

Analytical Training Procedure for Chemistry Technician

- 1.0 Purpose** – This procedure provides a training program for the preparation of alcohol, volatiles and immunoassay samples in the Toxicology section of the Raleigh, Triad, and Western locations of the State Crime Laboratory. This training will provide technicians with the background and working knowledge to prepare biological samples for specific analyses and give competent testimony. Practical/laboratory exercises are an integral part of this training program. The exercises are used to emphasize and reinforce the quality assurance and quality control of all tests performed. The trainee will be required to complete a written exam with a minimum score of 85 % and to complete all practical exercises successfully. The Toxicology Training Coordinator shall prepare a Training Section Completion Summary detailing training activities and evaluating progress. Upon successful completion of each training section, the Toxicology Training Coordinator and the trainee shall complete the Training Checklist and the Training Section Completion Summary.
- 2.0 Scope** - This procedure applies to toxicology lab technician trainees in the Toxicology section in Raleigh (R), Triad (T), and Western (W) locations of the State Crime Laboratory (SCL).
- 3.0 Objectives**
- 3.1** Know and understand the Laboratory and Section policies and procedures governing evidence handling and note taking.
 - 3.2** Successfully complete each training requirement in the Liquid Handling Systems Calibration Check section.
 - 3.3** Successfully complete each training requirement in the Alcohol/Volatiles Sample Preparation section.
 - 3.4** Successfully complete an alcohol/volatiles competency exam.
 - 3.5** Successfully complete each training requirement in the Immunoassay Sample Preparation section.
 - 3.6** Successfully complete an immunoassay competency exam.
 - 3.7** Successfully complete a written exam on both alcohol/volatiles and immunoassay sample preparation.
 - 3.8** Successfully complete a moot court.
- 4.0 Procedure**
- 4.1 Training of Experienced Toxicology Lab Technician** - In the event a Toxicology Lab Technician with previous training and/or experience in toxicology sample preparation is hired, the Toxicology Technical Leader shall assess the Toxicology Lab Technician's knowledge, skills, and abilities based on any written training documentation provided by the Toxicology Lab Technician's previous employer. The Toxicology Lab Technician's training program will be designed based on the Toxicology Technical Leader's assessment.

4.2 Laboratory Safety

- 4.2.1** Prior to working with any new chemical, solution, or standard, read and comprehend the SDS for each. This includes the determination of which PPE and engineering / administrative controls are required when handling each chemical.
- 4.2.2** Prior to handling any body fluids, discuss the safety precautions necessary when handling items that may contain bloodborne pathogens, including the appropriate use of required personal protective equipment and engineering / administrative controls. Demonstrate the ability to properly don and doff personal protective equipment.

4.3 Liquid Handling Systems Calibration Check

- 4.3.1** The trainee shall read and understand the applicable sections of the [Equipment Calibration and Maintenance procedure](#).
- 4.3.2** The Toxicology Training Coordinator or designee shall review and discuss with the trainee the applicable sections of the [Equipment Calibration and Maintenance procedure](#).
- 4.3.3** The Toxicology Training Coordinator or designee shall provide information to the trainee on how to perform the calibration check of the liquid handling systems.
- 4.3.4** The Toxicology Training Coordinator or designee shall provide information to the trainee on how to document the calibration check of the liquid handling systems.
- 4.3.5** The trainee shall successfully perform a calibration check of all Toxicology Liquid Handling Systems in accordance with the [Equipment Calibration and Maintenance procedure](#).

4.4 Alcohol/ Volatiles Sample Preparation

- 4.4.1** The trainee shall read and understand the applicable sections of the following procedures: [Equipment Calibration and Maintenance](#), [Alcohol Analysis by HSGC](#), [Headspace Gas Chromatography Calibration and Maintenance](#), and [Volatile Analysis by Headspace Gas Chromatography](#).
- 4.4.2** The Toxicology Training Coordinator or designee shall review and discuss with the trainee the applicable sections of the following procedures: [Equipment Calibration and Maintenance](#), [Alcohol Analysis by HSGC](#), [Headspace Gas Chromatography Calibration and Maintenance](#), and [Volatile Analysis by Headspace Gas Chromatography](#).
- 4.4.3** The Toxicology Training Coordinator or designee shall provide information to the trainee on how to prepare all types of samples for alcohol and volatiles analysis using the liquid handling systems.
- 4.4.4** The Toxicology Training Coordinator or designee shall provide information to the trainee on the quality control solutions used throughout the alcohol and volatiles analysis.

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- 4.4.5** The Toxicology Training Coordinator or designee shall provide information to the trainee on the documentation required when performing an alcohol and volatiles analysis.
- 4.4.6** The trainee shall observe the preparation of samples for alcohol and volatiles analysis by the Toxicology Training Coordinator or designee.
- 4.4.7** The trainee shall successfully prepare all the required performance check samples in accordance with the following procedures: [Equipment Calibration and Maintenance](#), [Alcohol Analysis by HSGC](#), [Headspace Gas Chromatography Calibration and Maintenance](#), and [Volatile Analysis by Headspace Gas Chromatography](#).
- 4.4.8** The trainee shall successfully prepare all the required alcohol calibration and verification samples and the required documentation in accordance with the following procedures: [Equipment Calibration and Maintenance procedure](#), [Alcohol Analysis by HSGC](#), [Headspace Gas Chromatography Calibration and Maintenance](#), and [Volatile Analysis by Headspace Gas Chromatography](#).
- 4.4.9** The trainee shall successfully prepare 50 practice alcohol samples in replicate and the required documentation in accordance with the following procedures: [Equipment Calibration and Maintenance](#), [Alcohol Analysis by HSGC](#), [Headspace Gas Chromatography Calibration and Maintenance](#), and [Volatile Analysis by Headspace Gas Chromatography](#).
- 4.4.10** The trainee shall successfully prepare a volatiles sample in replicate and the required documentation in accordance with the following procedures: [Equipment Calibration and Maintenance](#), [Alcohol Analysis by HSGC](#), [Headspace Gas Chromatography Calibration and Maintenance](#), and [Volatile Analysis by Headspace Gas Chromatography](#).
- 4.4.11** The trainee shall successfully complete an alcohol and volatiles competency exam.
- 4.5 Immunoassay Sample Preparation**
- 4.5.1** The trainee shall read and understand the applicable sections of the following procedures: [Equipment Calibration and Maintenance](#), [Toxicology Quality Assurance](#), and [Enzyme Immunoassay](#).
- 4.5.2** The Toxicology Training Coordinator or designee shall review and discuss with the trainee the applicable sections of the following procedures: [Equipment Calibration and Maintenance](#), [Toxicology Quality Assurance](#), and [Enzyme Immunoassay](#).
- 4.5.3** The Toxicology Training Coordinator or designee shall provide information to the trainee on how to prepare samples for analysis by immunoassay using the liquid handling systems.
- 4.5.4** The Toxicology Training Coordinator or designee shall provide information to the trainee on the quality control solutions used in the analysis of samples by immunoassay.
- 4.5.5** The Toxicology Training Coordinator or designee shall provide information to the trainee on the documentation required to be maintained when analyzing of samples by immunoassay.
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4.5.6 The trainee shall observe the preparation of samples for analysis by immunoassay by the Toxicology Training Coordinator or designee.

4.5.7 The trainee shall successfully prepare the samples required for a Critical Reagent QC check of a new kit lot or other solution/standard in accordance with the following procedures: [Equipment Calibration and Maintenance](#), [Toxicology Quality Assurance](#), and [Enzyme Immunoassay](#).

4.5.8 The trainee shall successfully prepare 45 practice samples, along with the required quality control samples, in accordance with the following procedures: [Equipment Calibration and Maintenance](#) and [Enzyme Immunoassay procedure](#).

4.5.9 The trainee shall successfully complete an immunoassay competency exam.

4.6 Written Examination

4.6.1 The written examination shall demonstrate the trainee's knowledge and understanding of the procedures used in the preparation of samples for alcohol/volatiles analysis.

4.6.2 The written examination shall demonstrate the trainee's knowledge and understanding of the procedures used in the preparation of samples for analysis by immunoassay.

4.6.3 The trainee shall complete a written exam on both blood alcohol and immunoassay sample preparation with a minimum score of 85 %.

4.7 Courtroom Testimony

4.7.1 The trainee shall attend a lecture, provided by the Toxicology Training Coordinator or designee, covering courtroom testimony.

4.7.2 The trainee shall successfully complete a moot court by achieving a satisfactory rating for all categories as documented in the SCL Moot Court Evaluation by the Toxicology Training Coordinator.

4.8 Required Reading

- [Equipment Calibration and Maintenance procedure](#)
- [Alcohol Analysis by HSGC procedure](#)
- [Headspace Gas Chromatography Calibration and Maintenance procedure](#)
- [Volatile Analysis by Headspace Gas Chromatography procedure](#)
- [Enzyme Immunoassay procedure](#)
- [Toxicology Quality Assurance](#)

5.0 References

5.1 North Carolina State Crime Laboratory Procedures

6.0 Safety

- This document provides an outline for training on procedures that are written in additional detail in specific Toxicology Section documents. To see safety hazards for particular procedures, refer to that specific procedure.

7.0 Records

- Toxicology Lab Technician Training Checklist
- Training Section Completion Summary
- Moot Court Evaluation Rating Sheet

7.0 Attachments – N/A

Revision History		
Effective Date	Version Number	Reason
12/09/2020	2	Dropped Technician level from title References to Toxicology Procedures updated References to Toxicology Unit Replaced with Toxicology Section References to Blood Alcohol replaced with alcohol 1.0 and 2.0 – add Raleigh, Triad, and Western 4.2 and 6.0 added safety training requirements 1.0, 3.3, 3.4, 3.7, 4.4, 4.4.3-4.4.6, 4.6.1, and 4.4.11 - Added volatiles 4.4.10 - New