A. **Purpose**:

Within this document are general guidelines that are important for maintaining the integrity and forensic defensibility of the work performed within the Controlled Substances (CS) Unit. A controlled substance is generally a drug or chemical whose manufacture, possession, or use is regulated by a government entity (e.g., illicitly used drugs or prescription medications). Evidence is usually submitted for two (2) purposes – weight and qualitative examination. Currently quantitative analyses (other than weight measurements) are not conducted within the CS Unit. Comparisons of analyte quantities within evidence, as long as numerical values are not reported, can be considered qualitative and may be performed. Such requests usually come from evidence that has been suspected of being tampered or adulterated and accompanies known exemplars for comparison purposes.

B. **Scope:**

This document includes general information and describes the workflow related to the overall process of evidentiary examinations conducted within the CS Unit. Only qualitative analyses are conducted and quantitation (i.e., purity determination) is not currently perform. Comparisons of relative purities (without quantitation), however, are sometimes performed in order to determine of submitted evidence is consistent with being tampered or adulterated. Definitions related both to the CS Unit and other Units can be found within the appendix of this document

C. **Responsibility**:

Analysts assigned to the Controlled Substance Unit.

D. **Safety**:

Proper PPE must be worn whenever analyzing drug evidence. At a minimum proper ventilation (e.g., use of a powder-safe hood) will be used when potential hazards for drug exposure exist. Eye protection (e.g., safety glasses) must be worn when there is a potential for eye injury. It will be the responsibility of the employee to determine when proper eye protection will be used.

E. **Procedure**:

1. All analysts must work in a manner that provides safe working conditions for themselves and their co-workers.
2. Analysts should wear lab coats and disposable gloves will be worn while analyzing evidence. Gloves will be changed in-between different items of evidence, as well as between the use of

reference materials, so as to avoid contamination. Lab coats will be changed when there is an indication of contamination or when such activities warrant changing (e.g., residue analyses).

3. All evidence transfers are documented in LIMS-Plus when they occur. Personal identification numbers (PINs) are used in conjunction with staff [person-to-person] evidentiary transfers.
   a. In the event that an aliquot of evidence is split and transferred to a second analyst, a sub-item will be created in LIMS-Plus. The chain of custody will be maintained for all portions of evidence if said evidence is to be analyzed or returned.
   b. If an error is found within the chain of custody for a case then that information will be brought to the attention of the appropriate Lead Examiner (or higher). Certain QA actions will be taken to correct and document the issue.
4. All cases are opened, inventoried, and closed by analysts with the assistance of a witness, when needed.
5. A witness will verify the contents of the submission both during initial inventory and during the closing of a case.
6. Only one case should be opened and/or closed by an analyst at a time. This practice is in place to avoid mixing-up case materials.
7. All evidence sampling and transfers will include appropriate labeling (e.g., laboratory number and item identifiers).
8. Photographs may be taken of evidence, as appropriate. Photographs can be used to supplement case notes and allow analysts to minimize written notes. All photographs, whether used by an analyst during their examination(s) or not, will be retained within appropriate storage locations according to their case file(s). While hardcopies only need to be made which are necessary for a case, all digital photos must be retained.
9. Ink will be used for all casework documentation (Blue pens are preferred and red ink is discouraged).
10. Examination areas, surfaces, utensils, and any other such equipment will be pre-cleaned (e.g., methanol, ethanol, acetone) prior to an underlayment barrier (e.g., brown paper or equivalent) being placed down when analyzing all evidence in order to prevent contamination. Such cleaning is especially important when examining/analyzing drug residue evidence. For drug residue evidence disposable equipment (e.g., spatulas, pipettes) should be used and surfaces should be pre-tested for possible contamination prior to evidence being examined/placed down, whenever possible.
11. Evidence lockers are usually assigned to individual analysts and can contain evidence, aliquots of evidence, extracts of evidence, and other similar case materials. All such evidentiary materials will be stored under proper seal and kept locked when not being actively analyzed. All evidence within these lockers will be placed under proper evidence seal, when possible. Tamper-evident tote tags

should be used on the outside of evidence lockers (along with handwritten inked initials on the tags) at the end of a workday to ensure integrity of stored evidence inside a locker. Any incident where an analyst feels evidence or integrity of evidence may be of concern is required to contact the appropriate Unit Lead (and higher) for necessary QA action.

12. All non-common abbreviations used within worksheets and case notes should be defined within appropriate case documentation.
13. Analysts will follow laboratory procedures for case analyses. Significant deviations are changes in procedures which could adversely affect the results of experiments. If significant deviations from procedures are necessary then analysts must discuss the issue(s) with the appropriate Unit Lead (and higher) and obtain pre-approval using the QA process (such approval can additionally be documented in case notes). Minor deviations are changes in a procedure which do not adversely affect the results of an experiment. The analyst must document such deviations in the case file notes.
14. Laboratory areas (both examination and instrumental) will be kept clean. This is not only good laboratory practice, but it is also done to avoid case contamination and any exposure to chemicals, drugs, and/or biological materials.
15. All supplies and reagents will be stored in a manner so as to ensure that they are suitable for use and to preserve their integrity.
16. Consumable materials will be ordered to meet the needs of the laboratory testing that is performed. When orders are placed for items that can affect the quality of the testing, the ordered items must meet the needs of the test. When receiving items from a vendor analysts must verify the contents of what was received prior to using such materials in casework.
17. All reagents must be properly labeled and secured in a manner so as to ensure that they are suitable for use in case analyses. Analysts will store and maintain reagents with special handling requirements in a manner that meets said requirement. Manufacturer's information (e.g., MSDS, SDS) should be consulted when analysts are unsure of storage (e.g., refrigerator, solvent cabinet), use, or potential hazards.
18. All reagents and reference materials (with the exception of certified reference materials) that are used in case analyses must be validated before use with casework. In general, a reagent is deemed acceptable for casework use if the reagent gives results that are as expected whether it be for positive and negative use.
19. All standards must be stored to maintain their integrity. Manufacturer's guidelines should be followed.
20. Standards used for comparison purposes can be evaluated/validated at the same time that evidence is analyzed.

21. All instruments will be verified as operable and pass operating criteria prior to being used for casework.
22. Instruments should be maintained appropriately to maintain quality.
23. Instruments that do not meet daily QA requirements and which can't be corrected to meet said requirements will be marked as out of service and won't be used for casework until appropriate QA requirements are met.

General Case Flow in the CS Unit:

24. Cases are initially received from submitting agencies in the Evidence Receiving Unit (ERU) and then transferred the CS Unit. Evidence must be under proper seal during all transfers between sections.
25. A case file and paperwork is prepared for each case and barcode and milestone labels are usually included.
26. Case(s) are assigned to an analyst through LIMS-Plus and analysts transfer evidence from a storage location to themselves using LIMS-Plus.
27. Analysts will document and verify that evidence is under proper seal and has not been tampered since being transferred from ERU through the use of a witness.
28. The analyst will open a case with a witness so verification of evidence can be performed. Documentation of this action is recorded appropriately.
29. The inventorying of a case is documented using the appropriate Unit form(s).
30. If a discrepancy is found the analyst will note it and, depending on its nature, may halt the analysis until the issue can be resolved. If the issue jeopardizes the quality of the evidence, work will be halted on the case, the situation will be recorded within case documentation, and the Unit Lead (or higher) will be informed. Evidence Receiving Unit or Case management Unit personnel should be notified if administrative discrepancies exist. When an analyst contacts a submitting agency concerning a discrepancy they will record this communication and its resolution within appropriate documentation (e.g., case notes, entry in LIMS-Plus).
31. Once the inventory is acceptable and without issue an analyst can work independently.
32. Labels are made for the case and appropriate analyses will be conducted according to established procedures.
33. Weights are taken based on the case and following the guidance in procedures. Aliquots are taken based on case needs and following the guidance in procedures. Aliquots and evidence not actively being worked will be stored under proper seal within an evidence locker. Appropriate chain of custody will be maintained at all times.

34. Case paperwork is compiled (e.g., notes, instrument data sheets, worksheets) during analyses. Case notes describe the evidence and details of the analyst's observations and work. Pictures can be used to supplement case notes and it is acceptable to annotate case pictures with necessary information – just as long as critical information is not blocked. Case notes must be legible and can be recorded using the appropriate forms.
35. Two (2) samples are usually obtained from each piece of evidence and identifications are generally made when results from both samples are in agreement. This usually occurs when either two portions or two samples both result in the same conclusion. Findings should be recorded on appropriate forms.
36. Upon completing the analyses for a case conclusions are made based on the compiled data. Appropriate controls will have been used to ensure quality work (reference standards will have been used for positive controls and analyte-free materials will have been used for negative controls). Findings are entered into LIMS-Plus and the case is marked, 'Draft Complete.' The draft report should be placed in the case jacket and will be reviewed after a technical reviewer is assigned in LIMS-Plus.
37. Any corrections resulting from the technical review (TR) will be noted (e.g., within the appropriate area in LIMS-Plus). If corrections warrant a continuation of the TR then the reviewer will select 'Reject Findings' within LIMS-Plus and return the case to the analyst with enough explanation as to why the case was sent back for corrections. A discussion is always recommended so adequate communication between analyst and reviewer is ensured.
38. Prior to return of evidence to the Evidence Receiving Unit the case is re-inventoried and closed (sealed) by the analyst in the presence of a witness. Documentation of this action is recorded appropriately.
39. The evidence can be transferred into storage in the "Cases in Review" location until all the reviews have been completed.
40. After TR is successful the same process occurs with administrative review (AR) – along with the same method of communication and documentation within LIMS-Plus.
41. Anytime disagreements cannot be resolved during TR and/or AR, then an appropriate Unit Lead (or higher) will be consulted. Resolution to disagreements are usually accomplished either at the Deputy Director level or prior.
42. After all reviews are successful a final report is generated. The original report is maintained electronically within LIMS-Plus.
43. The analyst can make copies (e.g., 3) of the report and these copies along with the evidence can get transferred back to the Evidence Receiving Unit. Once of the report copies should get a sub-item within LIMS-Plus. This is for tracking purposes when the report copy is transferred to the submitting agency from ERU.

44. A supplemental report may need to be issued when additional evidence or additional work on evidence is performed (often at the request of the submitting agency). This supplemental report will be completed and issued having the same level of technical and administrative reviews as was done with the original report. It will be clearly marked as being a supplemental report and reference will be made to the original report (e.g., date of original report). Only supplemental results should be included in the supplemental report. It is not necessary to include results from the original report.
45. A revised (aka. amended) report is used when corrections are needed within the original report. This report will be completed and issued having the same level of technical and administrative reviews as was done with the original report. It will be clearly marked as being a revised (or amended) report and reference will be made to the original report (e.g., date of the original report). The before and after changes will be included within the revised report so that the reader will adequately know what was changed from the original report.
46. Distribution of supplemental and/or amended reports should be similar to original reports (i.e., trackable through sub-itemization in LIMS-Plus).
47. The report case file may be filed appropriately.

APPENDIX – Abbreviations and Definitions:

ACET: Acetone
Amph: Amphetamine
APAP: Acetaminophen ; Paracetamol ; N-acetyl-para-aminophenol
BB: Borate Buffer
BBX: Borate Buffer Extraction
Benzo: Benzodiazepine
bl: Blood
BM: Botanical Material
bndl: Bundle
cap: Capsule
CFB: Cocaine Free Base
CH: Cystolithic-like Hairs
CH P/A: Cystolithic-like Hairs present or absent
CHEP: Cyproheptadine
cmpd: Compound
coc: Cocaine
cont: Containing/Container
CPB: Clear Plastic Bag
CRM: Certified Reference Material
CS: Controlled Substance(s)
CSF: Cocaine Salt Form
CZLB: Clear Zip Lockable Bag
DS: Daily Standard
DSS: Division of Scientific Services
ea: Each
ECO: Evidence Control Officer
Encl: Enclosed
env: Envelope
EPB: Evidence Plastic Bag
ETOAc ; EACT: Ethyl Acetate
EtOH: Ethanol
evid: Evidence
FA: Fatty Acid
FTIR: Fourier Transform Infrared Spectrophotometry
g: Grams
GC: Gas Chromatography
GCMS: Gas Chromatography/Mass Spectrometry

GHB: Gamma Hydroxybutyrate ; Gamma-Hydroxybutyric Acid
HPLC/MS ; LC/MS: High Performance (Pressure) Liquid Chromatography/Mass Spectrometry
HS: Heat Sealed
Insol: Insoluble
IPA ; iPrOH: Isopropanol
IR: Infrared
IS: Internal Standard
K: Kilogram
KPBC: knotted plastic bag corners
KT: knot tied
liq: liquid
LIMS-Plus ; JT ; JTRAX: JusticeTrax® laboratory information management system (LIMS) software
LSD: Lysergic Acid Diethylamide
6-MAM ; 6-AM: 6-Monoacetylmorphine
Mar: Marihuana ; Marijuana
ME: Manilla-like Envelope
MeOH: Methanol
meth: Methamphetamine
mg: Milligram
mL: Milliliter
MS: Mass Spectrometry
NCS: No Controlled Substances
NDD: No Drugs Detected
Neg: Negative
NS: Not Scheduled
Num: Numerous
OCP: One Clear Plastic
op: Opioids
P1: Portion One
P2: Portion Two
p: Powder
PCP: Phencyclidine ; Phenylcyclohexylpiperidine
pdr: Powder
PE: Petroleum Ether
PKG: Package/Packaging
plb: Plastic Bag
PM: Plant Material
Pos: Positive
PPE: Personal Protective Equipment
Proc: Procedure

pwdr: Powder
PZB: Plastic Ziplockable Bag
QAQC ; QA/QC: Quality Assurance/Quality Control
QA: Quality Assurance
QC: Quality Control
rel: Related
res: Residue
RS: Rock Substance
Sol ; Sol'n: Solution
STD: Standard
RT: Retention Time
tbt: Tablet
tab: Tablet
THC: Tetrahydrocannabinol
Total U ; TU: Total Uncertainty
TX ; tox: Toxicology
TX Bag: Toxicology Convenience Bag
Uncer ; U: Uncertainty
ur: Urine
UV: Ultra Visible
UV/VIS: Ultraviolet/Visible Spectrophotometry
vol: Volume
WE: Weighing Events
wt: Weight
ZLB ; zip: Ziplockable Bag

Proper Seal: Packaging of evidence such that the material contained within the packaging is free from sample loss, contamination, and/or un-noticed deleterious change.

Visible Residue: A term used to describe an amount of a solid material that is visible within evidence and is in a quantity too small to be adequately isolated and weighed (e.g., less than a milligram of solid, a few particles of solid powder).

Non-Visible Residue: A term that can be used to describe evidence where no solid drug-like material is visible but which non-visible particles of potential analyte may be present.

Reference Standards: materials (usually pure) that are commonly purchased and which meet certain traceability requirements. Product information (e.g., purity, lot number, expiration date) are usually found on reference standard containers. These are sometimes referred to as pure standards and are commonly used to verify the identity of a detected analyte.

DEA Exempt Standard: Chemicals purchased or made in a concentration of 1mg/mL or less.

"Like" items: evidence within a case that have similar physical appearance, including packaging and contents.

Sample Selection: A process wherein evidentiary "Like" items, or portions of said items, are selected to be analyzed. There is no assumption of homogeneity – only that the "Like" items may contain the same material(s). Any reported analytical results will only be from items that were actually selected and tested. Results are only considered related to the whole population of the submitted evidence when all of the items have been analyzed.

Sampling Plan: A process wherein evidentiary items are analyzed and their results represent the entire contents based on a statistical plan. This plan can be used with multiple item populations and can be used to determine the number of samples an analyst needs to analyze in order for an inference about the whole submission (population) to be made. The CS Unit does not currently use a sampling plan. However, in the event that a customer requires a result which represents the entire submission's population, a Bayesian statistical approach will be used (e.g., SWGDRUG Sampling Plan) and use of the plan will be documented in the case.

Analyst: a scientist who has certain authorizations, such as to handle and analyze evidence in a particular discipline or Unit. They are typically responsible for the security of the evidence they handle, analytical work they perform, and reporting of results.

Toxicology Convenience Bag: a bag or container used by the laboratory for convenience. These are labeled as "TX" to demonstrate that they were added to the case by the laboratory.

Witness: An employee or authorized analyst within the DSS laboratory that can act as a verifier of an action. Although the witness may not be responsible for analytical work, they are responsible for verifying that an activity took place (e.g., evidence was sealed, number of items of evidence were received/returned, weight value was transcribed and/or recorded correctly).

Rev. #	History
6	Added guidance under section E.3, added a and b concerning itemization of aliquots and addressing chain of custody issues.
7	Updated Section A with more description of purpose. Moved Section C (Definitions) to the Appendix section. Added a section titled Scope. General reformatting of document. Updated Section C with more definitions (DSS, LIMS-Plus, Proper Seal, Residues, Reference Standards, Sample Selection, Sampling Plan, Analyst, Witness). Added powder-safe hood to Section D. Updated Section E regarding changing of PPE, usage of LIMS-Plus, information within LIMS-Plus, gave more clarification throughout section, updated retaining all photographs, emphasized cleaning of equipment/area, gave more instruction on use of evidence lockers and tamper evident tote tags for outside of lockers, described more QA aspects during case examinations, added description of positive/negative control usage, added description of administrative functions of case file documentation, emphasized chain-of-custody and proper seal of evidence/aliquots, described what needs to be done in LIMS-Plus during TR/AR rejections, general updates throughout section. Combined sections E and F (removed 'General Information') ; Created an appendix section and added definitions and more acronyms/abbreviations.