Technical Procedure for Pipettes

1.0 Purpose – This technical procedure shall be followed for the operation of pipette instruments.

2.0 Scope – This procedure applies to all pipettes set up for dispensing liquid samples in the Trace Unit.

3.0 Definitions

- **Pipette** - Slender tube for measuring and transferring small portions of a fluid.

4.0 Equipment, Materials, and Reagents

4.1 Equipment

4.1.1 All pipettes used for any analysis of evidence.

4.2 Materials

4.2.1 Appropriate range Pipette tips including but not limited to the following:

- Combitips Plus 1-50 mL for repeater pipettes
- Pipette Tips 1 µL
- Pipette Tips 1000 µL
- Pipette Tips 0-200 µL
- Pipette Tips 0.5-10 µL
- Macro Pipette Tips 1-5 mL

4.3 Reagents

4.3.1 Distilled water

5.0 Procedure

5.1 Calibration

5.1.1 All pipettes used for casework shall be calibrated annually by a qualified contractor in accordance with ISO standards and the manufacturer's recommended specifications. The upper limit shall not vary by more than 1 % and the lower limit shall not vary by more than 2 %. If a pipette does not meet the criteria, it shall be marked as "Not in Use" and set aside for repair by the Laboratory's designated company. Once repair has been made and the pipette meets the above stated criteria, it may be return to service.

5.1.2 After all pipettes have been calibrated, sign the log with the date and check off that each of the pipettes were calibrated. Write the date the next calibration is due and initial that the calibration was completed.

5.1.3 Insert the calibration report sheet into the log. Sign and date the sheet.

5.2 Verification of New Pipettes

5.2.1 A newly purchased pipette shall come with a certificate of analysis from the manufacturer verifying the instrument functions properly within the accepted range of that instrument.

5.2.2 Pipettes older than one year from purchase date shall be calibrated by a qualified contractor in accordance with ISO standards and the manufacturer's recommended specification.

5.3 Pipetting Technique

5.3.1 Attach a clean tip firmly to the instrument. Never handle the tip directly near the orifice.

5.3.2 Before entry into the sample solution, depress the thumb knob to the "first stop."

5.3.3 Immerse the tip approximately 3 mm into the sample solution.

5.3.4 Smoothly return the plunger knob to the release position allowing sample to enter tip. Do not allow the knob to "snap" back to the release position.

5.3.5 Withdraw the tip from the sample solution. Do not wipe the tip.

5.3.6 Place tip against the side wall of receiving vessel.

5.3.7 Smoothly depress the plunger knob to the first stop, pause; then depress the knob to the "second stop."

5.3.8 With the knob still held in its lowest position, slowly withdraw the tip while sliding it against the wall of the receiving vessel.

5.3.9 Return the knob to the release position. Do not allow the knob to "snap" back.

5.3.10 Remove the disposable tip by firmly depressing the tip ejector button.

5.4 Recommendations for reproducibility and accuracy.

5.4.1 Affect the same speed for both the intake and delivery of all samples. Smooth depression and release of the plunger knob will give consistent results. Never allow the plunger to "snap" back. Consistency of technique is a key to precision.

5.4.2 Depress the plunger knob to the proper stop before insertion of the tip into the solution. Depression of the plunger knob after insertion may cause the formation of an air bubble in the tip and result in a filling error.

5.4.3 Insert the tip to approximately the same depth in the sample each time. It is not recommended to go deeper than 3 mm. Hold the instrument as vertical as possible.

5.5 Maintenance - If a pipette does not meet the calibration criteria, it shall be marked as "Not in

Use" and set aside for repair by the laboratory's designated company.

5.6 Standards and Controls - Distilled water and an analytical balance shall be stored and used at room temperature for calibrations.

5.7 Calculations – N/A

5.8 Uncertainty of Measurement – N/A

6.0 Limitations - Pipette only volumes that fall within the specified range of the instrument.

7.0 Safety - Pipette tips are sharp and can puncture the skin.

8.0 References

Premier Technologies. "The Standard in Measurement." Office of the Director Technical Service & Field Support, Owings Mills, MD, 1993.

9.0 Records

- Calibration Records
- Annual Calibration Log
- Maintenance Log

10.0 Attachments – N/A

Revision History		
Effective Date	Version Number	Reason
09/17/2012	1	Original ISO Document
10/18/2013	2	Added issuing authority to header
08/29/2014	3	Updated header to Physical Evidence Section – Trace Unit, issuing authority to Physical Evidence Section Forensic Scientist Manager. Updated all references in procedure from Trace Evidence Section to Trace Unit.