Deviation Request Form (DRF)

Directions: The Initiator will complete Sections A through C. Additional continuation pages can be included if necessary.

Initiator	MJ DeHaan	**Date**	06/22/2020

A. Requested deviation applies to (Technical Procedure – include specific section):

Forensic Biology Procedure for Casework Training, multiple sections - see attached

B. Requested deviation:

See attached

C. Necessity for the deviation:

To add STRmix software training and update wording throughout.

D. Technical review and Authorization (to be completed by the Quality Manager and/or Technical Leader)
Comments(to include merits and impacts):

Approved	☑	Yes	☐	No	Duration	until next version
Signature	Mackenzie DeHaan Digitally signed by Mackenzie DeHaan DN: C=US, OU=Forensic Biology, O=NCSCL, CN=Mackenzie DeHaan, E=mdehaan@ncdoj.gov Reason: I have reviewed this document Location: Date: 2020-06-22 11:09:12 Foxit PhantomPDF Version: 9.3.0				Date	06/22/2020

E. Quality Assurance Authorization (to be completed by the Quality Manager, Forensic Scientist Manager or designee)

Acceptable within general QA guidelines and good laboratory practice?	☑	Yes	☐	No
Significant negative impact to Crime Laboratory Quality System?	☐	Yes	☑	No

Restrictions/limitations:

Effective 07/01/2020

☑	Authorized	☐	Rejected	Signature	Jody H. West Digitally signed by Jody H. West DN: cn=Jody H. West, o=DOJ, ou=State Crime Laboratory, email=jwest@ncdoj.gov, c=US Date: 2020.06.24 11:21:20 -04'00'	Date	6-24-20

DRF_Forensic Biology Training Procedure

The following sections will have wording added/amended:

5.0 The progress of the trainee within the training program will be updated weekly. This may be done through the use of a form for tracking progress or through a discussion between the trainee and training officer.

5.2.3.4 The trainee shall observe and demonstrate the inventory process for SAKs submitted for analysis within Forensic Biology.

5.2.5.4 The trainee shall successfully identify appropriate area(s) and collection technique for samples requiring swabbing for epithelial testing where no body fluids are present.

5.3.2.5 A minimum of 10 samples shall be tested.

5.4.10 and a quiz on microscopy.

5.5.6.1 make lecture plural. Add wording "and lectures covering the use of STRmix for interpretation."

5.5.6.3 The trainee shall read and understand the Forensic Biology Procedure for STR Analysis and Interpretation. They will also review the Procedure for the Use of Armed Xpert.

5.5.6.4 Insert new section -The trainee will demonstrate the ability to manually deconvolute a mixture, by hand and with the assistance of the Armed Xpert software to demonstrate understanding of how to establish genotypes from a given mixture.

5.5.6.5 Insert new section – The trainee shall attend a demonstration of the use of STRmix software and demonstrate to the trainer how to use the software.

5.5.6.6 Insert new section – The trainee shall interpret samples provided by the training officer using the STRmix software to correctly interpret profiles, including discussion of troubleshooting of samples.

5.5.7 Rename section Statistics; Replace remainder of section with below wording:

5.5.7.1 The trainee shall attend lecture by the Technical Leader or designee on statistics, covering historic uses and likelihood ratios.

5.5.7.2 The trainee shall read and understand the Forensic Biology Procedure for STR Analysis and Interpretation and the National Resource Council (NRC II) report on DNA.

5.5.7.3 The training officer shall demonstrate the use of STRmix to calculate statistics.

5.5.7.4 The trainee shall demonstrate the ability to hand calculate statistics given a profile and the population frequencies.

5.5.7.5 The trainee shall demonstrate the ability to use STRmix to calculate statistics and make the appropriate propositions for given scenarios.

5.5.8 The trainee must pass a quiz on interpretation and statistics.

5.5.8 Insert a new section "CODIS" and subsections as below:

5.5.8.1 The trainee shall attend a lecture by the CODIS administrator or designee on the use of CODIS.

5.5.8.2 The training officer shall familiarize the trainee with the Forensic Biology procedures for CODIS.

5.5.8.3 The trainee shall read and understand the Forensic Biology procedures for CODIS.

5.5.8.4 The trainee shall complete the required training and paperwork to gain access to the CODIS software.

5.5.8.5 The trainee shall demonstrate the ability to correctly enter samples into the CODIS software and perform employee searches as required.

5.5.8.6 The trainee must pass a quiz on CODIS.

Insert a new 5.6.8.8 in Notes, Report Writing, and Reviews section: The trainee shall complete mock case sets to mimic the type of cases they will encounter when released for casework. These cases will be worked as if they were actual cases and will undergo the review process similar to casework.

Insert a new 5.7 Kinship analysis and subsections below:

5.7.1 The trainee will review Training in kinship analysis/LR ratio reporting/testifying (given by Dr. Coble – 10/22/2018)

5.7.2 The trainee will read and understand the FB Procedure for Kinship Analysis, CODIS manual, Butler Ch. 14, Buckleton Ch. 11, Other readings as provided by training officer.

5.7.3 The trainee will attend a demonstration of use of Popstats for parentage/kinship analysis and training in use of stats calculations for relationships (Popstats calculations)

5.7.~~5~~4 The trainee will practice comparing profiles and entering into Popstats to generate statistics from samples provided by the training officer (Use of previously generated DNA profiles from known child/mother/father relationships to be entered into the Popstats program is allowed). The trainee will evaluate the results from software output using known true relationship pairings and also using known false relationship pairings.

5.7.~~6~~5 The trainee will successfully complete a competency test in kinship analysis– given sets of egrams or previously generated data, they will make comparisons and generate statistics as necessary and draft a report. Note: This is not required before being released as a qualified DNA analyst, however, it is necessary before independently performing kinship analysis casework.

5.12. Remove current wording for section and replace with the below wording:

5.12.1 Prior to performing casework technical reviews and/or combined technical/administrative reviews, additional training in reviews will be completed and documented.

5.12.2 The review trainee will read and understand current forms and procedures for completion of reviews.

5.12.3 The trainee will attend a demonstration of the review process for the type of review they are training to complete.

5.12.4The trainee will observe a minimum of three (3) different qualified reviewers complete the applicable review processes.

5.12.5 The trainee will perform a mock review and provide comments to the reviewer of record for the case. For technical reviews a total of 10 separate cases will be reviewed, for combined reviews a total of 5 cases will be completed.

5.12.5.1 The qualified reviewer of record will review the documentation from the review trainee and will provide feedback on the review comments to the trainee and the Technical Leader.

5.12.6 The trainee will successfully complete the review practical for technical reviews. No practical is required for combined reviews.

5.12.7 All documentation will be maintained in the analyst's training file along with a memo releasing them to perform reviews on Forensic Biology casework.

Procedure for Casework Training

1.0 Purpose - The purpose of this procedure is to provide a training program for the analysis of forensic evidence in the Forensic Biology Section at the North Carolina State Crime Laboratory. This program shall provide individuals with the theoretical background and the working knowledge to conduct independent casework analysis and give understandable and accurate expert witness testimony in the field of blood identification, semen identification, DNA analysis, YSTR analysis, and review training. Heavy emphasis shall be placed on quality assurance of all tests performed (data integrity via thorough documentation). Upon completing the training program, the trainee shall demonstrate the following:

- Theoretical background of the principles of blood and semen identification, DNA and related disciplines such as population genetics, biochemistry, molecular biology, and statistics.
- Working knowledge of the principles and practices of serological theories as they relate to the forensic analysis of blood and semen identification.
- Working knowledge of the principles and practices of PCR based DNA technology as it relates to forensic analysis.
- Ability to perform independent and accurate forensic analysis on forensic case material using aseptic techniques.
- Ability to provide expert witness testimony that includes, but is not limited to, the presentation of blood and/or semen identification technology, forensic DNA analysis and the defense of analytical conclusions.

2.0 Scope - This training program applies to Forensic Scientists in the Forensic Biology Section who work with forensic evidence. This training program may be completed in part or in whole. If completed in part, the Forensic Scientist shall conduct independent analysis only on the areas which they have been deemed competent.

3.0 Definitions – See Section Definition List

4.0 Equipment, Material, and Reagents - See specific Forensic Biology Section procedures.

5.0 Procedure

5.1 Training of Experienced Forensic Scientists - In the event a Forensic Scientist with previous training and/or experience in forensic analysis is hired, the Technical Leader shall assess the Forensic Scientist's knowledge, skill, and abilities based on any written training documentation provided by the Forensic Scientist's previous employer(s). The Forensic Scientist's training program will be designed based on the Technical Leader's assessment.

5.2 Background Training

5.2.1 Quality Control

5.2.1.1 The quality control officer or designee shall provide information to the trainee on how the buffers, solutions, and reagents necessary for testing are prepared.

5.2.1.2 The quality control officer or designee shall provide information to the trainee on quality control checks that are required on buffers, solutions, reagents, test kits, instrumentation and software.

5.2.1.3 The training officer shall demonstrate the documentation of lot numbers for reagents into FA.

5.2.1.4 The trainee shall read and understand the Forensic Biology Section Procedures for reagent preparation and quality control.

5.2.1.5 The trainee must pass a quiz on Quality Control.

5.2.2 Aseptic Technique and Contamination Control

5.2.2.1 The Polymerase Chain Reaction (PCR) is a powerful tool that allows very small amounts of DNA to be amplified over a million times. Because of the sensitivity of this technique, contamination control is a very serious issue that must be emphasized and practiced with every sample. The Forensic Biology Section Procedure for Aseptic Technique and Contamination Control shall be followed.

5.2.2.2 The training officer shall refer to the Forensic Biology Section Procedure for Aseptic Technique and Contamination Control and shall demonstrate this procedure.

5.2.2.3 The trainee must pass a quiz on aseptic technique and contamination control.

5.2.3 Receiving and Handling Evidence

5.2.3.1 The trainee shall read and understand the State Crime Laboratory Procedure for Evidence Management.

5.2.3.2 The trainee shall read and understand the State Crime Laboratory Policy and Procedure for Evidence Submissions.

5.2.3.3 The trainee shall read and understand the Forensic Biology Section Procedure for Evidence Handling.

5.2.4 Work Flow

5.2.4.1 The training officer shall lecture on the proper order of processing items for DNA analysis**.**

5.2.4.2 The trainee shall be given a minimum of 5 case scenarios from cases with multiple items to determine the evidence that should be worked and the order it is to be worked.

5.2.5 Screening and Collection of Evidence - Screening, collection, and preservation are essential to properly examining evidence. In addition to visual screening an item, the alternate light source may be used to identify latent body fluids.

5.2.5.1 The trainee shall read and understand the Procedure for the Use of an Alternate Light Source.

5.2.5.2 The training officer shall demonstrate use of the alternate light source to visualize blood and semen on various surfaces.

5.2.5.3 Using the alternate light source, the trainee shall successfully identify the appropriate areas (if any) on 5 samples that would require further analysis.

5.3 Blood Analysis

5.3.1 Historical Body Fluid Testing and Bloodstain Pattern Awareness

5.3.1.1 The trainee shall attend a lecture by the Technical Leader or designee on historical testing procedures and bloodstain pattern awareness.

5.3.1.2 The trainee shall complete the assigned reading for this block of instruction.

5.3.1.3 The trainee must pass a quiz on Historical Body Fluid Testing and Bloodstain Pattern Awareness.

5.3.2 Blood Identification

5.3.2.1 The trainee shall attend a lecture on the theory and the analytical procedure for blood analysis by the Technical Leader or designee.

5.3.2.2 The training officer shall familiarize the trainee with the Kastle-Meyer (KM) test and shall demonstrate performance of this test.

5.3.2.3 The trainee shall perform the KM test and document the results.

5.3.2.4 The training officer shall familiarize the trainee with the procedure for the RSID blood test and shall demonstrate the performance of this test.

5.3.2.5 The trainee shall perform the RSID test on the designated samples and record the results.

5.3.2.6 The trainee shall complete the assigned readings for this block of instruction.

5.3.2.7 The trainee must pass a quiz on Blood Identification.

5.4 Semen Analysis

5.4.1 The trainee shall attend a lecture by the Technical Leader or designee on the theory and analytical procedure for semen and spermatozoa identification.

5.4.2 The training officer shall familiarize the trainee with the Forensic Biology Section Procedure for Semen and Sperm Analysis and shall demonstrate the Acid Phosphatase (AP) test.

5.4.3 The trainee shall attend a lecture by the Technical Leader or designee on the theory of microscopy to include the maintenance, use and nomenclature of the microscope.

5.4.4 The training officer shall familiarize the trainee with the Forensic Biology Section Procedure for Sperm Identification and shall demonstrate staining slides using the Christmas tree stain.

5.4.5 The trainee shall test various samples with the AP test and view slides prepared from these

samples to identify samples and record results.

5.4.6 The trainee shall view and document various animal sperm slides and record visual observations.

5.4.7 The trainee shall quantitate spermatozoa on a minimum of 20 slides provided by the training officer and shall record the results.

5.4.8 The training officer shall familiarize the trainee with the procedure for the RSID semen test and shall demonstrate this test.

5.4.9 The trainee shall perform the RSID test on the designated samples and shall record the results.

5.4.10 The trainee must pass a quiz on semen identification.

5.5 DNA Analysis

5.5.1 The trainee shall complete all assigned readings and shall complete the documentation for all tests performed.

5.5.2 Extraction

5.5.2.1 The trainee shall attend a lecture on the theory and analytical procedure for DNA extraction given by the Technical Leader or designee.

5.5.2.2 The training officer shall familiarize the trainee with the Forensic Biology Section Procedure for DNA Extraction using the EZ1 Advanced XL and shall demonstrate this procedure to include demonstration of processing samples using the QIACube instrument.

5.5.2.3 The trainee shall read and understand the Forensic Biology Section Procedure for DNA Extraction using the EZ1 Advanced XL.

5.5.2.4 The trainee shall perform DNA isolation on a minimum of 10 bloodstains. A minimum of 5 blood samples shall be from simulated known bloodstains and a minimum of 5 shall be from simulated case samples.

Note: The 10 samples do not have to be extracted from 10 different individuals.

5.5.2.5 The trainee shall perform DNA isolation on a minimum of 5 cheek swabbings.

5.5.2.6 The trainee shall perform differential extractions using the QIACube instrument on a minimum of 5 semen samples, to include samples that contain a mixture of bodily fluids. A minimum of 4 separate batches shall be performed to fulfill this requirement.

5.5.2.7 The trainee shall collect and perform DNA isolation on a minimum of 2 cigarette butts.

5.5.2.8 The trainee shall collect and perform DNA isolation on a minimum of 5 “touch

samples" (samples where only epithelial cells are suspected to reside) collected from a variety of substrates, such as hats, bandanas, door knobs, clothing, etc.

5.5.2.9 The trainee shall perform DNA isolation on a minimum of 5 hair roots.

5.5.2.10 The trainee shall perform supervised DNA isolation on a minimum of 5 bone and/or teeth samples. Note: This requirement is NOT necessary for becoming a qualified DNA Forensic Scientist, but is necessary before performing independent analysis of bone or teeth.

5.5.2.11 The trainee must pass a quiz on Extraction.

5.5.3 Quantitation of DNA

5.5.3.1 The trainee shall attend a lecture on the theory and analytical procedure for DNA Quantitation given by the Technical Leader or designee.

5.5.3.2 The training officer shall familiarize the trainee with the Forensic Biology Section Procedure for DNA Quantitation with Quantifiler Trio® and shall demonstrate this procedure to include manual and robotic setup using the QIAgility liquid handler.

5.5.3.3 The trainee shall read and understand the Forensic Biology Section Procedure for DNA Quantitation with Quantifiler Trio®.

5.5.3.4 The trainee shall demonstrate a manual setup of the Quantifiler Trio® standard curve.

5.5.3.5 The trainee shall perform rtPCR DNA quantitations using appropriate controls on isolated DNA samples prepared by the trainee. The trainee shall quantitate all DNA samples isolated that are discussed above, to include a combination of manual and robotic setups using the QIAgility liquid handler.

5.5.3.6 The trainee shall interpret the results of each quantitation.

5.5.3.7 The trainee shall understand the validation studies performed for quantification.

5.5.3.8 The trainee must pass a quiz on Quantitation.

5.5.4 Amplification of DNA

5.5.4.1 The trainee shall attend a lecture by the Technical Leader or designee on the theory and analytical procedure for the amplification of DNA.

5.5.4.2 The training officer shall familiarize the trainee with the Forensic Biology Section Procedure used in amplification for Fusion 6C and demonstrate this procedure to include both manual and robotic setup using the QIAgility liquid handler.

5.5.4.3 The trainee shall read and understand the Forensic Biology Section Procedure for PowerPlex Fusion 6C Amplification as well as the associated validation studies.

5.5.4.4 The trainee will perform the amplification process using previously extracted and

quantified DNA training samples to include a combination of manual and robotic setups using the QIAgility liquid handler.

5.5.4.5 The trainee must pass a quiz on Amplification.

5.5.5 Capillary Electrophoresis

5.5.5.1 The trainee shall attend a lecture by the Technical Leader or designee on the theory and analytical procedure for capillary electrophoresis.

5.5.5.2 The training officer shall familiarize the trainee with the Forensic Biology Section Procedure for Use of the 3500 Genetic Analyzer for casework and demonstrate this procedure for the 3500 series to include manual and robotic setup using the QIAgility liquid handler.

5.5.5.3 The trainee shall read and understand the Forensic Biology Section Procedure for Use of the 3500 Genetic Analyzer for casework and applicable validation studies.

5.5.5.4 The trainee shall prepare and successfully perform electrophoresis runs using samples previously amplified to include a combination of manual and robotic setups using the QIAgility liquid handler.

5.5.5.5 The trainee shall demonstrate the ability to prepare and change buffers as well as perform the weekly maintenance and cleaning procedures on the instruments (depending on the equipment used).

5.5.5.6 The trainee must pass a quiz on Capillary Electrophoresis.

5.5.6 Interpretation

5.5.6.1 The trainee shall attend a lecture by the Technical Leader or designee on the theory for interpreting DNA.

5.5.6.2 The training officer shall familiarize the trainee with the Forensic Biology Section Procedures used in interpretation and demonstrate interpretation.

5.5.6.3 The trainee shall read and understand the Forensic Biology Section Procedure for Analysis and Interpretation with Fusion 6C and the Procedure for Use of Armed Xpert for Mixture Interpretation.

5.5.6.4 The trainee shall interpret all electropherograms of all controls and amplified training samples based on section procedures.

5.5.6.5 The trainee shall examine the electropherogram of any sample that displayed unsuccessful genotyping (i.e., the sample did not align with a ladder marker) and determine, if possible, the reason for the problem.

5.5.6.6 After determining the reason a sample(s) failed to produce a genotype, the trainee shall discuss the reanalysis of the sample(s) with the Technical Leader or training coordinator.

5.5.6.7 The trainee shall analyze and interpret previously analyzed samples as provided.

5.5.7 Statistics and CODIS Operation

5.5.7.1 The trainee shall attend a lecture by the DNA Technical Leader or designee on random match probability, to include use of the ArmedXpert software**.**

5.5.7.2 The trainee shall read and understand the Forensic Biology Section Procedure for Use of Armed Xpert for Mixture Interpretation.

5.5.7.3 The training officer shall demonstrate the use of Armed Xpert.

5.5.7.4 The trainee shall attend a lecture by the CODIS Administrator or designee on the use of CODIS.

5.5.7.5 The training officer shall familiarize the trainee with the Forensic Biology Section procedures for CODIS.

5.5.7.6 The trainee shall read and understand the Forensic Biology Section procedures for CODIS.

5.5.7.7 The trainee shall demonstrate the ability to manually calculate both the random match probability and mixture calculations. The trainee shall also demonstrate the ability to calculate both the random match probability using the CODIS POPSTATS and Armed Xpert programs.

5.5.7.8 The trainee shall develop an understanding of the National Research Council (NRC II) report on DNA.

5.5.7.9 The trainee must pass a quiz on Interpretation and Stats.

5.5.8 Notes, Report Writing, and Reviews

5.5.8.1 The trainee shall read and understand the Laboratory Procedure for Use of FA.

5.5.8.2 The training officer shall demonstrate the use of the FA and the workbooks used in the section for documentation.

5.5.8.3 The trainee shall demonstrate his/her understanding of the proper use of the FA and the section workbooks.

5.5.8.4 The training officer shall familiarize the trainee with the Forensic Biology Section Procedure for Casework Report Writing.

5.5.8.5 The trainee shall read and understand the Forensic Biology Section Procedure for Casework Report Writing.

5.5.8.6 Using the reporting guidelines as outlined in the respective procedures, the trainee shall draft mock reports on all competency test results and mock cases.

5.5.8.7 The training officer shall familiarize the trainee with the Casework Review Checklist and demonstrate the case review process.

5.5.9 Quality Assurance/Quality Control

5.5.9.1 The trainee shall have a lecture on accreditation, audits, and inspections.

5.5.9.2 The trainee shall read and understand pertinent scientific literature provided by the Technical Leader, including SWGDAM guidelines.

5.5.9.3 The trainee shall develop a thorough understanding of the current DNA Federal Standards (Quality Assurance Standards for Forensic DNA Testing Laboratories and American Society of Crime Laboratory Directors).

5.6 YSTR Analysis

5.6.1 The trainee shall attend a lecture in YSTR analysis, including validation overview, interpretation, and statistical analysis.

5.6.2 The trainee shall read and understand the section procedures for amplification using Y23 and the analysis and interpretation of profiles generated from this amplification.

5.6.3 The training officer will demonstrate the amplification, analysis, and interpretation of samples to include generation of statistics and report writing.

5.6.4 The trainee will amplify and process a minimum of 10 samples using the genetic analyzer. They will then analyze and interpret the generated profiles, including generating statistics.

5.6.5 The trainee will generate reports from the samples using section reporting procedures. Note: This requirement is NOT necessary for becoming a qualified DNA Forensic Scientist, but is necessary before performing independent YSTR analysis.

5.6.6 The trainee must pass a quiz on YSTR Analysis.

5.7 Courtroom Testimony

5.7.1 The trainee shall attend a lecture covering the court system, working with attorneys, courtroom demeanor, and ethical practices.

5.7.2 The trainee shall complete all assigned readings.

5.7.3 The trainee shall attend court and observe a minimum of three testimonies presented by a qualified Forensic Scientist.

5.7.4 The trainee will have a minimum of three practice moot courts where feedback will be given regarding their testimony on mock cases.

5.7.5 The trainee shall successfully complete a moot court by achieving a satisfactory rating for all categories documented in the State Crime Lab Moot Court Evaluation to be completed by the Technical Leader. If the trainee has been qualified in a discipline previously, an exception may be approved by the Forensic Scientist Manager. These trainees will still have to undergo an oral board in the discipline.

5.8 Competency Test - Individuals shall successfully complete a series of at least three well defined

competency tests. These tests are to determine the trainee's ability to analyze case samples consistently from a variety of sources. Competency tests may include blood, mixed fluids, and simulated cases.

5.9 Written Examination and Oral Board – The written examination and oral board shall examine the trainee's understanding of the theoretical and working knowledge of blood analysis, semen analysis, DNA, PCR, STRs, and the following subject areas as applicable for the trainee:

5.9.1 Interpretation of electropherograms.

5.9.2 Presentation of the PCR and STR technology in court.

5.9.3 Understanding of population frequencies generated.

5.9.4 Understanding of validation studies.

5.9.5 Knowledge of the technical literature associated with the procedures and loci under study.

5.9.6 Knowledge and understanding of the laboratory's Quality System.

5.10 Monitoring of New Analysts Performing Casework

5.10.1 The newly released Forensic Scientist shall receive the evidence in FA, conduct the analysis, prepare the notes and write the report in FA.

5.10.2 For at least the first six months of casework for the newly released Forensic Scientist, the Technical Leader or their designee(s) shall perform the combined Technical/Administrative Review in FA for each case. The Technical Leader, in consultation with the Forensic Scientist Manager and the Training Officer, may shorten the six month time frame if an appropriate quantity and complexity of casework has been completed. The justification by the Technical Leader for shortening the period shall be documented by memorandum in the newly released Forensic Scientist's training file.

5.11 Additional Training of Qualified Forensic Scientists

5.11.1 In the event that the Forensic Biology Section incorporates a significant change or implements a new analytical procedure, method, equipment or instrument, the previously qualified Forensic Scientists shall successfully complete a training program prior to being allowed to perform analysis on casework samples incorporating said changes.

5.11.2 The training program shall demonstrate the previously qualified Forensic Scientist's working knowledge and technical skills as it pertains to the newly incorporated analytical procedure, method, equipment, or instrument.

5.11.3 The training program shall, at a minimum, consist of a written examination and a competency test. The training program may also consist of readings of relevant scientific publications; lecture(s) pertaining to any new technology advances and/or policy and interpretation changes; or wet lab scenarios where instruction on new laboratory techniques may be demonstrated and hands on practice of new laboratory techniques may be performed.

5.11.4 The written examination shall test the Forensic Scientist's technical knowledge of the new analytical procedure, method, equipment, or instrument.

5.11.5 The competency test is a mock case provided to the Forensic Scientist to work as a real case, but without assistance or consultation. The Forensic Scientist shall not know the expected outcome of the test. For successful completion, the Forensic Scientist shall obtain the expected conclusions and generate an associated case file that is in compliance with Section and Laboratory policies.

5.12 Training for Reviews

5.12.1 Prior to performing casework technical reviews, the Forensic Scientist shall undergo additional training in the completion of technical reviews.

5.12.1.1 The Forensic Scientist shall perform mock reviews on a minimum of 10 cases.

5.12.1.1.1 The Forensic Scientist shall document any changes/review comments.

5.12.1.1.2 The qualified Forensic Scientist who becomes the reviewer of record for the case will review the documentation provided during the course of the mock review. The scientist shall discuss each review with the scientist in training. All review comments and suggestions shall be placed in FA. The training file must contain the list of cases mock reviewed.

5.12.1.2 Upon successful completion of the mock reviews, the Technical Leader and Section Manager will write a memorandum releasing the scientist to perform reviews. For the first 6 months after being released to perform technical reviews, the Technical Leader or their designee(s) shall perform the combined Technical/Administrative Review for each case in which the newly released Forensic Scientist has performed a Technical Review.

5.12.2 Before a qualified Forensic Scientist performs Combined Technical/Administrative reviews, additional training shall be completed and documented.

5.12.2.1 The Forensic Scientist shall perform mock reviews on 5 cases.

5.12.2.1.1 The Forensic Scientist shall document any changes/review comments.

5.12.2.1.2 The Forensic Scientist who becomes the analyst of record for the case will review the documentation provided during the course of the review. The senior scientist shall discuss each review with the scientist in training. All documentation shall be placed in the training file.

5.12.2.2 Upon successful completion of the mock reviews, the Technical Leader and Section Manager will write a memorandum releasing the scientist to perform reviews.

6.0 Limitations - N/A

7.0 Safety - There are many potential hazards that exist in the Laboratory. It is the responsibility of the Training Officer to ensure the Trainee is aware of all potential hazards. These potential hazards include, but are not limited to, the following:

7.1 Infectious Agents

- Viral agents, including HIV and Hepatitis
- Bacteria, including sexually transmitted diseases
- Fungi
- Parasites

7.2 Hazardous Materials

- Caustic Agents (Acids and Bases)
- Carcinogens/mutagens
- Teratogens
- Organic chemicals
- Flammable materials
- Oxidizers

7.3 Electrical Hazards

- Electrophoresis units
- Laboratory equipment
- Grounding

7.4 Burn Hazards

- Autoclaves
- Thermal cyclers

7.5 Laboratory Safety Procedures

7.5.1 Individuals must be trained in laboratory safety by the Section Safety Officer prior to the commencement of training. Various manuals are provided that must be followed to ensure safety of all Laboratory personnel. The following manuals are to be used for reference and guidance for laboratory safety: SDS Notebook, the State Crime Laboratory Safety Manual, and the DOJ Safety Manual.

7.5.2 It is the responsibility of the Safety Officer to alert the trainee to safety hazards specific to this Laboratory, including all items mentioned above.

8.0 References

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National Research Council Committee on DNA Forensic Science (1996) An Update: The Evaluation of Forensic DNA Evidence. Washington, D.C., National Academy Press.

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Gaensslen, R.E. *Sourcebook in Forensic Serology, Immunology, and Biochemistry.* 2nd ed. National Institutes of Justice, 1989.

Houck, M.M. and J.A. Siegel. *Fundamentals of Forensic Science*. 2nd ed. New York, NY: Elsevier, 2011.

Saferstein, R. *Criminalistics: An Introduction to Forensic Science*. 10th ed. Upper Saddle River, NJ: Prentice Hall, 2011

Saferstein, R., editor. *Forensic Science Handbook. Volume I*. 2nd ed. Upper Saddle River, NJ: Prentice Hall, 2002.

Saferstein, R., editor. *Forensic Science Handbook. Volume II*. 2nd ed. Upper Saddle River, NJ: Prentice Hall, 2005.

Saferstein, R., editor. *Forensic Science Handbook. Volume III*. 2nd ed. Upper Saddle River, NJ: Prentice Hall, 2010.

9.0 Records

- Training Logs and Notebooks
- Casework Forensic Scientist Training Manual Log Sheet
- Casework Forensic Scientist Training Questions

10.0 Attachments – N/A

Revision History		
Effective Date	Version Number	Reason
08/06/2018	1	Original Document