SAN DIEGO POLICE DEPARTMENT
CRIME LABORATORY

FORENSIC CHEMISTRY UNIT

ALCOHOL MANUAL

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August 21, 2019

1.0 INTRODUCTION

1.1 GENERAL GUIDELINES

1.1.1 A gas chromatographic method is utilized for the analysis of ethanol in blood and urine collected from living subjects. The method includes the use of an automatic headspace sampler, flame ionization detector, and a gas chromatography data handling system. The gas chromatograph is calibrated with alcohol standards providing a calibration curve for quantitative analysis of the ethanol content in unknown samples. Standards, controls, and reference materials must be fully documented in the case packet. In the event that new procedures, methodology, or instrumentation must be utilized in an analysis, the new method must be validated and approved in accordance with laboratory procedures prior to use.

1.2 UNIT DESCRIPTION

1.2.1. The Forensic Chemistry Unit is budgeted for eight positions: one Supervising Criminalist, six Criminalists, and one laboratory technician.

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

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

1.3 UNIT FUNCTIONS

1.3.1 This unit performs controlled substance analysis and ethyl alcohol analysis.

1.3.2 General duties performed include:

1.3.2.1 Performing analysis of blood and urine samples for ethyl alcohol concentration.

1.3.2.2 Court testimony regarding all aspects of analysis and interpretation of results.

1.3.2.3 Providing breath instrument operator training and support to law enforcement and personnel.

2.0 PERSONNEL AND JOB DESCRIPTIONS

2.1 SUPERVISING CRIMINALIST

2.1.1. The duties of the supervisor in the Forensic Chemistry Unit include:

2.1.1.1. Supervising the analysis of alcohol in blood and urine.

2.1.1.2. Ensuring proper procedures are followed.

2.1.1.3. Reviewing case packets to ensure proper documentation of analytical procedures.

2.1.1.4. Ensuring adequate unit staffing levels every day.

2.1.1.5. Ensuring that new criminalists receive the proper training and pass appropriate competency tests, written tests, and mock court testimony.

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

2.1.1.7. Ensuring unit policies are being followed though documentation in logs and records.

2.1.1.8. Evaluating employee performance.

2.1.1.9. Preparing staff reports:

2.1.1.9.1. Budget requests
2.1.1.9.2. Monthly unit statistics
2.1.1.9.3. Special projects

2.1.1.10. Acting as an advocate for the staff to upper management.

2.1.1.11. Monitoring and approving electronic time cards.

2.1.1.12. Assisting with coordinating the contracted drug toxicology analysis and blood drawing services.

2.2 CRIMINALIST I & CRIMINALIST II

2.2.1. The duties of the Criminalists in the Forensic Chemistry Unit include:

2.2.1.1. Analyzing blood and urine samples for alcohol.

2.2.1.2. Performing breath alcohol tests when needed.

2.2.1.3. Providing and documenting correct maintenance of tools, equipment, and instrumentation as needed, and monitoring instruments and arranging for repair as needed.

2.2.1.4. Preparing reagents as needed.

2.2.1.5. Preparing legible notes and reports.

2.2.1.6. Ensuring proper sealing and disposition of evidence, and maintaining proper chain of custody.

2.2.1.7. Participating in and/or organizing correlation studies as needed..

2.2.1.8. Keeping the supervisor informed of operations, problems, and unusual circumstances.

2.2.1.9. Maintaining proper public relations.

2.2.1.10. Carrying out special projects as requested by supervisor.

2.2.1.11. Acting as a technical resource for the Department and others and giving appropriate explanations of conclusions to officers and attorneys in a timely manner.

2.2.1.12. Assisting other criminalists with training in analytical and administrative procedures and technical problems.

2.2.1.13. Participating in the development of new procedures and validating new instrumentation and equipment as needed.

2.2.1.14. Distributing reports to district and city attorneys when necessary.

2.2.1.15. Testifying as a alcohol expert in court.

2.2.1.16. Preparing monthly statistics.

2.2.1.17. Following laboratory safety procedures.

2.2.1.18. Participating in the proficiency test program.

2.2.1.19. Teaching breath instrument operator classes.

2.3 CRIMINALIST III (Technical Lead)

2.3.1. The duties of the Criminalist III in the Forensic Chemistry Unit include:

2.3.1.1. Coordinating the technical operation of the unit in accordance with quality assurance standards.

2.3.1.2. Creating, reviewing, and/or revising technical policies and procedures prior to final approval by the Quality Manager.

2.3.1.3. Coordinating training of new and current employees in analytical procedures, and ensuring completion of training documentation.

2.3.1.4. Developing technical training plans in the unit.

2.3.1.5. Coordinating, reviewing, and approving new method and instrument validations and verifications, including documentation, prior to final approval by the Quality Manager.

2.3.1.6. Acting as technical reference for the unit Supervisor, Quality Manager, and any auditors.

2.3.1.7. Acting as a mediator, when necessary, in the technical review process.

2.3.1.8. Providing technical consultation, as needed, to members of the unit.

2.3.1.9. Working with the supervisor and Quality Manager to ensure criminalist compliance with QA, laboratory, and unit policies and procedures, and that the requirements of Title 17 CA Code of Regulations.

2.3.1.10. Evaluating new technologies to determine if appropriate for the unit.

2.3.1.11. When technical problems are identified, coordinating with the Quality Manager and Supervisor to ensure appropriate corrective actions are taken.

2.3.1.12. The duties of the Criminalist III in the Forensic Chemistry Unit also include those of the Criminalist I and II in section 2.2.

2.4 LABORATORY TECHNICIAN

2.4.1. The duties of the laboratory technician in the Forensic Chemistry Unit include:

2.4.1.1. Ordering, picking up, and stocking supplies for the Unit and coordinating with vendors.

2.4.1.2. Preparing and stocking reagents as needed.

2.4.1.3. Washing lab-ware and filling printers as needed.

2.4.1.4. Assisting in monitoring instruments and arranging for repairs and service as needed.

2.4.1.5. Following proper safety procedures and assisting in safety projects.

2.4.1.6. Keeping the supervisor informed of operations, problems, and unusual circumstances.

2.4.1.7. Maintaining proper public relations.

2.4.1.8. Carrying out special projects as requested by the supervisor.

2.4.1.9. Participating in the development of new procedures and validations, as needed.

2.4.1.10. Helping maintain the various standards, reagents, and logs.

2.4.1.11. Maintaining and updating Safety Data Sheets.

2.4.1.12. Cleaning common areas in the Unit.

2.4.1.13. Maintaining the chemical inventory for the Unit.

2.4.1.14. Testifying in court, if called to do so.

2.4.1.15. Providing assistance to other units of the laboratory when requested and available.

2.4.1.16. Disposing of hazardous material and chemical waste as needed.

2.4.1.17. Maintaining and stocking room 138.

2.4.1.18. Assisting Criminalists in breath instrument maintenance and quality assurance.

2.4.1.19. Assisting with set-up and take-down of breath instrument operator class

2.4.1.20. Researching and compiling information and paperwork for discovery requests.

2.5 BLOOD DRAW CONTRACT EMPLOYEES

2.5.1 Outside staff is contracted to provide phlebotomy services for the laboratory.

2.5.2 Per Vehicle Code Section 23158, the contract blood draw provider must staff properly licensed or certified individuals.

2.5.3. The Forensic Chemistry Unit Supervisor and Purchasing handle the contracting of blood drawing services.

3.0 SUBMISSIONS AND HANDLING

3.1 IMPOUND SUBMISSIONS

3.1.1. Blood and urine evidence are impounded under an incident number and will be identified with unique barcode numbers. One barcode number can be used to identify one or more tubes of blood collected at the same time from the same subject.

3.1.2. Forensic Chemistry Criminalists receive impounds from the Narcotics Vault personnel.

3.2 IMPOUND RECEIPT AND RETURN

3.2.1. Impounds are generally stored in the Narcotics Vault. Each criminalist must sign for custody of the item from Property or Narcotics Vault personnel.

3.2.1.1. Samples kept overnight will be stored in a working refrigerator.

3.2.1.2. Following analysis, the samples are returned sealed to the Narcotics Vault by the analyst.

3.3 SEALING OF EVIDENCE

3.3.1. All evidence shall be sealed prior to being accepted for analysis.

3.3.1.1. In cases where it is not sealed, the condition will be documented in the notes.

3.3.2. Items analyzed will be labeled with the Criminalist's initials.

3.3.3. All analyzed items will be resealed in appropriate packaging.

3.3.4. Following examination, the impound will be sealed. Evidence tape will be placed to cover the tube cap or urine bottle lid and extend over the cap or lid and onto the sides of the container with the Criminalist's initials across the tape and onto the container.

3.4 BLOOD AND URINE ALCOHOL DISCREPANCY POLICY

3.4.1. If an impound discrepancy occurs on a blood or urine sample, the nature of the discrepancy will be evaluated to determine if testing can continue.

3.4.1.1. If the discrepancy is a minor administrative error (such as a misspelling in the name) that can easily be addressed at the

Vault or analyst level. The error will be corrected and the sample will be analyzed.

3.4.1.1.1. A note regarding the correction will be put in the EvidenceOnQ system or in analyst's notes.

3.4.1.2. If the error is grievous (such as a misidentification or wrong label). The Vault Personnel or the Criminalist will notify the officer and it will be the impounding officer's responsibility to rectify the error. Analysis may still be conducted.

3.4.2. If the sample is analyzed prior to the error being noted, the correction process will be documented in the Criminalist's notes and a corrected report will be issued.

3.4.3. If the sample is not analyzed a note will be added to EvidenceOnQ and the external agency (City District Attorney's Office) and impounding officer will be notified.

3.5 BLOOD DRAW GENERAL INFORMATION

3.5.1. Blood draws are performed by licensed or certified contract personnel.

3.5.2 The laboratory technician or Criminalist will check for expired blood vials during restocking. Criminalists will also check prior to transferring blood samples to new tubes.

3.5.3 All blood draws must be witnessed by an officer.

3.5.4 The phlebotomist will initial and note the time of collection on the label. The blood label, which should be generated through EvidenceOnQ, will be placed onto the vial.

3.5.5 Two vials of blood are recommended to be drawn into gray-top tubes for all requests.

3.5.6. Outer plastic storage tubes are used to house blood vials for testing.

3.5.6.1. The blood vials will be placed in the provided tubes, capped, and sealed.

3.5.6.2. Evidence tape should cover the tube cap or urine bottle lid and extend over the cap or lid and onto the sides of the container with the initials of the person sealing it across the tape and onto the container.

3.5.6.3. A second blood vial label, generated using EvidenceOnQ, will be placed on the storage tube..

3.5.7. Analysis for blood alcohol concentration will only be performed if the sample was collected 24 hours or less from the time of the incident.

3.6 IMPROPERLY COLLECTED SAMPLES

3.6.1 Blood samples submitted for alcohol analysis are collected in 10-mL gray-stoppered blood vials containing sodium fluoride (100 mg), preservative, and potassium oxalate (20 mg), anticoagulant. Standard 0.25% sodium fluoride and 0.20% potassium oxalate vials may also be used. Any deviation from expected sample vial conditions will be handled as follows:

3.6.1.1. Blood from purple, green, blue, and gold topped tubes will be transferred to a new gray-topped vial prior to analysis.

3.6.1.1.1. The vial and case notes must document the transfer.

3.6.1.2. Clotted samples will be homogenized with a tissue grinder prior to analysis.

3.6.1.2.1. Homogenization it will be documented in the case notes.

3.6.1.3. Samples from serum separator/plasma vials will not be analyzed.

3.6.2. Second void urine samples submitted for alcohol analysis are collected (no sooner than twenty minutes after first voiding the bladder) and placed into bottles containing approximately 0.9 grams of sodium fluoride. Any deviation from expected sample bottle conditions will be handled as follows:

3.6.**2.1.** Second void samples received in containers not containing sodium fluoride will have sodium fluoride added.

3.6.2.1.1. The container and notes must document the addition of the preservative.

3.6.**2.2.** Samples not indicating first or second void will be treated as a first void sample and will not be analyzed.

3.6.**2.3.** **Samples labeled as first void** will not be analyzed.

3.7 DOCUMENTATION OF BLOOD/URINE SAMPLE COLLECTIONS

3.7.1. Blood draws and urine collections performed in Room 138 or off site will be entered into the EvidenceOnQ system.

3.7.2. The Subject's name must be entered into the Owner field in EvidenceOnQ.

3.7.2.1. Samples drawn for the Medical Assistance Unit or Internal Affairs may be confidential. In those cases, case numbers may be used in place of subject names.

3.8 GENERAL SAMPLE HANDLING PROCEDURES

3.8.1. Protective clothing will be worn when handling biological samples, including lab coats, gloves, and full protective facemask when samples are opened.

3.9 TURN AROUND TIMES

3.9.1. Routine alcohol analysis is typically completed within one week of impounding.

3.9.2. Felony blood sample analysis is typically completed within one business day of impounding.

3.10 ALCOHOL SAMPLES SUBMITTED WITH A TOXICOLOGY REQUEST

3.10.1. Alcohol results less than 0.100g% will be submitted to a contract laboratory for toxicology analysis. No action is required by the submitting officer.

3.10.1.2. The general toxicology request form is generated in EvidenceOnQ using the following steps:

3.10.1.2.1. Use barcode number to pull up the case in EvidenceOnQ.

3.10.1.2.2. Check the boxes for Drug Testing, Comprehensive Drug Panel, and Stop if General Positive

3.10.1.2.3 Click save

3.10.1.2.4. From the menu bar select Reports, then select External Reports, followed by Biotox Lab. The system will automatically prepare the Biotox Report.

3.10.1.2.5. Print this report, review and sign it, and provide it to the vault personnel when you return the samples.

3.10.2. If the alcohol results are ≥ 0.100g%, and no justification was provided, the sample will not be sent for toxicology analysis.

3.10.3. A toxicology request can be completed by a detective for alcohol analysis of non-DUI violations. These requests will generally be from the Sex Crimes, Vice, or Homicide units.

3.10.3.1. The work requests are submitted to the clerical unit where they will be processed.

3.10.3.2. The clerical staff will enter the case completion information into the laboratory database system.

3.10.3.3. A copy of the request goes to the vault so the sample can be pulled for analysis.

3.10.4. For samples collected for violations other than DUI, samples will be sent for toxicology analysis using the following guidelines:

3.10.4.1. General Drug Panel – if collection was within 72 hours of the incident

3.10.4.2. Comprehensive Drug Panel – if collection was within 48 hours of the incident

3.10.4.3. Special Drugs and GHB – if collection was within 8 hours of the incident

3.11 BREATH ALCOHOL INSTRUMENTS AND SUBJECT TESTING

See Breath Alcohol Manual

4.0 POLICIES

4.1 ALCOHOL ANALYSIS

4.1.1. Criminalists must be thoroughly familiar with Title 17 of the California Code of Regulations.

4.1.2. Only one blood vial or urine bottle will be opened at any one time.

4.1.3. Blood alcohol results are reported to three decimal places due to the accuracy, sensitivity, and calculated uncertainty of measurement of our process.

4.1.4. Blood alcohol results of greater than 0.000% but less than 0.010% are reported as "negative."

4.1.5. Blood alcohol results over 0.400 grams% are reported as "Greater than 0.400 g%."

4.1.6 Urine samples will not be routinely analyzed for alcohol.

4.1.6.1. Urine samples will only be tested if they are second void samples and no blood is available.

4.2 ACCEPTABLE CRITERIA FOR REPORTS

4.2.1. All testing will require instrumental testing of two aliquots.

4.2.2. Calibration requirements and calculated control values must meet acceptability criteria in sections 9.1 and 9.2.

4.2.3. Aliquots meet acceptability criteria in section 9.2.2.

4.2.4. The Criminalist may only report out results for those items that have been analyzed.

4.2.5. All reports will be technically and administratively reviewed prior to release.

4.3 CONSUMING SAMPLES FOR ANALYSIS

4.3.1. Occasionally, consuming a sample during analysis is required. In these instances, the unit supervisor is notified. In addition, permission to consume the sample should be obtained from the attorney assigned to the case or, if an attorney has not been assigned to the case, the detective assigned to the case. Three business days will be allowed after the Criminalist has reached out to the attorney or detective before proceeding with evidence consumption in the absence of a response. This process should be documented in the case notes.

4.4 MARKING ANALYZED ITEMS

4.4.1. Individual containers housing blood tubes, as well as the blood tubes, will be marked with the Criminalist's initials.

4.5 REQUESTS FOR EVIDENCE

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

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

4.5.3. Whenever possible, the original Criminalist will prepare the sample for release.

4.5.4. The case packet will be annotated indicating the approximate volume, in milliliters, 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.

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

4.6 ALCOHOL ANALYSIS WASTE

4.6.1. Waste generated by alcohol testing will be placed in sharps containers with biohazard labels. These containers will be taken to the fifth floor for disposal when full.

4.7 GAS SUPPLIES AND ROOM 138 SUPPLIES

4.7.1. 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.

4.7.2. 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.

5.0 CASE DOCUMENTATION

5.1 NOTES

5.1.1. The note pages will be numbered. The total number of pages will be annotated on the first and last pages of the notes. If subsequent pages are added to a packet, total number of pages will be updated accordingly.

5.1.2. All note pages will contain the Criminalist's initials, page number, and the date. Barcodes are used to identify items within the note pages.

5.1.3. The report and case notes will be maintained in the Crime Lab with the laboratory case files after completion.

5.1.4. Notes must be legible; abbreviations must be common and understandable, or listed in the approved abbreviation list (see section 13); permanent ink must be used.

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

5.1.6. Any irregularities, such as a non-gray top tube, clotting, etc, will be documented.

5.1.7. Evidence disposition must be listed in notes.

5.1.8. Notes must include the start and end dates of analysis

5.1.9. All testing conducted must be listed in the notes and all test results used to form conclusions must be included.

5.1.10. Conclusions will be included in the notes.

5.1.11. Calibrator and control lot numbers will be documented.

5.1.12. All quantitative alcohol results will be recorded to four decimal places.

5.1.13. Any printouts not used to form final conclusions, interpretations, or opinions (ex: the run had to be repeated due to the failure of a control) may be discarded, but the notes of the subsequent run must indicate that the test was conducted and why the data was not kept.

5.1.14. Administrative documents (ex: work requests) will be included in the case packet as notes. All pertinent case information, Criminalist initials, and date of inclusion must be present.

5.1.15. Communications affecting testing, or giving opinions or results beyond those already released, must be documented.

5.1.15.1. The Criminalist may document the communication via a printed email added to the case packet, by writing it into the case notes pages, or by using a communication log, with the exception of opinions for hypotheticals.

5.1.15.1.1. Opinions for hypotheticals will be kept, by incident number, in a binder in the Forensic Chemistry Unit.

5.1.15.2. The documentation must include who the communication was between, the date, a brief description of the topics or results discussed, and any decisions made during the communication.

5.1.16. Incident reporting forms, if applicable.

5.2 REPORT FORMAT

5.2.1. Criminalist's conclusions are entered into the Narcotics Database.

5.2.2. A Microsoft Word report template is used to generate the report and must include:

5.2.2.1. The last name/identifier of the defendant(s) listed on the barcodes analyzed

5.2.2.2. Blood or urine collection date

5.2.2.3. Barcode numbers of the items analyzed

5.2.2.4. Bottle or vial type containing the sample

5.2.2.5. Criminalist's name and PD ID number

5.2.2.6. Analysis performed

5.2.2.7. Results obtained

5.2.2.7.1. Numerical results will be given to three decimal places.

5.2.2.7.2. The associated current uncertainty of measurement will be listed for all results between 0.010% and 0.400%.

5.2.2.7.3. Results of 0.000% or greater than 0.400% will not have a U of M.

5.2.2.8. Date of authorization

5.2.2.9. Initials and date of technical and administrative reviewers

5.2.2.10. Disposition of evidence

5.2.3. The alcohol analysis report must contain specific information for the DMV admin per se program. That includes the subject's name, draw date, barcode number, date of analysis, dates data is compiled and the report generated, results, analyst's name, title, and signature.

5.3 DISTRIBUTION AND RETENTION

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

5.3.1.1. Certified copies will be indicated by a certified cover sheet.

5.3.2. Reports are faxed or emailed following administrative review.

5.3.2.1. Verbal results can be released after the analysis packet has been through technical review.

5.3.3. Original case packets, identified by the date of analysis and Criminalist's initials, will be filed in the laboratory.

5.3.4. Case packets are filed after scanning.

5.3.5. Requests for copies of reports will be referred to the clerical staff.

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

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

5.3.8. Copies of Breath alcohol maintenance records, calibration check reports, and GC instrument maintenance logs will be provided to the clerical staff by the Forensic Chemistry Unit staff at the beginning of each month for distribution to appropriate end user.

5.3.8.1. Original records will be kept in the Forensic Chemistry Unit.

5.3.9. A list of Room138 Blood and Urine Collection is forwarded to the appropriate end users by the clerical staff.

5.3.10. All alcohol records will be maintained according to the Quality Assurance policies.

5.3.11. Subjects must personally appear at the Headquarters front desk of the Police Department with their driver's license, or DMV identification and photo identification if their license was relinquished, to receive their results.

5.4 NARCOTICS DATABASE

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

5.4.1.1. Open the Narcotics Database.

5.4.1.2. Click the "Scan Barcode" button.

5.4.1.3. Type or scan the barcode numbers of the items to be reported, this can be done individually or in a batch.

5.4.1.4. Select "Import."

5.4.1.5. If you need to export data to Excel, click "Export."

5.4.1.6. Close the window by selecting "Return" after the hourglass disappears.

5.4.2. To enter data into the database

5.4.2.1. Type or scan the barcode of one of the items. All previously entered items for that incident number should populate.

5.4.2.2. Click on the barcode item line and then click edit.

5.4.2.3. Add all necessary information and click "save" and then "return,"

5.4.2.4. Repeat for all items to be reported.

5.4.3. Reviewing and releasing results

5.4.3.1. After conducting a technical review of the case packet, the reviewer will review the data entered into the Narcotics Database and notify the analyst if any edits need to be made.

5.4.3.2. After conducting a administrative review of the case packet, the reviewer will review and release the data entered into the Narcotics Database.

5.4.3.2.1. Click "Bar Code" or "Incident Number" and type in the appropriate number.

5.4.3.2.2. For each barcode click the line of that item then click "Edit" and ensure that all of the item testing information matches the report and notes.

5.4.3.2.2.1. Click "Return" after reviewing each one.

5.4.3.2.3. For each item, if the information is correct, click the line of that item and then click "Review." This will release the results.

5.4.3.2.4. If any information is incorrect, work with the Criminalist who did the work to correct the issues before clicking on "Tech Review."

5.5 MONTHLY STATISTICAL REPORTS

5.5.1. Each Criminalist reports their daily activities on individual monthly stat sheets due to the unit supervisor by the 5th workday of the following month. Alcohol stats will include:

5.5.1.1. Number of samples analyzed

5.5.1.2. Number of court appearances and hours of court time, including court preparation

5.5.1.3. Training time

5.5.1.4. Special projects

5.5.1.5. Review hours

5.5.1.6. Narcan condition

5.5.1.7. Meetings

5.5.1.8. Crime Scenes and Crime Scene reports

5.5.1.9. Other activities should also be reported

6.0 EQUIPMENT

6.1 ALCOHOL EQUIPMENT LIST

6.1.1. The Forensic Chemistry Unit utilizes the following items of equipment (see chart below for specifics):

6.1.1.1. **A Clarus 500 Gas Chromatograph, with a Turbo-matrix 110 Headspace Sampler:** for quantitating blood alcohol concentrations.

6.1.1.2. **A Shimadzu GC-2010 Plus Gas Chromatograph, with an HS-20 Headspace Sampler:** for quantitating blood alcohol concentrations.

6.1.1.3. **Auto Pipette/Dilutor**: to draw up a preset amount of blood or urine and internal standard then dispense both into a sample vial.

6.1.1.4. **Refrigerator**: for storage of standards and samples.

6.1.1.5. **Tube Rocker**: for mixing blood and samples prior to analysis.

6.1.1.6. **Analytical Pipettes**: to obtain specific quantities of components used to prepare solutions.

Equipment	Make	Model	Serial#	Software version
GC 3	Perkin Elmer	Clarus 500	650N2102204	Total Chrome Navigator 6.3.2.0646 or higher
GC 3 (headspace)	Perkin Elmer	Turbo Maxtrix 110	M41L12000285	
GC	Shimadzu	GC-2010 Plus	C118054	LabSolutions 5.92 Or equivalent
GC (headpsace)	Shimadzu	HS-20 LOOP	0207153000364CZ	
Fridges (Alcohol)	GE	GTH21KBWWW	MM042467	-
Diluter A	Hamilton	MicroLab 600 Series	ML600BD1647	-
Diluter B	Hamilton	MicroLab 600 Series	ML600CE3471	-

6.2 HEADSPACE GC PERFORMANCE CHECKS

6.2.1. Calibrators and controls are run with every set of case samples (including positive and negative controls, and a specificity check solution) as well as any time maintenance that could affect calibration or retention time is performed on the instrument.

6.2.1.1. This system check will ensure that the peaks of compounds of interest can be separated and each component identified, as well as that the quantitation being performed is accurate.

6.2.1.2. When these checks are run as the result of maintenance, the results will be evaluated as per sections 9.1 and 9.2 by a Criminalist and initialed before being filed in the instrument binder.

6.2.1.3. If the result of the checks do not meet acceptable criteria, no casework will be conducted using that instrument until the problem is resolved. See section 7.4.

6.2.3. The HGCs are covered by outside vendor service contracts for repair and maintenance.

6.2.4. Unit Criminalists and laboratory technicians can conduct periodic cleaning and maintenance of the HGCs when needed.

6.2.5. An outside vendor will perform preventative maintenance of the instruments on an annual basis.

6.2.5.1. Labels affixed to the instrument will indicate the date of last preventative maintenance and due date of the next.

6.2.6. Problems, maintenance, etc., are documented in the individual instrument maintenance binder located in the alcohol analysis room.

6.3 DILUTOR CALIBRATION CHECKS

6.3.1. The dilutors are covered by outside vendor service contracts for repairs, maintenance, and calibration.

6.3.2. Calibration will be performed by an outside vendor annually, and after any maintenance that affects measuring capabilities is performed, proving traceability to NIST.

6.3.1.1. A label affixed to the dilutor will indicate the date of last calibration and due date of the next.

6.3.1.2. The Quality Assurance Manager will make arrangements for the calibration.

6.3.3. Unit Criminalists and laboratory technicians can conduct periodic cleaning and maintenance of the dilutors when needed.

6.3.2. Problems, maintenance, etc., are documented in the maintenance binder located in the alcohol analysis room.

6.4 UNCERTAINTY OF MEASUREMENT FOR BLOOD RESULTS

6.4.1. The uncertainty of measurement will be determined for each instrument which performs alcohol quantitation of blood samples.

6.4.1.1. The maximum calculated repeatability and accuracy and linearity measurements are incorporated in the calculation of combined standard uncertainty.

6.4.1.2. Expanded uncertainties will be calculated at the 95.45% confidence level

6.4.1.2.1. This value must be ≤ 0.005g% for values under 0.100g% and ≤ 5% for values of 0.100g% or higher, per Title 17 requirements.

6.4.1.3. Standards must be Certified Reference Material (CRM) with values traceable to NIST Standardized Reference Material (SRM).

6.4.1.4. Analytical data and calculations used to determine the measured uncertainty will be maintained in an uncertainty binder in the Forensic Chemistry Unit.

6.4.1.5. Over the course of five days (not necessarily consecutive), criminalists perform calibrations and quantitations using NIST traceable standards.

6.4.1.5.1. New calibrations curves will be run with each sample set.
6.4.1.5.2. Criminalists will run a minimum of 10 replicated each of five standards of different ethanol concentrations with each calibration curve.

6.4.1.6. The following formula will be used for the expanded uncertainty:

$$U_c = \sqrt{u(repeatability)^2 + u(accuracy\ and\ linearity)^2}$$

$U = k \times U_c$ Where U is the expanded uncertainty and k is the coverage factor.

6.4.2. The measured uncertainty will be re-established if the quantitation capability of an instrument is affected through repair.

6.4.2.1. When a new criminalist is added to the unit, they will perform the above runs to calculate their contribution to the uncertainty of measurement. The values will be evaluated to confirm that the newly calculated U of M is not higher than the one currently reported. If it is higher, the reported uncertainty of measurement will be recalculated.

6.4.3. Control charts will used to look for trends and to evaluate the diluter, controls, and material used in the analysis of blood samples.

6.4.3.1. The charts will be updated with every blood run and monitored by the Tech Lead.

6.5 OTHER EQUIPMENT PERFORMANCE EVALUATION

6.5.1. Refrigerators and freezers containing standards have NIST traceable thermometers and are checked weekly to ensure they are within established ranges.

6.5.1.1. Current records are kept on the individual refrigerator and archived records will be kept in binders in the Unit..

6.5.1.2. If temperatures are found to be out of range, temperature sensitive materials will be moved to another suitable location.

6.5.2. Hoods are checked on a monthly basis by a Lab Safety representative.

6.5.2.1. Hoods are checked annually by an outside vendor.

6.5.3. Other equipment is repaired or replaced as needed.

6.6 USE OF EQUIPMENT

6.6.1. Use and maintenance of equipment will be restricted to those properly trained to do so.

6.6.2. Alcohols and other volatile organic solvents will not be used to wash or rinse glassware used for alcohol analysis.

6.7 STANDARD PREPARATION

6.7.1. A standard log will be maintained on all standards used within the unit and will include:

6.7.1.1. Name of the standard
6.7.1.2. Storage location
6.7.1.3. Manufacturer lot number
6.7.1.4. Expiration dates, if known
6.7.1.5. Lab standard or lot number

6.7.2. Verification of standards will be done prior to casework via instrumental analysis or manufacturer certificates.

6.7.2.1. The instrumental data will be evaluated as outlined in sections 9.1 and 9.2.

6.7.2.2. Standards that do not pass verification will not be used.

6.7.3. Verification information and manufacturer certificates of analysis will be kept in binders labeled “Standard Verifications,” located in the Forensic Chemistry Lab.

6.7.4. Standards will be stored according to manufacturer specifications.

6.7.4.1. Standards stored refrigerated or frozen will be monitored weekly using NIST traceable thermometers.

6.7.4.1.1. If temperatures fall out of range, the standard will be verified before use. If the standard cannot be verified it will be discarded.

6.7.5. Standards must be labeled with the name of the standard, lab standard number, the date received or date inspected, and initials.

6.8 SOLUTION PREPARATION/TESTING

6.8.1. A solution log will be maintained on all solutions used within the unit and will include:

6.8.1.1. Name of the solution
6.8.1.2. What it is used for
6.8.1.3. Specific directions for preparation (see section 16)
6.8.1.4. The test used to verify the reagent and the expected results
6.8.1.5. Verification test results

6.8.2. Each solution will be tested by a criminalist prior to use in casework.

6.8.2.1. The lot number for the new solution will not be assigned until the solution has been verified.

6.8.2.1.1. The test date will indicate the first date of use and will be used as the lot number for the solution.

6.8.2.2. Results of testing will be recorded in the solution log along with the initials of the Criminalist performing the test.

6.8.2.3. If the expected results are not obtained during solution verification, the solution will not be put in to use. See section 7.4.

6.8.3. Stock bottles containing solutions will be identified by the name of the solution and a lot number, and include any appropriate signal words.

6.8.3.1. Working solutions obtained from the stock bottles will be labeled with the same lot number, as well as with the name of the solution and specific hazards.

6.8.4. Chemical and standard containers will be labeled with the date received, and initials of the person checking them in.

7.0 QUALITY ASSURANCE

7.1 GENERAL QUALITY ASSURANCE

7.1.1. General Quality Assurance Policies are covered by the Quality Manual.

7.2 DEFINITIONS

7.2.1. Annual – 12 months

7.2.2. Weekly – Calendar week (Sunday-Saturday)

7.3 MAINTENANCE LOGS

7.3.1. Maintenance logs must be kept for the following instrumentation:

7.3.1.1. HGCs
7.3.1.2. Dilutors

7.3.2. Maintenance logs will contain the following information:

7.3.2.1. Make, model, and serial number
7.3.2.2. Record of all internal or external maintenance, who performed it, and the date
7.3.2.3. Dates the instrument was removed from service
7.3.2.4. Testing results to return the instrument to service, who tested it, and the date

7.4 CALIBRATION AND PERFORMANCE CHECKS

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

7.4.1.1. An Incident Summary Form will be filled out, if applicable (see section 7.8).

7.4.2. Whenever possible, the Criminalist or technician discovering the problem should attempt to troubleshoot the issue while communicating with the rest of the unit that the piece of equipment, solution, or standard should temporarily not be used in casework (does not need to be recorded in the maintenance log). This communication must be done through the use of a filled out "Troubleshooting" tag, at a minimum.

7.4.3. If troubleshooting fails, or the issue is persistent, the Technical Lead or Supervisor will be notified to determine if the piece of equipment, solution, or standard needs to be pulled from service.

7.4.3.1. If the equipment, solution, or standard needs to be pulled from service, this must be communicated to the rest of the unit through the use of a filled out "Out of Service" tag, at a minimum.

7.4.4. If the issue has potentially affected released casework results the Technical Lead and Supervisor should be notified immediately to evaluate.

7.4.5. All equipment maintenance, and any time a piece of equipment is removed from or returned to service, it must be documented in the applicable maintenance log.

7.5 TECHNICAL AND ADMINISTRATIVE REVIEWS

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

7.5.1.1. Results can be released following a technical review.

7.5.2. Technical reviewers must have a current satisfactory proficiency test or be signed off in alcohol analysis in forensic chemistry.

7.5.3. The reviewers will look at all technical worksheets, datasheets, and printouts within the case packet.

7.5.4. At the completion of their review, the reviewer will sign and date the report and the first page of the Criminalist's notes.

7.5.5. Administrative reviews are generally performed by the unit supervisor.

7.5.6. 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.

7.5.7. Narcotics database entries are checked and released by the admin reviewer (see section 5.4.3.).

7.5.8. The Criminalist that performed the work must address (correct or otherwise resolve) all concerns raised by the technical reviewer.

7.5.8.1. Cases may not be transferred to another technical reviewer because of disagreements in the review process.

7.5.8.2. If no agreement can be reached, the Criminalist will consult with the Technical Lead, together with the technical reviewer, to resolve the disagreement.

7.6 CASE REVIEW CRITERIA

7.5.8.3. Incident Summary Forms must be filled out, if applicable (see section 7.9).

TECHNICIAL REVIEW **Performed by qualified Criminalist on all reports.**
Barcodes and dates are properly recorded on notes and reports
Name(s) are properly recorded on reports properly recorded on reports when needed (ex: reports for sexual assaults or homicides)
Incident numbers and Detectives names are
Evidence tubes or bottles are described
Proper laboratory approved procedures were used
Tests conducted, attempted and results obtained were documented
Appropriate controls, standards, and blanks were used
Supporting data, records, printouts, etc. are included
Instrument operating parameters are recorded
Criminalist's results or conclusions are reasonable, appropriate, and supported by the data, notes, and comments
Addresses all technical concerns with the Criminalist who performed the analysis.
Consults with the Technical lead, together with the Criminalist who performed the analysis, to resolve any conflicts that arise during technical review as necessary
Control charts have been updated.
ADMINISTRATIVE REVIEW **Performed by unit supervisor or designee.**
Reports are complete
All pages are numbered appropriately
Writing is legible
Notes and records are permanent (i.e. ink)
Corrections are made by an initialed single strikeout, and date if needed; no info is obliterated or erased
Criminalist's initials and dates are on each page
A technical review has been performed by a qualified Criminalist

7.7 PROFICIENCY TESTING PROGRAM

7.7.1. Each criminalist signed off to do alcohol analysis must satisfactorily complete one proficiency test in alcohol analysis per calendar year.

7.7.2. Analysis of the samples will follow the procedures and policies used to test unknown case samples.

7.7.3. All results of proficiency testing must be consistent with the test provider's results to be deemed satisfactory.

7.8 INCIDENT SUMMARY FORM

7.7.3.1. If the test results are unsatisfactory, the Technical Lead and Supervisor will assess the situation and determine the best course of action.

7.7.3.1.1. Actions may include, but are not limited to, change in procedure, reanalysis of samples, retraining, and removal from casework.

7.7.4. Criminalists will be notified of proficiency test results via a Proficiency Test Record form.

7.8.1. For any equipment failure, unexpected control result, or when a technical policy is violated in the process of analysis, an Incident Summary Form (ISF) must be filled out.

7.8.2. ISFs will be filled out by the Criminalist or Technician who discovered the issue when the issue is regarding an equipment failure or unexpected control result. When the issue is regarding a failure to follow a technical policy, the Criminalist conducting the analysis will fill out the form.

7.8.3. After filling out all pertinent information on the ISF, the form, along with all supporting documentation, will be submitted to the Technical Lead for tracking and any necessary follow up.

7.8.4. ISFs will be tracked and monitored by the Technical Lead to check for trends that could indicate issues such as problems with lab equipment, training inadequacies, or process failures.

7.8.4.1. The Technical Lead will follow up on each issue, and as appropriate:

7.8.4.1.1. Take action to control and correct the issue.

7.8.4.1.2. Address the consequences, to include evaluating potentially effected casework.

7.8.4.1.3. Ensure follow up actions completed and is effective.

7.8.4.1.4. Escalate the issue to a CAR (see Quality Manual).

7.8.5. Copies of ISFs will be kept in maintenance, reagent, or standards binders, associated case packets, and/or electronically as appropriate.

7.8.5.1. ISFs included in case packets will be treated as notes.

8.0 INSTRUMENTAL PREPARATION

8.1 HGC PREPARATION

8.1.1 The current validated methods for each instrument, along with the settings, will be maintained in a binder in the Forensic Chemistry Unit.

8.1.1.1. The method is capable of the analysis of a reference sample of known alcohol concentration within accuracy and precision limits determined by the uncertainty of measurement, and Title 17.

8.1.1.2. The method is free from interference from anticoagulants and preservatives added to the sample.

8.1.1.3. The method gives test results that are always less than 0.010 grams% when fasting subjects free of alcohol are tested.

8.1.1.4. The method is capable of analyzing ethanol with a specificity that is adequate and appropriate for traffic law enforcement.

8.1.2. Baking out the instrument for at least one hour prior to running samples is strongly recommended.

8.1.2.1. To bake out, turn the temperatures for the HS oven, GC oven, and needle to 200°C

8.1.3. Ensure that all gas tanks have a minimum of 200 PSI remaining.

8.1.4. Light the flame on the detector.

8.1.5. At the completion of analysis turn off the gasses.

8.1.6. Before making any GC parameter changes on the Perkin Elmer instruments, you must release control of the instrument from the computer. See section 8.3.6.

8.2 SOFTWARE PREPARATION

8.2.1. Set up data and sequence folders for the run.

8.2.1.1. Name each using the date of the run in the following format MMDDYY. If there are multiple runs on one day, each subsequent run will have a letter added to the end (MMDDYYA, MMDDYYB, etc)

8.2.2. Build a run sequence in TC Navigator

8.2.2.1. Open a recently used sequence and save it to the sequence folder you created.

8.2.2.1.1. Give the sequence the same name as the folder.

8.2.2.2. Enter your run information on this template by scanning, or typing, in the sample barcodes.

8.2.2.3. Update the "number" and "data" fields with consecutive numbers.

8.2.2.4. After you have finished entering your run information, save the updated sequence.

8.2.2.5. Print a copy of the sequence for you case packet.

8.2.2.5.1. Uncheck the "process information" box before printing.

8.3 RUNNING THE SEQUENCE

8.3.1. Load vials into their appropriate positions in the autosampler tray.

8.3.2. From the Actions tab, choose "Set Up"

8.3.2.1. Click the box marked "Store Data in the above Paths" and select the data folder created for this run for the Raw and Results file pathways.

8.3.2.2. Click OK

8.3.2.3. When the TC Navigator screen shows "READY" under GC3 and for I/F and GC, the software is ready to start the run.

8.3.3. When the GC display reads "ready" at the bottom, the instrument is ready to start the run.

8.3.4. On the headspace display, adjust the vial number to run to 1-13.

8.3.4.1. The calibrators, controls, and line must be run and evaluated prior to running any casework samples.

8.3.4.2. Later, to run case samples the vial numbers will be changed to start at 15 and run as needed.

8.3.5. Press Start on the HS display to start the run.

8.3.6. When the run is finished release control through the Run tab.

9.0 SAMPLE PREPARATION

9.1 CALIBRATION PROCEDURE

9.1.1. This method is calibrated for each run with a minimum of three different concentrations of alcohol standards, analyzed in duplicate, with the calibration forced through zero.

9.1.1.1. The standards are purchased as Certified Reference Material (CRM) with values traceable to NIST Standardized Reference Material (SRM).

9.1.2. The software calculates the calibration of the gas chromatograph from the analysis of the alcohol standards.

9.1.3. The results are reported to four decimal places for each standard and plotted on a graph.

9.1.4. The best fit line equation and R^2 value are included on the calibration curve printout.

9.1.4.1. Currently the minimum acceptable value for R^2 is 0.998, and the minimum acceptable slope is 1.175.

9.1.4.2. Values must be recorded in the notes and may be truncated to three significant figures.

9.1.4.3. If the slope and R^2 do not meet acceptable criteria, no casework will be conducted using that instrument until the problem is resolved. See section 7.4.

9.2 CALIBRATION CHECKS

9.2.1. In addition to the calibrators, a variety of controls are run to check the calibration and performance of the instrument.

9.2.1.1. Results of all controls will be documented in the case packet.

9.2.2. Prior to running the calibrators, a specificity check solution (see section 12 for composition) will be run.

9.2.2.1. The instrument must be capable of integrating and identifying all 5 peaks from the mixture in addition to the internal standard peak on the capillary column. There must be clear separation of ethanol and the internal standard peaks from all other components.

9.2.2.2. Ethanol and N-propanol must be fully resolved from every other compound.

9.2.3. Following the calibrators, 0.050%, 0.080%, and 0.400% NIST traceable ethanol controls will be run.

9.2.3.1. The range of acceptable results for each of these controls is the value of the control +/- the current Uncertainty of Measurement.

9.2.3.1.1. The Uncertainty of Measurement at a 95% confidence interval cannot exceed +/- 5% of the known value for sample at or above 0.100g% or +/- 0.005 of the known value for samples under 0.100g%, Per Title 17.

9.2.4. After the control with the highest concentration of ethanol, a negative control will be run.

9.2.4.1. The negative control must be free of any ethanol and have no discernable, well-formed peaks other than n-propanol.

9.2.5. A whole blood ethanol control will be run following the negative control.

9.2.5.1. The whole blood ethanol control is analyzed in duplicate and must meet the requirements for case samples set out in section 10.2.

9.2.6. The last injection of the run sequence will be an additional 0.080% NIST traceable ethanol control which must meet the same criteria as in 9.2.3.

9.2.7. If the results of any of the above checks do not meet acceptable criteria, no casework will be conducted using that instrument until the problem is resolved. See section 7.4.

9.3 WORKSHEET PREPARATION

9.3.1. Samples must be imported into the Narcotics database from EvidenceOnQ, and subsequently exported to Excel to be used to prepare the worksheet. See section 5.4.

9.3.1.1. After exporting, the Excel sheet will automatically populate with the Barcode Number, Blood Draw Date, and Subject Name for each samples.

9.3.1.2. Close the Import/Export window.

9.3.1.3. Copy the information into a notes page.

9.3.1.4. Include the charge and number of vials on the worksheet.

9.4 SAMPLE PREPARATION

9.4.1. Prior to sampling, gently mix the samples on a tube rocker for at least 10 minutes, allowing the samples to mix thoroughly and come to room temperature.

9.4.2. For the Perkin Elmer instrument check the headspace vials with a sizing cylinder prior to use. They must fit easily without protruding out the bottom of the cylinder.

9.4.3. The dilutor settings will be set to add 50 µL of the sample and 1000 µL of internal standard.

9.4.3.1. Ensure that enough internal standard is in the reservoir for the entire run.

9.4.3.2. Prime the internal standard solution through the dilutor to remove all air bubbles and add fresh solution in the syringe and tube.

9.4.3.3. If necessary, wipe the pipette tip clean with a tissue to remove excess liquid. Be careful to avoid touching the end of the pipette tip.

9.4.4. Universal biohazard precautions will be taken at all times.

9.4.5. Verify the barcode number and sample name on the outer plastic tube against the worksheet before opening it.

9.4.5.1. Initial and date the sample barcode label in the appropriate space.

9.4.6. Remove the blood vial from its outer tubes.

9.4.6.1. Verify the barcode number and sample name on the blood vial against the worksheet.

9.4.6.2. Initial and date the sample barcode label in the appropriate space

9.4.7. Use a "Safe Needle" to extract a sample from the vial and dispense it into a small disposable sample cup (0.5 mL).

9.4.8. For urine samples, verify the barcode number and sample name on the bottle against the worksheet and initial and date the sample barcode label before using a plastic transfer pipette to transfer urine samples into a small disposable sample cup (0.5 mL).

9.4.9. Place the dilutor pipette tip into the sample to be analyzed and push the button on the handle to activate the dilutor sampling. Remove the pipette tip

from the solution and wipe the sides of the pipette with a tissue, being careful to avoid touching the end of the pipette tip.

9.4.10. Verify the barcode number on the sample and write a corresponding unique identifier on the headspace cap or vial.

9.4.10.1. Caps or vials may be labeled ahead of time but must be verified at time of sampling.

9.4.11. Place the dilutor pipette tip into the appropriate headspace vial and push the button on the pipette handle again to dispense the liquid into the vial. Do not let the tip contact the liquid as the vial fills.

9.4.11.1. All case samples, and the whole blood ethanol control, are run in duplicate, so two vials will be prepared for each.

9.4.12. Stopper the headspace vial with a gray butyl stopper and seal with an aluminum crimp cap.

9.4.13. Wipe the dilutor pipette tip clean and flush with internal standard when needed.

9.4.14. Place sealed vials in the instrument autosampler tray ensuring that the vial location correctly corresponds to the run sequence.

9.4.15. Discard the headspace vials into appropriate sharps containers at the completion of the run.

10.0 RESULTS and CALCULATIONS

10.1 INSTRUMENT CALCULATIONS

10.1.1 The software calculates the amount of ethanol present in a sample using the ratio of the peak area of ethanol to that of the internal standard and dividing by the slope of the calibration line.

10.2 SUBJECT SAMPLE CALCULATIONS

10.2.1. Subject sample results will be recorded into the notes to four decimal places.

10.2.2. Determine the average of the duplicatesand then round to three decimal places to get the result.

10.2.2.1. Apply the current uncertainty of measurement to the rounded result to calculate the acceptability range for the duplicates.

10.2.2.2. Verify that the values of the duplicates, when rounded to three decimal places, are within the acceptability range.

10.2.2.3. If the values of the duplicates are within the acceptability range, report the average of the duplicatesto three decimal places.

10.2.2.4. If the values of the duplicates are not within the acceptability range, the results will not be reported.

10.2.2.4.1. In place of a result, the analyst will write "repeat" in the results column of the notes.

10.2.2.4.1.1. The notes will also indicate the reason that sample must be repeated (ie: duplicates out of range)

10.2.2.4.2. When repeat analyses are conducted, the notes of the subsequent run will document which samples are being repeated and the date of the original analysis.

10.2.3. After determining that urine results meet the requirements of 10.2.2, the rounded average is divided by 1.3, per Title 17.

10.2.3.1. The numerical results are reported as the "Blood Alcohol Result" in grams%.

11.0 COURT

11.1 GENERAL COURT POLICIES

11.1.1. General court policies are covered by the following references:

11.1.1.1. Quality Manual
11.1.1.2. City of San Diego Employee Code of Conduct Handbook
11.1.1.3. SDPD Procedure 1.11

11.2 TESTIMONY REGARDING EFFECTS

11.2.1. Testimony to the physiological effects of ethanol are handled by Criminalists fully trained to give effects. Being authorized to run blood samples and/or to work the breath alcohol instruments is not sufficient.

11.3 COURT EVALUATIONS

11.3.1. Evaluations will be done a minimum of once per accreditation cycle in each discipline.

11.3.2. Evaluations will be performed by another qualified Criminalist.

11.3.3. If a criminalist has not testified in a discipline during the accreditation cycle, they will notify QA by email.

11.3.4. Evaluation forms or emails are kept by QA.

11.4 COURT POLICY

11.4.1. Criminalists generally operate on an "on-call" basis and should not appear on the basis of a subpoena alone.

11.4.2. A criminalist should be placed on-call when the actual date of the trial is finalized and no later than the day before they are needed to allow time to prepare the court packet.

11.4.3. The prosecuting agency should maintain close communication with the Criminalist on the day needed and allow a one-hour response time for court.

11.4.4. If a Criminalist is unavailable for court, the unit supervisor will have the technical reviewer testify.

11.4.5. One analyst is assigned each month as the primary on-call trial analyst for alcohol trials.

11.4.5.1. This individual typically covers all breath alcohol trials for the month, DMV testimony, as well as testifying to the effects of alcohol for blood samples tested by a criminalist not qualified to make such testimony.

11.4.5.2. If the on-call individual is not available, the supervisor will assign a qualified criminalists may be available to testify.

11.4.6. When a Criminalist is planning to be away from the office for three or more business days, they must have an out of office memo issued to the district and city attorneys, put an out of office autoreply on their email, and change their voicemail to an out of office message for the duration of their absence.

11.5 PROCESSING SUBPOENAS FOR ALCOHOL CASES

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

11.5.2. Each Criminalist is responsible to follow-up on their subpoenas.

11.6 SUBPOENAS FOR CONTRACT PERSONNEL

11.6.1. The laboratory is not responsible for receipt or distribution of subpoenas for Contract personnel.

11.7 DISCOVERY REQUESTS

11.7.1. Refer to the Quality Manual.

12.0 REAGENT and SOLUTION PREPARATION

12.1 Internal Standard Solution ~0.01g%

12.1.1. Partially fill a class a 2-liter volumetric flask with distilled water.
12.1.2. Add 0.25 mL of certified n-propanol (Fisher Scientific or equivalent) with an adjustable micropipette.
12.1.3. Stopper and mix.
12.1.4. Bring to volume with distilled H_2O.
12.1.5. Stopper and mix thoroughly.
12.1.6. Label appropriately and store in the flask at room temperature.

12.2 Individual Specificity Check Solution

12.2.1. Label five 2-liter volumetric flasks with the following:
12.2.1.1. Acetaldehyde
12.2.1.2. Methanol
12.2.1.3. Isopropanol
12.2.1.4. Acetone
12.2.1.5. Ethanol.
12.2.2. Partially fill each with distilled H_2O.
12.2.3. With an adjustable micropipettor and clean disposable tips, pipette the following amounts into its appropriately labeled flask:
12.2.3.1. 0.25 mL of acetaldehyde (Acetaldehyde, ACS reagent, Mallinckrodt or equivalent)
12.2.3.2. 0.25 mL of methanol (Methanol, GC Grade Reagent, Fisher Scientific or equivalent)
12.2.3.3. 0.25 mL of isopropanol (Isopropanol, Spectral Grade 99.8 %, EM Industries or equivalent)
12.2.3.4. 0.25 mL of acetone (Acetone, Certified A.C.S. Reagent, Fisher Scientific or equivalent)
12.2.3.5. 0.40 mL absolute ethanol (Ethanol, 200 proof, Roseville or equivalent)
12.2.4. Stopper and mix each flask.
12.2.5. Bring each flask to volume with distilled H_2O.
12.2.6. Stopper and mix each flask thoroughly.
12.2.7. Analyze the solutions to determine the retention time of each analyte.
12.2.8. The solution can be stored in labeled, capped glass bottles at room temperature indefinitely.

12.3 Specificity Check Solution

12.3.1. Partially fill a 2-liter volumetric flask with distilled H_2O.
12.3.2. With an adjustable micropipettor and clean disposable tips, pipette the following amounts into the flask:
12.3.2.1. 0.50 mL of acetaldehyde
12.3.2.2. 0.50 mL of methanol
12.3.2.3. 0.50 mL of isopropanol
12.3.2.4. 0.50 mL of acetone
12.3.2.5. 0.80 mL absolute ethanol.
12.3.3. Stopper and mix.
12.3.4. Bring to volume with distilled H_2O.
12.3.5. Stopper and mix thoroughly.
12.3.6. Transfer the solution to red stopper vials using a winged infusion set (see 12.4).
12.3.7. Label vials appropriately.
12.3.8. Store up to 8°C indefinitely after transferring.
12.3.9. The approximate ethanol concentration in the mixture is 0.030 grams.

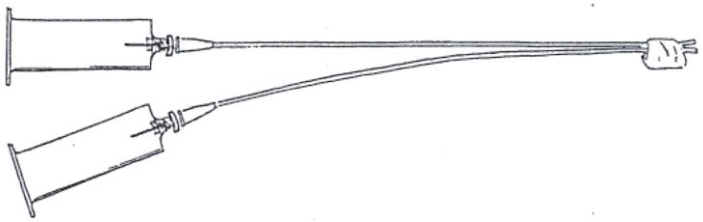
12.4. Procedure to Transfer Solutions from Flasks to Vacutainers®

12.4.1. Equipment Required:
12.4.1.1. Two winged infusion sets
12.4.1.2. Two Vacutainer® holders
12.4.1.3. Metal weight covered with parafilm
12.4.1.4. Two Leur adapters

12.4.2. Each winged infusion set is connected to a Vacutainer® holder by means of a Leur adapter. See Figure 1
12.4.3. The tubing is cut just above the needles and the needles are disposed of in a sharps container.
12.4.4. The tubing is held together in three places with Parafilm.
12.4.5. The weight is attached near the cut end of the tubing with Parafilm.
12.4.6. The tubing of the specially adapted winged infusion sets are dropped into the container containing the solution.
12.4.7. One Vacutainer® tube is pushed onto each of the adapters in the Vacutainer® holder.
12.4.8. The suction created by the vacuum draws the solution until the tubes are full.
12.4.9. The first two tubes filled with the solution will be discarded as they serve the purpose of flushing the transfer equipment.

Figure 1

WINGED INFUSION SET ADAPTED FOR TRANSFER OF ALCOHOL SOLUTIONS INTO VACUTAINER® TUBES



13.0 APPROVED ABBREVIATIONS

Definition	Abbreviation (no regard to capitalization or periods)
Acetaldehyde detected	AAD
Acetone detected	ACD
Barcode label added	B
Blue-top tube	BT
Gray-top tube	GT
Green-top tube	GNT
Isopropanol detected	IsoD
Low sample volume	LSV
No initials on seal	NIOS
Not sealed	NS
Purple-top tube	PT
Sending to Biotox	T
Transferred, from - to	→