-green light. Redwop fluorescent powder is recommended as a primary use fluorescent powder for examination of latent prints with forensic light sources and ultraviolet light sources.

9.1.3.2 PREPARATIONS

No specific preparations are needed as the powders and materials being used are commercially prepared.

9.1.3.3 INSTRUMENTATION

No specific instrumentation is involved in powder processing.

9.1.3.4 Minimum Standards and Controls

The Standards and Controls for the Powders consist of insuring that the powders being used are in the proper condition. Powders should not be exposed to high humidity or moisture. Powders may clump if exposed to excessive moisture or contaminants. Moisture content and contaminants may be minimized by keeping the stock container closed as much as possible and using containers with small amounts of powder. This will minimize the moisture content as well as reduce any contamination of the stock container with substances from the item being processed. The date the container is opened is to be used as the batch number, established by month/day/year (060404). If additional containers are opened on the same day, add an alpha character to the batch number (060404a, b, c, etc.). The batch number shall be placed on the original and working container and in the examiner's notes. Shelf life is indeterminable; however, if clumping of the powder is observed, it shall be discarded.

9.1.3.5 PROCEDURE OR ANALYSIS

STANDARD POWDERS

Powders may be applied by various means, but the preferred procedure for most items is the use of a brush. Fiberglass brushes are the easiest to use and maintain while permitting application over a wider area. Powders are more effective if applied in very small amounts. While some examiners prefer pouring a supply of powder into a secondary container or a piece of paper, direct contact between brush and powder container is acceptable. Only the ends of the brush bristles should be coated with the powder, and the brush should be gently tapped several times to remove all but a minimum amount.

With the brush handle in a nearly perpendicular position to the surface, the bristle ends are lightly and delicately moved over the surface. Discoloration of the latent print residue will usually appear immediately. With a fiberglass brush and a proper amount of powder, the impression will develop in density with each light pass until no further development can be observed. Even slightly excessive amounts of powder will cause a fill to occur between ridges. This fill must be removed

with continued brush strokes until the impression is as free of extraneous powder as possible. Except on highly polished surfaces, excessive brushing is rare with a fiberglass brush. However, at the first indication that the impression is being removed, all further brushing must cease.

Extraneous residue on the surface may cause a general painting effect which obscures friction ridge detail. A lift made of the area can sometimes remove the extraneous material and permit a second application of powder. This second application may offer better contrast between latent print deposit and the background.

MAGNETIC POWDERS

Magnetic powder must be applied with a magnetic application device. Wands which contain a movable magnet attract the powder when the magnet is depressed and release the powder when it is raised. Contact between powder and surface is completed without bristles and is more light and delicate than the fiberglass brush. However, the particle size, larger than standard powder, has a tendency to paint some surfaces. Excessive powder can sometimes be removed by passing the magnetic wand without powder near the surface. Since the magnetic attraction holding the iron particles is relatively weak, the supply can be depleted quickly. Surface areas examined generally must be processed more slowly with magnetic powders, and great care must be exercised to prevent actual contact between the end of the wand and the surface.

REDWOP POWDER

Redwop powders are applied in the same manner as standard powders. It is not recommended to make a lift of the latent print but view with a light source. If lifting is desired, process with black powder and then lift.

9.1.3.6 INTERPRETATION OF RESULTS

Powder developed latent impressions which may be of value for identification must be properly preserved. Experiments have revealed that the developed latent impressions have a weaker adhesion to the surface than undeveloped, and, as a result, are more susceptible to damage from accidental contact. Two methods of preservation are normally afforded the powder developed latent: photography and lifting.

Photographic preservation of developed impressions which may be of value for identification is essential and must be accomplished as soon as possible. Lifting is also an approved procedure but caution should be taken when lifting to insure that the lift cannot be made with confidence that it will be successful, the developed fiction ridge detail should be photographed prior to lifting.

9.1.3.7 REFERENCES

Cowger, James F. Friction Ridge Skin Comparison and Identification of Fingerprints; Boca Raton: CRC Press, 1993.

Lee, Henry C.; Gaensslen, R. E., eds. Advances in Fingerprint Technology; CRC Press LLC, Boca Raton, FL, 1994.

Olson, Robert. Scott's Fingerprint Mechanics; Charles C. Thomas Publisher: Springfield, IL, 1978.

Waldoch, Terry L. "The Flame Method of Soot Deposition for the Development of Latent Prints on Non-porous Surfaces"; Journal of Forensic Identification, 1993, 43, 5, 463-465.

9.1.4 CYANOACRYLATE ESTER FUMING

9.1.4.1 INTRODUCTION

Cyanoacrylate esters are the active ingredients in the super bond adhesives and are generally available according to the type of alcohols used in manufacturing. Most cyanoacrylates are methyl or ethyl esters. Regardless of type, the esters volatilize into long chain molecules with a positive electrical charge. In an atmosphere of relatively high humidity, the cyanoacrylate ester molecules are attracted to fingerprint residue and polymerize upon the deposit.

Properties of the polymer are dependent upon the type of cyanoacrylate ester used. Both ethyl and methyl esters produce a visible white coating. Ethyl ester polymers are softer and less durable while methyl ester polymers can usually only be removed with solvents. However, the durable, hard property of the methyl ester appears to inhibit dye applications.

Locktite and other brand name products contain a cyanoacrylate ethyl ester and have proven to be quite effective for fuming. Locktite 495 Super Bonder provides a liquid useful for heat acceleration techniques while Hard Evidence is a gel which reacts to exposure to air. Any product containing ethyl ester generally will be more effective when subsequent laser dye applications are indicated. Cyanoacrylate ester fuming is highly effective with nonporous items made of plastics or metal. It is superior to any other method for the processing of gun metal.

9.1.4.2 PREPARATIONS

No specific preparations are needed as the cyanoacrylate materials being used are commercially prepared.

9.1.4.3 INSTRUMENTATION

Cyanoacrylate Fuming Chambers, Atmospheric and Vacuum

9.1.4.4 MINIMUM STANDARDS AND CONTROLS

The Standards and Controls for cyanoacrylate ester fuming procedure require the use of test impressions. Non-evidentiary items such as aluminum foil, film leaders, glass slides, or pieces of plastic bags are convenient substrates when deliberately deposited with a test impression and placed near the evidence. Processing should be terminated when test impressions have reached

optimum development. However, all items should be watched carefully as faster or slower development may occur. Exposure of surfaces to a high concentration of fumes can result in overdevelopment which obscures impressions due to total surface polymerization. The batch number for cyanoacrylate ester will be established by the date opened, such as (060404). If additional bottles are opened on the same day, add an alpha character to the batch number (060404a, b, c, etc.). The batch number must be placed on the working container. Documentation of this process will be entered in the Daily Reagent Verification Logbook by initialing adjacent to the test date and by recording the batch number. This test shall be performed for each chamber cycle. The shelf life is indeterminable and may be used as long as it remains in a semi-liquid state and has a positive reaction with the test strip.

ATMOSPHERIC CHAMBER

Volatilization of cyanoacrylate ester at normal room temperature is relatively slow but is a viable procedure for evidence processing. Vapors must be contained, and a tank or plastic enclosure is most often used. A ratio of two drops of adhesive for every gallon of capacity or volume with relatively high humidity is usually effective. Polymerization may be retarded or prevented by low humidity. The addition of a cup of lukewarm water usually will improve the fuming results. Development time will vary with the temperature, humidity and the substrate being processed.

Application of heat greatly accelerates volatilization. Metal blocks or a hot plate can serve as the heat source but caution must be used not to over heat to the point where cyanide vapors can be produced. An aluminum dish or shaped foil may be placed on the hot surface and the adhesive poured onto the aluminum. A cup of warm water is placed in the enclosure. Volatilization can be very rapid and development may be accomplished. Care must be taken to closely observe the process to insure that the item is not overdeveloped.

An alternative, which offers rapid development time with minimum health risk, is to use a light bulb as the heat source. A standard light receptacle is added to the processing tank with a wire loop support fashioned to hold a watch glass approximately 1 inch above the light bulb. The adhesive is dropped onto the watch glass. A cup of warm water is placed in the enclosure if additional humidity is needed. Once the container is covered tightly, the light is turned on. Rapid volatilization does not begin until the heat from the bulb penetrates the watch glass. Natural convection currents aid dispersal of the fumes and development is generally accomplished in about 15 minutes.

VACUUM CHAMBER

A vacuum chamber using humidity and cyanoacrylate vapors @37C is a highly sensitive system to develop fingerprints on the inside of polyethylene bags, hand guns, long guns, gas cans, etc. Vacuum chambers are particularly effective on evidence that has a soot or oil film on the surface. Incubating dry fingerprints prior to CA fuming enhances the ridge detail.

9.1.4.5 INTERPRETATION OF RESULTS

Photographic preservation of developed impressions which may be of value for identification is essential and must be accomplished as soon as possible. Once the latent impressions are recorded, further processing sometimes reveals impressions in which polymerization was too indistinct for visual notice or did not occur. Powders and particulate developers are effective and often permit additional photographic and lifting preservation. Small particle reagent will sometimes adhere to faint impressions when powders will not. Laser dye application is generally effective after powder, particulate, or SPR application as the liquid dye solution will normally wash away the particulate remnants. However, vinyl, rubber, oily guns, and hard plastics, especially those used in cash register drawers, may not be receptive to any powder.

9.1.4.6 REFERENCES

Lee, Henry C.; Gaensslen, R. E., eds. Advances in Fingerprint Technology; CRC Press LLC, Boca Raton, FL, 1994.

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.

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9.1.5 DYE STAINS

9.1.5.1 INTRODUCTION

Dye staining was developed as a means of enhancing cyanoacrylate ester polymerized impressions. The dye stain is applied to a non-porous item that has been subjected to cyanoacrylate ester fumes. The dye stain is applied to the object and visually examined utilizing an alternate light source. The application of the dye stain enhances the latent developed with cyanoacrylate ester fumes to allow for visualization and photography. Each dye stain listed below will have different preparation steps and optimum viewing parameters.

9.1.5.1.1 RHODAMINE 6G

Rhodamine 6G fluoresces between 450 nm – 540 nm.

The examiner can choose from two preparations of Rhodamine 6G solutions. The preparation chosen is primarily dependent on the reaction of the substrate to the solvent used. A 0.01% to 0.001% Rhodamine 6G in methanol or isopropanol, weight to volume, is productive for most surfaces with methanol being the preferred solvent. Working solutions of Rhodamine 6G should be prepared in small amounts. Weaker solutions are recommended from the degree of background fluorescence. Aerosol spraying or fuming with Rhodamine 6G has been attempted with no consistent improvement in results, and are not recommended. Aqueous Rhodamine 6G solutions should be used when methanol or other organic solvents will be destructive to the surface being

treated. If distilled water is not available deionized water may be used. The LP Section does not currently employ this aqueous solution in processing procedures, but should be included in this manual should a situation arise when destruction of evidence is a possibility with the Methanol Formula.

METHANOL FORMULA

- 4 grams of Rhodamine 6G
- 4 liters of methanol.

Combine the ingredients and continue to stir the solution until all of the powder is dissolved.

AQUEOUS FORMULA

- 4 grams of Rhodamine 6G
- 4 liter of distilled water.
- 3-6 drops of Synperonic N (optional)
  - Synperonic N is a surfactant which allows for a sheeting effect or more even covering of the item with the working solution.

Combine the ingredients and continue to stir the solution until all of the powder is dissolved.

9.1.5.2 INSTRUMENTATION

- High Intensity Ultra Violet Light Source
- Alternate Light Source

Rhodamine 6G: examine the evidence using 450 nm to 540 nm light and view with orange goggles or red goggles.

Other wavelengths of light and goggle combination may provide better contrast and visualization of the latent print. The examiner should capture the best print possible using the available light source and filters.

Proper safety precautions including avoiding skin exposure and proper eye protection with appropriate optical densities must be utilized when operating ultraviolet light sources, lasers or alternate light sources. Consult the appropriate user's manuals for the safe use and appropriate eye protection for the specific piece of equipment being utilized.

9.1.5.3 MINIMUM STANDARDS AND CONTROLS

Dye stains work by staining latent impressions developed with cyanoacrylate ester. Non-porous, non-evidentiary items are to be used on which a latent test print is deposited. This testing procedure must be performed for each working solution at the time the solution is made. Documentation of this process must be done in the form of a reagent log to include a lot number. If additional batches are made on the same day, add an alpha character to the lot number (#####a, b, c, etc.). The lot number must be placed on the original/working container. Documentation of this

process must be included in the reagent logbook by placing the date and initials of the preparer (chemist) adjacent to the quantity made and by recording the lot number. The LP verifying analyst must initial by the preparer's documentation, indicating a positive reaction with a test material. This test shall also be performed for each day that the reagent is needed. Documentation of this process will be entered in the Daily Reagent Verification Logbook by the LP analyst initialing adjacent to the test date and by recording the batch number.

SHELF LIFE:

Rhodamine 6G stock solution is indefinite, working solution must not exceed six months

9.1.5.4 PROCEDURE OR ANALYSIS

All applications should be done in a fume hood.

RHODAMINE 6G

1) Apply the solution to the item to be processed by immersion or squirt bottle.
2) Rinse the item with methanol and allow to dry.
3) Examine the item with the alternate light source at the appropriate wavelength, 450 nm – 540 nm, using the appropriate filters.

9.1.5.5 INTERPRETATION OF RESULTS

Photographic preservation of developed impressions which may be of value for identification is essential and must be accomplished as soon as possible.

9.1.5.6 REFERENCES

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.

McCarthy, Mary M. "Evaluation of Ardrox as a Luminescent Stain for Cyanoacrylate Processed Latent Impressions"; Journal of Forensic Identification, 1990, 40, 2, 75-80.

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http://www.cbdiai.org/Reagents/by40.html

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Menzel, E. Roland. “A Guide to Laser Latent Fingerprint Development Procedures”; Identification News, September 1983.

9.1.6 BLOOD PROTEIN ENHANCEMENT

9.1.6.1 INTRODUCTION

Enhancement of impressions believed to be deposited in blood can be done through the application of a solution that results in a color change when in contact with alpha amino acids or proteins present in the blood. The suspected blood on the surface of the object should be dry prior to the processing with the selected solution. Application of a blood protein solution may prevent a serological exam of the evidence after staining. The type of surface and order for sequential processing is listed below in the Procedure or Analysis section for each stain.

NOTE: The Latent Print analyst should consult with a serologist or DNA analyst prior to application of a solution if there is reason to believe the reagent process could be detrimental to subsequent DNA testing and results.

9.1.6.2 PREPARATIONS

NINHYDRIN

See Chemical Processing of Porous-Ninhydrin

AMIDO BLACK

CHEMICAL FORMULA

1) Dissolve 1.0 gram of amido black (Naphthol blue black) in 50 milliliters of glacial acetic acid.
2) Add 450 milliliters of methanol and thoroughly mix.

- Rinse Option #1: Mix 50 milliliters of glacial acetic acid with 450 milliliters of methanol
- Rinse Option #2: Mix 50 milliliters of glacial acetic acid with 950 milliliters of distilled or deionized water

9.1.6.3 MINIMUM STANDARDS AND CONTROLS

Make a test impression on a non-porous, non-evidentiary item, by placing a small amount of blood (no human blood) on the item and allowing the blood to dry. Apply the selected solution to the item and if a blue-black stain observed, the solution is working properly. Documentation of this process must be done in the form of a reagent log to include a lot number. If additional batches are made on the same day, add an alpha character to the lot number (#####a, b, c, etc.). The lot number must be placed on the original/working container. Documentation of this process must be included in the reagent logbook by placing the date and initials of the preparer (chemist) adjacent to the quantity made and by recording the lot number. The LP verifying analyst must initial by the preparer’s documentation, indicating a positive reaction with a test material. This test shall also be performed

for each day that the reagent is needed. Documentation of this process will be entered in the Daily Reagent Logbook by the LP analyst initialing adjacent to the test date and by recording the batch number.

SHELF LIFE

- Ninhydrin must not exceed one year.
- Amido Black is indefinite.

9.1.6.4 PROCEDURE OR ANALYSIS

NINHYDRIN

Ninhydrin can be used on any surface but should primarily be used on porous items. Porous items can be processed with ninhydrin visualizing both blood proteins and other alpha amino acids.

See Chemical Processing of Porous-Ninhydrin

AMIDO BLACK

Amido black is a permanent procedure which can be used on porous or non-porous surfaces. Amido black can be applied after cyanoacrylate fuming in many cases (see McCarthy and Grieve, 1989).

All applications should be done in a fume hood.

1) Amido Black solution is applied to the item by immersing the item in the solution in a large tray, ensuring complete coverage of the area to be examined, or by using a squirt bottle.
   a) The solution should be agitated before evidence application as well as during the immersion process.
2) Rinse with the selected solution followed by the second rinse solution of distilled or deionized water until the desired result is observed.

9.1.6.5 INTERPRETATION OF RESULTS

NINHYDRIN

The blood impressions as well as other protein based impressions will be intensified and additional detail not previously visible may be revealed. Coloration is not permanent, and while some impressions have remained visible for years, others have faded in a matter of days. Photographic preservation of developed impressions which may be of value for identification is essential and must be accomplished as soon as possible.

AMIDO BLACK

The blood impressions will be intensified and additional detail not previously visible may be revealed. Photographic preservation of developed impressions which may be of value for identification is essential and must be accomplished as soon as possible. Dried impressions which lose contrast may be re-immersed in the second rinse solution and re-photographed

9.1.6.6 REFERENCES

Cowger, James F. Friction Ridge Skin Comparison and Identification of Fingerprints; Boca Raton: CRC Press, 1993.

Lee, Henry C.; Gaensslen, R. E., eds. Advances in Fingerprint Technology; CRC Press LLC, Boca Raton, FL, 1994.

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.

Olson, Robert. Scott's Fingerprint Mechanics; Charles C. Thomas Publisher: Springfield, IL, 1978.

McCarthy, Mary M.; David L. Grieve. "Preprocessing with Cyanoacrylate Ester Fuming for Fingerprint Impressions in Blood"; Journal of Forensic Identification, 1989, 39, 1, 23-32.

FBI Processing Guide for Developing Latent Print, 2000; http://onin.com/fp/fbi_2000_lp_guide.pdf

Norkus, P.; Kevin Noppinger. "New Reagent for the Enhancement of Blood Prints"; Identification News, 1986, 26, 4, 5 & 15.

9.1.7 GENTIAN VIOLET

9.1.7.1 INTRODUCTION

Gentian violet (crystal violet) is a sensitive stain which reacts with epithelial cells and other portions of latent print residue transferred upon surface contact. The presence of sebum appears to serve as an excellent transfer medium for sloughed epidermal cells and as a result, gentian violet is usually effective on surfaces which readily hold the deposited sebum, such as the adhesive side of tapes. The high sensitivity of gentian violet produces an immediate reaction upon skin contact; therefore, leak proof gloves are required for examinations. Accidental staining of hands is relatively harmless but usually cannot be de-stained. Disappearance of discoloration is a result of cell sloughing.

9.1.7.2 PREPARATIONS

Gentian violet working solution: 0.1% concentration preferred.

Higher concentrations are sometimes used, but increased amounts of gentian violet are difficult to dissolve and can create an increased background discoloration.

If distilled water is not available deionized water may be used.

Dissolve 1.0 grams of gentian violet in one liter of distilled water.

9.1.7.3 MINIMUM STANDARDS & CONTROLS

Dye stains, such as Gentian Violet, work by discoloring latent impressions composed of epithelial cells and sebum. Non-porous, non-evidentiary items (tape) are to be used on which a latent test print is deposited. This testing procedure must be performed for each working solution at the time the solution is made. Documentation of this process must be done in the form of a reagent log to include a lot number. If additional batches are made on the same day, add an alpha character to the lot number (#####a, b, c, etc.). The lot number must be placed on the original/working container. Documentation of this process must be included in the reagent logbook by placing the date and initials of the preparer (chemist) adjacent to the quantity made and by recording the lot number. The LP verifying analyst must initial by the preparer's documentation, indicating a positive reaction with a test material. This test shall also be performed for each day that the reagent is needed. Documentation of this process will be entered in the Daily Reagent Verification Logbook by the LP analyst initialing adjacent to the test date and by recording the batch number. Shelf life is indefinite.

9.1.7.4 PROCEDURE OR ANALYSIS

1) Immerse item to be processed in the working solution in a large tray.
2) Allow the item to remain completely immersed for approximately 30 seconds while agitating.
3) Remove the item from the working solution and rinse excess stain from the item by washing with a gentle flow of cold tap water.
4) This process may be repeated until optimum contrast is reached between the impressions developed and the background.

9.1.7.5 INTERPRETATION OF RESULTS

Photographic preservation of developed impressions which may be of value for identification is essential and must be accomplished as soon as possible. Stained impressions which fade as the tape dries may be improved by immersing the tape in a tray of clear water and photographing the impressions while the tape is submerged.

9.1.7.6 REFERENCES

Arima, T. "Development of Latent Fingerprints on Sticky Surfaces by Dye Staining or Fluorescent Brightening"; Identification News, February 1981.

Cowger, James F. Friction Ridge Skin Comparison and Identification of Fingerprints; Boca Raton: CRC Press, 1993.

9.1.8 STICKY SIDE TAPE POWDER TECHNIQUE

9.1.8.1 INTRODUCTION

The use of powder suspensions to develop impressions on the sticky side of tape has proven to be an effective alternative to the gentian violet technique. The use of powder suspensions to maximize contrast is the preferred technique on dark colored tapes lacking the availability of vacuum metal deposition. The consistent performance of powder suspensions on the adhesive side of tapes may, in the future, relegate the gentian violet technique to a secondary role when processing the adhesive side of tapes.

9.1.8.2 PREPARATION

Combine standard black powder or Redwop fluorescent powder with tap water at a ratio of 1:1.

Add transparent dishwashing liquid (Ivory® works best) to the solution and stir until the mixture is the consistency of a thick paste.

9.1.8.3 MINIMUM STANDARDS AND CONTROLS

Powders work by adhering and causing staining of latent print residue. Non-evidentiary items (tape) are to be used on which a latent test print is deposited. This testing procedure must be performed for each working solution at the time the solution is made. This test shall be performed for each case and documentation of this process shall be included in the examiner's processing notes by indicating a positive reaction to the procedure. Shelf life is not an issue as only amounts needed for the particular evidence are mixed and then discarded.

9.1.8.4 PROCEDURE OR ANALYSIS

1) Immerse item to be processed in the working suspension or paint the mixture on the sticky side of the tape using a soft bristled brush.
2) Allow the suspension to remain on the item for approximately 10 seconds.
3) Remove the item from the suspension and rinse excess suspension from the item by washing with a gentle flow of cold tap water.
4) This process may be repeated until optimum contrast is reached between the impressions developed and the background.

9.1.8.5 INTERPRETATION OF RESULTS

This technique has been shown to be very productive and stable. Photographic preservation of developed impressions which may be of value for identification is essential and must be accomplished as soon as possible.

9.1.8.6 REFERENCES

Gray, M. Leanne. “Sticky-side Powder Versus Gentian Violet: The Search for the Superior Method for Processing the Sticky Side of Adhesive Tape”; Journal of Forensic Identification, 1996, 46, 3, 268-272.

Kimble, Gary W. “Powder Suspension Processing”; Journal of Forensic Identification, 1996, 46, 3, 273- 280.

9.1.9 GUN BLUEING TECHNIQUE WITH CARTRIDGE CASINGS

9.1.9.1 INTRODUCTION

Although many gun blueing formulations exist today, they essentially all work in a similar fashion. In short, blueing involves inducing an artificial rusting process using a specifically prepared oxidizing solution containing primarily seleneous acid and copper sulfate. These two compounds are responsible for the final blue/black color. While the metal is in contact with the solution, copper and selenium are removed from the solution and deposited together on the surface of the metal, most likely as the alloy copper selenide (CuSe). The presence of any fingerprint residue on the metal surface inhibits the deposition of the dark colored alloy. The resulting fingerprint detail appears light against a dark colored metallic background.

9.1.9.2 PREPARATION

Combine Perma Blue® Liquid Gun Blue with tap water at a ratio of 1:1.

9.1.9.3 MINIMUM STANDARDS AND CONTROLS

Non-evidentiary items (cartridge casings) are to be used on which a latent test print is deposited. This testing procedure must be performed for each working solution at the time the solution is made. Documentation of this process must be done in the form of a reagent log to include a lot number. If additional batches are made on the same day, add an alpha character to the lot number (#####a, b, c, etc.). The lot number must be placed on the original/working container. Documentation of this process must be included in the reagent logbook by placing the date and initials of the preparer (LP analyst) adjacent to the quantity made and by recording the lot number. The LP verifying analyst must initial by the preparer’s documentation, indicating a positive reaction with a test material. This test shall also be performed for each day that the reagent is needed. Documentation of this process will be entered in the Daily Reagent Verification Logbook by the LP analyst initialing adjacent to the test date and by recording the batch number. Documentation of this process shall be included in the examiner’s processing notes by indicating a positive reaction to the procedure.

SHELF LIFE

Indefinite

9.1.9.4 PROCEDURE OR ANALYSIS

1) Immerse the body of the casing to be processed in the working solution.
2) Agitate the casing in the solution for approximately 10-15 seconds while monitoring the oxidation process to prevent overdevelopment.
3) Remove the casing from the solution and stop the oxidation process by dipping the treated casing in a beaker of tap water.
4) This process may be repeated until optimum contrast is reached between the impressions developed and the background.

9.1.9.5 INTERPRETATION OF RESULTS

This technique has been shown to be very productive and stable. Photographic preservation of developed impressions which may be of value for identification is essential and must be accomplished as soon as possible.

9.1.9.6 REFERENCES

Leben, D. A. (1997, January-March). Evaluation of Gun Blueing Solutions and Their Ability to Develop Latent Fingerprints on Cartridge Casings. FDIAI NEWS, 10-11.

Also please refer to *ASCL Quality Manual* (ASCL-DOC-01).

9.2 ABBREVIATIONS

Abbreviation	Meaning
#	Number
✓	Check
(s)	Suspect
(v)	Victim
/	And
BB	Brown box
BE	Blue evidence
BP	Black powder
BPS	Brown paper sack
BRO	Brown
C	Cartridge
CA	Cyanoacrylate(superglue)
CC	Cartridge Casing
CD	Compact Disc
Ck(s)	Check or Checks
CL	Clean
COMP	Comparison
CPD	Carpal Delta
ENV	Evidence
EXC	Excessive
FI	Fiber

FPR	Fingerprint Record
FRAG/FRAGS	Fragment/Fragments
GW	Greenwop powder
HG	Handgun
HT	Hypothenar
Insuff	Insufficient
INTERDIG	Interdigital
L	Left
LP	Latent Prints
JT	JusticeTrax-LIMS Plus
LFP	Latent Fingerprint
LG	Long
ME	Manila Envelope
MOD	Moderate
MP	Magna Powder
MULTI	Multiple
N	Ninhydrin
NIN	Ninhydrin
NO	Number
NV	No value
PLST	Plastic
PP	Palm Print
PPR	Processed prior to receipt
PROC	Processing
R	Right
R6G	Rhodamine 6G
RE	Red Evidence
RET	Returned
RW	Redwop powder
STC	Said to Contain
T	Thenar
V	Value
WE	White evidence
WPS	White Paper Sack