Technical Procedure for General Laboratory Equipment

1.0 Purpose - This procedure specifies the required elements for the use of general laboratory equipment.

2.0 Scope - This procedure applies to all pipettes and evidence refrigerator/freezers in the Toxicology Units of the State Crime Laboratory.

3.0 Definitions - N/A

4.0 Equipment, Materials and Reagents

4.1 Equipment

- Glass Class A pipettes
- Mechanical pipettes
- Liquid Handling Systems
- Toxicology refrigerators/freezers

4.2 Materials and Reagents

- Deionized water

5.0 Procedure

5.1 Procedure for Pipettes

5.1.1 Calibrations and Certificates

5.1.1.1 Pipettes used in procedures that involve quantitative measurements shall be certified.

5.1.1.2 Glass pipettes used for quantitative measurements shall be Class A.

5.1.1.2.1 Glass Class A pipettes that are damaged or cannot be cleaned thoroughly must be discarded.

5.1.1.2.2 Glass Class A pipettes do not need to be certified annually.

5.1.1.3 Mechanical pipettes shall have the calibration certified annually.

5.1.1.3.1 Calibration shall be performed by an approved outside contractor.

5.1.1.4 Liquid Handling Systems shall have the calibration certified annually.

5.1.1.4.1 Calibration shall be performed by an approved outside contractor.

5.1.1.5 Certificates of calibration shall be stored in the section files.

5.1.2 Performance Checks

5.1.2.1 Mechanical pipettes shall have their calibration checked every two months.

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5.1.2.1.1 The calibration shall be checked by gravimetrically using a calibrated balance and deionized water.

5.1.2.1.1.1 Place a container on the balance and tare.

5.1.2.1.1.2 If the mechanical pipette is a single volume pipette:

5.1.2.1.1.2.1 Dispense the volume of deionized water into the container and record the results in the pipette logbook along with the identifying information of the pipette and the initials of the person performing the calibration check.

5.1.2.1.1.2.2 Tare the balance and repeat **5.1.2.1.1.2.1**.

5.1.2.1.1.3 If the mechanical pipette is adjustable the calibration check shall be performed at both the lowest and highest settings of the pipette:

5.1.2.1.1.3.1 Dispense the lowest volume of deionized water into the container and record the results in the pipette logbook along with the identifying information of the pipette and the initials of the person performing the calibration check.

5.1.2.1.1.3.2 Tare the balance and repeat **5.1.2.1.1.3.1**.

5.1.2.1.1.3.3 Repeat **5.1.2.1.1.3.1** and **5.1.2.1.1.3.2** for the highest volume setting.

5.1.2.1.1.4 If the results are outside of 3 % for volumes greater than 10 µL or 10 % for volumes equal to or less than 10 µL of expected value, clean the pipette and repeat either **5.1.2.1.1.2** or **5.1.2.1.1.3**, whichever applies.

5.1.2.1.1.5 If the results are still outside of 3 % or 10 % (whichever is appropriate for the pipette volume being checked), remove the pipette from service and notify the Toxicology or Drug Chemistry Technical Leader, whichever is appropriate.

5.1.2.2 Liquid Handling Systems shall have their calibration checked every two months.

5.1.2.2.1 The calibration shall be checked by gravimetrically using a calibrated balance and deionized water.

5.1.2.2.1.1 Place a container on the balance and tare.

5.1.2.2.1.2 Draw the appropriate sample volume of deionized water into the syringe on the liquid handling system.

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5.1.2.2.1.3 Dispense the total volume into the container.

5.1.2.2.1.4 Record the results in the pipette logbook along with the identifying information of the pipette and the initials of the person performing the calibration check. This weight shall be within 3 % of the expected value.

5.1.2.2.1.5 Draw the appropriate volume of deionized water from the container and re-weigh the container.

5.1.2.2.1.6 Record the result in the pipette logbook and subtract from the value obtained in **5.1.2.2.1.4**. Record the result of the subtraction. The result will be equivalent to the volume of sample removed in **5.1.2.2.1.5**. This result shall be within 3 % of the expected value.

5.1.2.2.1.7 Repeat steps **5.1.2.2.1.1** thru **5.1.2.2.1.6**.

5.1.2.2.1.8 If the results are outside of 3 %, remove the liquid handling system from service and notify the Liquid Handling System Key Operator.

5.1.3 Application of Procedure on Evidence

5.1.3.1 Follow all manufacturer procedures for the use of the specific pipette used in any procedure.

5.2 Procedure for Toxicology Refrigerators and Freezers

5.2.1 Standards and Controls

5.2.1.1 Each refrigerator/freezer in the Toxicology Unit shall have the temperature recorded and monitored by a Chemistry Technician III, Evidence Technician, or designee.

5.2.1.2 Any refrigerators or freezers that are out of tolerance or show any other refrigeration problems shall be reported to the Toxicology Technical Leader who will evaluate the nature of the problem and propose a solution.

5.2.2 Calibrations - N/A

5.2.3 Sampling - N/A

5.2.4 Application of Procedure on Evidence

5.2.4.1 The acceptable temperature range of the refrigerators shall be 2 – 8 °C.

5.2.4.2 The freezers shall be at zero degrees C or below.

5.2.4.3 Refrigerators/freezers with a manual temperature chart shall have the chart initialed each working day by a Chemistry Technician III, Evidence Technician, or designee to signify temperature verification.

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5.2.4.4 Automatic temperature charts shall be changed weekly by a Chemistry Technician III, Evidence Technician, or designee.

5.2.4.5 All charts shall be labeled with the refrigerator serial number, if present.

5.2.4.6 Records of the temperature monitoring shall be maintained in the Toxicology Unit.

5.2.4.7 The temperature of the refrigerators and freezers shall be checked annually with a NIST traceable thermometer by a Chemistry Technician III, Evidence Technician, or designee. If a refrigerator or freezer is found to be out of compliance with the criteria established in **5.2.4.1** and **5.2.4.2**, the Toxicology Technical Leader shall be notified immediately.

5.2.5 Calculations - N/A

5.2.6 Uncertainty of Measurement - N/A

6.0 Limitations - N/A

7.0 Safety - When working with glass pipettes, use caution if the pipette is broken.

8.0 References - Manufacturer's instructions for each model of pipette.

9.0 Records

- Temperature control record for Toxicology refrigerator/freezers.
- Pipette certificates

10.0 Attachments – N/A

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Revision History		
Effective Date	Version Number	Reason
09/17/2012	1	Original Document – Technical Procedure O-01 was converted to ISO Standards.
10/26/2012	2	Inserted 5.2.4.7 for annual temperature check with NIST traceable thermometer; grammar
02/15/2013	3	Adjusted header for consistency with other Toxicology procedures 2.0 - inserted "Toxicology Unit", removed specific location 5.1.2.1.1.4 and 5.1.2.1.1.5 - inserted 10 % range for 10 µL and below Removed 5.1.3 - reference to sampling 5.2.1.1, 5.2.4.3, 5.2.4.4, and 5.2.4.7 - inserted Evidence Technician
05/14/2013	4	5.2.4. -: changed 4 (+/- 5 °C) to an acceptable range of 2 - 8 °C

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