Idaho State Police
Forensic Services

Approval for Quality System Controlled Documents

Discipline/Name of Document: Controlled Substances
#11 Analytical Method for the Quantification of Methamphetamine Using GC/MS with Internal Standards

Revision Number: 4

Issue Date: 08/08/2008

APPROVED BY: Corina C Owsley
Quality Manager

8/8/08
Date Signed

#11
Analytical Method
For the Quantification of Methamphetamine
Using GC/MS with Internal Standards

1.0.0 Background

Under normal circumstances quantification of a substance's purity is not part of the analytical scheme used by the Idaho State Police Forensic laboratories. By special request this analysis can be performed. Typically this analysis is performed on casework that will ultimately be tried in federal court. This analytical method was derived from the principles and methods detailed in EPA publication "SW-846" and the states of Oregon and Utah's quantitation analytical methods.

2.0.0 Scope

The following procedures have only been approved for the analysis of methamphetamine.

3.0.0 Equipment and Reagents

3.0.0 Gas Chromatograph/ Mass Spectrometer (GC/MS) and corresponding software.

3.1.0 Solid methamphetamine hydrochloride. The purity is to be documented with a certificate of analysis from the vendor.

3.3.0 ACS grade chloroform stabilized with either ethanol or pentene.

3.4.0 Class A volumetric flasks.

3.5.0 1.0 ml Gastight® type syringes. Syringes that are used to generate the standard calibration curve will have their accuracy checked before each use via section 7.9.0 of this AM. The verification must encompass the expected working range of the syringe, 200ul and 800ul. Syringes that fail to meet the acceptance value of (+/-) 3% will be replaced.

3.6.0 Internal standard. With a ratio of 1.3 ml of (98% or greater) n-tridecane per 1 L chloroform, prepare at least one liter. Each sequence of samples and standards must be made with the same internal standard.

3.7.0 0.5 N sodium carbonate solution. Add 2.7g of sodium carbonate to 100mls of water.

4.0.0 Generation of Standard Curve

A six point calibration curve will be generated.

4.1.0 Prepare a standard stock solution of approximately 2,000 ug/ml. Accurately weigh approximately 40-50 mg of methamphetamine, add to a 25ml volumetric flask and dissolve and bring to volume with the internal standard. Calculate the concentration.

4.2.0 Using the syringe, auto-sampler vials, and stock standard prepare an additional five 1.0 ml standards. Into five autosampler vials place 0.1, 0.2, 0.4, 0.6, 0.8 ml of

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stock std and then dilute to 1.0 ml using the internal standard. The undiluted stock standard must be one of the points on the curve. If the stock standard point does not fall within the linear range of the instrument then a more dilute stock standard is prepared and a new curve is run or the acquisition parameters of the instrument can be altered, i.e. split ratio, and the original curve rerun.

4.3.0 Add approximately 100 ul (3 drops) of a 0.5N sodium carbonate solution to each vial and mix.

4.4.0 Using the GC/MS software set up the calibration acquisition parameters and tables. The curve is to be generated using linear regression with the points weighted using the inverse square. For Hewlett Packard/Agilent Chemstation software, the parameters and tables are found in the data analysis/ calibration section.

5.0.0 Sample Preparation

One of the basic requirements in determining an accurate quantification is that the sample must be homogenous. The sample must also be prepared using the same extraction procedure that was used in generating the standard curve.

5.1.0 Initially rough grind the sample with a mortar and pestle until the entire sample will pass through a US No. 4 sieve. Roll and quarter the sample until a representative sub sample of about 10 grams is obtained. Grind the sub sample until a fine powder is formed. **NOTE:** If the sample is less than 10 grams then grind the entire sample into a fine powder.

5.2.0 Using an analytical balance that is accurate to at least 0.1 milligram, accurately weigh out an amount of sample that is equal to, or less than, what was used for the stock standard, and place into a 25 ml volumetric flask. Add internal standard, dissolve, and bring to volume.

5.3.0 Into an auto sampler vial aliquot approximately one milliliter of sample extract, add approximately 100 ul of 0.5 N Na_2CO_3, mix and analyze.

5.4.0 Samples are to be run in duplicate (two separate weighings and extractions). The sample exhibiting the lowest response is used for calculating the result. The duplicate results must be within 10%, if they are not then extract a new pair of samples and analyze.

5.5.0 If a sample(s) is to be forwarded to another laboratory for quantitative analysis, the originating laboratory will analyze the sample(s) qualitatively, prepare the sample(s) as per 5.1.0 above, then send a maximum of 1g per sample to the laboratory doing the quantitative analysis.

5.5.1 If permission is granted from the federal prosecutor, samples may be analyzed as a composite. The samples will be composited at the originating laboratory by mixing all of the samples that tested positive qualitatively for methamphetamine and the resultant mixture is processed per section 5.1.0.

6.0.0 Calculation and Reporting of Final Results

6.1.0 Calculation

Using the equation of the valid curve, calculate the concentration in the vial (the

computer software should do this). Use the following equation to calculate the concentration of the analyte in the original sample:

$$\frac{(\mathbf{A}\ \text{ug/ml}) \times (\mathbf{Milliliters\ of\ solvent})}{(10) \times (\mathbf{B}\ \text{mg})} = \mathbf{C}\ \%\ \text{analyte}$$

A = Concentration given by curve
B = Weight of sample used, in milligrams

If C is less than 48 % then the sample is re-extracted and reanalyzed using a larger sample size.

6.2.0 Reporting
Using the formula:
C x D x (0.90)= X

Where **C**=result from equation in 6.1.0
D= total weight of sample in grams

Report the result as "the sample contains at least X grams of methamphetamine *calculated as the hydrochloride salt*".

7.0.0 Notes and QA/QC

7.1.0 The curve must be linear as defined by a correlation coefficient of 0.998 or better. The correlation coefficient is generated by the Agilent (Hewlett-Packard) Chemstation software.

7.2.0 The area counts of the internal standard should be consistent from the beginning to the end of the run (+/- 10% of the mean).

7.3.0 A new curve will be generated before each quantitation sequence. A sequence is defined as a batch(s) run consecutively without the introduction of non-quantitation samples. A batch is defined as up to twenty injections. At the end of each batch a positive control will be run, the results of which must be (+/-) 7% of the stated value. The Relative Percent Difference (RPD) will be calculated for each batch of positive controls:

$$RPD = \frac{|R1-R2|}{E} * 100$$

Where R1 = calculated result of the first positive control run after the generation of the curve.
R2 = calculated result of positive control run at the end of the batch, or sequence if two or more batches are run together.
E = Expected value

The RPD will be less than 14%.

7.4.0 Injector should have a split liner with a glass wool plug.

7.5.0 A positive control will be analyzed each time a curve is generated. The positive control will come from a source other than what was used to generate the curve. Another in-house standard from a different lot, if available, and prepared by a different analyst is to be used as the positive control. To a 100ml volumetric flask add approximately 0.1g of methamphetamine, that has been accurately weighed, then dissolve and bring to the mark with internal standard. The positive control is made with the same batch of internal standard as the rest of the run. Aliquot one milliliter into a auto-sampler vial and add sodium carbonate solution.

7.6.0 The accuracy of the curve is validated when the value of the positive control is within (+/-) 7% of the stated value.

7.7.0 The calibration curve, chromatogram and quantitation report of the positive controls, chromatogram(s) and quantitation report(s) of all samples, and chromatograms of all applicable blanks are to be kept in the case notes. Chromatograms of standards used to generate the curve do not need to be kept.

7.8.0 Each time a quantitative analysis is performed a data pack will be sent to the discipline leader. This data pack will include; copies of the calibration curve, all quantitation reports, the calculated positive control RPD's for each batch, and the calculated internal standard mean.

7.9.0 For the 1.0 ml syringe weigh 10 replicate aliquots of water at 200 ul and 800 ul. Calculate average recovery and standard deviation at each level. For the purpose of the calculations, the density of water is 0.998 g/ml. The acceptance criteria are (+/-) 3%.

8.0.0 History

Revision #	Issue or review date	History	Author or Reviewer
0	5/24/02	Original Issue	D.C. Sincerbeaux
1	8/27/02	Add #	D.C. Sincerbeaux
2	1/10/03	Added 7.7 and 7.8	D.C. Sincerbeaux
3	9/30/05	Added 4.4.0, Changed 5.1.0, 5.2.0, 5.3.0, 4.3.0, 7.3.0 and renumbered 7.0. Added 7.10.0	D.C Sincerbeaux
4	8/08/08	added 3.5, 3.6, 5.3, 5.5.0, 5.5.2 6.2, 7.8, 7.9. Changed 4.1, 4.2, 4.4, 6.1, 6.2, 7.1, 7.3, and 7.5	D.C. Sincerbeaux

Idaho State Police
Forensic Services

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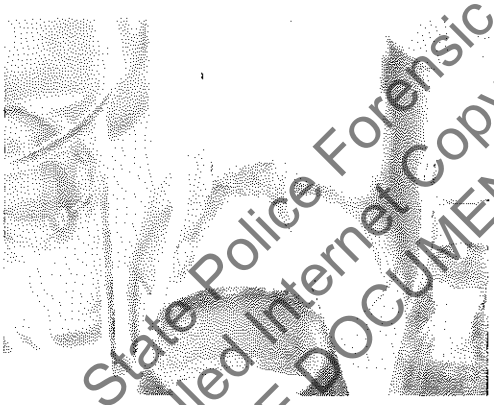

Discipline/Name of Document: Toxicology Training Manual
Section Two – Ethanol and Other Volatiles

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Quality Manager

5/24/07
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TABLE OF CONTENTS

Section Two

Ethanol and Other Volatiles

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Ethanol and Other Volatiles

2.1 TRAINING OBJECTIVES

This section of the toxicology training plan has many objectives. It 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 following 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 *Required Reading* cited and all accessible literature must be consulted as necessary.

To facilitate the over-all process, training for Analytical Method 4.1 and 4.2 must be pursued concurrently. Answers to questions are to be provided verbally and/or in written form depending on the background and experience of the trainee analyst. As part of the training process, the Trainee must assist the Trainer with the preparation of samples for analysis as well as perform analysis on blood control samples. Due to the nature of the analysis of biological fluids to detect ethanol and other volatiles, the Trainee must successfully complete the required competency test prior to supervised application of the Analytical Methods on actual case material.

2.2 ADMINISTRATIVE ISSUES

2.2.1 The Trainee must be familiar with the Idaho State Police Policies Manual.

2.2.2 The Trainee must be knowledgeable of the content and application of the Forensic Services Quality Manual.

2.2.3 The Trainee must be well informed in the content and application of the Forensic Services Health and Safety Manual.

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 Required Reading

1. Kippenberger, D.J. and Selayka, 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.

3. Idaho State Police Forensic Services Technical Bulletin 1, February 2003.

4. Idaho State Police Forensic Services Technical Bulletin 3, February 2003.

5. Idaho State Police Forensic Services Technical Bulletin 5, February 2003.

6. Idaho State Police Forensic Services Technical Bulletin 6, February 2003.

7. Idaho State Police Forensic Services Technical Bulletin 10, September 2003.

2.4 SOLUTION PREPARATION

2.4.1 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.

2.4.2 The Trainee must explain the nomenclature and calculations involved in the determination of weight percent and volume percent solutions.

2.4.3 Required Reading

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

2.5 GAS CHROMATOGRAPHY (GC) THEORY AND OPERATION

2.5.1 The Trainee must possess a comprehensive background in regards to the principles of GC.

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

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

2.5.4 Define the following terms as they relate to GC.

2.5.4.1 *Resolution*
2.5.4.2 *Area Under the Curve*
2.5.4.3 *HETP*
2.5.4.4 *Sensitivity versus Specificity*

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

2.5.6 Discuss measures to alleviate peak tailing.

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

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

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

2.5.10 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, prepare an analysis sequence,

reprocess data, perform a manual calibration, and modify the analysis report format and setting processing parameters to optimize peak detection and integration.

2.5.11 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.

2.5.12 Required Reading

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

2. Levine, B. *Alcohol.* pp. 170-184, *in:* Principles of Forensic Toxicology, edited by Barry Levin, AACC, 1999.

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.

2.6 HEADSPACE THEORY AND OPERATION

2.6.1 Trainee must possess a working knowledge of the theory and practice of headspace analysis.

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

2.6.3 The Trainee must demonstrate their ability to operate a Headspace Analyzer through both the system software and the instrument touch pad.

2.6.4 The Trainee must be acquainted with how the headspace method parameters such as the GC cycle time, thermostating time, pressurization time, etc., must be optimized.

2.6.5 The Trainee must demonstrate their understanding of the system software as it applies to the headspace analyzer including setting up the HS analysis method.

2.6.6 The Trainee must demonstrate or discuss their ability to maintain a headspace analyzer. This includes replacement of seals and sampling needle, transfer line replacement, adjustment of the hand crimper, troubleshooting techniques and the documentation thereof.

2.6.7 Required 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.

2.7 PIPETTE INTERMEDIATE CHECK THEORY AND OPERATION

2.7.1 ARTEL PCS 2™ Pipette Calibration System

2.7.1.1 The Trainee 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.

2.7.1.2 The Trainee must describe the operating principle of the PCS 2™ Pipette Calibration System.

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

2.7.1.4 The Trainee must explain the routine maintenance performed on the PCS 2™ Pipette Calibration System.

2.7.1.5 Required 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.

2.7.2 Gravimetric Pipette Intermediate Checks

2.7.2.1 The Trainee must describe the principle, equipment and calculations involved when using the gravimetric method to perform an intermediate check of a POVA.

2.7.2.2 The Trainee must demonstrate their ability to perform an intermediate check on the syringes for the sample dilutor.

2.7.2.3 Required Reading

1. Byer, B.J., How to Use and Check Pipetting Equipment, Scientific Newsletters, Inc., 1977.

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

2.8 SAMPLE DILUTOR OPERATION

2.8.1 The Trainee must have a working knowledge of the Hamilton MICROLAB® dilutor.

2.8.2 The Trainee must demonstrate the operation of the Hamilton MICROLAB® dilutor.

2.8.3 The Trainee must describe the routine maintenance performed on the Hamilton MICROLAB® dilutor.

2.8.4 Required Reading

1. Hamilton MICROLAB® User's Manual.

2.9 ANALYTICAL METHODS

2.9.1 Analytical Method 4.1

2.9.1.1 The Trainee 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.*

2.9.1.2 Trainee must describe the types of samples which qualify for analysis with Analytical Method 4.1.

2.9.1.3 Trainee must detail their approach in determining if a blood tube/container is compliant with IDAPA 11.03.01.

2.9.1.4 Trainee must describe the proper storage of blood, urine and vitreous humor samples in the laboratory.

2.9.1.5 Trainee must describe the quality assurance requirements described in Analytical Method 4.1.

2.9.1.6 Trainee must describe the acceptance criteria for an analysis run.

2.9.1.7 Trainee must describe how quality assurance data is monitored and where it must be stored.

2.9.1.8 Trainee must describe the authentication process for both quantitative and qualitative ethanol and other volatiles standards and controls.

2.9.1.9 Trainee must describe how blood, urine and vitreous humor alcohol concentrations must be reported.

2.9.1.10 Trainee 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.

2.9.1.11 Trainee must indicate the statement that must be placed on the analysis report when urine is analyzed for ethanol concentration.

2.9.1.12 Trainee must describe how qualitative volatiles must be reported.

2.9.1.13 To develop their expertise in using the Analytical Method, the Trainee will apply the Analytical Method to the analysis control samples and/or old proficiency test samples.

2.9.1.14 <u>Required Reading</u>

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 Optimized for the Perkin-Elmer HS-40 Headspace Autosampler, 1999.

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

6. Levine, B., *Alcohol. in:* Principles of Forensic Toxicology, edited by Barry Levin, pp. 170-184, AACC Press, 1999.

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. 341-348, AACC Press, 2003.

2.9.2 Analytical Method 4.2

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

2.9.2.2 Trainee must describe the types of samples that Analytical Method 4.2 is applied for.

2.9.2.3 Trainee must describe the quality assurance requirements described in Analytical Method 4.2.

2.9.2.4 Trainee must describe the acceptance criteria for an analysis run.

2.9.2.5 Trainee must describe how quality assurance data is monitored and where it must be stored.

2.9.2.6 Trainee must describe the authentication process for both quantitative and qualitative ethanol and other volatiles standards and controls.

2.9.2.7 The Trainee must discuss the different types of alcoholic beverages and their respective alcohol content.

2.9.2.8 Trainee must describe how alcohol concentrations must be reported in alcoholic beverages, simulator solutions and unknown solutions.

2.9.2.9 Trainee must describe how qualitative volatiles must be reported.

2.9.2.10 To develop their expertise in using the Analytical Method, the Trainee will apply the Analytical Method to the analysis of control samples and/or simulator solutions.

2.9.2.11 Required Reading

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

2. 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.

3. Restek Applications Note #59598, Dual-Column Confirmational GC Analysis of Blood Alcohols Using the Rtx®-BAC1 and Rtx®-BAC2 Columns Optimized for the Perkin-Elmer HS-40 Headspace Autosampler, 1999.

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

5. Levine, B., *Alcohol. in:* Principles of Forensic Toxicology, edited by Barry Levin, pp. 170-184, AACC Press, 1999.

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

2.9.3 Analytical Method 5.1.1 and 5.1.2

2.9.3.1 The Trainee 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.*

2.9.3.2 The Trainee must outline the requirements for pipette calibration in regards to frequency and acceptance criteria.

2.9.4 Analytical Method 5.2

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

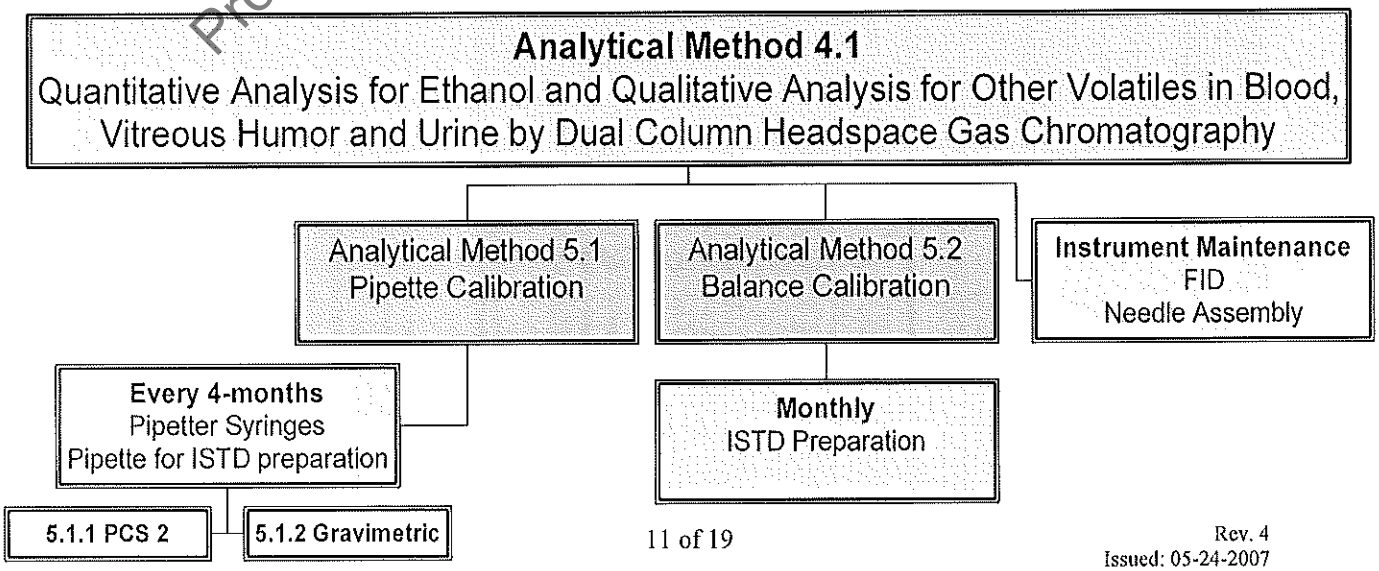
2.9.4.2 The Trainee must describe the intermediate check procedure for the balance(s) utilized for preparation of solutions for alcohol/volatiles analysis.

2.9.4.3 The Trainee must outline the requirements for balance calibration and intermediate checks in regards to frequency and acceptance criteria.

2.9.4.4 The Trainee must outline the requirements for periodic and as needed maintenance.

2.9.5 Relationship Between Analytical Methods

2.9.5.1 The Trainee must explain the following flow diagram.



2.10 CASEFILE PREPARATION

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

2.10.2 The Trainee must describe the worksheets and data that are to be compiled for a centrally stored QA file for each analysis run.

2.10.3 The Trainee must describe requirements for administrative and technical review of casefile and analysis report.

2.11 PHARMACOLOGY AND IMPAIRMENT DETECTION

2.11.1 The Trainee 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.

2.11.2 The Trainee must describe the situation when the alcohol content of arterial blood exceeds that of venous blood.

2.11.3 The Trainee must be familiar with the metabolism of ethanol and other commonly encountered volatiles. This must include how metabolism relates toxicity.

2.11.4 The Trainee 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.

2.11.5 The Trainee must describe their understanding of postmortem changes and their effect on alcohol concentration.

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

2.11.7 Required Reading

1. Levine, B., *Alcohol.* pp. 170-184, *in:* Principles of Forensic Toxicology, edited by Barry Levin, AACC, 1999.

2. Kunsman, G.W., *Human Performance Testing.* pp. 170-184, *in:* Principles of Forensic Toxicology, edited by Barry Levin, AACC, 1999.

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. Hobbs, W.R., Rall, T.W. and Verdoorn, T.A., *Drugs Acting on the Central Nervous System - Hypnotics and Sedatives; Ethanol.* pp. 361, 386-393, *in:* Goodman and Gilman's The Pharmacological Basis of Therapeutics, McGraw-Hill, 1996.

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.

2.12 PREPARATION AND PRESENTATION OF COURTROOM TESTIMONY

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

2.12.2 The analyst must describe proper attire for court.

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

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

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

2.12.6 The analyst must discuss the implications of the following events:
- 2.12.6.1 Stipulation
- 2.12.6.2 Objection Over-ruled
- 2.12.6.3 Objection Sustained

2.12.7 The analyst must be aware of what is required of them for the following:
- 2.12.7.1 Rebuttal Testimony
- 2.12.7.2 Witness Exclusion

2.12.8 The Trainee must discuss sections of Idaho Code where the analysis of biological or unknown samples could be applied.

2.12.98 Required 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.

2.13 MOCK COURTROOM TESTIMONY

A mock court trial must be conducted for the Trainee 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.

2.14 COMPETENCY TESTING

To complete training, the Trainee 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.

2.15 PERFORMANCE OF ANALYSIS ON CASE MATERIAL

Upon successful completion of competency testing, the Trainee must complete no less than 30 case samples under close supervision. The 30 samples must be divided into a minimum of two analysis runs. The Trainer will cosign these case reports. A listing of the co-signed case samples is to be compiled and included in training records.

Idaho State Police
Forensic Services
Toxicology Discipline

Section Two

Ethanol and Other Volatiles

Topic Completion Sign-off

2.2 ADMINISTRATIVE ISSUES

Date of Completion _____ Trainee _____

Trainer _____

2.3 EVIDENCE HANDLING ISSUES

Date of Completion _____ Trainee _____

Trainer _____

2.4 SOLUTION PREPARATION

Date of Completion _____ Trainee _____

Trainer _____

2.5 GAS CHROMATOGRAPHY (GC) THEORY AND OPERATION

Date of Completion _____ Trainee _____

Trainer _____

2.6 HEADSPACE THEORY AND OPERATION

Date of Completion

Trainee

Trainer

2.7 PIPETTE INTERMEDIATE CHECK THEORY AND OPERATION

Date of Completion

Trainee

Trainer

2.8 SAMPLE DILUTOR OPERATION

Date of Completion

Trainee

Trainer

2.9 STANDARD OPERATING PROCEDURES

Date of Completion

Trainee

Trainer

2.10 CASEFILE PREPARATION

Date of Completion

Trainee

Trainer

2.11 PHARMACOLOGY AND IMPAIRMENT DETECTION

Date of Completion

Trainee

Trainer

2.12 PREPARATION AND PRESENTATION OF COURTROOM TESTIMONY

Date of Completion

Trainee

Trainer

2.13 MOCK COURTROOM TESTIMONY

Date of Completion

Trainee

Trainer

2.14 COMPETENCY TESTING

Date of Completion

Trainee

Trainer

2.15 PERFORMANCE OF ANALYSIS ON CASE MATERIAL

Date of Completion

Trainee

Trainer

Section Two

Ethanol and Other Volatiles

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, 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

FBI NATIONAL ACADEMY

MONIDA CHAPTER

IDAHO PRIMARY AND ALTERNATES

(List of 16)

Region	Primary	Alternate #1	Alternate #2	Alternate #3
I	235th Graduated Donald Ashenbrenner Coeur d'Alene PD	239th Daniel Mattos Kootenai County SO	243rd Greg McLean Post Falls PD	247th Kimberly Edmonson Kootenai County SO
II	236th Currently-Attending Bill Bones Boise PD	240th Jeff Lavey Meridian PD	244th Scott Mulcahy Boise PD	248th Frank Wyant Caldwell PD
III	237th Terry Felsman Pocatello PD	241st Rajeev Sahni Ada County SO	245th Scott Gay Blackfoot PD	249th Ken Brown Idaho Falls PD
IV	238th William Gardiner ISP	242nd Richard K. Allen Garden City PD	246th Kevin Hudgens ISP	250th William Reese ISP

Additional Nominees:

251st -
252nd - Dana Borgquist, Ada County SO
253rd -
254th - Charlie Spencer, ISP

234th Session - 7/6 - 9/12/2008
235th Session - 9/28 - 12/12/2008
236th Session - 1/3 – 3/13/2009
237th Session - 3/29 – 6/5/2009
238th Session -7/5 – 9/11/2009
239th Session - 9/27 – 12/11/2009
240th Session -1/3 – 3/12/2010
241st Session – 3/28 – 6/4/2010
242nd Session – 6/27 – 9/13/2010
243rd Session – 9/26 – 12/3/2010
244th Session – 1/2011
245th Session – 3/2011
246th Session – 7/2011
247h Session – 9/2011
248th Session – 1/2012
249th Session – 3/2012
250th Session – 7/2012
251st Session – 9/2012
252nd Session – 1/2013
253rd Session 3/2013
254th Session – 7/2013
255th Session – 9/2013
256th Session 1/2014
257th Session – 3/2014

9/19/08

STATE OF IDAHO NA APPLICANTS

REGION I

Rank	Name	Department	Date of Application	Comments
Sgt.	GREENSIDES, JAMES	Coeur d'Alene PD	12/01/95	
Sgt.	BODNAR, JONATHAN B.	Kootenai County SO	6/11/97	
Sgt.	PICHE, TED P.	Lewiston PD	1/12/01	
Chief Deputy	ALEXANDER, MITCHELL V.	Shoshone County SO	1/27/04	
Lt.	EDMONDSON, KIMBERLY J.	Kootenai County SO	4/01/04	247th Nominee
Lt.	MATTOS, DANIEL M.	Kootenai County SO	3/14/06	239th Nominee
Sgt.	AYERS, JASON	Coeur d'Alene PD	1/31/07	
Lt.	McLEOD, DUNCAN	Coeur d'Alene PD	2/07/07	
Lt.	McLEAN , GREG MARTIN	Post Falls PD	2/28/07	243rd Nominee

9/19/08

STATE OF IDAHO NA APPLICANTS

REGION II

Rank	Name	Department	Date of Application	Comments
Capt.	FOLWELL, RANDALL J.	Ada County SO	8/31/96	
Lt.	SAHNI, RAJEEV	Ada County SO	9/9/96	241st Nominee
Capt.	BONES, WILLIAM J.	Boise PD	10/4/00	236th Nominee Currently attending
Lt.	OVERTON, JOHN A.	Meridian PD	*11/8/99	
Lt.	STOWE, ROBERT D.	Meridian PD	*11/8/99	
Patrol Sgt.	RANDALL, TIM S.	Nampa PD	11/5/01	
Lt.	SHEPHERD, AARON D.	Ada County SO	9/4/02	
Sgt.	CALLEY, PATRICK M.	Ada County SO	9/11/02	
Sgt.	ROWE, MICHAEL J.	Ada County SO	9/4/02	
Sgt.	SCHNEIDER, PATRICK L.	Ada County SO	9/5/02	
Sgt.	OLSEN, ALAN W.	Ada County SO	9/9/02	
Capt.	ALLEN, RICHARD K.	Garden City PD	10/5/02	242nd Nominee
Sgt.	WALLACE, CRAIG E.	Garden City PD	10/10/02	
Capt.	WYANT, FRANK M.	Caldwell PD	10/25/02	248th Nominee
Lt.	MOORE, CHRISTOPHER A.	McCall PD	11/7/02	
Chief	LAVEY, JEFFREY ALLEN	Meridian PD	2/17/06	240th Nominee
Staff Sgt.	THUESON, TERANCE ANDREWS	Twin Falls PD	10/16/06	
Capt.	MULCAHY, SCOTT	Boise PD		244th Nominee
Capt.	RITTER, PETER B	Boise PD	12/13/03	
'Capt.	COMPTON, GARY L.	Boise PD	12/11/04	
Capt.	SMITH, HAROLD EUGENE	Boise PD	4/27/06	
Lt.	STOTTS, CRAIG	Twin Falls PD	1/19/06	
Capt.	BORGQUIST, DANA	Ada County SO	10/17/06	252nd Nominee
Lt.	BUCK, STACY	Kimberly-Hansen PD	10/8/08	

9/19/08

STATE OF IDAHO NA APPLICANTS

REGION III

Rank	Name	Department	Date of Application	Comments
Lt.	FELSMAN, TERRY F.	Pocatello PD	2/6/97	237th Nominee
Sgt.	LINN, KENNETH E.	Pocatello PD	2/11/97	
Sgt.	BRENNAN, MICHAEL P.	Pocatello PD	2/12/97	
Asst. Chief	McNEIL, MICHEAL V.	Ketchum PD	6/16/03	
Lt.	HIGGINS, KELLY J.	Chubbuck PD	2/12/05	
Lt.	GAY, SCOTT L.	Blackfoot PD	4/6/05	245th Nominee
Capt. Detectives	WILLIAMS, TRAVIS McCALL	Madison County SO	8/15/05 2/13/07	
Capt.	BROWN, KEN	Idaho Falls PD	6/5/06	249th Nominee
Sgt.	ERICKSON, COLIN	Rexburg PD	10/9/06	
Detective	BALL, RONALD	Rexburg PD	10/18/06	
Sgt.	BARKER, DOUGLAS	Rexburg PD	2/1/07	
Lt.	FOSTER, ROBERT	Rexburg PD	2/1/07	
Detective	STUBBS, DAVID GLEN	Rexburg PD	8/29/07	
Lt.	PETERSON, TERRY JAMES "JIM"	Pocatello PD	2/25/08	

9/19/08

STATE OF IDAHO NA APPLICANTS

REGION IV

Rank	Name	Department	Date of Application	Comments
Lt.	SCHENCK, CHRISTOPHER G.	Idaho State Police	1/16/98	
Sgt.	FIELD, RICHARD A.	Idaho State Police	9/2/98	
Lt.	KAUFMAN, GARY L.	Idaho State Police	12/2/799	
Sgt.	PETERSON, ALLEN D.	Idaho State Police	1/1/00	
Sgt.	GONZALES, ISMAEL J.	Idaho State Police	1/2/00	
Lt.	GANSKE, MICHAEL J.	Idaho State Police	1/4/00	
Sgt.	CARLOCK, VICTORIA J.	Idaho State Police	1/7/00	
Sgt.	GREEAR, JONELLE S.	Idaho State Police	1/10/00	
Sgt.	JOHNSON, TIM B.	Idaho State Police	1/12/00	
Sgt.	OLIVER, KENT E.	Idaho State Police	1/12/00	
Sgt.	MATLOCK, DEAN L.	Idaho State Police	1/13/00	
Lt.	SPENCER, CHARLIE J.	Idaho State Police	5/26/04	250th Nominee
Lt.	REESE, WILLIAM L.	Idaho State Police	7/19/04	
Sgt.	DYE, GORDON S.	Idaho State Police	8/25/04	
Sgt.	WHITE, KEVIN A.	Idaho State Police	8/29/04	
Sgt.	BRUSH, GARY S.	Idaho State Police	9/2/04	
Lt.	OSWALD, ALLEN J.	Idaho State Police	4/22/05	
Capt.	GARDINER, WILLIAM F.	Idaho State Police	10/25/06	238th Nominee
Lt.	WEADICK, CHRISTOPHER	Idaho State Police	10/25/06	
Lt.	DAVIS, STEVEN A	Idaho State Police	2/5/07	
Capt.	HUDGENS, KEVIN	Idaho State Police	3/4/08	246th Nominee

Idaho FBINAA
Advisory Board Meeting
Post Falls, Idaho September 24, 2008

Attendance:
Pat Bermingham, Jim Kerns, Kevin Fuhr, Ron Freeman, Kevin Platts, Robert Storm, Lonnie Richardson, Ralph Powell, Dorothy Broyles, Randy Lewis, Bruce Jones, Scot Haug, Travis Chaney, Dave Kramer

Meeting Called to order by President Scot Haug at 0700 hrs.

Items of Business:

- Dorothy Broyles provided copies of the matrix showing the regions candidates and noted that session # 247 had been inadvertently left out and said we would have to insert session #247 into the matrix and move the other sessions to follow.
- Jim Kerns asked for discussion on ISP having their own region, and for consideration to have them fall within the other regions, and that it is important that the ISP Officers that have been given the opportunity to attend the NA remain active in the Association. Kerns also suggested possibly having one ISP Representative for each of the Regions.
- Bruce Jones commented that he recalled ISP being given their own region because of their size and the Director selects.
- Ralph Powell said that it is difficult fitting in to the other regions, because the State Police when they have promotions may move the person from one region to another region of the State. ISP has already given up one spot that they had every 3rd or 4th session. He reiterated that they have been trying to be very considerate of the other regions and accommodating them by not taking extra slots when they become available.
- Jim Kerns inquired why ISP has not had a more active participation in the Chapter.
- Ralph Powell responded that ISP has encouraged members by paying registration, and travel expenses but are prohibited from paying membership costs. The costs of attending the conference are sometimes competing with other training needs with limited funding to do both.
- Travis Chaney suggested that the Association prepare a written agreement that as part of being selected to attend the NA, they will agree to remain active in the Chapter functions and membership. He also agrees that ISP needs to get more involved in having members remain active and participate in the Chapter conference.
- Travis Chaney covered how Idaho obtained a couple extra slots during his term as President, he was able to persuade the FBI of the need for our region when he was back at the Presidents meeting, but within about the last 4 years, we have lost some of those slots, and it is more difficult for us to meet the needs of our Matrix list.
- Ralph Powel stated that their new Director is supportive of the NA. He asked for the opportunity to discuss with the Director about a change to their policy or procedure on assigning NA graduates from the ISP to attend and remain active in the Association.

- Kevin Platts suggested that an option to paying for membership might be to make the membership transferable and not issued to an individual.
- Scot Haug suggested sending a letter to the Director of ISP showing the benefits and expectations of the Chapter on sending a candidate to the National Academy. He also agreed that a written agreement as part of the consideration for attendance packet should be looked at. Scot will get with incoming President Rob Storm and the Montana Chapter to work on a possible agreement.
- The Matrix was reviewed for changes by each region.
- The issue of ISP's involvement with participation was tabled until Ralph Powell has an opportunity to discuss it with the Director, and he will report to us at the next meeting.
- Scot Haug turned the meeting over to new President of the Montana/ Idaho Chapter FBINAA, Rob Storm.
- No further business was discussed and the meeting was adjourned.

Report submitted by:
David Kramer
Idaho Advisory Board Secretary