2.3 Preparation of Standards and Controls for Alcohol Testing

2.3.1 Materials And Supplies Needed

- Reagent grade, absolute (100%) ethanol.
- Reagent grade methanol, 2-propanol, 1-propanol, acetone, 2-methyl-2-propanol (t-butanol).
- Class A volumetric pipets for quantitative standards.
- Reagent grade water.
- Class A volumetric glass stoppered flasks of proper capacity for the dilutions being made.
- Electronic pipet, 100 - 1000 µL

2.3.2 Ethanol Standards (Calibrators)

Aqueous (NIST Traceable) Calibrators are purchased from Cerilliant at the following concentrations:

- Multicomponent Alcohol Mix- item number A-076: 100 ug/mL of methanol, ethanol, isopropanol and acetone
- Multicomponent Alcohol Cal Kit- item number A-054: 500 ug/mL, 1000 ug/mL and 4000 ug/mL of methanol, ethanol, isopropanol and acetone
- Ethanol-200 mg/dL- item number E-032
- Ethanol-500 mg/dL- item number E-053

2.3.3 Ethanol Controls:

Aqueous (NIST Traceable) Controls are purchased from Cerilliant at the following concentrations:

- Ethanol- 20 mg/dL- item number E-056
- Ethanol- 80 mg/dL- item number E-030
- Ethanol- 150 mg/dL- item number E-041
- Ethanol- 300 mg/dL- item number E-033
- Ethanol- 400 mg/dL- item number E-036

Whole Human Blood Ethanol Controls are purchased from Cliniqa:

- Whole Blood Ethanol, level 1- item number 93211
- Whole Blood Ethanol, level 2- item number 93212

2.3.4 Internal Standards:

Preparation of n-propanol (1-propanol) internal standard:

Into a four liter volumetric flask add approximately 2000 mL reagent grade water and 1.0 mL 1-propanol. Fill to the mark after approximately one hour. Final concentration of the solution is approximately 0.020 g/dL.

Preparation of t-butanol (2-methyl-2-propanol) internal standard:

Into a four liter volumetric flask add approximately 2000 mL reagent grade water and 0.4 mL 2-methyl-2-propanol. Fill to the mark after approximately one hour. Final concentration of the solution is approximately 0.0078 g/dL.

NOTE: The volumetric measurement of the t-butanol must be made at 26 degrees Centigrade (79 degrees F) or higher because its freezing point is 25.3 degrees C (77.5 degrees F).

NOTE: Newly prepared internal standard solution should be analyzed prior to being utilized for casework. The area count of the new internal standard should be within +/- 20% of the average of the most recent batch of samples.

2.3.5 Volatile Mix Control:

2.3.5.1

Prepare a 1 to 10 primary dilution in a separate labeled 100 ml volumetric flask for each analyte. Into each flask add approximately 50 ml reagent grade water and pipet 10 ml of the neat reagent grade chemical. Fill the flask to within one centimeter of the mark and let it sit at room temperature for approximately one hour before making the final dilution to the mark.

Volatile	density at 20 deg C	grams /100 ml after 1st dilution
Methanol	0.791	7.91
Ethanol	0.789	7.89
Isopropanol	0.785	7.85
Acetone	0.790	7.90

2.3.5.2

Volatile control: 0.100 g/dL methanol, ethanol and isopropanol, and acetone
To one 500 ml volumetric flask add approximately 250 ml reagent grade water and pipet the following amounts to give the listed corresponding approximate concentrations using an appropriately sized

serological pipet into the volumetric flask. Fill the flask to within one centimeter of the mark and let it sit at room temperature for approximately one hour before making the final dilution to the mark.

Volatile	**ml STEP 1 sol'n**	**grams/100 ml final conc.**
Methanol	6.32	0.100
Ethanol	6.34	0.100
Isopropanol	6.37	0.100
Acetone	6.33	0.100

To make a low volatile mix, prepare as above and then dilute the solution in a 1:10 ratio, resulting in the following concentrations:

Volatile	**volatile mix conc.**	**low volatile mix conc.**
Methanol	0.100	0.010
Ethanol	0.100	0.010
Isopropanol	0.100	0.010
Acetone	0.100	0.010