SAN DIEGO POLICE DEPARTMENT
FORENSIC SCIENCE SECTION

FORENSIC CHEMISTRY UNIT

NARCOTICS ANALYSIS UNIT POLICY

Issuing Authority: Frank Healy, Quality Manager
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1.0 INTRODUCTION

1.01 UNIT DESCRIPTION

A. The Forensic Chemistry Unit is budgeted for seven positions: one supervising criminalist, five criminalists, and one laboratory technician.

B. The unit is located at Police Headquarters. Narcotics analysis is performed on the 6th floor in the Forensic Chemistry Unit, located in rooms 617 and 618.

C. The criminalist positions in this unit are governed by civil service requirements that call for a four-year science degree as a minimum expectation.

1.02 UNIT FUNCTIONS

A. This unit performs controlled substance analysis, alcohol analysis, and coordinates the contracted toxicology analysis and blood drawing services.

B. General duties performed include:

1) Perform analysis on suspected controlled substances in the form of solids, liquids, pills, and plant material.

2) Court testimony regarding all aspects of analysis and interpretation of results.

C. Combinations of methods are used to identify controlled substances. These methods include:

1) Color tests

2) Microcrystalline tests

3) Microscopic examinations of plant structures

4) Raman spectroscopy

5) Infrared spectroscopy

6) Gas chromatography/mass spectroscopy

7) Literature, CD-Rom, and Internet references for pharmaceutical pill identification.

2.0 PERSONNEL AND JOB DESCRIPTIONS

2.01 SUPERVISING CRIMINALIST

The duties of the supervisor in the FORENSIC CHEMISTRY Unit include:

A. Supervise the analysis of controlled substances.

B. Ensure proper procedures are followed.

C. Review and initial final case packets to ensure proper documentation of analytical procedures.

D. Ensure adequate unit staffing levels every day.

E. Ensure that new analysts receive the proper training and pass appropriate competency tests, written tests, and mock courts.

F. Serve as a liaison between the contractors, department, district attorney's office, city attorney's office, and other end users of the laboratory.

G. Inspect logs and records to ensure unit policies are being followed.

H. Evaluate employee performance.

I. Prepare staff reports:

1) Budget requests

2) Monthly unit statistics

3) Special projects

J. Support and represent the staff in all professional endeavors in the unit to upper management.

K. Monitor and approve electronic time cards.

2.02 CRIMINALIST I & CRIMINALIST II

The duties of the criminalists in the Forensic Chemistry Unit include:

A. Analyze impounded evidence for controlled substances.

B. Maintain neat work environment.

C. Monitor instruments and arrange for repair as needed.

D. Prepare reagents as needed.

E. Prepare legible notes and/or reports on all substances analyzed.

F. Maintain proper chain of custody for evidence.

G. Testify in court on analyses when called to do so.

H. Keep supervisor informed of operations, problems, and unusual circumstances.

I. Maintain proper public relations.

J. Carry out special projects as requested by supervisor.

K. Act as a technical resource for the Department and others as needed.

L. Assist other analysts with training in analytical and administrative procedures and technical problems.

M. Participate in the development of new procedures.

N. Distribute reports to district and city attorneys when necessary.

O. Testify as controlled substance analyst expert.

P. Prepare monthly statistics.

Q. Prepare individual reports for detectives for crimes other than Health and Safety violations. These include vice cases, sex crime cases, and homicides.

R. Follow laboratory safety procedures.

S. Take annual proficiency tests with a passing score of 100% once fully trained.

2.03 Laboratory Technician

A. Order needed supplies for Forensic Chemistry unit
B. Prepare and stock reagents as needed.
C. Wash and stock lab ware as needed.
D. Assist in monitoring instruments and arranging for repair as needed.
E. Follow proper safety procedures.
F. Keep supervisor informed of operations, problems, and unusual circumstances.
G. Maintain proper public relations.
H. Carry out special projects as requested by the supervisor.
I. Participate in the development of new procedures, as needed.
J. Help maintain the narcotics standards.
K. Help maintain the reagent logs and perform quarterly checks.

3.0 SUBMISSIONS AND HANDLING

3.01 IMPOUND SUBMISSIONS

A. Narcotics evidence is submitted under an incident number. The items contained within the impound will be identified with unique barcode numbers. A barcode number can be used to identify one item, or multiple items within an impound.

B. Felony and in-custody cases are impounded at Headquarters in the property area on P-1. Narcotics vault personnel recover these impounds Monday through Friday.

C. Forensic chemistry criminalists receive impounds from the Vault personnel.

3.02 ITEMS NOT EXAMINED

See Narcotics Analysis Methods Manual.

3.03 SAMPLING PLAN

See Narcotics Analysis Methods Manual.

3.04 PRELIMINARY TESTING

A. Cases impounded on Fridays after the morning pick-up will be given the highest priority on the following Monday morning.

B. Cases impounded on the weekend should be analyzed by the end of business day on the following Monday.

C. Preliminary testing should routinely be completed by the end of the business day on the day first received by the analyst.

D. Turn-around times are subject to change based on staffing, numbers of examinations required for each impound, and complexity of the analysis required. Complex cases requiring

GCMS analysis are normally completed within three days of submission.

E. The supervisor may reallocate resources and may notify the District Attorney's Office or City Attorney's Office of any delays.

F. If a criminalist is called to court or must perform other duties prior to completion of preliminary testing, they may return unopened cases to the Narcotics Vault for analysis by the remaining staff.

3.05 FINAL REPORTS

A. Receipt of a court subpoena for a narcotics case is the notice that the evidence must be confirmed for trial unless we are notified confirmation is no longer needed. The subpoena must include the name of the defendant, the incident number, and the trial date. The criminalist who did the preliminary test will analyze these cases if possible. It is the criminalist's responsibility to ensure that the final work is completed and the review process has been completed prior to the court date. Generally, a minimum of five-work days' notice is required for final analysis.

B. Laboratory requests may be received from other units, such as Homicide or Sex Crimes, for narcotic analyses of substances seized during an investigation. The unit supervisor will assign these cases to criminalists. Those cases, when assigned, will be analyzed and confirmed, producing a final report.

C. The laboratory may receive faxed or emailed notification of a trial date from officers, detectives and prosecutors. The information must be routed through the clerical staff for tracking.

3.06 BUY PROGRAMS

A. There are two types of buy programs: Buy-Walk and Buy-Bust. Buy-Walk operations involve the purchase of controlled substances with an arrest occurring at a later time. A Buy-Bust operation involves the purchase of controlled substances and an immediate arrest. Those arrestees will be in-custody pending arraignment.

B. The narcotics detective will notify the vault and the forensic chemistry supervisor in advance of a buy program. The detective will provide the vault staff or the forensic chemistry supervisor with the following information:

1) Name and phone number of primary contact.

2) Operation code name that will be annotated on every impound.

3) Approximate start date and length of program.

4) Approximate number of impounds anticipated.

C. One criminalist will be assigned to work all impounds under a program. Buy program impounds are worked in addition to routine casework.

D. It is the responsibility of the assigned criminalist to ensure that all impounds submitted have been analyzed.

E. Criminalists must keep the supervisor apprised of the status of each program.

3.07 PRIORITIZING DRUG CASEWORK

A. Preliminary case impounds, including in-custody buy-bust cases, should be prioritized by date received, followed by area station impounds. Routine cases are analyzed first, followed by bulk impounds. Urgent requests for cases going to court may have priority.

B. Buy-walk program impounds and other assigned cases are to be worked as time permits between the higher priority casework.

3.08 ASSIGNMENT OF SUBPOENA CASES

A. Electronic subpoenas are received in the clerical office. They are logged, by trial date, at the receptionist desk. One portion of the subpoena is stamped indicating receipt, and is returned to the District Attorney's office. The second portion is forwarded to a criminalist for action.

B. Criminalist s will review the subpoena and ensure all necessary information is provided and processed as follows:

1) Ensure testing has already been completed for preliminary hearings. This can be accomplished by checking the county database. If the preliminary report has been issued, no further action is required. If the required work has not been completed (i.e. marijuana cases that have not been examined), the subpoena will be assigned by the supervisor.

2) Ensure all subsequent names and incident numbers are provided.

3) Verify the original criminalist who performed the preliminary testing.

4) Trial case subpoenas, a copy of the subpoena will be given to the criminalist. Annotate the date the copy was provided.

C. Each criminalist is responsible for checking the status of the trial and ensuring that the required analysis is completed before the trial date. The supervisor will be notified in the event the work cannot be completed in time.

3.09 IMPOUND RECEIPT AND RETURN

A. Impounds are stored in the Narcotics Vault. Each criminalist signs using the electronic signature pad indicating receipt of the impound.

1. Generally, cases will be returned to the Vault at the end of each day. Exceptions follow in #2 below.

2. Daily impound cases not returned to the Vault at the end of the day, will be stored in locked cabinets or sealed at the criminalist's bench overnight in the Forensic Chemistry Unit.

3. Cases stored in locked cabinets will be closed.

B. No criminalist should accept an impound directly from an officer. It must be received through the Vault.

C. Evidence transferred between vault personnel and criminalists must be hand-to-hand, and signed for using the electronic signature pad in the presence of the appropriate individual.

D. All evidence transfers of impounds will be handled through the Vault.

3.10 SEALING OF EVIDENCE (See General Quality Assurance Manual Section 8)

A. Unsealed evidence will not be accepted for analysis. The Vault has procedures to deal with this issue.

B. Whenever possible, impounds should be opened in a manner that maintains the original evidential seal.

C. No more than one impound will be opened at a time for examination.

D. All items with suspected controlled substances are generally sealed in clear plastic bags. Unanalyzed suspected controlled substances may be placed with the analyzed item or in a clear separate plastic bag.

E. Following examination, all items with suspected controlled substances will be annotated to include at a minimum:

Barcode #
Initials

F. Following examination, the impound will be sealed using the department issue evidence tape. The seal should run across the outer opening of the impound. The criminalist must initial and date across the seal and onto the impound itself.

G. The evidence seal should be placed, whenever possible, in such a location as to not cover another person's seal.

3.11 REVERSE STING OPERATIONS

A. The request for sting material may be requested through the Forensic Chemistry Unit or the Narcotics Vault supervisor. The Forensic Chemistry Unit supervisor will appoint a sting operation criminalist to coordinate the preparation and subsequent analysis of the samples. The criminalist will check out the selected samples from the Vault and break or separate the material into the appropriate sample weights. The weighed samples are photographed and a code is assigned to each sample. The material is placed into a marked plastic bag, heat sealed, and returned to the Vault.

B. When the material is re-impounded, the original criminalist, if possible, will reweigh the impound, recording the weight. Any irregularity in the coding system (such as partial or complete obliteration), a significant weight discrepancy, or an apparent significant difference between the material received and the original material will require retesting of the material. Final analysis will be done on an "as needed" basis.

3.12 HANDLING/REPACKING ITEMS FOR FINGERPRINT PROCESSING

A. Impounds annotated “Hold for Prints” will be handled in a manner to preserve possible fingerprints. Criminalists will wear a fresh pair of gloves when working with these cases to prevent the possibility of depositing their prints on items. Cotton liners can also be worn under the gloves to further prevent the deposit of prints.

B. Items that may be processed for fingerprints should be handled as little as possible and in areas generally not suitable for print processing. The criminalist should handle the evidence carefully to prevent the obliteration of possible prints.

C. Paraphernalia such as pipes or spoons are generally not examined. They can be left in the impound envelope without processing or analysis.

D. If money is found in the impound in an amount of $20.00 or less, the criminalist shall note the amount in his/her notes. If the amount is greater than $20.00, the criminalist shall note the amount in his/her notes, and will email the officer a notification so that the money can be impounded properly. No analysis shall take place until the money has been removed from the impound. The email will be copied to Vault personnel as well as the Quality Assurance manager.

E. The clerical staff receives requests to process narcotics evidence for fingerprints. If the impound has been analyzed by a criminalist, the clerical staff will annotate “-N” on the top of the request and forward a copy of the request to the original criminalist.

1. The criminalist will obtain the impound from the vault.
   a. The criminalist will remove and repack any suspected controlled substances into clear plastic bags with tamper-resistant seals annotating that it is a repack and identifying the barcode, date, and initials.
   b. The criminalist will repack the original packaging to be processed for fingerprints into a second package and annotate that it is the original packaging with the barcode, date, and initials. Other items that may be suitable for fingerprint processing should also be placed in this second package.
   c. The crime scene unit can be contacted if the criminalist has any questions about items suitable for fingerprint processing.
   d. Once the original packaging has been repacked for latent print processing, a new barcode must be

generated in the FileOnQ system using the following procedure.

i. Open the desktop version of the FileOnQ program and type the incident number into the incident number field.
ii. Select “New.” This will generate a new screen with the original case information automatically filled in.
iii. Fill in the appropriate information for the newly created item, including the item type, date and time the item was generated, and criminalist generating the item.
iv. The “Additional Description” field should be annotated with information indicating the originating barcode number and a brief description of the newly generated item.
v. A new barcode label must be printed and attached to the outside of the new impound envelope. Use the “Print Barcode Label” button to print labels.

e. The original and newly generated packaging will be returned to the Vault for storage.

2. The criminalist will add a “+” to the “N” designation indicating that the items have been repacked, and will include the new barcode number, date and their initials. A copy of the request will remain with the case packet as an administrative document. The original will be placed in the crime scene unit’s mail bin for printing. The “+N” sign will signal the crime scene unit supervisor that the impound is ready for fingerprint processing.

3. The criminalist will not repack large seizures of controlled substances for fingerprint processing.

4.0 POLICIES

4.01 UNIT POLICIES: DRUG ANALYSIS

See Narcotics Analysis Methods Manual.

4.02 ACCEPTABLE CRITERIA FOR PRELIMINARY REPORTS

See Narcotics Analysis Methods Manual

4.03 ACCEPTABLE CRITERIA FOR FINAL REPORTS

See Narcotics Analysis Methods Manual

4.04 ACID NEUTRALIZATION PROCEDURE

A. During analysis of narcotics, small amounts of acid are generated in spot wells on plates. The plates are placed in a stoppered sink with water and sodium bicarbonate.

B. Prior to discharge into the sewage system, the water solution will be checked with pH paper to ensure a neutral pH (pH range of 6.0-9.5). The minimum safety equipment worn by the criminalist neutralizing the acid or washing spot plates includes gloves, safety glasses, and a lab coat.

C. A neutralization log will be kept to record the date, operator initials, type of waste treated, approximate amount, and the pH determined after treatment.

4.05 GAS SUPPLIES AND ROOM 138 SUPPLIES

A. The laboratory technician will ensure Room 138 is stocked for use. Supply requests, including lab-wide supplies, will be processed through the laboratory technician responsible for ordering supplies.

The gas delivery truck driver brings filled compressed gas tanks to the Police Department and removes the empty tanks. The tanks are currently stored in the Sally Port on the first floor. The laboratory employee that meets the driver and escorts him/her into

the building will be responsible for signing the invoice and providing a copy of the invoice to the clerical staff.

4.06 CRYSTAL TEST WASTE

A. Waste generated by crystal testing will be placed in a sharps container that has had the biohazard labels defaced. These containers will be included as part of the narcotics burn.

4.07 MINIMUM TESTS FOR "NO CONTROLLED SUBSTANCE DETECTED" (NCSD), AND "NO CONTROLLED SUBSTANCE" (NCS) RESULTS

See Narcotics Analysis Methods Manual

4.08 ABSENCE NOTIFICATION

Forensic Chemistry staff must notify the unit supervisor if they will be absent.

4.09 CONSUMING SAMPLES FOR ANALYSIS

See Narcotics Analysis Methods Manual

4.10 MARKING ANALYZED ITEMS

See Narcotics Analysis Methods Manual

4.11 DEFENSE REQUESTS FOR EVIDENCE (See Laboratory General Policy, Discovery Responsibilities, p. 9-3)

A. The laboratory will comply with court orders for release or splits of evidence.

B. Samples will not be released until a final laboratory analysis has been completed.

B. Whenever possible, the original criminalist will prepare the sample for release.

C. When splitting a sample for release, the criminalist must generate a new barcode in the FileOnQ system for the newly generated sample following the procedure outlined in section 3.12 E.

D. The case packet will be annotated indicating the weight of the material prepared, the incident number, barcode, date and initials of the criminalist. A copy of the court order will be attached to the case packet.

E. The item to be released and the copy of the court order received will be turned in to the Vault for release.

5.0 REPORTING

5.01 REPORT FORMAT

A. Criminalist's final conclusions are recorded in a Microsoft word report template, generated by the narcotics database during the course of analysis.

B. Each report must include:

1) The name of the defendant(s) listed on the impound tag

2) Incident #

3) Arrest/incident date

4) Barcode #

5) Packaging information, including the type of containers

6) Description

7) Net weight (See K.)

8) Criminalist's name

9) Date of analysis

10) Examinations performed and results obtained

11) Initials and date of technical and administrative reviewer.

C. The note pages will be numbered. The total number of pages will be annotated on the first page of the notes. If subsequent pages are added to a packet, a new page number total will be added to the first page of the notes.

D. All note pages will contain the incident number, criminalist's initials, page number, and the date. Barcodes are used to identify items within the note pages. Abbreviated item identifiers may be used instead of barcodes, if a key clearly associates those numbers with the barcodes.

E. The report and case notes will be maintained with the laboratory case files.

F. Notes must be legible; abbreviations must be common and understandable, or listed in the abbreviation list; permanent ink must be used.

G. Corrections and/or interlineations (inserted notes) will be initialed. If the corrections or interlineations are done on a date other than the date listed on the bottom of the report or on the note page, the correction/interlineations(s) will be dated.

H. Reference materials and sources relied on to form conclusions will be noted. This includes the specific GCMS library program, Drug I.D.Bible edition and page, Ident-A-drug, etc.

I. If multiple items are examined, the report must specify which items are included in the color, crystal, visual, and instrumental testing.

J. The measured uncertainty for any reported net weight will be included in the footer of all preliminary and final reports. (See the uncertainty determination binder for the unit's current determined uncertainty values.) Balances are checked using NIST certified weights on a quarterly basis.

K. If a criminalist's balance is replaced, subject to repair, or found to be out of compliance the uncertainty of measurement for that balance will be re-established to see if there is an effect on the reported uncertainty.

5.02 DISTRIBUTION AND RETENTION

A. Reports are faxed or emailed on a -regular basis to their appropriate end users by the clerical staff.

B. Final reports are faxed or emailed following administrative review to the District Attorney's Office or City Attorney's Office.

C. Results are entered into the Narcotics Database prior to generating a written report.

D. Attachments (printouts, correspondence, notes, etc) will be attached to the report. Original reports will be filed in the Narcotics Files located in the clerical area. The clerical staff, following faxing or emailing of the reports, will file narcotics packets.

E. Narcotics packets are filed after scanning by incident number and year of most recent analysis. Files will be maintained for the current year plus the previous 2 years; only the electronic file will be kept after this time period.

F. Reanalysis reports will be stapled on top of any original reports and filed by the reanalysis date. The notes page will be annotated to indicate a reanalysis of another criminalist's case.

5.03 REQUESTS FOR REPORTS

A. Completed reports should be faxed or emailed directly to the appropriate office if a – number or email is provided..

B. Requests for subsequent copies of reports will be referred to the clerical staff. The clerical staff will pull the case packet and fax or email a copy to requesting law enforcement personnel.

C. Defense attorneys will be referred to the prosecutor's office for copies of reports involving criminal cases.

D. Requests for copies of reports for civil cases will be referred to the unit supervisor.

E. Requests for reports by other agencies will be referred to the narcotics detective to avoid possible conflict with criminal investigations.

5.04 DATABASE IMPORTS

A. Each impound must be imported into the Narcotics Database from the FileOnQ database by the case criminalist. Impounds are imported using the following steps:

1) Open the Narcotics Database by clicking on the desktop icon.
2) Click the "Scan Barcode" button.
3) Type or scan the barcode(s) affixed to the outside of the impound envelope to be imported. Impounds can be scanned individually or in a batch.
4) Select "Import." Close the window by selecting "Return" after the hourglass disappears.

5.05 STATISTICS

A. Currently, each criminalist reports their daily activities on individual monthly stat sheets due to the unit supervisor by the 5th workday of the following month. Narcotic stats will include:

1) Number of preliminary cases examined, and the number of items examined.

2) Number of court cases examined, and the number of items examined.

3) Number of court appearances.

4) Training time, specials projects, and other activities may also be reported.

B. For clarification, exhibit examined represents one item:

If a plastic bag contains six balloons and three are analyzed, this constitutes three items for statistical purposes.

One written report represents one case.

6.0 EQUIPMENT

6.01 NARCOTICS EQUIPMENT LIST

A. The Forensic Chemistry Unit utilizes the following items of equipment:

1) GC Mass Spectrometer: for rapid separation of drug compounds. The separated component is then fragmented by electrons into ions to form the mass spectrum. The computer does a comparison of the data and provides various options for identification of substances.

2) Polarized Light Microscope: For monitoring the various stages of crystal growth during a microcrystalline test. High power magnification is employed (100x).

3) Stereomicroscope: For low power magnification needs (4-40x approximately). The stereomicroscope is used for examining the plant hairs and structures of suspected marijuana.

4) Electronic Balance: For the weight determination of all drug substances and in making reagents.

5) Incubation Oven: For drying or catalyzing chemical reactions through the addition of heat.

6) Heat Sealer: Certain drugs (PCP) or impounds with obnoxious odors are placed into a special plastic bag and sealed with a heat sealer.

7) Fume Hood: Provides a safer environment by providing a place to work with chemicals (color tests, liquid chromatography, extractions, etc.).

8) FTIR: For rapid identification of drug compounds and their isomers. Chemical groups within a sample respond to absorption of infrared light by producing vibrational bands. Infrared bands arise from an interaction between light and the oscillating dipole moment of a vibrating molecule. The comparison of those bands and their intensities to a reference spectrum allows for an identification of the unknown.

9) RAMAN: For rapid identification of drugs, including some mixtures and ones contained in packaging. The chemical groups within a sample produce inelastic scattering bands during excitation with monochromatic laser. The comparison of those bands and their intensities to a reference spectrum allows for an identification of the unknown.

6.02 EQUIPMENT PERFORMANCE EVALUATION

A. The polarized light microscopes, stereomicroscopes, and electronic balances are all serviced annually. Equipment service records other than for microscopes are kept with the instrument. Calibration checks on the balances are performed quarterly by the laboratory staff.

B. The GC/MS is covered by a service contract for repair and maintenance. Auto tunes are conducted weekly and after any maintenance. Unit criminalists conduct periodic cleaning and maintenance of the GC/MS. Problems, maintenance, etc., are documented in the individual instrument maintenance binder located in the GC/MS room.

C. If the result of any auto tune does not meet acceptable criteria, no casework will be conducted using that piece of equipment until the tune problem is resolved.

D. The FTIR and RAMAN are covered by a service contract for repair and maintenance. The calibration and maintenance binders are located near the instruments.

E. Other repairs are called in as needed on the other equipment.

7.0 QUALITY ASSURANCE

7.01 GENERAL QUALITY ASSURANCE

General Quality Assurance Policies are under separate cover.

7.02 REAGENT PREPARATION/TESTING

A. A narcotics reagent log will be maintained on all reagents used within the unit. The information provided will include the name of the reagent, the type of test it is used for, specific directions for preparation of the reagent, and the expected results when used.

B. Each reagent will be tested prior to use in casework with a verified standard. The testing date will be the lot number for the new reagent and indicate the first date of use. The new reagent will replace the previous reagent when the new reagent is tested. The test used to validate the reagent will be described along with the specific expected results of testing.

C. Stock bottles containing reagents will be identified by a lot number. This number should correspond to working bottles obtained from the parent stock.

D. Reagents will be tested for validity when first put into use, quarterly, and prior to use in casework. Reagents will also be tested whenever there is a suspicion of a problem. If there is a problem with a working solution, the contents will be discarded, bottles cleaned, and refilled with fresh stock solution. The stock solution should be tested at that time. All reagents located on the main hood or at the criminalist's benches, will be tested on a quarterly basis.

1. Each criminalist will perform the tests on their own color and crystal test reagents. A designated criminalist will perform the tests on the color test reagents in the main hood. Test results will be documented on the Color/Crystal Reagent

Working Solution QC log. Log sheets will be maintained in the forensic chemistry unit reagent log binder.

2. A binder will be kept for standards and a separate binder for reagents. The binders will track in-use standards, reagents, and lot numbers.

3. Only previously validated drug standards may be used for confirmatory testing. Secondary drug standards approved for use may be used if they have been validated by instrumental means prior to use as drug standards. All drug standard validation documentation must be maintained in the standard binders.

E. Reagents housed in the main fume hood are monitored for stocking purposes and label condition.

7.03 REAGENT BOTTLE LABELING

Working solutions located in the main hood are labeled with the name of the solution, specific hazards associated with it, and lot number. Additional information is located in the reagent binder. Stock solutions must be labeled with the name of the reagent, and lot number. Chemical and standard containers will be labeled with the date received, and criminalist's initials.

7.04 STANDARD PREPARATION

A. A narcotics standard log will be maintained on all standards used within the unit. The information provided will include the name of the standard, and the storage location. Each standard will be assigned a laboratory lot number for tracking purposes. Applicable lot numbers and expiration dates, if known, will also be maintained.

B. Validation of standards will be done via instrumental analysis and manufacturer certificates, when possible. When not possible, either of the two is sufficient. The instrumental data will be evaluated as outlined in the Narcotics Methods Manual.

C. Validation information and manufacturer certificates of analysis will be held in binders labeled "Standard Validations," by name of standard, located in the Forensic Chemistry Lab.

D. Verified standards will be identified by a green sticker and the letter "V." Non-verified standards will be stored in a different location.

E. Standards will be stored according to manufacturer specifications. Standards stored refrigerated or frozen will be monitored weekly using thermometers whose calibration is traceable to NIST. If temperatures fall out of range, the standard will be revalidated. If the standard cannot be validated it will be discarded.

7.05 STANDARD LABELING

Standards must be labeled with the name of the standard, the standard lot number, the date received or date inspected, and initials. This does not apply to GCMS vials prepared for instrumental analysis.

7.06 BALANCE CHECKS

A. Calibration Checks
Bench top balances will be checked for calibration in-house on a quarterly basis using NIST traceable standard weights. Worksheets will be completed by the laboratory technician. Following review by the unit supervisor, completed worksheets will be maintained in the Maintenance binder. An outside vendor will perform calibration and maintenance of the balances on an annual basis. The NIST traceable standard weights will be calibrated every four years by an outside vendor. The outside vendor must be capable of providing NIST traceable calibration. The quality assurance manager will make arrangements for the outside service. The weights will then be checked annually after balance calibration.

B. Uncertainty of Measurement
This will be done if there is any maintenance done on a balance that would affect weighing capability or a new balance is purchased. The maximum calculated repeatability and linearity measurements along with manufacturer specified readability are incorporated in the calculation of combined standard uncertainty. Expanded uncertainties are calculated for both the 95% and 99.7% confidence intervals. Measurements will be taken using NIST-traceable weights, including: ten replicates of each 0.010 g, 1 .000 g, 10.000 g, 50.000 g, and 100.000 g; and 20 replicates of each 0.020 g, 2.000 g, and 20.000 g. The maximum standard deviation from all of the weights on all the balances is used in the uncertainty of measurement calculations. Over the course of 5 days (not necessarily consecutive), analysts perform measurements using a set of NIST traceable weights on their balances with 4 different target measurements. The 4 measurements are 0.050 grams, 5.000 grams, 40.000 grams, and 200.00 grams. Analysts will record values in both the morning and the afternoon, and will do individual placement of weights for an overall sum and a total weight.

Analysts also place the weights in different positions on their weighing pan. The numbers are plugged into the following formula:

$$U_c = \sqrt{u(\text{readability})^2 + u(\text{repeatability})^2 + u(\text{linearity})^2}$$

$U = k * u_c$ Where U is the expanded uncertainty and k is the coverage factor.

All measurements will be kept in the uncertainty binder including the worksheets generated to record balance measurements.

When a new criminalist is added to the unit, the uncertainty of measurement will be determined on their analytical balance to confirm that the reported uncertainty is not effected. If there is an effect, the reported uncertainty of measurement will be recalculated.

7.07 GC/MS CALIBRATION CHECKS

GC/MS instruments will be auto tuned weekly when in use. Auto tune reports are kept on file in chronological order in binders kept with the instruments. The criminalist or laboratory technician who runs and evaluates the auto tune will initial it prior to filing it.

A mix of laboratory standards close in elution times along with low and high molecular weights will be run quarterly on the universal method, with the results filed in the instrument binder, to check the GC/MS. This system check will ensure that the retention times of related compounds can be separated and each component identified.

7.08 FTIR and RAMAN CALIBRATION CHECKS

A. <u>FTIR (quarterly)</u>

1. A VAL-Q calibration check.
2. A Thermo Fisher polystyrene standard will be run under the same conditions as evidential samples.

B. <u>RAMAN</u>

1. Alignment and calibration of the laser on the RAMAN must be performed within the 30 days prior to use as well as quarterly. The instrument notifies the user when this is required.
2. A Thermo Fisher polystyrene standard will be run quarterly under the same conditions as evidential samples.

7.09 PERFORMANCE CHECKS

If the result of any performance check does not meet acceptable criteria, no casework will be conducted using that piece of equipment or that reagent until the performance problem is resolved.

7.10 TECHNICAL AND ADMINISTRATIVE REVIEWS

A. Reports will be technically and administratively reviewed prior to dissemination following established review criteria.

B. Technical reviewers must have a current satisfactory proficiency test or be signed off in the drug category in forensic chemistry. The reviewer will look at all technical worksheets, datasheets and printouts within the case packet. At the completion of his or her review, the reviewer will sign the report and the first page of the criminalist's notes on the lines designated for the technical review.

C. Administrative reviews on preliminary packets are generally performed by the unit supervisor. The administrative reviewer also initials the report and criminalist note pages.

D. The type of review conducted must be identifiable. If not otherwise specified, a "T" by the initials indicates a technical review, and an "A" indicates an administrative review.

E. Narcotics database entries are checked by the person entering the data. They are also checked by each reviewer.

7.11 CASE REVIEW CRITERIA

TECHNICIAL REVIEW **Performed by peer on all preliminary and final reports.**
Name(s), incident number and barcodes (or defined identifiers) are properly recorded on notes/reports
Evidence packaging and seals are described
Proper laboratory approved procedures were used
Tests conducted/attempted and results obtained were documented
Appropriate controls/standards/blanks were used
Supporting data/records/photos/printouts/diagrams for tests are included
Instrument operating parameters are recorded or saved
Criminalist's results or conclusions are reasonable/appropriate and supported by the data/notes/comments
ADMINISTRATIVE REVIEW **Performed by unit supervisor or designee.**

Reports are complete
All pages are numbered indicating the total number
Writing is legible
Notes and records are permanent (i.e. ink)
Corrections are made by an initialed single strikeout; no info is obliterated or erased
Incident number, criminalist's initials, and dates are on each page and all supporting documents.
Barcodes (or defined abbreviations) are used to identify items within the note pages. Abbreviations are clearly defined with barcodes.
Abbreviations are comprehensible
A technical review has been performed by a qualified criminalist
Criminalist has addressed (corrected or otherwise resolved) all concerns raised by the technical reviewer

7.12 IMPOUNDS RECEIVED WITHOUT SUBJECT NAMES

Impounds without suspect names will not be routinely analyzed unless they are part of a buy operation or with a Forensic Chemistry request approved by the supervisor.

8.0 COURT

8.01 GENERAL COURT POLICIES

General court policies are under separate cover.

8.02 TESTIMONY REGARDING EFFECTS

Testimony to the physiological effects of narcotics substances are handled by the on-call detective experts in the narcotics section

8.03 COURT EVALUATIONS

The supervisor generally performs court evaluations. When necessary, a phone conversation with the attorneys involved in the case may be used as a substitute.

8.04 COURT ON-CALL POLICY

Although the laboratory receives subpoenas, the criminalists operate on an "on-call" basis only. Criminalists will not appear on the basis of a subpoena alone. A criminalist should be placed on-call when the actual date of the trial is finalized. A phone call to the criminalist is required to place them on-call. The criminalist should be placed on-call no later than the day before they are needed to allow time to prepare the court packet. The prosecuting agency should maintain close communication with the criminalist on the day needed and allow a one-hour response time for court.

8.05 PROCESSING SUBPOENAS FOR DRUG CASES

A. Subpoenas arrive in batches and are logged in by trial date. The clerical staff processes subpoenas and places them in the Forensic Chemistry bin for dissemination as needed.

B. Each criminalist is responsible to follow-up on his or her subpoenas. Most will be resolved without trial. The criminalist will need to track his or her cases electronically and ensure final reports are completed prior to set trial dates.

C. Court cases can be tracked as follows:

1) "Trial-Jury" or "Superior" court cases can be checked for readiness hearing dates (this may also be called "dispo") on the County Computer System (CCS hereafter).

2) To access the CCS, click on the icon. Enter your ID# and your password. On the Command line type PRD then the right hand ENTER. Hit the Pause Break button to clear the screen.

3) Type "DA10" space. Now type the D.A. No. or Prosecutor's Case Number listed on the subpoena. Hit right hand ENTER. An example of a No. is B4326001. If the D.A. or Pros. No. has an "M" or no letter, a Q must be added in front of the number. The number must be 7 digits long. If only 5 are listed, add a 01 - defendant, 02 - 2nd defendant, on the end.

4) Write the readiness date on each subpoena:

a) If no readiness hearing is listed, you must assume the case is "set"/"confirmed" (going to court) unless you call and find out otherwise.
b) Sometimes the readiness will have taken place before you check it on the computer. If so, the results will be listed.

5) All "Superior Court" or "Jury-Trial" cases can be checked on the computer a couple of days following the readiness. If not listed, the appropriate phone number on the subpoena must be contacted.

6) a) Any subpoenas with a readiness result of

VACATED
PC1000
CALLED OFF
PLEAD GUILTY
PRELIMINARY EXAM CONTINUED
SENTENCING INFORMATION

should be marked as such and filed.

b) Any subpoenas with a readiness result of

SET
CONFIRMED
will be checked out from the vault for final analysis.

9.0 TRAINING

9.01 NARCOTICS ANALYSIS TRAINING OUTLINE

All Forensic Chemistry criminalists will receive Training Block I. Training Blocks II – VII can be completed in any order, and will be based upon the training needs of the section. . A formerly trained or experienced Forensic chemist may complete the Training Blocks in a more abbreviated form, based upon past training, but will complete a competency test, written exam, and co-signed casework, prior to performing independent casework analysis. The Reading List can be amended with appropriate and more current references.

Installment 1
Introduction

A. Review of Forensic Chemistry Narcotics Analysis Unit Policy and Methods Manual

B. General Training Plan
   1. Lecture and demonstration of procedure by senior criminalists as well as general knowledge of Forensic Science
   2. External training (available classes and professional organizations)
   3. Participation in professional meetings/seminars/study groups
   4. Training itinerary to be completed for each block of training
   5. Court testimony and Presentation of Evidence
      a. Lab policies and general court procedures
      b. Observation of other criminalists
      c. Notes
      d. Standards/blanks
      e. Computer library/Sequence of Color, Crystal, GCMS tests
      f. Prop 115s
      g. Criminal and Civil Law Procedures
   6. Reference materials

C. General Procedures
   1. Notes and casework documentation
   2. Proper weighing procedures
   3. Use of reagents and controls and log sheets
   4. Number of samples out at any one time
   5. Opening sealed evidence
   6. Sealing and labeling of evidence

7. Cleanliness of work area
8. General case approach
    a. Number of items per case
    b. Inventory process
    c. Sample handling techniques
9. Evidence storage
10. Chain of custody
11. Discrepancies
12. Subpoena process and policies
13. Case assignment process
14. H&S Schedule
15. Reference materials
16. Pill cases
17. General analytical scheme
    a. Color tests
        1) Documenting color tests
        2) Use of standards/blanks
    b. Crystal tests
        1) Documenting crystal tests
        2) Use of standards/blanks
    c. Instrumentation/other
        1) GC/MS
        2) IR
        3) Raman
18. Databases
    a. Narcotics
    b. FileOnQ
    c. CRMS
    d. CCS
19. Quality Assurance
    a. Quarterly checks
    b. Maintenance
20. Ethical Practices in Forensic Science

Installment 2
Phenethylamines

A. General
   1. Drug class
      a. Stimulants
      b. Sympathomimetic amine
      c. Effects
      d. Background
      e. Form of use

   2. Synthesis and structure
      a. Stereochemistry/isomers
      b. Forms
         1) Powder/crystalline
         2) Liquid
         3) Tablets
      c. Precursors

   3. Common packaging
      a. Plastic bags
      b. Paper bindles
      c. Vials

   4. Ingestion
      a. Injection
      b. Oral
      c. Inhaled

B. Analytical Procedures

   1. Preliminary testing
      a. Color tests, components, and results
         1) Marquis
         2) Nitroprusside
         3) Wagner's
         4) Other color tests
         5) Documenting color tests
         6) Use of standards/blanks
      b. Crystal tests, components and results
         1) Types of microcrystal tests
            a) Gold chloride

         2) Specific amphetamine tests
            a) Direct
            b) Hanging drop (indirect)
         3) Methods of encouraging crystal growth
         4) Documenting crystal shapes

5) Use of standards/blanks

2. Final analysis

a. GC/MS
1) Types of gas chromatograph instruments
2) Theory of operation
3) Use and analysis capabilities and limitations
4) Analysis parameters
a) Column type
b) Heat of injection and oven
c) Other temperature program parameters
5) Mass selective detectors
6) Sample Preparation Software Orientation
7) Sample injection
8) Sample results/software analysis
9) Documenting of GC/MS analysis
10) Use of standards/blanks
11) Computer library
a) Matching criteria
b) Adding data to the library
c) Warnings – isomers, mixtures

b. Fourier Transform Infrared Spectroscopy (FTIR)
a) Theory of operation
b) Uses and analytical capabilities and limitations
c) Sample preparation
d) Analysis parameters/procedures
i) Completion of a run
ii) Warnings – isomers, mixtures

c. RAMAN
a) Theory of operation
b) Uses and analytical capabilities and limitations
c) Sample preparation
d) Analysis parameters/procedures
i) Completion of a run
ii) Warnings – fluorescence, subtraction

C. Related compounds/precursors

1. Methamphetamine
2. Amphetamine
3. Methylmethamphetamine
4. Mephentermine
5. Phentermine
6. Phenmetrazine
7. Phendimetrazine

8. Ritalin
9. Ephedrine
10. Phenylpropanolamine
11. Pseudoephedrine
12. MDA
13. MDMA
14. Strychnine

D. Trainee practice
1. Perform color and crystal examinations of standards and training samples until confident with results
2. Perform instrumental or other analysis with standards and training samples until confident with results
3. Analyze minimum of 15 adjudicated cases

.

E. Competency test
1. Minimum of 10 samples will be analyzed according to lab policy
2. Work independently; no peer review
3. 100% score required; graded by trainer

F. Written exam
1. 80% score required to pass; graded by trainer

G. Moot court; graded by supervisor

H. Co-signed casework
1. 10 completed, co-signed cases
2. Submission of list of co-signed cases

I. Commencement of casework
1. Completion of training itinerary
2. Submission/approval of itinerary
3. Supervisory notification

J. Suggested Reading list

1. SDPD Narcotics Analysis Methods Manual (current)
2. SDPD Narcotics Analysis Unit Policy Manual (current)
3. E.G.C. Clarke, Editor, *Isolation and Identification of Drugs*, Elsevier, 1969.
4. C. Fulton, *Modern Microcrystal Tests for Drugs*, Wiley-Interscience, 1969.
5. Feigl, *Spot Tests in Organic Analysis*, Elsevier, 1966.
6. Smith and Dent, *Modern Raman Spectroscopy A Practical Approach*, Wiley, 2005.
7. Larkin, *Infrared and Raman Spectroscopy*, Elsevier, 2011.

8. Smith, *Understanding Mass Spectra A Basic Approach*, Wiley, 2004.

Installment 3
Common drugs with crystal tests, or Physical IDs

Caines

A. General
   1. History of cocaine
   2. Physical appearance
      a. Rock cocaine vs. cocaine HCl
      b. d vs. l cocaine
   3. Chemical structure

B. Analytical Procedures
   1. Preliminary testing
      a. Color tests: components and results
         1) Wagner's test for cocaine base vs. cocaine HCl
         2) Marquis
         3) One-step acidified Cobalt thiocyanate
      b. Crystal tests: components and results
         1) Gold chloride - 5%, 2-step test
   2. Final analysis
      a. GC/MS
      b. IR
      c. Raman

C. Related compounds/precursors

D. Special consideration/analysis
   1. Cocaine base vs. cocaine HCl
      a. Methanol vs. hexane extractions
         1) Extraction with hexane - GC run. Cocaine HCl will not extract in hexane.

E. Trainee practice
   1. Perform color and crystal examinations of standards and training samples until confident with results.
   2. Perform instrumental or other analysis with standards and training samples until confident with results.

F. Suggested Reading List
   1. *CRACK - The Drug Chromatographer*, Applied Science
   2. "Crack: What is it and what it does", *Microgram*, August 1986
   3. SDPD Training Bulletin, "Rock" or "Crack" Cocaine, April 1987
   4. Poison Lab Publication, "Cocaine"

5. DEA Laboratory notes, “Specific Field Test for Cocaine”, Nov 1973
8. J.C. Robertson, “Legal and Analytical Aspects of Cocaine”
9. Lee, “The Alkaloids”, *Cocaine Handbook.*

Opiates

A. General
1. Classification
2. Synthesis
3. Physical appearance
   a. Tar
   b. Brown-tar powder
   c. Tablets
   d. Chunks - opium
4. Usage
   a. Injection
   b. Ingestion

B. Analytical procedures
1. Preliminary testing
   a. Color tests
      1) Wagner’s
      2) Marquis
      4) Mecke
   b. Crystal tests
      1) Mercuric iodide
2. Final analysis
      1) GCMS
      2) IR after extractions

C. Special considerations
1. Fentanyl
   a. Effects

D. Trainee practice
1. Perform color and crystal examinations of standards and training samples until confident with results.
2. Perform instrumental or other analysis with standards and training samples until confident with results.

E. Suggested Reading List
1. SDPD Narcotics Manual “Opiates (classification, general information)”.
2. Goodman and Gilmans’ *The Pharmacological Basis of Therapeutics*, “Opioid Analgesic and Antagonists”.
3. CND Analytical, Inc., *Analytical Profiles of the Narcotic Analgesics*, 1991.
4. J.P. Bono, “Black Tar Heroin”, July 1986.

5. Barber, Ventura Sheriff's Crime Lab, "Heroin and Opiates Refresher Course".
6. J. Thornton, *CAC Newsletter*, "Specificity of Microcrystalline Tests for Heroin", 1985.

Other

A. GHB / GBL / 1,4-Butanediol
   1. General
      a. Chemical name, class, uses, schedule
      b. Synthesis and structure
      c. Physical appearance
      d. Packaging
      e. Ingestion routes
      f. Handling precautions

   2. Analytical procedures
      a. Preliminary tests
         1) Color tests
            a) Wagner's
            b) Cobalt thiocyannate
            c) Ferric
            d) Liebermann
            e) Duquenois/Chens 2
         2) Crystal tests
            a) $AgNO_3$
      b. Final analysis
         1) GCMS and IR
   3. Special considerations
      a. Analogs / prodrugs

B. Phencyclidine
   1. General
      a. Chemical name, class, uses, schedule
      b. Synthesis and structure
      c. Physical appearance
      d. Packaging
      e. Ingestion routes
      f. Handling precautions

   2. Analytical procedures
      a. Preliminary tests
         1) Color tests
            a) Wagner's
            b) Cobalt thiocyannate
         2) Crystal tests
            a) KMNO4
      b. Final analysis
         1) GCMS

3. Special considerations
    a. Odor
    b. Handling of samples/warnings
    c. Analogs
    d. Handling of liquid/extraction techniques

C. Trainee practice
1. Perform color and crystal examinations of standards and training samples until confident with results.
2. Perform instrumental or other analysis with standards and training samples until confident with results.

E. Suggested Reading List
1. F. Tennant, “Medico-Legal Identification of the Phencyclidine (PCP) User”
2. “Identification of Some Analogs of the Hallucinogenic Phencyclindine”
3. Drug ID Bible or similar

Physical Identification

A. Lecture
1. Identification by imprint
2. Different sources of identification
    a. Drug ID Bible
    b. Rx ID CD
    c. Indent-A-Drug
    d. Internet References (Rx List.com, Drugs.com, etc.)
    e. Information on container
3. Clandestine pills vs. manufactured pills
4. GC/MS confirmation/analysis
5. Controlled substances act
6. Special considerations
    a. Narcotic preparations
    b. steroids

B. Trainee practice
1. Perform preliminary and final examinations of standards and training samples until confident with results.

C. Suggested Reading List
1. R. Collins at www.steroidlaw.com, “Anabolic Steroids and the Law - Steroids 101”.
2. R. Collins at www.steroidlaw.com, “Anabolic Steroids and the Law - anabolic Steroids as Controlled Substances - History and Law”.

Competency test

A. Practical
   1. Minimum of 10 samples will be analyzed according to lab policy
   2. Work independently; no peer review
   3. 100% score required; graded by trainer

B. Written exam
   1. 80% score required to pass

C. Co-signed casework
   1. 10 completed, co-signed cases
   2. Submission of list of co-signed cases

D. Commencement of casework
   1. Completion of training itinerary
   2. Submission/approval of itinerary
   3. Supervisory notification

Installment 4
Plants and exotics

<u>Marijuana and THC</u>

A. Forms
   1. Physical appearance
      a. Whole plants
      b. Plant Material
      c. Concentrated cannabis "hashish"
         1) How it is made
         2) Potency
         3) Form of ingestion
   2. Botany
      a. Marijuana
      b. Leaf form terminology
      c. Botanical definition

B. Analytical procedures
   1. Visual identification of plant material
      a. Leaf form
      b. Stem
      c. Flowering tops
      d. Whole plants, plant material, hashish
   2. Microscopic identification
      a. Cystolithic hairs
      b. Glandular hairs
      c. Covering hairs
      d. Seeds

3. Chemical tests
    1. Types of tests
        a. Duquenois
        b. Modified Duquenois-Levine
            1) Specificity
    2. Chemistry of marijuana and THC
        a. THC, CBD, CBN, etc.
4. Requirements for final vs preliminary

C. Marijuana species “controversy”
1. *Ruderalis*
2. *Sativa*
3. *Indica*

D. Trainee practice
1. Perform color examinations of standards and training samples until confident with results.
2. Perform instrumental or other analysis with standards and training samples until confident with results.
3. Perform microscopic examinations of a minimum of 10 plant samples.

E. Suggested Reading List
1. R.C. Clarke, “Marijuana Botany - An Advanced Study: The Propagation and Breeding of Distinctive Cannabis”.
2. J.I. Thornton and G.R. Nakamura, “The Identification of Marijuana”.
3. U.S. Treasury Department, Bureau of Narcotics, “Marihuana Its Identification”.
4. G.R. Nakamura, “Forensic Aspects of Cystolith Hairs of Cannabis and Other Plants”.
5. G.R. Nakamura and J.T. Thornton, “The Forensic Identification of Marijuana: Some Questions and Answers”
6. K.W. Goddard, “Further Investigation into the Identification of Marijuana”.

Hallucinogenic Mushrooms (Psilocybin, Psilocin)

A. General
1. Chemical structure
2. Physical appearance
3. Packaging
4. Ingestion

B. Morphological identification
1. Shape, size, color
2. Spores
3. Stems

C. Analytical procedures

1. Sample preparation
2. Preliminary tests
    a) Morphological identification
    b) Color tests
3. Court tests
    a) GCMS

D. Trainee practice
1. Perform color examinations of standards and training samples until confident with results.
2. Perform instrumental or other analysis with standards and training samples until confident with results.

E. Suggested Reading List
1. R. Norland, *What's in a Mushroom*.

LSD and LAMPA

A. Chemical name, class, schedule

B. General
1. Structure
2. Synthesis
3. Physical appearance
4. Packaging
    a. Ingestion
    b. Warnings

C. Extraction procedures

D. Analytical procedures
1. Preliminary tests
    a. Van Urk
    b. Ultraviolet lamp
2. Final analysis
    a. GC/MS

E. Special considerations
1. Must separate from LAMPA
2. Watch out for DOB

F. Trainee practice
1. Perform color examinations of standards and training samples until confident with results.
2. Perform instrumental or other analysis with standards until confident with results.

G. Suggested Reading List
1. "Lysergic Acid Diethylamide"

Khat

A. Chemical name, class, schedule

B. General
   1. Chemical structure
   2. Physical appearance
   3. Packaging
   4. Ingestion

D. Extraction procedures

D. Analytical procedures
   1. GC/MS

E. Special considerations
   1. cathine vs pheylpropanolamine

F. Trainee practice
   1. If samples are available, perform extraction and instrumental analysis.

G. Suggested Reading List
   1. "Khat" DEA Drug Identification Bible

Competency test

A. Practical
   1. Minimum of 10 samples will be analyzed according to lab policy
   2. Work independently; no peer review
   3. 100% score required; graded by trainer

B. Written exam
   1. 80% score required to pass

C. Co-signed casework
   1. 10 completed, co-signed cases
   2. Submission of list of co-signed cases

D. Commencement of casework
   1. Completion of training itinerary
   2. Submission/approval of itinerary
   3. Supervisory notification