DISTRICT OF COLUMBIA
DEPARTMENT OF FORENSIC SCIENCES

FORENSIC SCIENCE LABORATORY
DIGITAL EVIDENCE UNIT

QUALITY ASSURANCE MANUAL
(ISO/IEC 17025:2005 STANDARDS)

TABLE OF CONTENTS

INTRODUCTION

Quality performance, conforming to recognized standards of good laboratory practice, is the most important goal of the Forensic Science Laboratory (FSL) Digital Evidence Unit (DEU) within the D.C. Department of Forensic Sciences (DFS). Just as new and improved methods of forensic analysis are developed to meet the expanding needs of the criminal justice system, it is essential for laboratory quality standards to progress in parallel. The DEU is committed to diligently implementing policy and procedure changes to ensure quality in all facets of laboratory operations.

The DEU quality system, represented by the DFS Departmental Operations Manual (DOM), the Quality Assurance Manual (QAM) and the Laboratory Operations Manual (LOM), provides a mechanism for identifying and implementing the practices that support excellent performance.

All DEU analysts share in the responsibility for adherence to the established quality measures as well as the overall success of the quality program.

The continued development and improvement of the DEU quality system serves to increase confidence in the resulting work product while strengthening the professional integrity of the DEU. Through the use of recognized quality practices and procedures, the DEU will continue to produce high quality work and meet the challenges of future laboratory accreditations.

SCOPE

The purpose of the DEU's quality management system is to ensure quality forensic services are provided to the District of Columbia's Criminal Justice System. This quality assurance manual contains or references the policies, practices and procedures of the DEU quality system that ensure technical competence and valid forensic examination results. The Forensic Sciences Lab (FSL) Quality Assurance Manual (QAM), the DEU's QAM, the DFS Departmental Operations Manual (DOM), and the Laboratory Operations Manual (LOM) facilitate achieving this goal and meeting the ISO/IEC 17025:2005 Accreditation requirements.

Accreditation requirements are based on the International Organization for Standardization/International Electrotechnical Commission International Standard 17025 General Requirements for the Competence of Calibration and Testing Laboratories (ISO/IEC 17025:2005) and any supplemental requirements for Accreditation of Forensic Testing Laboratories. The combined requirements of ISO/IEC 17025:2005 and any Supplemental Requirements are hereafter referred to as ISO/IEC 17025:2005. The QAMs, DOM and LOM also facilitate internal and external audits of the quality system to evaluate the DEU's conformance with ISO/IEC 17025:2005 standards.

GOALS AND OBJECTIVES

The Digital Evidence Unit quality assurance system operates in accordance with the quality policies and practices established in the laboratory's Quality Assurance Manual (QAM), the Departmental Operations Manuals (DOM), and the Laboratory Operations Manuals (LOM).

It is the goal of the Digital Evidence Unit (DEU) to:

- Provide user agencies access to data acquired from digital devices in a forensically sound manner.
- Provide user agencies with unbiased, forensically defensible analysis of digital data.
- Provide expert testimony regarding laboratory findings resulting from analysis of digital data.

It is the objective of the DEU quality assurance program to ensure that:

- All acquisitions of digital devices are done using proper forensically sound methods and documented appropriately.
- All analysis of digital devices are documented and are accurate in presentation of findings.

QUALITY TERMINOLOGY

Accountability: The quality of subordinate workers by which they are responsible for their own work and answerable to a superior.

Acquisition: The process of acquiring a digital devices, creating a forensic copy or "image."

Accreditation: A process by which an authoritative body gives formal recognition that an entity is competent to carry out specific tasks.

Administrative documentation: All case related documents that are not technical examination documentation, test item (evidence) chain-of-custody receipts, submission paperwork, correspondence received/sent, the Administrative Review Form and other pertinent information.

Administrative error: A clerical error, such as a typographical error, that may occur in an examination report or in the preparation of a proficiency test.

Administrative review: A procedure used to check case file documentation and case reports for consistency with laboratory policy and for editorial correctness**.** This is documented in DEU with the Administrative Review Form.

Administrative reviewer: The Laboratory Manager, designated Technical Leader or qualified designee who conducts an administrative review**.**

ANAB: American National Standards Institute (ANSI)-American Society for Quality (ASQ) National Accreditation Board. ANAB provides ISO/IEC 17025 accreditation for forensic testing laboratories. Formerly FQS.

Analysis (Digital Evidence Unit): Examination of an image of a digital device with regard to the scope as defined by the search warrant/investigation using a forensically sound methodology and tool, producing a report of findings.

Analyst: An employee or contract employee who conducts and/or directs the analysis and acquisition of digital devices. Some analysts also interpret data and reach conclusions. Used interchangeably with the term "examiner".

Analytical/Interpretative error: An error in the examination process that produces an incorrect result or conclusion.

ANSI-ASQ National Accreditation Board: The signatory of the International Accreditation Forum (IAF) multilateral recognition arrangements for quality management systems and environmental management systems; One of two brands of the ANSI-

ASQ National Accreditation Board, a non-profit, non-governmental organization that provides accreditation services to public- and private-sector organizations and is jointly owned by the American National Standards Institute and the American Society for Quality.

Approved Test Provider: A proficiency test provider that has complied with the test manufacturing guidelines established by an accrediting body's Proficiency Review Committees.

Assessment: A review conducted to compare the various aspects of the laboratory's quality system with criteria for that performance. Also referred to as an audit.

Assessor: A person who conducts assessments.

Audit: A review conducted to compare the various aspects of the laboratory's quality system with criteria for that performance. Also referred to as an assessment.

Auditor: A person who conducts audits.

Best Evidence: a forensic copy (image) of the original evidence that is stored, documented and treated as evidence.

Case Documentation: All administrative and technical examination documentation for a given case.

Case File: Files containing administrative and technical examination documentation generated or received by a laboratory pertaining to a particular case.

Case Identification Number: A unique alphanumeric identifier that is assigned to an FSL case submission.

Casework: Laboratory activities concerning the examination of evidence and/or crime scenes.

CD/DVD: optical media that can store digital data.

Chain-of-custody log: A form, or electronic equivalent, used to document all transfers of evidence.

Chip: a silicon semiconductor varying in metal contact points that contains data in some devices.

Chip-Off: An advanced technique used on mobile devices and unidentified media to extract the chip independent of the device and acquire/analyze the data it contains.

Competency test: The evaluation of a person's ability to perform work in a functional area prior to the performance of independent casework. Expected test results are known to the laboratory but not the test taker.

Competent: Possessing the requisite knowledge, skills and abilities to perform a job.

Computer systems: A complete, working computer to include any software and peripheral devices.

Condition adverse to quality: An all-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items and nonconformity issues.

Contributor: law enforcement agencies that submits evidence to the laboratory.

Controlled document: A document that is tracked when issued and/or distributed.

Court official: An individual such as a prosecutor, defense attorney or judge who completes an external testimony evaluation form.

Crime/forensic laboratory: A laboratory (with at least one full-time scientist) which examines physical evidence in criminal matters and provides opinion testimony with respect to such physical evidence in a court of law.

Crime scene: An area, object or person, from which evidence is identified, documented, collected and/or interpreted.

Crime scene personnel: Individuals who perform the identification, documentation, collection and/or interpretation of material at a location external to the laboratory.

Custody: The care and control of an item implying responsibility for its protection and preservation.

Deficiency: An inadequacy; lacking in some necessary quality of an element. Deficiencies include missing data, incomplete data, inaccurate data and/or incomplete reports**.**

Deviation: An authorized variance from a documented policy, practice, or procedure. A deviation can be major or minor depending on the circumstances.

DEU: Digital Evidence Unit. An operational unit of the Forensic Science Laboratory.

DEUNet: The internal closed network of the Digital Evidence Unit, residing in the DEU laboratory.

DFS: Department of Forensic Sciences, Washington D.C.

Digital device: a device that holds data stored or transmitted in binary form. Examples include a desktop computer, laptop computer, or USB storage device.

Digital evidence: Information of probative value stored or transmitted in binary form.

Digital Evidence Unit: A unit within the FSL that is responsible for the acquisition and examination of digital evidence.

Directing: The process of motivating, leading, guiding, stimulating, and activating people.

Discipline: A major area of casework for which a laboratory may seek accreditation.

Discrepancy: Being at variance or different from the accepted consensus.

Document: Information in any medium including, but not limited to, paper copy, computer disk or tape, audio or video tape, electronic file, compact or digital video disc, photograph, overhead, or photographic slide.

Document control: The process of ensuring that controlled documents prescribing quality-affecting activities or specifying quality requirements, including revisions, are reviewed for adequacy, approved for release by authorized personnel and distributed for use to the personnel performing the prescribed activities.

DOM: Agency Departmental Operations Manual

DVR: Digital Video Recorder. A device that can record digital video, often using a proprietary storage format and recording system.

Encryption: a technique used to obfuscate or protect data by employing a specific algorithm or cypher.

Environmental conditions: Any characteristic of the facilities that could reasonably be expected to impact the quality of the laboratory's work product.

Evidence: An item submitted for examination(s).

Examination: An analysis of an item or comparison of items; The procedure utilized by the laboratory analyst to obtain information from evidence in order to reach conclusions concerning the nature of and/or associations related to evidence received by the laboratory. The term examination is equivalent to the term "test" as used in this manual.

Examination documentation: Documents that are technical in nature and support the results and/or conclusions presented in a laboratory report. Examples of documents include diagrams, printouts, photographs, observations, and results of examinations.

Examiner: An employee or contract employee who conducts and/or directs the analysis and acquisition of digital devices. Some examiners also interpret data and reach conclusions. Used interchangeably with the term “analyst”.

External proficiency test: A test provided by a source external to the laboratory.

Finding: A nonconformity identified during an audit with documented requirements**.**

Follow-up action: Action to eliminate the cause of a detected Level 2 non-conformity. This is documented on as action steps on the *Quality Corrective Action Report*.

FSL: Forensic Science Laboratory. A division under the DFS, alongside the Public Health Laboratory and the division of Crime Scene Sciences, responsible for processing forensic evidence.

Forensic Science: The application of scientific knowledge and methodology to legal problems and criminal investigations.

Goal: A statement of purpose that defines the mission of an organization.

Good laboratory practice: Operating practices and procedures for promoting quality and ensuring the integrity of the work product.

Hard drive: a piece of media on which data is found, written to or recovered. Hard drives can be internal or external and can have a variety of interfaces dependent on their function.

Hash sets: Reference data sets released by the National Institute of Technology and Standards (NIST) that provide the hash values for all known software for use in analysis of device images.

Hash value: A string of alphanumeric characters that are unique to a digital entity and are used for verifying the integrity of digital evidence. A hash value acts as a digital fingerprint to ensure that the Best Evidence and Working copies are identical to the original evidence.

Identification: The determination that separate items originated from the same source to the exclusion of all others.

Image: A forensic copy of a digital device that is usually verified by a hash value.

Inconsistency: Any reported results that differ from the consensus results. Inconsistencies may be classified as administrative, systemic, analytical or interpretive.

Individualization: The decision that two separate items originated from the same source (identification).

Internal proficiency test: Proficiency testing program managed and controlled within the laboratory system.

Item Identifier: An alphanumeric designator assigned to an item submitted to the FSL.

JTAG: Joint Test Action Group. An advanced mobile device acquisition technique that involves connecting directly to the Test Access Ports (TAPs) on the device and reading the raw data from memory chips.

Laboratory Director: The highest ranking manager within the FSL**.**

Lead Auditor: An experienced auditor who is assigned the responsibility of leading a team of auditors to conduct a portion of an audit.

LIMS: Laboratory Information Management System. The electronic system DFS uses to track evidence chain of custody, requests for testing, communications and findings.

Logical acquisition: An acquisition of a digital device that only copies data visible within the file system.

LOM: Division Laboratory Operations Manual

Major deviation: A deviation that has the potential to impact the quality systems, may affect multiple cases, or is applicable over an extended period of time.

Management system: The organizational structure, responsibilities, procedures, processes, and resources for implementing quality management; includes all activities which contribute to quality, directly or indirectly.

Manager: A person with the responsibility for directing and controlling an organizational unit or program.

May: A word used when an element of the quality system is optional or discretionary.

Measurement of uncertainty: A parameter associated with the result of a measurement that characterizes the dispersion of the values that could reasonably be attributed.

Media: Objects on which electronic data can be stored.

Method: The course of action or technique followed in conducting a specific analysis or comparison leading to an analytical result.

Minor deviation: A deviation that is not expected to impact the quality system and generally will not have an extended duration.

Mobile Device: A device that hold digital data that has cellular or wireless capability or both. Examples include a cellular phone, iPod, or tablet.

Must: A word used when an element of the quality system is required.

National Measurement Standards: May be primary standards, which are primary realizations of the SI units or agreed representations of SI units based on fundamental physical constants, or they may be secondary standards which are standards calibrated by another national metrology institute such as the National Institute of Standards and Technology (NIST).

Natural science: Chemistry, biology and physics**.**

No Value: The determination of "no value" by an examiner indicates that the information present in the print is such that, when compared to another print, two or fewer or the three conclusions can be reached.

Nonconformity, Level 1: A situation or condition that directly affects and has a fundamental impact on the quality of the work product or the integrity of the evidence (see Quality Corrective Action).

Nonconformity, Level 2: A situation or condition which may affect the quality of the work but does not, to any significant degree, affect the fundamental reliability of the work product or the integrity of the evidence (see Follow-up Action).

Notes: The documentation of procedures, standards, controls and instruments used, observations made, results of tests performed, charts, graphs, photos, and other documents generated that are used to support an analyst's conclusions.

Objective: A measurable, definable accomplishment that furthers the goals of the organization.

Objective Test: A test which, having been documented and validated, is under control so that it can be demonstrated that all appropriately trained staff will obtain the same results within defined limits. These defined limits relate to expressions of measurement uncertainty.

Open proficiency test: A proficiency test, known to the participant as such, prepared to evaluate the participant's competence related to casework.

Organizing: The process of identifying, specifying and assigning work, grouping work and resources into a structure and establishing a chain of command between individuals and groups.

Performance Check: A verification that the equipment, instrument, or process is working as expected. Analysis of a control may be used as a performance check.

Physical acquisition: An acquisition of a digital device that includes a logical acquisition, all data outside the filesystem and data that can be recovered or carved.

Planning: The analysis of relevant information from the past and present and the assessment of probable future developments so that a course of action may be determined that enables the organization to meet its stated objectives**.**

Policy: A guiding principle, operating practice, or plan of action governing decisions made on behalf of an organization.

Practices: In this manual, a term used to describe laboratory quality affecting processes that are used by the FSL.

Primary Standard: A standard designated or widely acknowledged as having the highest metrological qualities and whose value is accepted without reference to other standards of the same quantity.

Principle: A basic rule, assumption or quality; a fixed or predetermined policy or mode of action.

Procedure: The manner in which an operation is performed; a set of directions for performing an examination or analysis – the actual parameters of the methods employed.

Proficiency Review Committee (PRC): A committee appointed by an accrediting body, whose role is to evaluate the performance of accredited laboratories in proficiency tests.

Proficiency tests: Tests to evaluate the continuing capability of analysts and the performance of the laboratory. The expected results of the test are unknown to those individuals taking the test.

Proper seal: A seal that prevents loss, cross-transfer or contamination while ensuring that attempted entry into the container is detectable. A compliant seal may include a heat seal, tape seal, or a lock with, at minimum, the initials of the person creating the seal being placed across the seal onto the container when possible.

Protocol: A directive listing the procedures to be followed in performing a particular laboratory examination or operation; the overall plan for analysis of a particular item of evidence.

Qualified: A term used to identify personnel who successfully complete a training program, pass a competency test and participate in the proficiency testing program.

Qualitative Analysis: Procedures that use visual, microscopic, or instrumental methods to determine the characteristics or constituents of a sample or specimen without regard to quantity.

Quality assurance: The planned and systematic actions necessary to provide sufficient confidence that a laboratory's product or service will satisfy given requirements for quality.

Quality audit: A management tool used to evaluate and confirm activities related to quality. Its primary purpose is to verify compliance with the operational requirements of the quality system.

Quality control: Activities conducted according to established standards used to monitor the quality of analytical data and to ensure that it satisfies specific criteria.

Quality Corrective Action (Q-CAR): Action put in place *after* a nonconformity event to identify and eliminate the cause of the undesirable situation, and to bring the deficiency into conformity with a required standard. This is documented in a *Quality Corrective Action Report* (Q-CAR).

Quality documentation: Documents of records pertaining to the quality system such as audit reports, Quality Corrective Action forms, deviation forms and testimony evaluations.

Quality manager: An individual designated by management who, irrespective of other responsibilities, has the defined authority and obligation to ensure that the quality requirements of the management system are implemented and maintained.

Quality manual: A document stating the quality policy and describing the various elements of the quality system and quality practices of the organization or unit.

Quality Preventive Action (Q-PAR): Action put in place *before* a potential nonconformity occurs in order to eliminate the cause of an identified undesirable situation and to bring the deficiency into conformity with a required standard. This is documented in a *Quality Preventive Action Report* (Q-PAR).

Quality records: Documents pertaining to the quality system such as audit reports, Quality Corrective Action reports and testimony evaluations.

Quality system: The organizational structure, responsibilities, procedures, processes, and resources for implementing quality management; includes all activities that contribute to quality, directly or indirectly. This term is equivalent to "management system" as used in ISO 17025:2005.

Quantitative Analysis: Analysis of a substance that determines the amount or proportion of its constituents.

Questioned sample: An evidence sample to be examined for the purpose of comparison or identification.

Record: A document that provides evidence of a condition, work performed, activities conducted, and/or quality for archival purposes.

Re-exam technique: A quality assurance technique whereby a previously examined sample is re-examined by a different analyst.

Reference material: A material or substance having known properties. These materials may be used for the identification of unknown substances, calibration of instruments, assessments of a measurement method, or assigning value to materials.

Reliability: Possessing the quality of being dependable; may refer to personnel, materials or equipment.

Request: The act or an instance of a contributor asking for the examination of evidence by the laboratory.

Root cause: The fundamental reason for a condition adverse to quality, that, if corrected or precluded, would minimize or prevent that condition, and/or similar conditions, from occurring.

Routine Process/Procedure: A process or procedure that is performed on an on-going basis.

Safety manual: A document stating the safety policy and describing the various elements of the safety system of the organization.

Scientist: A person who employs scientific methods in the examination of evidence in a forensic laboratory.

Search warrant: The authority granted by the court that allows for the acquisition and analysis of digital devices.

Secondary evidence: Material derived from an item of evidence.

Secured area: Locked or otherwise limited access space under laboratory control that has access restricted to personnel authorized by the Laboratory Director.

Shall: A word used when an element of the quality system is required.

Should: A word used when an element of the quality system is recommended, but not required.

SIM Card: Subscriber Identity Module. A card found in devices that employ cellular technology, usually furnished by the mobile carrier.

Standard Operating Procedure (SOP): A document that specifies the steps, methods, equipment, and materials necessary to perform a task properly. SOP's are written to provide instruction and standardization of activities affecting quality.

Standards: Something established by authority, custom, or general consent as a model or example.

Sub-discipline: A specific type of analysis within an accredited discipline.

Supervisor: A person directly responsible for overseeing the work in an organizational unit.

Technical Leader: A designated employee who is responsible for the technical operations of a laboratory unit and who may be able to stop or suspend unit operations.

Technical procedures: Of or relating to a practical subject organized on scientific principles.

Technical review: The review of notes, data, and other documents that form the basis for a scientific conclusion**.**

Technical reviewer: An employee or contract employee who is a current or previously qualified analyst in the methodology being reviewed that performs a technical review of, and is not an author of, the applicable report or its contents.

Testimony: The firsthand authentication of a fact.

Unsuitable: Not suitable for examination.

USB device: Universal Serial Bus device. A common portable media storage device that hold digital data.

Validation: The process of performing a set of experiments that establish the efficacy and reliability of a technique or procedure or modification thereof.

Verification: Confirmation of an examiner's conclusion by another qualified examiner. With regard to software/hardware, this is used interchangeably with "performance check."

Will: A word used when an element of the quality system is required.

Working copy: A forensic copy (image) of the original evidence that is verified by a hash value and used to perform all analysis.

Write-blocker: A software or hardware device that is used to prevent any changes being made to original evidence.

PART 4 MANAGEMENT REQUIREMENTS

SECTION 4.1 ORGANIZATION

4.1 The Department of Forensic Sciences (DFS) is a public government agency that performs both state and municipal forensic investigations and examinations for the District of Columbia. The Digital Evidence Unit (DEU) is under the Forensic Science Laboratory (FSL). The DEU is located at the Consolidated Forensic Laboratory at 401 E Street SW, in Washington D.C., 20024. The DEU follows the FSL QAM for requirements pertaining to section 4.1.

In general, the DEU Manager or designee is charged with the executive and administrative responsibilities for the operation of the DEU. The DEU Manager or designee maintains administrative control and governs the laboratory's activities directly or through subordinates. The DEU Manager or designee's responsibilities and authorities are defined in the associated job description. The DEU Manager or designee has the authority to make decisions that affect the DEU.

SECTION 4.2 MANAGEMENT SYSTEM

4.2. The DEU follows the FSL QAM for requirements pertaining to section 4.2 with exceptions listed by corresponding section below.

4.2.5 Documentation Hierarchy

The DEU's quality system documentation is comprised of laboratory policies and practices and unit policies and procedures. The authority to implement change within each category is described below.

DEU policy is set forth in this *Quality Assurance Manual*. The policy statements and any subsequent revisions are approved by the DEU Manager and issued by the designated FSL Quality Assurance personnel

DEU practices are found in the standard operating procedures. Practices are used to implement DEU policies. These practices and any subsequent revisions are approved by Forensic Sciences Laboratory Director and issued by the designated FSL Quality Assurance personnel.

Discipline specific laboratory policies and procedures supplement the DEU policies and practices. Laboratory policies and procedures, and any subsequent revisions are approved by the DEU Manager or designee.

SECTION 4.3 DOCUMENT CONTROL

4.3. The DEU follows the FSL QAM with regard to requirements that pertain to section 4.3.

SECTION 4.4 EXAMINATION REQUESTS

4.4. The DEU follows the FSL QAM with regard to requirements that pertain to section 4.4.

SECTION 4.5 SUBCONTRACTING OF EXAMINATIONS

4.5. The DEU follows the FSL QAM with regard to requirements that pertain to section 4.5.

SECTION 4.6 PURCHASING OF SERVICES AND SUPPLIES

4.6 General

The DEU follows the FSL QAM with regard to requirements that pertain to section 4.6 with exceptions noted below in their corresponding section.

4.6.1 The District of Columbia Office of Contracts and Procurements (OCP) policies and regulations govern the procurement of products and services from external sources.

4.6.2 The DEU will evaluate quality affecting supplies purchased by the DEU to ensure that they comply with specifications defined in the appropriate standard operating procedure (SOP) if applicable. The DEU does not purchase consumables or reagents.

4.6.4 The DEU does not have suppliers of critical consumables, supplies and services that affect the outcome of examinations. The DEU will adhere to the list of approved suppliers maintained by DFS Operations and OCP.

SECTION 4.7 SERVICE TO THE CUSTOMER

4.7 The DEU follows the FSL QAM with regard to requirements that pertain to section 4.7.

SECTION 4.8 COMPLAINTS

4.8 The DEU follows the FSL QAM with regard to requirements that pertain to section 4.8.

SECTION 4.9 CONTROL OF NONCONFORMING TESTS

4.9. The DEU follows the FSL QAM with regard to requirements that pertain to section 4.9.

SECTION 4.10 IMPROVEMENT

4.10. The DEU follows the FSL QAM with regard to requirements that pertain to section 4.10.

SECTION 4.11 QUALITY CORRECTIVE ACTION

4.11 The DEU follows the FSL QAM with regard to requirements that pertain to section 4.11.

SECTION 4.12 QUALITY PREVENTIVE ACTION

4.12 The DEU follows the FSL QAM with regard to requirements that pertain to section 4.12.

SECTION 4.13 CONTROL OF RECORDS

4.13 The DEU follows the FSL QAM with regard to requirements that pertain to section 4.13.1 with exceptions noted below in their corresponding section.

4.13.1.3 Access to DEU files is controlled according to DFS policies.

4.13.1.4 All electronically stored documentation are capable of instant retrieval and stored in such a manner as to prevent unauthorized access, destruction or deterioration. The DEU has controlled access to DEUNet as well as controlled physical access the data (badge access, retina scan) to prevent unauthorized access.

4.13.2 Technical Records

4.13.2.1 The DEU follows the FSL QAM with regard to requirements that pertain to section 4.13.2 with exceptions noted below in their corresponding section.

a) The DEU follows DEUSOP04 Case Creation and LOM02 Practices for Case Documentation and Report Writing.

b) The DEU does not use equipment that requires instrumental analysis or operating parameters.

c) The DEU photographs and documents evidence where applicable.

d) All results of examinations are recorded on appropriate DEU forms.

e) There are no calculations or data transfers in the DEU that are not part of a validated process.

f) All DEU Forms and reports have the name of the analyst performing the examinations. Initials may be entered electronically on each page and are equivalent to handwritten initials on the notes or forms as required.

g)The DEU'S Reports of Examination have numbered pages that indicate the total number of pages.

h) The DEU has DEUF06 Technical Review Checklist that is filled out by the analyst performing the technical review. All analysts performing technical reviews are authorized to do so. The DEU Technical Review Checklist (DEUF06) must be used by the technical reviewer and retained in the DEU case file.

4.13.2.3 Mistakes which occur in case documentation or records will be corrected digitally and the correction entered alongside the original documentation. No part of case documentation or records can be deleted. In the case of electronically stored records as in DEU, equivalent measures will be taken to avoid loss or change of original data such as saving a second copy of a form. [*LOM01 – Practices for the Examination of Evidence*].

4.13.2.3.2 Any change made to completed examination records generated and/or maintained in an electronic form shall be tracked by archiving the original copy in the case file. The final valid examination records shall be considered completed prior to any technical or administrative review of the records. All electronic records will be stored within the file structure of

the secure computer network. When possible, a forensic copy or "image" of the original evidence will be created. Both a Best Evidence copy and a Working Copy will be stored in DEU evidence and as part of the case file, respectively.

4.13.2.9 DEU does not utilize handwritten case notes. Exceptions will be made when an acquisition/examination is not done in the laboratory, following the appropriate DEU SOP. Computer generated notes are acceptable, and will be retained within the file system of the secure computer network**.** Initials may be entered electronically on each page and are equivalent to handwritten initials on the notes or forms as required.

4.13.2.10 Abbreviations and notations will be acceptable if they are clearly documented and readily comprehensible to the technical and/or administrative reviewer.

SECTION 4.14 INTERNAL AUDITS

4.14 The DEU follows the FSL QAM with regard to requirements that pertain to section 4.14.

SECTION 4.15 MANAGEMENT REVIEW

4.15.1 The DEU follows the FSL QAM with regard to requirements that pertain to section 4.15.

PART 5 TECHNICAL REQUIREMENTS

SECTION 5.1 GENERAL REQUIREMENTS

5.1. The DEU follows the FSL QAM with regard to requirements that pertain to section 5.1 with exceptions noted below in their corresponding section.

5.1.3 The DEU does not use reagents. This is not applicable to the DEU.

SECTION 5.2 PERSONNEL

5.2.1 The DEU follows the FSL QAM with regard to requirements that pertain to section 5.2 with exceptions noted below in their corresponding section.

5.2.1.1 Each sub-discipline within the DEU will have a documented training program that is used to develop an individual's knowledge, skills, and abilities required to perform forensic examinations. The DEU Training Manual outlines the acceptance criteria for each training module, where applicable. A trainee's successful completion of the training program will be documented by the unit manager, trainer or designee identifying the discipline(s) or sub-discipline(s) a trainee is qualified in. Such documentation will be maintained in the employee's training documentation file

5.2.1.2 DEU's training program includes training in the presentation of evidence in court.

5.2.1.3 Training should include the application of ethical practices in forensic sciences, a general knowledge of forensic science, and applicable criminal and civil law procedures.

5.2.1.4 The re-training of an analyst may occur when findings from a Quality Corrective Action or Preventative Action indicate that it is necessary. The DEU follows FSL's QAM for retraining of an analyst unless the QCAR or QPAR indicates otherwise.

5.2.2 Initial training and continuing education of laboratory personnel is an ongoing function of the laboratory. The DEU Training Program comprehensively covers all work performed by the unit and requires competency testing upon its conclusion. Specific sub-disciplines will list any special educational class requirements or certifications in their individual job descriptions.

Each scientist should take time to read periodicals, journals, articles, and in order to remain proficient in the field. The review of scientific periodicals and journals

is an important step in the continuing education and professional development of employees.

The DEU also ensures the development of employees via annual performance evaluations which begin and end with each fiscal year. It is the responsibility of both supervisor and staff to meet to establish goals, objectives and/or projects for an employee to complete. Mid-year meetings occur to allow for the supervisor and employee to discuss the progress of the employee or to determine if any areas warrant improvement. The DEU uses the performance evaluation system from the District of Columbia Department of Human Resources.

5.2.5 The DEU manager or designee issues competency memorandums that authorizes DEU employees to perform forensic examinations. DEUSOP17 Personnel Work Authorizations and Training addresses specific requirements for being authorized to work in the DEU. Records maintained of an employee's qualifications include education, professional experience, competency test results, proficiency test results and memos documenting successful completion of the training program(s). The aforementioned requirements also apply to contractors. These records will be maintained by the DFS Deputy Director for Quality.

5.2.5.1 Examiners who attend external training on new techniques will demonstrate competency in the new technique. Certification demonstrates competency. Employing new processes, techniques or procedures will be at the discretion of the unit manager or designee. For new hardware/software, DEUSOP16 Software/Hardware Validations, Verifications, Maintenance and Performance Checks is followed.

5.2.6 Technical Personnel Qualifications

5.2.6.1 Education

5.2.6.1.1 Scientists working in the DEU discipline will meet or exceed the educational requirements specified in the job announcement and/or description.

5.2.6.2 Competency Testing

5.2.6.2.1 All scientists, regardless of academic qualifications or past work experience, must complete a competency test or equivalent (e.g., certification) by achieving the intended results prior to assuming casework responsibilities in the DEU.

5.2.6.2.3 All scientists working in any sub-discipline of forensic science must satisfactorily complete competency testing in each sub-discipline prior to assuming casework responsibility in a sub-discipline where defined. A certification test can be used as a competency requirement.

SECTION 5.3 FACILITIES AND ENVIRONMENTAL CONDITIONS

5.3.1 The DEU follows the FSL QAM with regard to requirements that pertain to section 5.3 with exceptions noted below in their corresponding section.

5.3.4 The DEU is housed in a controlled-access facility. Access to and use of all DEU examination areas are controlled and limited. All visitors to the facility must pass through a screening area prior to their entrance. The dedicated examination areas within this facility are controlled by door locks, badge readers, biometric scanners and/or closed circuit television monitoring.

SECTION 5.4 TEST AND CALIBRATION METHODS AND METHOD VALIDATION

5.4.1 The DEU follows the FSL QAM with regard to requirements that pertain to section 5.4 with exceptions noted below in their corresponding section.

5.4.2.1 All procedures are validated before put into use in the DEU. If another accredited laboratory has validated the procedure or a standards entity (NIST) has done the validation, the DEU will consider the procedure validated. The reliability of a validated technical procedure that is new to the DEU will be confirmed in-house against any documented performance characteristics of that procedure prior to use on casework.

5.4.2.2.1 Infrequently performed testing within the DEU may require further verification before testing on evidence in conducted. Results of infrequent test may be verified with another tool or method.

5.4.2.3 The DEU does not use reference materials or reagents.

5.4.2.4 The DEU does not use standard materials or reagents.

5.4.2.5 See 5.4.2.3-5.4.2.4.

5.4.6 Estimation of Uncertainty of Measurement

The DEU is not a calibration laboratory or a testing laboratory that performs its own calibrations. There is no uncertainty of measurement in the digital evidence unit. This section does not apply to the DEU.

5.4.7 Control of Data

5.4.7.1 The DEU does not use calculations or data transfers.

5.4.7.2 When computers or automated equipment are used for forensic examinations, acquisition, processing, recording, reporting, storage, or retrieval of test data, the casework units will ensure that:

a) Computer software developed in-house is documented, evaluated and validated prior to use in accordance with DEUSOP16 Software/Hardware Validations and Verifications.
b) DEUNet houses DEU's test data. It is a secure, closed network only accessible by DEU personnel.
c) All computers in DEU are maintained and changes noted on their equipment maintenance logs found in the DEU laboratory.
d) DEUSOP16 Software and Hardware Validations, Verifications and Performance Checks pertains to DEU's specialized software.

SECTION 5.5 EQUIPMENT

5.5 The DEU follows the FSL QAM with regard to requirements that pertain to section 5.5 with exceptions noted below in their corresponding section.

5.5.1.1 DEUSOP16 Software and Hardware Validations, Verifications and Performance Checks pertains to DEU's policy regarding performance checking equipment within the DEU. This SOP also addresses the use of computer platforms and forensic tool performance checks.

5.5.2 Equipment and its software used for the examination of evidence must meet the requirements of the relevant standard operating procedure. Before being placed into service, equipment will be checked by the DEU to verify that it meets the unit's specifications. DEUSOP16 Hardware and Software Validation is followed. No equipment within the DEU requires calibration.

a) All DEU general service equipment is listed on DEU's non-maintenance equipment will be will be listed on the "Non-Maintenance Equipment Log" and does require service or updating.

b) Microscopes used by the DEU do not require calibration or maintenance. Their function within the DEU does not affect examinations or are used in any measurements.

c) The DEU does not use any volumetric equipment.

d) The DEU does not use any measuring-based equipment.

e) DEU computers and their performance checks are addressed in 5.5.1.1.

5.5.5 DEU will maintain records of each piece of equipment used for forensic examinations according to the *DOM05 – Practices for Instrument Calibration and Maintenance* where applicable. Equipment maintenance logs and performance checks are kept inside the DEU laboratory.

5.5.8 No DEU equipment requires calibration.

5.5.9 No DEU equipment is outside the direct control of the laboratory.

5.5.10 See 5.5.8.

5.5.11 See 5.5.8.

5.5.12 See 5.5.8.

SECTION 5.6 MEASUREMENT TRACEABILITY

The DEU is not a calibration laboratory, does not use equipment that requires calibration nor does the DEU use reference materials. The DEU does not require transportation and storage of such materials.

SECTION 5.7 SAMPLING

The DEU does not do sampling of evidence as part of its operation or as part of casework.

SECTION 5.8 HANDLING OF TEST ITEMS

5.8. The DEU follows the FSL QAM with regard to requirements that pertain to section 5.8 with exceptions noted below in their corresponding section.

5.8.4.1 Any evidence not in the process of examination must be protected from loss, cross-transfer or contamination. Digital evidence not under examination does not require a sealed container.

5.8.4.1.1 All evidence not in the process of examination will be maintained in an appropriate storage area which includes the DEU Laboratory evidence bench and the DEU Evidence Storage room. All evidence not in the process of examination will be maintained in an appropriate storage area within the laboratory or evidence storage.

5.8.4.2 Each item of evidence will be marked to ensure that it is uniquely identified and traceable to the DFS case number. Per the FSL QAM, if the evidence does not lend itself to marking, its proximal container (e.g., evidence bag) or identifying tag will be marked. In the DEU original evidence in the DEU is considered automatically returned to owner unless specified by requester and marking on container (e.g., evidence bag) is acceptable.

5.8.4.3 When evidence cannot be forensically copied or "imaged" and can only be recorded or collected by photography, the photograph(s) or will be treated as evidence. This excludes documentation photos of digital evidence where a "best evidence" copy is retained as evidence and the photos only document the condition of the device.

SECTION 5.9 ASSURING THE QUALITY OF TEST RESULTS

5.9 The DEU follows the FSL QAM with regard to requirements that pertain to section 5.9 with exceptions noted below in their corresponding section.

5.9.1 The DEU will have quality control procedures for monitoring the reliability of forensic examinations. The resulting data will be recorded in such a way that trends are detectable. Where practicable, statistical techniques will be applied when reviewing the results. Quality control measures may include, but are not limited to, the following:

a) DEU does not use reference materials.
b) Participation in proficiency testing programs;
c) Replicate tests using the same or different methods;
d) Retesting of retained items if applicable;
e) Correlation of results for different characteristics of an item of evidence.

5.9.3.5.1 When the proficiency test provider does not issues a "Pass" or "Fail", the Unit Manager will review the proficiency test questions and

answers and determine whether the scientist satisfactorily completed the test.

SECTION 5.10 RESULTS REPORTING

5.10. The DEU follows the FSL QAM with regard to requirements that pertain to section 5.10 with exceptions noted below in their corresponding section.

5.10.3 Additional Report of Examination Guidelines

5.10.3.1 A DEU *Report of Examination* may include additional information, deviations from, additions to, or exclusions from the test method and information on specific test conditions when it is necessary for the interpretation of the examination results.

5.10.4 Calibration Certificates

The DEU does not issue calibration certificates.

REFERENCES

ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories, International Organization for Standardization, Geneva, Switzerland (current revision).

ANAB™ ISO/IEC 17025 Accreditation Requirements for Forensic Testing Laboratories, ANSI-ASQ Accreditation Board, Alexandria, VA (current revision).

Departmental Operations Manuals (DOMs) (current revisions).

FSL Laboratory Operations Manuals (LOMs) (current revisions).

FSL Quality Assurance Manual (current revisions).

Unit Standard Operating Procedures (current revisions).