Idaho State Police
Forensic Services

Approval for Quality System Controlled Documents

Discipline/Name of Document: Toxicology Training Manual
Section Two – Ethanol and Other Volatiles

Revision Number: 5

Issue Date: 02/05/2009

APPROVED BY: _____
Quality Manager

2/5/09
Date Signed

Idaho State Police
Forensic Services

Toxicology Discipline Training Plan

Section Two – New Analyst Training

Ethanol and Other Volatiles

Trainee: _____
Forensic Scientist ____

Trainer: _____
Forensic Scientist ____

Trainer: _____
Forensic Scientist ____

2.0 TABLE OF CONTENTS

Section Two – New Analyst Training
Ethanol and Other Volatiles

2.1 TRAINING OBJECTIVES

2.1.1 Introduction

This section is intended to serve as a guide for an Idaho State Police Forensic Services (ISP-FS) analyst training to perform quantitative ethanol and qualitative "other volatiles" analysis, in both biological and non-biological samples. The analysis of these samples is described in Analytical Methods *4.1-Quantitative Analysis for Ethanol and Qualitative Analysis for Other Volatiles in Blood, Vitreous Humor and Urine by Dual Column Headspace Gas Chromatography* and *4.2-Analysis of Solutions Containing Ethanol and Common Volatiles.* The subsections address other related issues including administrative issues, the submittal of the sample to the laboratory, collection kit requirements and documentation, instrumental analysis, preparation of laboratory notes, issuance of the analysis report and subsequent courtroom testimony. In order to address questions in court, the analyst must possess knowledge of the pharmacology of ethanol and related compounds, field testing to detect impairment and the associated Idaho Codes. The references cited and all accessible literature must be consulted as necessary.

2.1.2 Approach to Training

2.1.2.1 To facilitate the over-all process, training for Analytical Method 4.1 and 4.2 must be pursued consecutively.

2.1.2.2 In order to address the training plan questions, The Background Reading cited, or equivalent, must be consulted if the Trainee is not familiar with the subject matter. Both the education and work experience of the Trainee must be considered, however, at least a verbal review of material for the trainer must be done to the satisfaction of the Trainer.

2.1.2.3 Answers to training plan questions may be provided verbally and/or in written form. This choice is at the discretion of the trainer.

2.1.2.4 Topics signed off during training for another toxicology subdiscipline need only be reviewed prior to sign-off.

2.1.3 Hands-on Analysis during Training Defined

2.1.3.1 Due to the nature of the analysis of biological fluids to detect ethanol and other volatiles, no casework "hands of the trainer" work will be pursued during the training. In its place, as part of the training process, the Analyst in Training will perform analysis their *hands-on* analysis on blood volatiles control samples and "old" proficiency tests.

2.1.3.2 The Analyst in Training will observe the trainer performing casework but until the Analyst in Training has successfully completed all training, the required competency test and signed off by the quality manager, no supervised case work will be performed.

2.1.4 Training Order

Although all training does not have to proceed in the order used in this training plan, certain topics must be completed prior to others.

2.1.4.1 Section 2.2 must be signed-off prior to additional sections.

2.1.4.2 A minimum of sections 2.3 through 2.10 must be signed off prior to hands-on analysis of blood volatiles controls and "old" proficiency tests.

2.1.4.3 Training plan sections 2.3 through 2.10 and 2.15 must be signed-off prior to competency testing.

2.1.5 Additional Training for Experienced/Signed-off Analyst

2.1.5.1 For training of an experienced analyst (Forensic Scientist II or III) in a new or updated technique or instrument, the training is to be commensurate with the magnitude of changes with consideration of the analyst's existing background. The extent of training to be required will be agreed upon by the discipline leader and quality manager with input from the analyst.

2.1.5.2 If a separate training plan section has been created for the training topic and/or analytical method then it must be utilized, otherwise the appropriate portions of this training plan section must be used.

2.1.6 Continual Awareness of Relevant Literature

The new or experienced analyst is reminded that this training plan only addresses the core of training for volatiles analysis. After the completion of training, the analyst is responsible for keeping their knowledge current through continual literature review. This must include relevant journals, newsletters and text books.

2.2 ADMINISTRATIVE ISSUES

2.2.1 The Analyst in Training must be familiar with relevant sections of the Idaho State Police Employee Handbook.

2.2.2 The Analyst in Training must be knowledgeable of the content and application of the Idaho State Police Forensic Services ISO/IEC 17025:2005 Compliant Quality/Procedure Manual. ISP Quality/Procedure Manual Exam must be successfully completed prior to pursuing additional training.

2.2.3 The Analyst in Training must be well informed in the content and application of the Idaho State Police Forensic Services Health and Safety Manual. The Health and Safety Manual Exam must be successfully completed prior to pursuing additional training.

2.2.4 Background Reading

1. Idaho State Police Employee Handbook (http://intranet/.htm or equivalent)

2. Idaho State Police Forensic Services ISO/IEC 17025:2005 Compliant Quality/Procedure Manual (I:\International Management System)\

3. Idaho State Police Forensic Services Health and Safety Manual. (I:\International Management System)\

2.3 EVIDENCE HANDLING ISSUES

2.3.1 Describe the procedures followed for the intake and transfer of specimens submitted for alcohol and/or volatiles analysis.

2.3.2 Describe the barrier protection measures required when handling biological samples and unknown liquids.

2.3.3 Describe the types of commonly available blood collection tubes and containers.

2.3.4 Describe what IDAPA 11.03.01 mandates as the proper way to collect a blood and urine sample for a forensic ethanol analysis.

2.3.5 Discuss the preservative and anticoagulant required for IDAPA compliant blood collection tubes/containers in terms of consequences of using an improper collection tube/container.

2.3.6 Describe the types and applications of the toxicology collection kits distributed by ISP-FS.

2.3.7 Discuss how ISP-FS kits comply with the requirements set forth in IDAPA 11.03.01.

2.3.8 Describe the agencies served by their laboratory region and the programs involved.

2.3.9 Background Reading

1. Kippenberger, D.J. and Selavka, C.M. *Training in Specimen Handling*. pp. 33-54, *in:* California Association of Toxicologists (CAT) Manual for Analytical Toxicology. 1994.

2. IDAPA 11, Title 03, Chapter 01: Idaho State Forensic Laboratory Rules Governing Alcohol Testing.

2.4 STATISTICS FOR ANALYTICAL DATA

2.4.1 Reporting of Quantitative Data

The Analyst in Training must possess a working knowledge of statistics applied to analytical data.

2.4.2 Discuss the following terms as they relate to analytical data:
- 2.4.2.1 *Population Mean versus Sample Mean*
- 2.4.2.2 *Population Standard Deviation versus Sample Standard Deviation*

2.4.3 Describe how variance and standard deviation are related.

2.4.4 Discuss the following terms as they relate to analytical data:
- 2.4.4.1 *Normal Distribution*
- 2.4.4.2 *Confidence Interval*

2.4.5 Describe how the population mean and population standard deviation are used to define a Gaussian curve.

2.4.6 Define the following terms as they are applied to analytical data:
- 2.4.6.1 *Accuracy*
- 2.4.6.2 *Precision*

2.4.7 Answer the following questions:
1. Can sample data be precise but not accurate?
2. Can sample data be accurate but not precise?

2.4.8 Contrast Random and Systematic Error.

2.4.9 Describe how standard deviation is used as an uncertainty value.

2.4.10 Discuss the following terms as they are applied to analytical data:
- 2.4.10.1 *Independent Variable*
- 2.4.10.2 *Linear Regression Analysis*
- 2.4.10.3 *Correlation Coefficient*

2.4.11 Background Reading

1. Skoog, D.A., West, D.M., Holler, F.J., Errors in Chemical Analysis. *in:* Analytical Chemistry, pp. 52- 77, Saunders College Publishing, 1994 (6th edition).

2. Linnet, K. and Boyd, J.C., *Selection and Analytical Evaluation of Methods – With Statistical Techniques. in:* TIETZ Textbook of Clinical Chemistry and Molecular Diagnostics, pp. 353 – 407, Elsevier, 2006 (4th edition).

3. Kahn, S.E. and Jandreski, M.A., *Laboratory Statistics.* pp. 340 - 361. *in:* Clinical Chemistry: Theory, Analysis, Correlation, Mosby, 2003.

2.5 SOLUTION PREPARATION

2.5.1 Demonstrate an ability to prepare, and record the preparation of, solutions required in the analysis of alcohol and other volatiles. This includes how to operate the top-loading balance and pipetters.

2.5.2 The Analyst in Training must explain the nomenclature and calculations involved in the determination of weight percent and volume percent solutions.

2.5.3 Background Reading

1. College Chemistry Text, chapter(s) discussing the properties of solutions.

2. Shugar, G.J., Shugar, R.A. and Bauman, L. *Grades of Purity of Chemicals* pp. 145-154, *pH Measurement*. pp. 232-234. *in:* Chemical Technicians' Ready Reference Handbook, McGraw Hill: New York, 1973.

3. Seamonds, B. and Byrne, E.A. *Basic Laboratory Principles and Techniques*. pp. 3 - 43. *in:* Clinical Chemistry: Theory, Analysis, Correlation. Mosby, 2003

2.6 GAS CHROMATOGRAPHY (GC) THEORY AND OPERATION

2.6.1 The Analyst in Training must possess a comprehensive background in regards to the principles of GC.

2.6.2 Provide a brief explanation of GC in terms understandable to a layperson.

2.6.3 Describe the influence carrier gas flow has on the efficiency of a GC-FID.

2.6.4 Define the following terms as they relate to GC.

- 2.6.4.1 *Resolution*
- 2.6.4.2 *Area Under the Curve*
- 2.6.4.3 *HETP*
- 2.6.4.4 *Sensitivity versus Specificity*

2.6.5 Discuss which GC parameters affect resolution. Describe how to approach a lack of resolution.

2.6.6 Discuss measures to alleviate peak tailing.

2.6.7 Describe how amount ratios and response ratios are used to construct a calibration curve.

2.6.8 Discuss the major advantages of using an internal standard method.

2.6.9 Demonstrate their ability to operate a GC equipped with a flame ionization detector (FID) through both the system software and the instrument controller.

2.6.10 Demonstrate a working knowledge of the operating software for the gas chromatograph. This must include the ability to utilize the system software to develop an analysis method, set processing parameters to optimize peak detection and integration, prepare an analysis sequence, reprocess data, and modify the analysis report format.

2.6.11 Demonstrate their ability to maintain a GC equipped with a flame ionization detector (FID). This includes inlet and detector maintenance, column installation, troubleshooting techniques and the documentation thereof.

2.6.12 Background Reading

1. Stafford, D.T., *Chromatography. in:* Principles of Forensic Toxicology, edited by Barry Levin, pp. 91 - 98, 100 - 108, 114 - 118, AACC Press, 2006 (2nd edition).

2. Levine, B. and Caplan, Y.H., *Alcohol. in:* Principles of Forensic Toxicology, edited by Barry Levin, pp. 169 -184, AACC Press, 2006 (2nd edition).

3. Dawling, S. Gas Chromatography. pp. 425-438, in: Clarke's Analysis of Drugs and Poisons, Third ed., edited by Moffat, Osselton, and Widdop, PhP, 2004.

2.7 HEADSPACE THEORY AND OPERATION

2.7.1 Analyst in Training must possess a working knowledge of the theory and practice of headspace analysis.

2.7.2 The Analyst in Training must describe how *the proportionality* known as *Henry's Law,* is utilized in headspace analysis.

2.7.3 The Analyst in Training must demonstrate their ability to operate Headspace Analyzer through both the system software and on the HS instrument.

2.7.4 The Analyst in Training must be acquainted with how the headspace method parameters sample oven temperature, loop temperature, transfer line temperature, vial equilibration time, vial pressurization time; in conjunction with GC cycle time must be optimized.

2.7.5 The Analyst in Training must demonstrate their understanding of the system software as it applies to the headspace analyzer including setting up the HS analysis method.

2.7.6 The Analyst in Training must discuss the maintenance of headspace analyzer. This also includes adjustment of the hand crimper, troubleshooting techniques and the documentation thereof.

2.7.7 Background Reading

1. Stafford, D.T. *Chromatography.* pp. 93-101, 103-114, *in:* Principles of Forensic Toxicology, edited by Barry Levin, AACC, 1999.

2. Saker, E.G. Screening and Quantitation by Headspace Technique of Some of the Vapors Most Commonly Found in Forensic Toxicology. pp. 1-33, in: Current Approaches in Forensic Toxicology, Chapter 11, SOFT Meeting, 1994.

3. Shaw, R.F. *Methods for Fluid Analysis.* pp. 217, 220-222, *in:* Medical-Legal Aspects of Alcohol, Second ed., edited by James C. Garriott, L & J, 2003.

2.8 PIPETTE INTERMEDIATE CHECK THEORY AND OPERATION

2.8.1 ARTEL PCS 2™ Pipette Calibration System

2.8.1.1 The Analyst in Training must have a working knowledge of how to prepare the ARTEL PCS 2™ Pipette Calibration System to perform an intermediate check of the status of a POVA's (piston operated volumetric apparatus) calibration.

2.8.1.2 The Analyst in Training must describe the operating principle of the PCS 2™ Pipette Calibration System.

2.8.1.3 The Analyst in Training must demonstrate their ability to operate the PCS 2™ Pipette Calibration System through completing an intermediate check on the syringes for the sample dilutor.

2.8.1.4 The Analyst in Training must explain the routine maintenance performed on the PCS 2™ Pipette Calibration System.

2.8.1.5 Background Reading

1. Analytical Method 5.1.1, PCS 2 Pipette Calibration.

2. Standard Operating Procedure for the PCS 2™ Pipette Calibration System, Artel Document #310A2715A, April 1997,

3. PCS 2™ Pipette Calibration System Procedure Guide, Artel Document # 15A2135, Version 5.1, 03-28-1997.

4. College Chemistry/Biochemistry Text, chapter(s) discussing Absorption Spectrophotometry.

5. Curtis, R.H., *Performance Verification of Manual Action Pipets: Part I,* Am. Clin. Lab. 12(7):8-9; 1994.

6. Curtis, R.H., *Performance Verification of Manual Action Pipets: Part II,* Am. Clin. Lab. 12(9):16-17; 1994.

2.8.2 Gravimetric Pipette Intermediate Checks

2.8.2.1 The Analyst in Training must describe the principle, equipment and calculations involved when using the gravimetric method to perform an intermediate check of a POVA.

2.8.2.2 The Analyst in Training must demonstrate their ability to perform an intermediate check on the syringes for the sample dilutor.

2.8.2.3 Background Reading

1. ISO 8655-6:2002, Piston-operated volumetric apparatus – Part 6: Gravimetric method for the determination of measurement error.

2.9 SAMPLE DILUTOR OPERATION

2.9.1 The Analyst in Training must have a working knowledge of the Hamilton MICROLAB® dilutor.

2.9.2 The Analyst in Training must demonstrate the operation of the Hamilton MICROLAB® dilutor.

2.9.3 The Analyst in Training must describe the routine maintenance performed on the Hamilton MICROLAB® dilutor.

2.9.4 Background Reading

1. Hamilton MICROLAB® User's Manual.

2.10 ANALYTICAL METHODS

2.10.1 Analytical Method 4.1

2.10.1.1 The Analyst in Training must convey their understanding of the analysis protocol in Analytical Method 4.1 for the *Quantitative Analysis for Ethanol and Qualitative Analysis for Other Volatiles in Blood, Vitreous Humor and Urine by Dual Column Headspace Gas Chromatography.*

2.10.1.2 Analyst in Training must describe the types of samples which qualify for analysis with Analytical Method 4.1.

2.10.1.3 Analyst in Training must detail their approach in determining if a blood tube/container is compliant with IDAPA 11.03.01.

2.10.1.4 Analyst in Training must describe the proper storage of blood, urine and vitreous humor samples in the laboratory.

2.10.1.5 Analyst in Training must describe the quality assurance requirements described in Analytical Method 4.1.

2.10.1.6 Analyst in Training must describe the acceptance criteria for an analysis run.

2.10.1.7 Analyst in Training must describe how quality assurance data is monitored and where it must be stored.

2.10.1.8 Analyst in Training must describe the authentication process for both quantitative and qualitative ethanol and other volatiles standards and controls.

2.10.1.9 Analyst in Training must describe how blood, urine and vitreous humor alcohol concentrations must be reported.

2.10.1.10 Analyst in Training must indicate the statement that must be placed on the analysis report when the blood collection tube/container does not comply with IDAPA 11.03.01.

2.10.1.11 Analyst in Training must indicate the statement that must be placed on the analysis report when urine is analyzed for ethanol concentration.

2.10.1.12 Analyst in Training must describe how qualitative volatiles must be reported.

2.10.1.13 Background Reading

1. Analytical Method 4.1, Quantitative Analysis for Ethanol and Qualitative Analysis for Other Volatiles in Blood, Vitreous Humor and Urine by Dual Column Headspace Gas Chromatography.

2. Idaho Administration Code, IDAPA 11.03.01, Rules Governing Alcohol Testing.

3. Christmore, D.S., Kelly, R.C. and Doshier, L.A. *Improved Recovery and Stability of Ethanol in Automated Headspace Analysis,* J. Forensic Sci. 29(4): 1038-1044; 1984.

4. Restek Applications Note #59598, Dual-Column Confirmational GC Analysis of Blood Alcohols Using the Rtx®-BAC1 and Rtx®-BAC2 Columns, 1999.

5. Stafford, D.T., *Chromatography. in:* Principles of Forensic Toxicology, edited by Barry Levin, pp. 91-98, 100-108, AACC Press, 2006.

6. Levine, B., *Alcohol. in:* Principles of Forensic Toxicology, edited by Barry Levin, pp. 169-184, AACC Press, 2006.

7. Caplan, Y.H., *The Determination of Alcohol in Blood and Breath. in:* Forensic Science Handbook, edited by Richard Saferstein, pp. 594-648, Prentice-Hall New Jersey, 1982.

8. Saker, E.G., *Screening and Quantitation by Head Space Technique of Some of the Vapors Most Commonly Found in Forensic Toxicology*, in: Current Approaches in Forensic Toxicology, Chapter 11, SOFT Meeting, 1994.

9. Klaassen, C.D., *Inhalants, in:* Principles of Forensic Toxicology, edited by Barry Levin, pp. 373-380, AACC Press, 2006.

2.10.2 Analytical Method 4.2

2.10.2.1 The Analyst in Training must convey their understanding of the analysis protocol in Analytical Method 4.2 for the *Analysis of Solutions Containing Ethanol and Common Volatiles.*

2.10.2.2 Analyst in Training must describe the types of samples that Analytical Method 4.2 is applied for.

2.10.2.3 Analyst in Training must describe the quality assurance requirements described in Analytical Method 4.2.

2.10.2.4 Analyst in Training must describe the acceptance criteria for an analysis run.

2.10.2.5 Analyst in Training must describe how quality assurance data is monitored and where it must be stored.

2.10.2.6 Analyst in Training must describe the authentication process for both quantitative and qualitative ethanol and other volatiles standards and controls.

2.10.2.7 The Analyst in Training must discuss the different types of alcoholic beverages and their respective alcohol content.

2.10.2.8 Analyst in Training must describe how alcohol concentrations must be reported in alcoholic beverages, simulator solutions and unknown solutions.

2.10.2.9 Analyst in Training must describe how qualitative volatiles must be reported.

2.10.2.10 Background Reading
In addition to reading listed under 2.10.1.13:

1. ISP-FS Standard Operating Procedure 4.2, *Analysis of Solutions Containing Ethanol and Common Volatiles.*

2. McAnalley, B.H., *Chemistry of Alcoholic Beverages.* pp. 1-27, *in:* Medicolegal Aspects of Alcohol, edited by James C. Garriott, Lawyers & Judges, 1996.

2.10.3 Analytical Method 5.1.1 and 5.1.2

2.10.3.1 The Analyst in Training must convey their understanding of the Pipette Calibration verification options set forth in Analytical Method 5.1.1, *PCS 2™ Pipette Calibration System* and Analytical Method 5.1.2, *Gravimetric Intermediate Checks.*

2.10.3.2 The Analyst in Training must outline the requirements for pipette calibration in regards to frequency and acceptance criteria.

2.10.4 Analytical Method 5.2

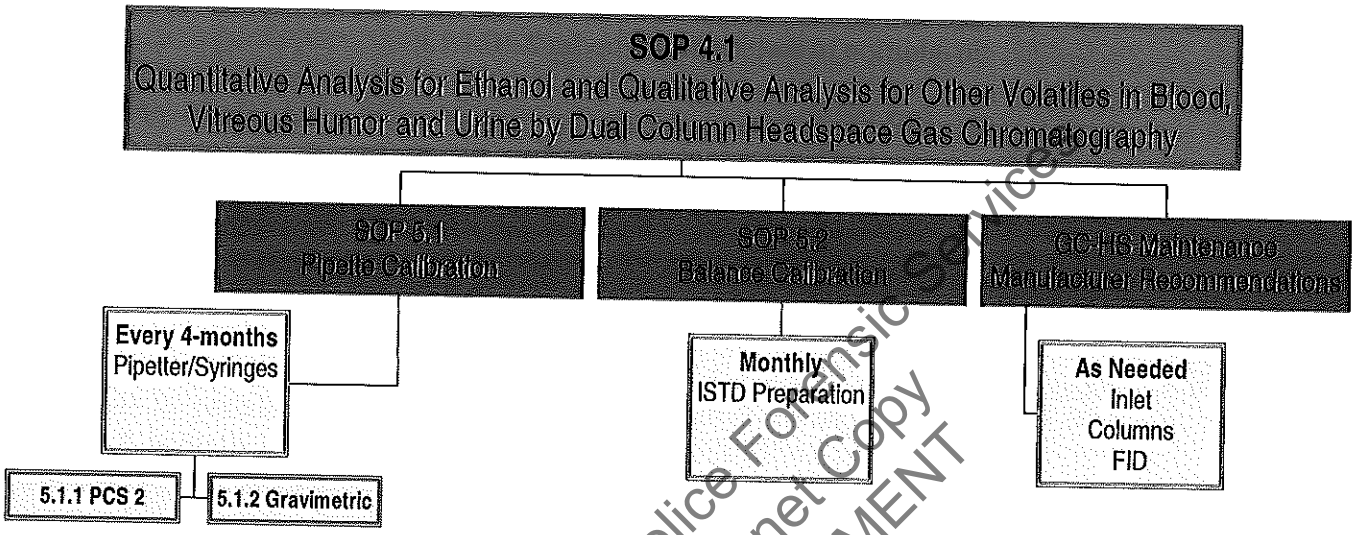
2.10.4.1 The Analyst in Training must convey their understanding of the balance calibration requirements set forth in Analytical Method 5.2, *Balance Calibration and Intermediate Checks.*

2.10.4.2 The Analyst in Training must describe the intermediate check procedure for the balance(s) utilized for preparation of solutions for alcohol/volatiles analysis.

2.10.4.3 The Analyst in Training must outline the requirements for balance calibration and intermediate checks in regards to frequency and acceptance criteria.

2.10.4.4 The Analyst in Training must outline the requirements for periodic and as needed maintenance.

2.10.5 Relationship Between Analytical Methods
The Analyst in Training must explain the following flow diagram.



2.11 CASEFILE PREPARATION

2.11.1 The Analyst in Training must describe which documents, data and completed worksheets are required to be included in an alcohol/other volatiles analysis casefile.

2.11.2 The Analyst in Training must describe the worksheets and data that are to be compiled for a centrally stored QA file for each analysis run.

2.11.3 The Analyst in Training must describe requirements for administrative and technical review of casefile and analysis report.

2.12 PHARMACOLOGY AND IMPAIRMENT DETECTION

2.12.1 The Analyst in Training must demonstrate a working knowledge of the pharmacology of alcohol and other commonly encountered volatiles. This must include an understanding of the factors affecting absorption, distribution and elimination.

2.12.2 The Analyst in Training must describe the situation when the alcohol content of arterial blood exceeds that of venous blood.

2.12.3 The Analyst in Training must be familiar with the metabolism of ethanol and other commonly encountered volatiles. This must include how metabolism relates toxicity.

2.12.4 The Analyst in Training must describe their understanding of the effects of alcohol and other commonly encountered volatiles on the human body. This must include how it contributes to mortality and impairment observed in DUI cases.

2.12.5 The Analyst in Training must describe their understanding of postmortem changes and their effect on alcohol concentration.

2.12.6 The Analyst in Training must be comfortable with the development, performance and interpretation of Standardized Field Sobriety Tests (SFST) and a Drug Recognition Exam (DRE).

2.12.7 Background Reading

1. Levine, B. and Caplan, Y.H., *Alcohol.* pp. 169-184, *in:* Principles of Forensic Toxicology, edited by Barry Levin, AACC, 2006.

2. Kunsman, G.W., *Human Performance Testing.* pp. 15 - 30, *in:* Principles of Forensic Toxicology, edited by Barry Levin, AACC, 2006.

3. Caplan, Y.H., *The Determination of Alcohol in Blood and Breath.* pp. 594-648, *in:* Forensic Science Handbook, edited by Richard Saferstein, New Jersey: Prentice-Hall, 1982.

4. Julien, R.M., *Central Nervous System Depressants: Alcohol and the Inhalants of Abuse.* pp. 64-92, *in:* Primer of Drug Action, New York: Freeman, 1998.

5. Perrine, D.M., *Depressants: Alcohol, Benzodiazepines, Barbiturates*, pp. 113-129, *in:* The Chemistry of Mind-Altering Drugs, ACS, Washington, DC, 1996.

6. Fleming, M.F., Mihic, S.J. and Harris, R.A., *Drugs Acting on the Central Nervous System - Ethanol. in:* Goodman and Gilman's The Pharmacological Basis of Therapeutics, 591 - 606, McGraw-Hill, 2006 (11th edition).

7. Garriott, J.C., *Pharmacology and Toxicology of Ethyl Alcohol.* pp. 23-38, *in:* Medicolegal Aspects of Alcohol, edited by James C. Garriott, Lawyers & Judges, 2003.

8. Jones, A.W., *Disposition and Fate of Alcohol in the Body.* pp. 47-96, *in:* Medicolegal Aspects of Alcohol, edited by James C. Garriott, Lawyers & Judges, 2003.

9. Jones, A.W., *The Biochemistry and Physiology of Alcohol: Applications to Forensic Science and Toxicology.* pp. 113-148, *in:* Medicolegal Aspects of Alcohol, edited by James C. Garriott, Lawyers & Judges, 2003.

10. Garriott, J.C., *Analysis for Alcohol in Postmortem Specimens.* pp. 163-174, *in:* Medicolegal Aspects of Alcohol, edited by James C. Garriott, Lawyers & Judges, 2003.

2.13 PREPARATION AND PRESENTATION OF COURTROOM TESTIMONY

2.13.1 The analyst must discuss proper demeanor and body language while testifying in court.

2.13.2 The analyst must describe proper attire for court.

2.13.3 The analyst must discuss ways to deal with nervousness while testifying.

2.13.4 The analyst must describe how a casefile must be reviewed in preparation for testimony.

2.13.5 The analyst must describe the typical sequence of questions pursued during direct and cross-examination.

2.13.6 The analyst must discuss the implications of the following events:
- 2.13.6.1 Stipulation
- 2.13.6.2 Objection Over-ruled
- 2.13.6.3 Objection Sustained

2.13.7 The analyst must be aware of what is required of them for the following:
- 2.13.7.1 Rebuttal Testimony
- 2.13.7.2 Witness Exclusion

2.13.8 The Analyst in Training must discuss sections of Idaho Code where the analysis of biological or unknown samples could be applied.

2.13.9 Background Reading

1. Weingarten, H. *The Expert Witness: the Toxicologist in Court.* pp. 225- 242, *in:* California Association of Toxicologists (CAT) Manual for Analytical Toxicology Training, 1994.

2. Sannito, T., *Nonverbal Communication in the Courtroom.* Champion, Sept.-Oct., 1985.

3. Idaho Code §18-8002, §18-8004, §18-8006, §23-1333.

2.14 MOCK COURTROOM TESTIMONY

A mock court trial must be conducted for the Analyst in Training to provide testimony for a minimum of the following situations.

1. DUI blood alcohol analysis with pharmacology questions.

2. "Open container violation" including questions about the alcohol concentration of various types of alcoholic beverages.

2.15 ANALYSIS OF CONTROLS AND "OLD" PROFICIENCY TESTS

Upon completion of a minimum of training plan sections 2.3 through 2.9, to develop their expertise in using the analytical method, the Analyst in Training will apply the Analytical Methods to the analysis of control samples, old simulator solutions and/or old blood alcohol proficiency test samples.

2.16 COMPETENCY TESTING

Upon completion of training plan sections 2.2 through 2.13, the Analyst in Training must complete a competency test consisting of the following samples:

1. ≥Six (6) whole blood specimens containing a wide range of appropriate alcohol concentrations and a minimum of one commonly encountered other volatile.

2. ≥Two (2) non-biological solutions containing appropriate ethanol concentrations.

2.17 PERFORMANCE OF ANALYSIS ON CASE MATERIAL

Upon successful completion of competency testing and the Quality Manager has reviewed and approved the training documentation, the Analyst in Training will be responsible of the analysis of no less than 30 case samples under close supervision. The 30 samples must be divided into a minimum of two analysis runs. A listing of the supervised case samples is to be compiled and included in training records.

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Ethanol and Other Volatiles

Topic Completion Sign-off

2.2 ADMINISTRATIVE ISSUES

Date of Completion _____ Analyst in Training _____

Trainer _____

2.3 EVIDENCE HANDLING ISSUES

Date of Completion _____ Analyst in Training _____

Trainer _____

2.4 STATISTICS FOR ANALYTICAL DATA

Date of Completion _____ Analyst in Training _____

Trainer _____

2.5 SOLUTION PREPARATION

Date of Completion _____ Analyst in Training _____

Trainer _____

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Topic Completion Sign-off

2.6 GAS CHROMATOGRAPHY (GC) THEORY AND OPERATION

Date of Completion _____ Analyst in Training _____

Trainer _____

2.7 HEADSPACE THEORY AND OPERATION

Date of Completion _____ Analyst in Training _____

Trainer _____

2.8 PIPETTE INTERMEDIATE CHECK THEORY AND OPERATION

Date of Completion _____ Analyst in Training _____

Trainer _____

2.9 SAMPLE DILUTOR OPERATION

Date of Completion _____ Analyst in Training _____

Trainer _____

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Topic Completion Sign-off

2.10 ANALYTICAL METHODS

Date of Completion _____ Analyst in Training _____

Trainer _____

2.11 CASEFILE PREPARATION

Date of Completion _____ Analyst in Training _____

Trainer _____

2.12 PHARMACOLOGY AND IMPAIRMENT DETECTION

Date of Completion _____ Analyst in Training _____

Trainer _____

2.13 PREPARATION AND PRESENTATION OF COURTROOM TESTIMONY

Date of Completion _____ Analyst in Training _____

Trainer _____

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2.14 MOCK COURTROOM TESTIMONY

Date of Completion _____ Analyst in Training _____

Trainer _____

2.15 ANALYSIS OF CONTROLS AND "OLD" PROFICIENCY TESTS

Date of Completion _____ Analyst in Training _____

Trainer _____

2.16 COMPETENCY TESTING

Date of Completion _____ Analyst in Training _____

Trainer _____

2.17 PERFORMANCE OF ANALYSIS ON CASE MATERIAL

Date of Completion _____ Analyst in Training _____

Trainer _____

Revision #	Issue Date	History
0	05-30-2000	Original Issue
1	12-16-2002	Updated to comply with Quality Manual
2	08-18-2004	Updated, refined, and reformatted.
3	02-01-2005	Additional emphasis on IDAPA 11.03.01 requirements and QA.
4	05-24-2007	Updated language, incorporated table of contents
5	02-05-2009	Added training mandates, including *hands of trainer* is not allowed for this training plan and toxicology training order requirements. Updated references. Added Statistics for Analytical Data section. Reformatting.